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AGENCY FOR INTERNATIONAL DEVELOPMENT
MISSION TO THE PHILIPPINES
APO San Francisco 96528

194p

# PROJECT PAPER

PROPOSAL AND RECOMMENDATIONS
FOR THE REVIEW OF THE
ASIA PROJECT ASSISTANCE COMMITTEE

MARCH 14, 1978

PHILIPPINES – SMALL FARMER SYSTEMS

UNCLASSIFIED

## SMALL FARMER SYSTEMS

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## ACRONYMS

| | | |
|---|---|---|
| ASEAN | - | Association of Southeast Asian Nations |
| BAECON | - | Bureau of Agricultural Economics |
| BIDA | - | Barangay Irrigators Development Association |
| BIDT | - | Basic Institutional Development Training |
| BISA | - | Barangay Irrigators Service Association |
| BMT | - | Basic Management Training |
| CDM | - | Camp Dresser & McKee International, Inc. |
| CY | - | Calendar Year |
| FAR | - | Fixed Amount Reimbursement |
| FSDC | - | Farm Systems Development Corporation |
| FX | - | Foreign Exchange |
| GOP | - | Government of the Philippines |
| HYVs | - | High Yielding Varieties |
| IFB | - | Invitation for Bid |
| ILO | - | International Labor Organization |
| IO | - | Institutional Officer |
| IRR | - | Internal Rate of Return |
| IRRI | - | International Rice Research Institute |
| ISA | - | Irrigators Service Association |
| LOP | - | Life of Project |
| MTIP | - | Management Training for Innovation Packages |
| NEA | - | National Electrification Administration |
| NGA | - | National Grains Authority |
| NIA | - | National Irrigation Administration |
| PCARR | - | Philippine Council for Agriculture & Resources Research |
| PM | - | Program Manager |
| RPWM | - | Rice and Production Water Management |
| SEC | - | Securities & Exchange Commission |
| SFS | - | Small Farmer Systems |
| SIO | - | Supervising Institutional Officer |
| UNCTAD | - | United Nations Conference on Trade and Development |
| UNDP | - | United Nations Development Programme |
| UPLB | - | University of the Philippines - Los Banos |

## MEASURES AND FOREIGN TERMS

| | | |
|---|---|---|
| 1 Cavan | - | 50 kilos |
| 1 Hectare (Ha) | - | 2.48 acres |
| $1.0 | - | ₱7.5 |
| Palay | - | Rough or unmilled rice |
| Kaisahan | - | Subgroup of about 10 farmers within an ISA |

# PART I

# SUMMARY AND RECOMMENDATIONS

AGENCY FOR INTERNATIONAL DEVELOPMENT

# PROJECT PAPER FACESHEET

1. TRANSACTION CODE: A (A - ADD, C - CHANGE, D - DELETE)

PP

2. DOCUMENT CODE: 3

3. COUNTRY/ENTITY: Philippines

4. DOCUMENT REVISION NUMBER:

5. PROJECT NUMBER (7 digits): 492-0301

6. BUREAU/OFFICE: A. SYMBOL: ASIA; B. CODE: 04

7. PROJECT TITLE (Maximum 40 characters): Small Farmer Systems

8. ESTIMATED FY OF PROJECT COMPLETION: FY 81

9. ESTIMATED DATE OF OBLIGATION: A. INITIAL FY 78; B. QUARTER 4 (Enter 1, 2, 3, or 4); C. FINAL FY 80

10. ESTIMATED COSTS ($000 OR EQUIVALENT $1 )

| A. FUNDING SOURCE | FIRST FY B. FX | FIRST FY C. L/C | FIRST FY D. TOTAL | LIFE OF PROJECT E. FX | LIFE OF PROJECT F. L/C | LIFE OF PROJECT G. TOTAL |
|---|---|---|---|---|---|---|
| AID APPROPRIATED TOTAL | 1,110 | 2,045 | 3,155 | 1,700 | 9,300 | 11,000 |
| (GRANT) | ( 110 ) | ( 45 ) | ( 155 ) | ( 700 ) | ( 300 ) | ( 1,000 ) |
| (LOAN) | ( 1,000 ) | ( 2,000 ) | ( 3,000 ) | ( 1,000 ) | ( 9,000 ) | ( 10,000 ) |
| OTHER U.S. 1. | | | | | | |
| OTHER U.S. 2. | | | | | | |
| HOST COUNTRY | | 1,600 | 1,600 | | 10,500 | 10,500 |
| OTHER DONOR(S) | | | | 1,900 | | 1,900 |
| TOTALS | 1,110 | 3,645 | 4,755 | 3,600 | 19,800 | 23,400 |

11. PROPOSED BUDGET APPROPRIATED FUNDS ($000)

| A. APPROPRIATION | B. PRIMARY PURPOSE CODE | PRIMARY TECH. CODE C. GRANT | PRIMARY TECH. CODE D. LOAN | E. 1ST FY 78 F. GRANT | E. 1ST FY 78 G. LOAN | H. 2ND FY 79 I. GRANT | H. 2ND FY 79 J. LOAN | K. 3RD FY 80 L. GRANT | K. 3RD FY 80 M. LOAN |
|---|---|---|---|---|---|---|---|---|---|
| (1) FN | B213 | 010 | 010 | 155 | 3,000 | 350 | 7,000 | 495 | |
| (2) | | | | | | | | | |
| (3) | | | | | | | | | |
| (4) | | | | | | | | | |
| TOTALS | | | | | | | | | |

| A. APPROPRIATION | N. 4TH FY 81 O. GRANT | N. 4TH FY 81 P. LOAN | Q. 5TH FY 82 R. GRANT | Q. 5TH FY 82 S. LOAN | LIFE OF PROJECT T. GRANT | LIFE OF PROJECT U. LOAN |
|---|---|---|---|---|---|---|
| (1) FN | - | - | - | - | 1,000 | 10,000 |
| (2) | | | | | | |
| (3) | | | | | | |
| (4) | | | | | | |
| TOTALS | | | | | | |

12. IN-DEPTH EVALUATION SCHEDULED: MM 12 YY 79

13. DATA CHANGE INDICATOR. WERE CHANGES MADE IN THE PID FACESHEET DATA, BLOCKS 12, 13, 14, OR 15 OR IN PRP FACESHEET DATA, BLOCK 12? IF YES, ATTACH CHANGED PID FACESHEET.

1 (1 - NO, 2 - YES)

14. ORIGINATING OFFICE CLEARANCE

SIGNATURE: [signature]

TITLE: William F. McDonald
Acting AD/CD

DATE SIGNED: MM 03 DD 06 YY 78

15. DATE DOCUMENT RECEIVED IN AID/W, OR FOR AID/W DOCUMENTS, DATE OF DISTRIBUTION: MM 03 DD 23 YY 78

AID 1330-4 (3-76)

## Philippines - Small Farmer Systems

### Summary and Recommendations

1. Borrower/Beneficiary: The Government of the Republic of the Philippines (GOP) will be the Borrower. The Executing Agencies will be (a) the Farm Systems Development Corporation (FSDC) and (b) approximately 600 existing Irrigators Service Associations (ISAs) plus 280 new ISAs whose members will be the ultimate beneficiaries. FSDC is an autonomous public corporation created to promote the organization and support of irrigation cooperatives and other farm-based associations. Its purpose is to increase agricultural productivity, raise farmer incomes and hasten rural development.

2. Amount of Loan: $10.0 million.

3. Terms: Repayment within 20 years, including a ten-year grace period; interest at 2% annually during the grace period, and 3% thereafter.

4. Amount of Grant: $1.0 million.

5. Purpose: To assist the GOP in its efforts to increase the productivity and hence the incomes of small farm families by providing them with irrigation and other farm support systems.

6. Project Description: The project consists of establishing small farmer irrigator associations so that members may own, operate and maintain irrigation and other farm support systems under the GOP's program for assisting small farmers. It is anticipated that approximately 280 new ISAs will be developed and some 600 existing ISAs further assisted as a result of this project. The project name has been changed from Small Scale Irrigation to Small Farmer Systems, at the request of the Administrator of FSDC, to more adequately reflect the nature of the project.

7. Project Costs and Financing Arrangements: The $10.0 million AID loan is being made available to FSDC for (a) the foreign exchange costs of necessary commodities and services to develop the FSDC and the ISAs and (b) the local currency costs of constructing and equipping the ISAs. The $1.0 million grant is being made available to FSDC to finance participant training and technical assistance. The GOP's contribution to the financing of the project is currently

estimated to be $10.5 million equivalent. The Danish Government has negotiated a $2.6 million commodity loan for irrigation pumps. Approximately $1.9 million is anticipated to be available during the life of the project.

8. Project Analyses: Technical, financial, social and economic analyses have been conducted and are presented in the body of this Project Paper. The results of these analyses and the general knowledge about the project lead to the conclusion that the proposed project is sound and suitable for AID financing. Furthermore, the experience gained from implementation of the previous AID assistance to FSDC has resulted in an intimate understanding of the nature of assistance to small farmers, including the many problems to be overcome. (A discussion of issues raised in the PRP Approval Message and subsequent communications is found in Annex A.)

9. Recommendations: It is recommended that:

   A. An AID funding level of $10.0 million loan and $1.0 million grant LOP be approved;

   B. A loan be authorized in the amount of at least $3.0 million; and

   C. A grant be authorized in the amount of at least $155,000 (FY 79 - $520,000; FY 80 - $325,000).

# PART II

## PROJECT BACKGROUND AND DETAILED DESCRIPTION

## A. BACKGROUND

It is estimated[1] that there are some 750,000 farmers cultivating 5 hectares or less of potentially irrigable land in the Philippines. These people are poor, and the low quality of their lives is regulated by a cycle of debt, low yields, low income and high risks with few opportunities to control and improve their situations.

Since 1972, the Government of the Republic of the Philippines (GOP) has been committed to a policy of increasing the self reliance and productivity of the small farmer, and expanding his participation in the development of the country. During this period, the GOP undertook a vigorous effort with large injections of government and foreign capital to spur the construction of large-scale multi-purpose irrigation infrastructure schemes through the National Irrigation Administration (NIA) in all areas of the country. During the implementation of the NIA programs it was realized that for small farmers, the topography of whose land was suitable for small irrigation systems, the provision of irrigation water through infrastructure schemes alone would not be sufficient in themselves to increase production, and hence incomes, and hence the quality of farmers' lives. To achieve this end, it was felt that farmers would need an institution tailored to their specific needs through which information and training on the best way to use such irrigated water could be channeled.

Thus in April 1975, the Farm Systems Development Corporation (FSDC) was created by Presidential Decree No. 681. Its task was to promote the organization and development of small scale irrigation and other farm-based associations. Its objective was to increase small farmers' incomes and hasten rural development by enlisting the farmers' commitment in efforts to improve agricultural productivity.

AID's interest in supporting FSDC was demonstrated by the authorization of a $6.5 million Small Scale Irrigation Loan in June 1975. By that time FSDC had adopted the Barangay Irrigators Service Association (BISA) Program as its major effort. BISA concentrated on establishing Irrigators Service Associations (ISAs) of about 70 farmers each, and assisting ISA members to own, operate, maintain and effectively use pump irrigation systems. Starting with a few pilot sites in Capiz, the program expanded rapidly until at the end of 1977, some 27,000 farmers, organized into over 460 ISAs had been reached.

In addition, under the Barangay Irrigators Development Association (BIDA) Program, FSDC provided institutional support for farmers whose land was or could be irrigated by communal gravity systems constructed by the NIA. By December 1977, about 13,000 farmers, organized into 214 irrigator associations had been reached by the BIDA program. This amounts to a total of 40,000 farmers covered by the BISA and BIDA programs.

The Small Scale Irrigation Project is providing support for both BISA and BIDA programs. The $6.5 million loan is being used to fund 50% of the local currency costs of irrigation infrastructure and farm support tools and equipment under Fixed Amount Reimbursement Agreements (FARAs), and to

1/ By the National Irrigation Administration (NIA) and the Farm Systems Development Corporation (FSDC)

provide the foreign exchange necessary to finance off-shore commodities such as pumps, field vehicles and engineering and communications equipment, and to fund contracts for pump and irrigation engineering services. $1.1 million in grant funds is being used to supply technical assistance in the form of the full time services of an engineering advisor, a farm mechanization advisor, a short-term training advisor, an operations advisor, 2 pump specialists; and to fund participant training in management and technical subjects and invitational travel.

The Small Scale Irrigation Loan got off to a slow start. In 1976 the implementing agency was in a formative stage, and experienced considerable difficulties with the physical as well as institutional infrastructure elements of the BISA program. Due to the pressure of meeting targets a number of inappropriate or substandard pumps were installed, and, as a result of rushed feasibility studies and engineering designs and construction schedules, less than adequate systems were built. An overly optimistic initial schedule of pump set installations and lower than anticipated farm equipment needs, a delay in implementing gravity diversion and rehabilitating irrigation systems, and a lack of field vehicles resulted in a slow start to the drawdown of the loan. In the absence of examples to point to, FSDC field staff had to persuade farmers to participate on the basis of faith and trust.

But, by January 1977 most of these problems had begun to be addressed. FSDC started making better use of the pumps on hand; a pump specialist was hired to assist them with a strategy to emphasize imported pumps in the early stages of the program in order to give more time for the development of the struggling local pump industry. Over time the experience gained by office design engineers and field construction engineers began to tell in the improved quality of the systems installed. Drawdown on the AID loan commenced late in 1976. At that time many USG excess property field vehicles were received and the speed and quantity of installing pump sets consequently increased. Temporary diesel units were installed on sites where electricity proved not to be available as anticipated. An agreement that FSDC would take over institutional activities of new NIA-constructed communal gravity systems under the BIDA program was reached in 1977. Also in 1977, FSDC and AID prepared a list of commodities to be procured; bids totaling $1.0 million of these were opened in February 1978 and are now being evaluated. All contract awards are scheduled to be made by May 30, 1978. Finally, the existence of successfully operating ISAs has greatly facilitated the task of field staff in gaining participation and support from farmers.

An internal FSDC evaluation of the project was undertaken for Crop Year 1976[1] and published in December 1977. An external AID evaluation was undertaken in January 1978, with the final report scheduled for March publication. Both evaluations found that the project was indeed realizing its purposes and goals, and excerpts from the two studies are cited throughout this paper.

1/"Assessment of the Impact of BISA Program's Irrigation Input on Farm Beneficiaries, Crop Year 1976", FSDC, Manila, December 1977. A copy of this evaluation is available in ASIA/PD, AID/W.

January 1978 saw a number of significant changes in the structure of FSDC and the implementation of its decree. To streamline management and implementation, the BIDA program was incorporated into the BISA program, with no administrative distinction being made in the institutional development of irrigators associations for pump and gravity systems. More importantly, FSDC has carried out a general decentralization with each of its five area offices now headed by members of senior management. These offices are: Area I - Baguio, serving Northern Luzon; Area 2 - Manila, serving Central and Southern Luzon; Area 3 - Iloilo, serving Visayas; Area 4 - Davao, serving Eastern Mindanao; Area 5 - Zamboanga, serving Western Mindanao. Authority for operational decision making and training of field and provincial level staff is now delegated to the area level, while the Central Office in Manila will continue as the source of supplies, program design and policy making.

FSDC's BISA program is not the only AID-supported project with small farmers as target beneficiaries, nor are ISAs the only type of small farmer associations being established in the Philippines. There are, for instance, some 17,500 Samahang Nayons (SNs), which are pre-cooperatives set up throughout the country for small farmer beneficiaries of Agrarian Reform. SNs serve primarily to teach "learning, savings, discipline" among their members, so that they can later move towards membership in fully fledged cooperatives. Activities of SNs include the establishment of savings funds, and a formalized course of training that covers institutional, financial and agricultural management. Membership in SNs is compulsory for Agrarian Reform beneficiaries that have been deemed amortizing owners; the Masagana 99 Program also requires SN membership. At present some 900,000 farmers are members. Many ISA members are also members of SNs.

AID is supporting a program to pilot test expansion of the SN's activities with the Samahang Nayon Development Project (SNDP), a sub-project of the Agrarian Reform Project. The SNDP seeks to test the SN members' capabilities of jointly operating and amortizing light equipment, developing their leadership capabilities through committee systems, improving their organizational record-keeping abilities, and the building and maintenance of multi-purpose meeting places/warehouses. The SNDP is currently underway in six barangays in two provinces.

The SN is the foundation of and provides the membership for the Area Marketing Cooperative (AMC), a multi-municipality or province-wide coop. There are currently 29 operational Area Marketing Cooperatives with a total membership of 2,945 Samahang Nayons representing some 177,000 farmer-members throughout the country.

The activities of SNs and Marketing Cooperatives are considered complementary to, and not in competition with, the activities of the ISAs. Institutional Officers, indeed, encourage ISA members to participate in the activities of SNs and other cooperatives as well as other government programs. FSDC also interacts with AID-supported institutions such as IRRI, PCARR and CLSU's Fishery Department for the exchange of information and ideas. When the Integrated Agricultural Production and Marketing Project develops technological packages for dissemination to small farmers, it is anticipated that FSDC field staff will be one of the groups to diffuse these technologies.

FSDC recognizes the need to draw on the expertise of other GOP departments and academic institutions in the implementation of its program. This is particularly true in the field of agriculture. Memoranda of Agreement have been negotiated with the National Food & Agriculture Council, the Bureau of Plant Industry, the Bureau of Soils and the National Grains Authority which formally establish cooperation between these agencies and FSDC. At the provincial level there is already informal considerable interaction with agency field personnel; and this interaction will increase in the future. Additional expertise, particularly with respect to IO training, is being sought from the State Agricultural Colleges; this is especially important now that most training functions have been decentralized to the Area Offices. The intention is not so much to have the IO fully trained in agricultural matters, but rather to ensure that he or she will know and be able to use available information, personnel and facilities.

## B. DESCRIPTION OF THE PROJECT

### 1. Introduction

Since mid-1975, FSDC has, in its own words, been undertaking integrated rural development at the lowest level - in the fields of the small scale farmers of the Philippines. By so doing, it is in pursuit of the twin project purposes of increased productivity and employment generation and hence of increased incomes for small farmers and their families. During the past three years FSDC has established over 600 ISAs comprised of some 40,000 small farmers whose land can technically be irrigated by pump or gravity systems. These ISAs are located in all regions of the country and on average consist of some 70 farm families cultivating about 1.5 hectares each. Once registered with the Securities and Exchange Commission (SEC), ISAs are eligible for loans from FSDC to construct their irrigation systems. For pump systems, including hardware as well as technical assistance in the form of feasibility studies and construction engineering, inputs are supplied by FSDC. For gravity diversion systems, design and construction are undertaken by NIA and institutional development of the ISAs is done by FSDC. In both cases labor, for at least 10% of the cost of the irrigation system, is provided by ISA members to construct irrigation canals and farm ditches. Under the Barangay Irrigators Service Association (BISA) program the ISA is viewed as a mechanism through which a wide range of farm inputs and training can be channeled to small farmers once an irrigation system has been completed. Since 1975 FSDC has been supported by an AID loan of $6.5 million and a grant of $1.1 million.

Existing ISA's are now in various stages of development; a few have had several irrigated cropping seasons, many are completing the construction of their systems, and others are in the early stages of organization. FSDC plans to continue to assist established and operating ISAs by providing training and/or loans for farm inputs, other than the irrigation infrastructure, as such needs are expressed by ISA members to their IOs. Examples of inputs include appropriate tools such as sprayers, threshers, dryers, hand tillers, and storage, transportation and marketing facilities. Training programs undertaken by FSDC for farmers on a grant basis include use of adaptive farm equipment and irrigated farming practices, farm record keeping, water resource management, group buying and selling, seed production, crop diversification and other on hand off-farm income generating activities. Newer ISAs will continue to be assisted to construct, maintain and operate their irrigation systems, and to use the water effectively once it has been delivered. Under strong pressure from the government to expand even further and faster, FSDC plans to help establish an additional 420 ISAs in 1978, affecting some 30,000 small farmers. 280 of these ISAs will directly benefit from the AID loan. The other 140 systems represent the ISAs whose pumps will be procured with Danish financing.

### 2. FSDC Assistance to the Small Farmer

The nature of FSDC's assistance to small farmers can best be viewed through the eyes of Pablo, a hypothetical member of a typical ISA, serviced by one of the 5 area offices.

Pablo first learned about the BISA Program when the Provincial Governor visited his barangay to find out if farmers and their families were interested in getting together to construct an irrigation system for their farms. The Governor explained that with irrigation, Pablo and his friends could grow two, and possibly even three crops a year, that by using high yielding varieties (HYV) and fertilizer they could certainly increase their yields and hence their incomes. He pointed out that the new electric cooperative in their province was ready and anxious to supply them with power. Water, he said, was the key to a better life for everyone. Pablo, his wife Anna, and his fellow farmers and their wives were interested, although they were a little surprised that they would be expected to pay for their irrigation system, to own and maintain it themselves. Sometime later, FSDC engineers surveyed the land in his area and found it technically feasible to install a pump system to irrigate about 100 hectares. Not long afterwards, some young people arrived to undertake a baseline social survey. These young people were applicants for jobs as Institutional Officers (IO's) and were undergoing part of the selection process. One of them was selected to be the IO for Pablo's area. She spent several months after her 21-day Basic Institutional Development Training (BIDT) training and helping 70 farm families in the irrigation area set up an ISA.

There were many different types of farmers in Pablo's barangay. About 40% were owner-cultivators like Pablo, while a quarter were lessees, paying a fixed rent to the landowner. The rest were share-tenants who paid a varying portion of their yield to the landlord. Most of the tenants split 70-30 with their landlord, with the farmer paying most of the production costs. Although the tenants stood to gain the least of all the farmers from the provision of irrigation water, they were amongst the most eager to establish the ISA. Some were encouraged by their landowners, and all were anxious to increase their incomes, some of which were as low as ₱440 ($59.00) per year.

The ISA was sub-divided into groups (called kaisahans) by area of about ten farmers each, whose fields were contiguous. The elected heads of the group made up the ISA executive board; all the members were part of the general assembly. Under the leadership of the President of the new association and with the help of the IO, the ISA registered with the Security and Exchange Commission, and thus assumed a legal identity. All members of the ISA received many hours of formal and informal institutional development training from the IO; the various members of the Executive Board received additional training. Training sessions were fitted into the work schedules of members, often taking place in the evenings and Sundays.

Now Pablo and Anna's ISA was eligible for an irrigation loan. The pump system (pump, motor, pumphouse materials, etc.) was to cost ₱150,000; Pablo, and the other ISA farmers were going to put up 10% of that cost in the form of self-help labor. The system was installed about six months after the IO came to the ISA. It included a small centrifugal pump, with the capability of lifting water 40 feet and producing 3,000 gallons of water per minute, powered by a 60 Hp motor. When the pump and other

supplies arrived from the Manila warehouse an FSDC construction supervisor purchased sand, gravel and cement, hired the skilled labor needed and supervised the installation; the farmers dug the canal laterals and helped build the structures and install the equipment and pipe. A pump operator was selected from the membership, and he was trained by an FSDC mechanic/electrician to do routine maintenance and make simple repairs on the pump and electric motor.

All this took longer than expected. Some of the farmers were reluctant to start work until they actually saw the pump; some were so distrustful, that they wanted to wait until they saw water flow from the pump. The IO and the construction supervisor tried to persuade each farmer to do his share, and once a few started, most of the rest joined in when they weren't working in their fields. Finally, some five months after the pump had been delivered, the ISA had its Inauguration Day; water flowed through the lateral and onto the first farmers' fields. Not all the ditches were completed; Pablo estimated that about half of the fields could receive water this year. It was the wet season, and the farmers planned to use the irrigation water only if it didn't rain for several days.

Fortunately, Pablo had completed all the ditches in his field and he irrigated his farm about a week after Inauguration Day. Earlier, each member of the ISA had paid a membership fee of ₱5.00 for the first crop season. In addition, every member had pledged to pay 7 cavans/hectare per crop season for the amortization of the pump system and to pay the bill from the electric cooperative. The ISA treasurer had explained that it would take ten years until the pump system was paid for, and that the loan was given at 8% interest.

Once the irrigation system was installed, the IO, who was raised in the next town, continued to visit the ISA about two or three days a week, and staying overnight at the house of the ISA President, after attending a 3-week course of Basic Management Training undertaken at the University of the Philippines at Los Banos in conjunction with the International Rice Research Institute (IRRI) followed by 12 days of Rice Production and Water Management training. She continued to provide informal, on-the-job training for individual members and groups involved in the management of the irrigation system and the new varieties and practices that were adopted. With another IO trained in finance, she helped set up records for the ISA, and worked with individual farmers to encourage them to start their own farm budgets. Pablo wasn't too interested in this, but his wife Anna realized that she could plan her family's finances better if she knew exactly where the money was going, so she began to attend the meetings and started to keep simple records.

The wet season rice was harvested, and Pablo got 59 cavans per hectare of rice for a total of 89 cavans from his 1-1/2 hectares. The previous wet season, without irrigation, Pablo had got only 36 cavans per hectare. After his friends had helped him thresh the rice, it was spread on mats to dry in the sun. Then Pablo stored it in his house and waited

for the rice buyer to arrive. He received only ₱40/cavan ($5.35); he had hoped for a higher price, but the buyer insisted that his rice was too moist, and that ₱40 was his final price. Pablo knew that he could get a better price from the National Grains Authority (NGA), but the nearest NGA warehouse was 30 kilometers away. Pablo kept 10 cavans (worth ₱400) for his family to eat, and sold the rest for ₱3,160. Anna calculated that after they had paid for the rice seed and the laborers they had hired earlier in the season, they would have ₱560 to pay the debt at the local sari-sari store, pay their five children's tuition fees and live until the next rice harvest. Their oldest child was in the 11th grade and both Pablo and Anna were hoping that she would go to the college in the Provincial capital to study accounting. Anna also wanted to save up to visit her mother who lived in Iloilo City, so Pablo decided he would plant a second irrigated rice crop.

The IO said that if Pablo used the right high yielding seed, fertilizer and pesticide, he could expect to get over 80 cavans per hectare. So Pablo borrowed ₱1,200 from his friend, the Barangay Captain, and planted two of his three fields. That cropping season was a nerve-wrecking time for Pablo and Anna. Early rains caused the river to flood, and the pipe from the river to the pump was swept downstream. It took three weeks until the ISA could get the welder from the provincial capital out to repair the damage. That last week it hardly rained at all. Later, the flat belt that connected the motor to the pump broke and Pablo volunteered to go the provincial capital to buy another. The IO told her Program Manager about the problem and he consulted the head of the Technical Services Division at the Area Office. The latter had been receiving reports from several ISA's complaining about the flat belt, and after talking to the Manila office, had decided to change to V-belts for longer life and higher efficiency. Pablo's ISA's pump system was soon converted to V-belts.

In spite of the difficulties, the dry season crop was harvested, and Pablo did indeed get 70 cavans on the one hectare that he planted. He was able to sell it for ₱43 per cavan and Anna calculated that after making payments to the ISA, repaying the ₱1,200 debt and paying the hired laborers, they had made ₱1,340 on the crop. For the entire year this was over 3 times the normal income they had received in past year. The IO had talked in the General Assembly about growing a third rice crop, but Anna now had the money to visit her mother, and Pablo felt they had worked enough that year.

Pablo and Anna were happy, but some of the other ISA members weren't so pleased. Although the ditches had been dug, some of the farmers whose land was farthest from the pump were complaining that they had received too little water, or no water at all. This problem was by no means unique to Pablo's ISA, and was of considerable concern to all the FSDC officials. A top level decision was taken to make water management studies and training a top priority.

It was felt that the best way to ensure a reliable supply of water to all farmers was to first ensure that all canals and ditches had been dug. A water delivery schedule would then be worked out with ISA leaders.

Employees from the Bureau of Soils and farm studies from institutions like IRRI and the Philippine Council for Agricultural Resources Research (PCARR) would be used to determine the requirements of the soils and the crops. Once a schedule had been mutually agreed to and when water was pumped, or released from the gravity system, it would first be delivered to the farmers whose fields were most distant from the irrigation source. Then water would be delivered on a daily basis to fields that were successively closer to the source. This rotational cycle would be repeated reguarly on a weekly basis.

FSDC staff realized that establishing a satisfactory delivery schedule and enforcing it would be a complex undertaking, requiring considerable technical skill and institutional cooperation on the part of the ISA members. They therefore decided to pilot the scheme on a few selected ISA's first, and to use the experience gained to train IO's as part of their Basic Institutional Development Training (BIDT). They also planned to staff each area office with a specialist trained in water resource management to supervise this aspect of the IO's work.

Another problem arose during the next cropping season; the bills from the electric cooperatives got higher and higher. The cooperative near Pablo's ISA was charging ₱0.60 per kilowatt hour, and the cost of running the pump for 600 hours (i.e. two crop seasons) to serve half the service area was ₱15,000. Nearly all the farmers (or their wives) were quite ready to pay to amortize the pump system, but were far more reluctant to pay the power bill. After all, as Anna said, the bills were higher than they had been led to expect. The IO reported back, and at the monthly PM's meeting at the Area Office the subject was thoroughly discussed. Back in Manila, the heads of Engineering and Finance got together. In some instances, it appeared that the costs could be reduced by improving the technical efficiency of the irrigation systems. This affected later decisions on pump purchases and irrigation design. Some established systems were modified. As well as replacing some flat belts with V-belts which increased both efficiency and reliability, some pumps were moved adjacent to the prime movers (i.e. electric motors or diesel engines). Many locally manufactured pumps broke down and were unreliable due to inadequate bearings. Local manufacturers were consulted and proved surprisingly willing to work on the problem and replace defective parts. A pump specialist was brought in to assist FSDC in examining the locally manufactured pump and to make suggestions for improving the design of existing local pumps or for using different sorts of pumps. FSDC later contracted the services of a U.S. consulting firm, Camp Dresser & McKee International, Inc. (CDM), which supplied two engineers to provide full time technical advisory services to assist FSDC in improving their engineering on pump irrigation systems. Additionally, high level discussions took place with officials of the National Electrification Administration (NEA) and in certain instances, additional grace time was granted and some charges were adjusted to ease the farmers' burden in the early period of the project's development. FSDC officials also felt that as a higher percentage of farmers in an ISA received a reliable supply of water, the problem would lessen. So it

proved. In Pablo's ISA, three quarters of the farmers received the amount of water that they wanted, when they wanted it during the second year, and by the third year nearly everyone was satisfied.

During the wet season, Pablo went to visit his friend Juan, whose farm was irrigated by a communal gravity diversion system. The system had been designed and built by the NIA engineers, but FSDC was financing the loan and providing institutional and other technical support. There had been a lot of problems when Juan's ISA was first established, because the irrigated land was farmed by families from two different barangays. The IO found it difficult to get ISA members to reach a consensus and almost impossible to get them to contribute their labor together. These problems were partially overcome when a stronger ISA president was elected, and a more experienced IO assigned to the ISA. As a result of the experiences of Juan's ISA, FSDC instructed its engineering division to avoid designing multi-barangay systems in the future. Juan's ISA loan was higher than Pablo's; the system had cost ₱260,000 ($35,000) and was irrigating 175 hectares. But Juan, of course, had no fuel bill to pay and he was satisfied to pay 12 cavans or ₱480 ($64.00) per hectare for 2 crop seasons to his ISA. Last season, Juan had been persuaded by his IO to grow vegetables on part of his land, and he had been happy to get more money for his beans than for his rice. Several of the farmers in Juan's ISA were having problems with rat holes in their paddy dikes. They informed the IO who called in an agricultural specialist IO from a nearby province and an extension worker from the Bureau of Agricultural Extension (or the Bureau of Plant Industry) to help.

During the third year, Pablo's IO attended 13 days of training on innovation packages. This training covered such subjects as group buying and selling, seed multiplication, institutional credit, organized rice production and the use and management of farm tools and equipment.

After her training, the IO in Pablo's ISA asked the farmers if they would like to borrow money from the FSDC through their ISA to buy some new tools, such as sprayers, threshers and hand tillers. Several farmers were interested, and a farm day was organized during which representatives from several local companies demonstrated their wares. A majority of ISA farmers were interested, and they were able to persuade the others that the additional ₱800 that they could expect from producing 17 more cavans per hectare was worth borrowing the ₱130,000 that could be repaid over 5 years at 12% interest.

By the end of the fourth year the ISA was well established, making regular amortization payments; and on the average each farm family was making about ₱1,863 ($250) more for the normal 1.5 hectare land holding than they had before the pump was installed. Some of the more enterprising farmers felt that it was time for the ISA to branch out into other activities. Various possibilities were discussed in the General Assembly. Some felt that marketing was the biggest problem and suggested that the ISA invest in storage or transportation facilities. Others felt that by purchasing a dryer and reducing the moisture content of their

rice they could get a higher price per cavan of palay (rough rice), especially if they sold it to the NGA. The ideas of other farmers and farmers' wives were wider-ranging. They wanted the ISA to branch out into new areas; to start a small rice mill; to try a poultry business; and to use the skills of various members of farmers' families to organize a crafts workshop. The IO contributed to the discussion, and also brought some financial and technical specialists from the Area Office to subsequent meetings. After some time, it was decided that a dryer should be purchased immediately and work on a storage facility be started, with the costs to be shared by several nearby ISAs. If this investment was successful, Pablo's ISA would look into the possibilities of the crafts workshop next year.

All in all, the farmer families in Pablo's ISA felt that things were really looking up for them since their ISA had been established.

3. AID Assistance to FSDC

To help FSDC to help Pablo, Anna, some 40,000 existing ISA families and about 30,000 new farmer families to improve their quality of life, AID proposes to follow on the $6.5 million loan with a $10.0 million new loan, more descriptively called a Small Farmer Systems (SFS) Loan. Also, it is proposed that the $1.1 million grant be supplemented by another $1.0 million grant. The proposed Small Farmer Systems (SFS) Project will assist FSDC in funding both physical and institutional infrastructure. The physical infrastructure components are irrigation systems, farm tools and machinery, storage and transportation facilities and water management devices. The institutional infrastructure consists of a series of training courses for FSDC field staff and ISA members, so that the physical components can be effectively used.

As is shown in Table A below, of the $10.0 million in new loan funds, $6.2 million will be spent on reimbursing 50% of the direct costs of physical infrastructure, following the same Fixed Amount Reimbursement (FAR) system used successfully on the first loan. Current plans allocate the $6.2 million as follows: $3.7 million for gravity irrigation systems; $1.5 million for pump irrigation systems; $0.4 million for upgrading of old systems and rehabilitation of systems damaged by natural disasters; $0.4 million for farm support systems which include farm equipment like threshers and hand-tillers and storage transportation or marketing facilities, as these are needed and can be afforded by individual ISA; and $0.2 million will be spent on additional physical infrastructure improvements to facilitate good water management, such as canal linings, canal structure improvements and turnouts. The $1.5 million for pump systems will fund 50% of all requirements for calendar 1978, and pipes and other non-pump components for calendar 1979. (The Danish loan funds $1.9 million for pumping equipment in 1979.)

The Table also shows $1.0 million of loan funds to be spent on commodity procurement of vehicles and construction and communications equipment. (For details, see Table 22, Annex J.)

TABLE A

Proposed Breakdown of AID Assistance to FSDC Under SFS Loan

| Type | Inputs (Million $) | % of Costs Reimbursed | Total Outputs |
|---|---|---|---|
| Gravity Irrigation Systems | 3.7 | 50% | 160 new ISAs |
| Pump Irrigation Systems | 1.5 | 50% | 120 new ISAs |
| Upgrading & Rehabilitation of Irrigation Systems | 0.4 | 50% | 200 existing ISAs |
| Farm Support Systems | 0.4 | 50% | 100 ISAs[1] |
| Water Management Infrastructure | 0.2 | 50% | 160 ISAs[2] |
| Commodities (FX costs) | 1.0[3] | 100% | Vehicles, equipment |
| Farmer & FSDC field staff training/Demonstration Centers | 2.8 | 100%[4] | All ISA farmers, 600 IOs and 100 PMs, trained; 4 demonstration centers established. |
| Total | 10.0 | | |

1/ The farm support systems consist of a mix of sprayers, tillers, threshers, and dryers, depending on the size and needs and choice of individual ISAs.

2/ Water Management infrastructure includes concrete linings for selected canal sections, upgrading canal structures and control structures, depending on needs of individual irrigation systems.

3/ An illustrative list of commodities with costs can be found in Table 22, Annex J.

4/ FSDC funds 100% of administrative and land costs.

The SFS loan differs from the earlier SSI loan in that it additionally proposes to fund 100% of the direct local currency costs of training for FSDC field staff and ISA farmers, while FSDC will fund 100% of the indirect, or administrative costs, of the program. This will include water management training and simple measuring devices to help overcome a problem of critical concern to both FSDC and AID as expressed in the recent evaluations. The recent decentralization of FSDC has resulted in the delegation of most field staff training activities to the area offices. AID proposes to support the area offices by funding 100% of the costs of establishing demonstration farms excluding land costs, for use by the four offices of Baguio, Davao, Zamboanga and Iloilo (Area II covering Central and Southern Luzon is already served by the demonstration farm adjacent to the training center at Valenzuela, Bulacan, near Metro Manila). It is anticipated that 600 IOs will receive one or more of the following courses: Basic Institutional Development Training (BIDT), Basic Management Training/Rice Production (BMT/RP), Water Management (WM), Management of Innovation Packages (MIP), and 100 Program Managers will attend management training courses. As a result of this field staff training, all ISA members will receive management and specialized training through their IOs.

In addition, under SFS, AID proposes to support FSDC with $1.0 million in grant funds. The breakdown of inputs to be funded by the grant is shown below in Table B.

TABLE B

AID Assistance to FSDC Under SFS Grant[1]

| Type | $ |
|---|---|
| Participant Training | 100,000 |
| Research & Development/Demonstration Centers | 100,000 |
| Regional Seminar | 40,000 |
| Invitational Travel | 35,000 |
| Prototype Equipment | 10,000 |
| Technical Assistance | 715,000 |
| Total - | 1,000,000 |

1/ Details of grant fund allocations, including costs and types of technical assistance personnel, can be found in the Technical Analysis, page 61.

The phasing of all project activities, whether technical or institutional, is dictated by the ISAs stage of development and by the perceived needs of members of individual ISAs. Certain components of the project will be common to all ISAs - i.e. institutional development leading to the registration of the ISA; installation of the irrigation system; management of the system so that all farmer members may benefit equitably; further institutional development in the setting up of financial records and organizations so that individual ISAs can branch out into secondary activities such as the purchase of farm support systems and the establishment of small scale ISA enterprises. These secondary activities will vary and will depend on the agricultural development or needs of individual ISAs and the "personality" of the ISA, its location, its IO, and the needs of the individual ISA members. The program components will, on average, be applied in the following time frame:

| | | | | |
|---|---|---|---|---|
| Registration of the ISA | Irrigation loan obtained; construction of the system | | | Small Scale ISA enterprises & Farm Support Systems |
| | * | Water resource mgt. institutional dev. | | |
| * | | * | | ** |
| 0 | 1 | 2 | 3 | Years |

* Common to all ISAs
** Varies from ISA to ISA

# PART III

# PROJECT ANALYSIS

## A. SOCIAL ANALYSIS

### 1. A Brief Summary: The Social Setting of Small Scale Agriculture

In order to more fully comprehend the extension of irrigation to small farmers, it is necessary first to understand the social setting of small scale agriculture in the Philippines. A knowledge of the social setting within which the farmer grew up and lives provides us with an insight into the kinds of variables or parameters which affect and help to pattern farmer responses to change.

As in many Southeast Asian countries, the traditions of Philippine agriculture have been based upon a class-structured rural society and the extraction of agricultural surpluses into the control of a relatively small proportion of the population. Part of the tradition involved the ownership of large tracts of prime agricultural land by individuals with varying degrees of social, political and economic power. Most agricultural production was the result of the labors of people who lived and worked on small parcels of land, but who provided shares of their crops to the influential landowners. These tenants (or share-croppers) along with the landless represented the bulk of the population involved in agriculture.

Part of this same tradition produced a strong relationship between the landowner or the purchaser of the harvested grain and the tenant farmer. The farmer provided labor, agricultural skills and grain; the landowner offered land, credit and access to a variety of social, political and economic resources. Because of his unique position in this relationship, the landowner displayed many of the characteristics of the classic "patron" figure. The landowner was the one who had access to resources and who was the one who normally could initiate action for changes on the agricultural scope.

Admittedly, the situation in rural Philippine has changed significantly. Agrarian reform is underway and the incorporation of farmers working small pieces of land into government agricultural programs is a long established policy of the Philippine Government. Nevertheless, important behavior and belief patterns born in agricultural tradition continue to influence the actions of farmers today. The small farmer, as a result, displays a conservative and pragmatic outlook in life. Although change is everpresent in the rural Philippines, it should be remembered that social tradition represents

a known entity, both secure and proven. Change, on the other hand, generally represents the unknown, full of uncertainty and risk.

Today, the average farmers with whom FSDC currently deals still rely to some extent on traditional sources of socio-political power for decision-making which affects an entire community. Small scale farmers continue to exercise very little status in rural society and are largely unaccustomed to the leadership role. There even continues at least a respect relationship between old landowners and small scale farmers. The continuing respect relationship due to old landowners is sharpened by the realization that about two-thirds[1] of the farmer-participants in FSDC projects do not own their own land. Although some are in the process of acquiring land, the process can take as long as 15 years. The old landowning families continue to occupy a high social status and may still receive payments from FSDC farmer-members. Nevertheless, the relative omnipotency of the landowner as a patron in rural Philippines has decreased noticeably.

Although the small farmer is perhaps more economically independent than before, there remains a need for relationships with patron-like figures. Such figures are currently present and they have access to knowledge and desirable resources.

An example of how this traditional element of rural society affects agricultural change can be drawn from the experience of FSDC staff. When FSDC had already established irrigation systems, the farmers themselves did not take initiative to acquire irrigation in the majority of cases. They were not even aware that an agency existed which could provide them with irrigation nor how to apply for assistance. A municipal mayor or other government official contacted them and asked if they would like to have irrigation. As in the past, access to the resources of government is not through the farmer himself but rather through brokers or go-betweens in the upper socioeconomic levels of rural society. The initiative to acquire FSDC assisted irrigation systems continues to rest primarily among upper

1/ Recent FSDC data suggests the following tenure status of ISA farmers: owner-cultivators, 38%; lessess, 24%; share-tenants, 34%; 4% unknown.

class brokers or the government itself rather than from the small farmers. In essence, this represents the continuation of a traditional social theme in a modern (and project-related) context.

Another social tradition which deserves attention in this summary is that of cooperative effort. It is often stated by planners and travelers that the Philippine farmer naturally follows the communal values of mutual assistance or group action for the common good. Planners often feel that their values will help to ensure a foundation for cooperatives.

In reality, these values certainly are present -- however, they tend to function largely under a set of pre-existing circumstances. For one, rural people are generally used to interacting with a finite group of people. These people are well-known and interaction is taken on a highly personal nature. These people also include one's immediate kin and neighbors. Rural life in the Philippines requires close interaction with neighbors and friends. Personal interrelation provides the context for information flow, access to resources, sharing of labor, and for entertainment. It is the importance placed on personal interrelationships which spawns such traditional values. Interestingly, however, the strength of personal relationships and the value of cooperative mutual assistance are based largely in the immediate community.

The immediate community is frequently composed of elaborately inter-twined kinship alliances. Loyalty and a sense of common interest to one's family and neighbors logically tie the community together. Therefore, cooperative endeavors which cross-over community lines usually are faced with having to create some new sense of common cause and often times includes the problem of old rivalries.[1] This sense of allegiance to one's community at the expense of others often even incorporates a sense of obligation to one's landlord. Therefore, in the immediate community the values of cooperation and mutual assistance are quite active and are often task or crisis oriented so that assistance comes during

1/ FSDC discovered this when irrigation systems were installed that served farmers from two different barangays. The difficulties of achieving consensus and cooperation led to a decision that future engineering designs would have to take existing social groupings into account.

times of need.

An additional aspect of the farming society is the farmer's view of his own existence. Despite some general increases in production capacity the small farmer still views himself as being in a relatively risky business. The rainy season may come late or the dry season early so that the weather is not always reliable. Planting is dependent upon the presence of the rains. A delayed planting could mean that the rice plants are still maturing in the field instead of already harvested when the typhoon season arrives. The threat of a typhoon's destructive force is a yearly occurrence that is all too often realized. Farmers are themselves in something of a delicate balance with nature -- a balance which sometime is tipped in favor of nature.

The small farmer traditionally lived in the realm of economic marginality. He grew enough to meagerly support his family and provide the surplus enough to satisfy his perceived needs -- given the unrealiability of weather, water at the right times, and the threats from insects and disease.

Against this background of risk and uncertainty, water presents an easily recognizable means through which the farmer can obtain some further degree of control over weather. An element of certainty and a partial elimination of risk is given to the small farmer. Such an insurance function is immediately realized and value actually voiced by farmers.

Another variable which influences the current society of the small farmer is the existing philosophy toward the acquisition of economic surpluses. Today, the philosophy of growing enough to satisfy his perceived needs continues to influence behavior. The important feature of this philosophy on the current scene is that the perceived needs, born in tradition, do not appear to have increased significantly. He is likely to pursue some increase in production but only within satisfying parameters. One must remember that the farmers' perception of standards of living is conditioned by comparison with the past life styles of their parents and grandparents. Relatively slight improvements are therefore viewed as major steps toward a "comfortable life". One way of reaching a "comfortable life" is simply to take some of the risk out of farming so that the yields possible just some of the time with

traditional methods can be made a regular occurrence.

In this context, it is significant to note that farmers universally see education as the primary means of social mobility. Increased income, in itself, is not viewed as the major means to long-term personal improvement. Farmers, in fact, do not appear to hope for changes in their own standards of living; rather they place their hopes for a better life in their children. Education is a way to become something other than a farmer, perhaps even entering a "professional" career. Education, they feel, is the primary way to provide their children with that opportunity. An increase in income through increased yields is sometimes valued by farmers simply as an avenue which can make possible the goal of educating their children.

2. An Overview of Irrigation in Agricultural Society

Irrigation in the Philippines is not new. Some believe irrigation to be of considerable antiquity in the country with a strong basis in pre-Spanish society. Early irrigation is believed to have been first used in wet-rice cultivation in lowlands, which then diffused to include the famous terraces of the mountain Ifugao. Early Spanish chronicles from the 16th century report the existence of lowland irrigation. By the beginning of the 20th century well-developed irrigation societies were reported among the Ilocanos. During the American regime, the "scientific" approach to farming was stressed. Part of this approach was a stress upon irrigation.

The farmer in the Philippines therefore is well aware of the value of a regular water supply and what irrigation can offer. The basic agricultural commodity, rice, is based upon water agriculture with which the farmer is very familiar. Therefore, the concept of a regular water supply is well-known and represents an immediately recognized benefit. In short, an irrigation program merely extends a long standing practice of rural life.

3. Participator Profile and Benefit Incidence

The direct beneficiaries of the project are people who till the soil in an area chosen for irrigation service. Participation in the project

includes those individual farmers who own, lease or share-crop approximately 1.5 hectares each.[1]

People involved in agriculture who do not have one of those three accesses to land remain outside of the direct beneficiary sphere. For example, the only way for landless laborers to acquire any benefit is indirectly through increased demand for their services (due to increased cropping intensity through irrigation). The FSDC evaluation of crop year 76 indicates that the use of hired labor increases with the introduction of irrigation - from 28 to 81 work days on average per year per hectare.

Farmers participating in the project numbered about 40,000 as of December 1977. Of these direct beneficiaries, more than 60% are tenants or lessees. The remainder are owners, part-owners or amortizing owners. The average size of landholding farmed by a project participant is 1.5 hectares. Over 85% farm 2 hectares or less. About 93% of the farmers are married with an average family size of around 6 (consistent with the mean family size reported for the Philippines generally in 1975). The mean age of the participating farmer is 46 years with about 70% of the farmers between the ages of 31 and 60.

Participants in the project display a long history of farming experience since the average period of time on the farm is over 20 years. Formal educational experience, however, is somewhat limited since over 60% of the farmers only achieved elementary schooling. Twenty percent reached high school while about 10% had no schooling whatsoever. Reliable income figures are always difficult to obtain in the rural areas.

Some direct benefit accrues to the landowners in the form of shares of the crops given by tenants. Shares given to the landlord by current te nt project participants average around 23% of the crop.

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1/ Evidence from Central Luzon indicates that some landless laborers also perceive themselves as beneficiaries. In certain instances they have contributed to ISA funds and even become members in return for the increased wage they expect to receive for harvesting two crops instead of one.

Approximately 15% of the crop goes to hired labor[1] and the remaining 62% goes to the farmer himself. Therefore, most of the increases in yield through irrigation flow to the participant tenant farmer; but benefits from increase in yield are also realized by farm laborers and landlords. This balance of benefits appears to be a reasonable format to follow given the social context of the farmer discussed earlier.

4. The Project and Farmer Motivation

As mentioned earlier in this report, the initiative to acquire an irrigation system rarely comes from the farmers themselves since farmers do not have the knowledge of the kinds of government program available to them. Farmers therefore react to an offer of an irrigation system, an offer which originates outside their immediate community. This pattern of initiative to acquire irrigation coming from an external source follows the age-old tradition of the small farmers' dependence upon influential patrons. Such a pattern itself is not necessarily bad; the interaction between FSDC and farmers merely exemplifies a continuing social tradition.

Once the initiative is made, the pervading motivation leading farmers to accept the concept of having an irrigation system and to join an ISA is the provision of water. Water is seen basically as a means to reduce the risk of not attaining traditional levels of production due to variations in weather and to allow the possibility of increasing yields beyond traditional levels. Simply stated, access to water is why farmers join an ISA. Acceptance of water is based primarily on the age-old concern of farmers, risk-aversion.

With water, farmers by and large continue to follow the existing cropping pattern with which they are familiar and which has proven to be relatively successful. Expectations of all farmers actually double cropping may be optimistic considering the general pattern of

1/ See Table T p. 87.

pragmatic conservatism existing among small scale farmers.[1] The tradition of satisfying instead of maximizing in the attainment of a living also indicates that increases in cropping intensity may be modest. Although farmers certainly do recognize the potential to realize an increase in yields and thereby an increase in income, this increase is not necessarily equated with more intensive cropping in the farmer's mind. Following this theme, it is interesting to note that about half of the project beneficiaries expressed a basic satisfaction with their current economic condition. This indicates that farmers may not approach increased yields and efforts to achieve dramatic increases in income with the same perspective as planners. Most farmers do not consider a better economic position very possible given the traditional structure of rural society. Rather a greater margin of security in achieving traditional standards of living is desired along with some additional economic comfort within those standards. Farmers do, indeed, report increases of income made possible with the combination of high yielding rice varieties, fertilizer and irrigation and these income increases are certainly valued.[2]

The initial acceptability of ISA functions which are not directly related to the provision of water appears tenuous without a working irrigation system. Farmers join an ISA to obtain water. Financial, management and organizational training are all initially viewed as

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1/ The recognition of this fact has been taken into consideration in the economic IRR analysis for the Base Case, Table F, page 42. Assuming a cropping intensity of 1.5, the project anticipates that full double cropping will be attained only in the third year of irrigated cropping. This assumption may be inflated for farmers in areas with short rainfall seasons; however, FSDC data shows increases in cropping intensities for rice in the first year of irrigation by areas (See Table C page 40.)

2/ FSDC experience suggests however, that ISA members, once they have increased their incomes through a reliable irrigation system, are willing and even anxious to attempt to further increase their incomes by investing in farm equipment or storage or marketing facilities.

a means to acquire water. The ISA role of coordinating extension services to farmers also represents an activity complementary to the provision of water. The experience of irrigation systems begun under the National Irrigation Authority and the initial efforts of FSDC both illustrate quite graphically that when the water does not flow farmers loose interest in irrigation associations. The training and extension services funneled through an irrigator organization do not fulfill a generally recognized need among farmers -- at least to a level sufficient to hold farmers together.

Farmer participation is affected by the policy of the project to have field workers actually live among the farmers in their areas of responsibility. The very high traditional value placed upon interpersonal relationships common among farmers can become active through the day-to-day contact with project field workers. By regularly being in the community, the farmer can begin to identify a commitment on the part of a person in his agricultural well-being. Communication becomes more effective between the farmer and the project staff because the field worker is at least a titular member of the community. The chances of cooperation with a field worker increase dramatically with the intensity of contact with the farming community. Participation intensity may increase or functions may be performed simply because a field worker suggests it. That suggestion may be given more credence as part of the obligation in an interpersonal relationship.

Once an irrigation system is in place and operated by farmers from a single community, participation often appears strengthened by a kind of pride in the ownership and operation of a water system. Farmers have intensified their involvement in some irrigation systems under the project by identifying the system as their own. They build and maintain the water channels and run the pumps. This kind of involvement and identification is a manifestation of the prevalent role the immediate community plays in the structuring of cooperative effort and common goals.

5. Role of Women:

The beneficiaries of FSDC's program are small farm families. In these families, women typically play a number of roles. These roles include the following:

- women often perform various farm tasks, including some that involve extensive physical exertion;
- women often attend community or organization meetings as the representative of their families;
- women often take responsibility for income-generating activities such as poultry raising or vegetable gardening;
- women often are the vendors of the family farm produce; and
- women are responsible for family nutrition and may borrow in cash or kind to feed their families, and as a result have a critical role in family cash flows and financial management.

In the Philippines there is a high respect for education. Both men and women have equal, ready access to education, particularly during the primary grades. As a result, although as in all traditional societies there is a considerable difference in the roles and status of men and women, educated women in the Philippines enjoy relatively high status and are often employed in positions of substantial responsibility. In the rural context this status results in qualified women holding positions of significant authority. Similarly female Institutional Officers (who constitute almost one-half of the Institutional Officers) are accepted as professionals in their work by the project beneficiaries.

The SFS project therefore will substantially benefit women. No special efforts are contemplated to expand the role of women in the project.

6. Obstacles:

The SSI project experience has not been without problems. One of the most significant of these occurred when an irrigation system was designed and set into operation for farmers residing in

more than one community or barangay. In essence, farmers from different barangays were asked to organize and cooperate in an irrigator association which administers a single irrigation system. This situation tends to challenge the essential integrity of the barangay unit which consists of old and stable interrelated families who assume their obligations and responsibilities within a well-defined power structure. In effect, a multi-barangay ISA (irrigator association) very likely will have to put what some members consider strangers and outsiders in charge of their most important resource, the land and its management. The loyalties of the ISA officers from another community are always in question even if they may have married into a family of the "rival" barangay which may contend for power within the same ISA.

In some cases, where the members of multi-barangay ISAs come from the same family, the problems of factionalism and a lack of cooperation did not exist. When everyone in a single barangay are of one faction "cooperation" within the ISA is more easily achieved. The problem appears to be whether or not the factions have a mutually accepted leader who has the final word in a dispute. For some there is a tradition for the oldest member of a large family to act as judge and intermediary in cases of breaking of the law. Heads of the wealthier families may even act as intercessors in disputes. If there is no agreed-on judge or mediator, preferably traditional, two factions may develop, each with its own head, and dissension prevails. One informant noted that factionalism and a lack of cooperation was his most common problem in attempting a multi-barangay project of any kind.

The loyalty, devotion and strength of the local family and extended kin groups are factors which promote cooperative action in most single-barangay ISAs. These same forces often lead to and exacerbate rival factions in multi-barangay ISAs. The Filipino farmer tends to view agricultural development and change in terms of the welfare of himself and his family within his immediate community. Although planners stress the need for "cooperation" as a necessary means for achieving these desired goals, the farmer does not generally understand "cooperation" in the same terms. Farmers did not ordinarily equate the need for cooperation with the program goal of providing irrigation. Cooperation to the farmer means getting the economic benefits for himself and his family through traditional means of dealing with the various power groups concerned on the local and national scene.

The current project plan and FSDC have recognized the existence of cooperation difficulties in irrigation systems incorporating more than one barangay and steps have been taken to allow for greater flexibility in the establishment of irrigation associations. Obviously, it would seem that the most socially sound method to follow is to favor the establishment of single barangay irrigation systems and avoid whenever possible multi-barangay organizations.[1] In this manner, problems of factionalism and the maintenance of cooperation will be minimized.

Some difficulties have also been encountered when farmers were asked to contribute free labor in the construction and maintenance of the irrigation system. Planners assumed that the farmer would be willing to provide their own labor voluntarily because of traditional communal values. Not all farmers were initially willing to contribute labor and there were requests for payment.[2] Actually, even the traditional system of mutual assistance represented short-term, task-life activities in which neighbors traditionally received food, drinks and entertainment in exchange of their labor.

The project has adopted a posture of flexibility toward the operation of individual ISA's and stressed the concept of a farmer-owned and operated system to help overcome any problems in the labor demands of the irrigation system. This flexibility and the responsibility of the ISA itself for meeting labor needs appear to have been successful in overcoming labor difficulties - especially in the case of single barangay ISAs.

7. Summary and Conclusions:

Basically, Small Farmer Systems appears socially sound. The project is founded upon a series of basic social tenets characteristic of agricultural society in the Philippines. With the regular provision of water and an ISA based upon membership coming from a single barangay, the social acceptability of the project runs quite high. Project benefits are recognized by farmers and these benefits

1/ This has been FSDC policy in establishing new ISAs since 1977.
2/ IOs are now trained to expect and overcome this problem.

answer some of their commonly expressed needs. Benefits also accrue to a variety of elements in rural society but the small scale farmer receives the greatest direct benefit. Therefore, from a social perspective, the project displays a realistic probability of reaching the target group.

## B. ENVIRONMENTAL ANALYSIS

### Background

In fulfilling the requirements of AID Regulation 16, Environmental Procedures, AID has the responsibility of insuring that the environmental consequences of proposed AID-financed activities are identified and considered by AID in collaboration with the GOP and that appropriate environmental safeguards are adopted in order to minimize adverse environmental impacts. In addition, AID has a policy to assist the GOP in strengthening its capability to identify and evaluate the potential environmental effects of proposed development plans and projects, and to select, implement and manage effective environmental protective measures.

In order to fulfill both the requirement and the policy, AID recruited an Environmental Specialist from the U.S. and gave a grant to the Inter-Agency Committee on Ecological Studies (ICES). The ICES secured the services of in-country environmental professionals to collect data for the Environmental Assessments.

The primary objective of ICES under the grant is to diffuse environmental awareness throughout GOP institutions. Thus there was an emphasis on training and involvement in preparation of Environmental Assessments of personnel with limited or no expertise in environmental work. Moreover, as many personnel as possible were involved in order to spread the training.

The first product to emerge from this training exercise is an Environmental Assessment of the AID-financed Small Scale Irrigation Project. (See Project Paper Supplement for the complete report.)

### Selection of Sub-Projects for Environmental Assessments

There will be more than 1,200 individual sub-projects under the BISA Program to cover the target area of approximately 190,000 hectares. Given the number of sub-projects, an Environmental Assessment could not be completed on each one. Therefore, Environmental Assessments were made on a "normal sub-project" and three other sub-projects representative of the potential major environmental problems associated with irrigation.

Four criteria were used in selecting the four sub-projects from the more than 1,200 sub-projects:

1. Potential Problems - three sub-projects represent the three environmental problems identified in the Initial Environmental Examination: Schistosomiasis, which is endemic in seven of the 29 provinces now covered under the Project; malaria, endemic in 10 provinces; and pesticide run-off, which is expected to increase in all provinces due to the increased use of agricultural chemicals.

2. Geographical Distribution - sub-projects were selected from each major island group.

3. Availability of Data - the sub-projects had completed feasibility studies based on adequate data.

4. Accessibility - sub-projects were accessible and relatively easy to visit.

On the basis of these four criteria, the following sub-projects were evaluated in the Environmental Assessment:

| Name of Project | Province | Significant Environmental Problems | Island Group |
|---|---|---|---|
| Landing Irrigation Sub-Project | Bohol | None(as control) | Visyas |
| San Isidro Irrigation Sub-Project | Daval del Norte | Schistosomiasis | Mindanao |
| Gen. Nakar Irrigation Sub-Project | Quezon | Malaria | Luzon |
| Sagrada Irrigation Sub-Project | Camarines Sur | Pesticide Run-Off | Luzon |

Scope of Coverage

The Environmental Assessment (Project Paper Supplement A) follows the general format and includes the general content specified in the Council On Environmental Quality "Guidelines for Preparing Environmental Impact Statements". This means that the Environmental Assessment describes both the project and its environment, predicts the consequences of the project on the environment and evaluates mitigation of adverse effects, alternatives, short versus long-term considerations and other aspects required by the Council on Environmental Quality.

The Environmental Assessment defines the environment in terms of both natural and socio-economic conditions. Thus it covers such natural parameters as land, water, atmosphere, aquatic and terrestrial life and ecological balance. It also covers such socio-economic parameters as demography, lifestyle and amenities, cultural minorities, historical sites, health, and economics.

Summary of Environmental Impacts

1. Individual sub-projects, because of their small size (100 to 300 hectares) will not have much of a measurable impact on natural and socio-economic conditions except in very unusual circumstances and only on a limited number of parameters.

2. There will be normal short-term effects like the turbidity of water and slight disruption of the area during construction of pump and canal structures.

3. There will be an increased risk of pesticide mishandling because the project will promote the use of agricultural chemicals. Careless disposal or application of some pesticides can result in adverse health effects.

4. There will be more pesticide run-off due to the increased use of agricultural chemicals. Some of these pesticides would have an adverse effect on fishes, crabs and snails found in ricefields.

5. In areas endemic for schistosomiasis, cases of poor water management might result in the establishment of breeding sites for snails, the intermediate host for schistosomiasis.

6. While sub-projects will be constructed in provinces endemic for malaria, they will seldom be constructed in sites which would become suitable breeding places for anopheles mosquitoes. Sub-projects, for the most part, are constructed in the plains rather than foothills and mountainous areas and possible adverse impacts do not warrant a separate recommendation.

7. The sub-projects will improve social and economic conditions in the rural areas. Irrigation projects will be marked by a growth in per capita income and a higher standard of living.

Conclusions

1. There is no potential major adverse environmental impact warranting curtailment of the program.

2. The FSDC will strengthen its training program in the use of appropriate (less persistent) pesticides in order to limit potential adverse ecological effects. Also, it will stress proper application of pesticides in order to protect the health of applicators.

3. The FSDC, in areas endemic for schistosomiasis, will encourage ISA members to accept treatment, will develop a control program for snails where necessary and will place additional emphasis on good water management practices.

4. A limited program of monitoring is recommended to be undertaken by FSDC. The program will document changes in pesticide use and their effects and in public health parameters.

# PART IV

# ECONOMIC, TECHNICAL AND ADMINISTRATIVE FEASIBILITY

## A. ECONOMIC ANALYSIS

The general conclusion that can be drawn from calculations is that the project is viable under almost any conditions. Even if capital costs were to rise or rice prices to drop significantly, the project would still be viable. The internal rate of return under expected conditions is 51%.

FSDC's experience over the past three years indicates a wide regional diversity in resource endowment among ISAs and a significant diversity in the stage of development of individual ISAs within the same region. The economic and financial analyses have been taken from the perspective of a typical ISA and the assumptions of FSDC's general framework of ISA development are used. The typical ISA is 100 has. and has about 70 farmer members. The capital costs for the irrigation system are appropriately ₱150,000. Training and program management costs have been included in the rate of return analysis. These will be discussed below.

The opportunity for a valuable learning experience exists in the exercise of calculating the benefits and costs as well as who is benefitting from a program. The process of questioning the many underlying basic assumptions may perhaps be more important than the result of the analysis itself. Both FSDC and AID staff began this process nearly a year ago. The questioning examined the assumptions in great detail, and tested them against the program's operational realities as then perceived. The analysis which follows is a result of that process - however, it is well-worth noting that within FSDC, the questioning intensely continues - how to best use scarce resources to meet program objectives.

Feasibility of an ISA is based upon increased rice production only, and this is the single benefit quantified. It should be noted from the outset that many ISA farmers produce not only rice but many other cash crops, such as mung beans and other vegetables of high nutritive value, melon, sugar cane, tobacco or poultry farming. In simple terms they are diversifying their on-farm production. Based upon empirical data, we assume that an ISA will increase rice yields from 36 cavans/hectare (non-irrigated) to 53 cavans/hectare/crop and with the availability of water will cultivate two crops of rice by the third year of operation.[1] The construction of the pump or diversion system and 50% of the distribution system is expected to occur in the first 12 months. Completion of the distribution system is estimated to reach 75% the second year and 100% the third year. Energy costs, while attributable only to pump systems, have been included in the analysis. The impact of construction being extended over a three-year period is reflected in the internal rate of return calculation.

1/ FSDC's data indicates dry season yields of 35 cavan/ha. without irrigation and 54.5 with irrigation.

Increased use of non-labor cash inputs will occur with the introduction of farm support systems in year 2. An ISA can then increase its average yield to 70 cavans/hectare crop with increased use of fertilizer, pesticides and herbicides [1] The shadow price of palay is assumed to be ₱55 which approximates the current world market price of US $300/metric ton for milled rice at .61 conversion factor discounted for transportation costs and quality.[2]

The farm support systems requires a learning process and thus adoption by the ISA (and the inclusion of the related benefits) is staged within years 2-4.

The farm support inputs such as storage and transportation facilities, which require a larger economic unit, or a federation of farmer organizations, have not been included in the analysis since such inputs only now are being slowly introduced. Nor have the anticipated benefits from agricultural diversification been included. The gains attributable to combining rice production with other crops have been well documented by BAECON (Bureau of Agricultural Economics). These benefits have not been included in the calculation of the project internal rate of return because to do so would require many additional assumptions that would significantly reduce the confidence level of expected result. However, it should be recognized that inclusion would raise the IRR.

For projects involving individual participants (such as many small farmers in remote locations), it is critical to assess whether they will have sufficient financial incentives and suitably timed cash flows so that they will be able and willing to participate enthusiastically in the project. A summary of the projected benefits to the farmers is included **on page 87 of this paper (also see** Annex J, Table 16). For the government and concerned donor organizations, it is important to calculate the net economic benefits of the project for each year of the project. This calculation is done in Table 1 and summarized in Tables 3 and 4, Annex J. Varying the assumptions result in the IRR's shown in Annex B-1.

The internal rate of return (IRR) is the preferred method of calculating financial or economic viability of a revenue-producing project such as this. Under this method, the discounted present value of the net benefits is calculated and cumulated for the years of the project. The IRR is defined as that discount rate which results in the total net present value of the project being equal to zero. The basic cost assumptions underlying the analysis are given in detail in Tables 5 through 10, Annex J.

1. Projected Yield Increase

The economic rate of return assumes that farmers are realizing the national rainfed average of 36 cavans/hectare without the project. With irrigation the yield increases to 53 cavans/hectare for each of the

1/ National average is 69 cavans/ha. for irrigated rice.
2/ $300/mt = ₱2,250/mt = ₱112.50/cavan of milled rice (.61 conversion rate) = ₱69/cavan of palay less discount of ₱14 for transport and quality = ₱55.

two cropping seasons, and with the addition of the farm support system to 70 cavans/ha. for each of the cropping seasons. The yield projections were validated from a variety of sources. (Refer to Tables 11 through 13, Annex J) The World Bank projection of a national irrigated average yield of 49 cavans in 1975 for HYV's with an estimated 40 percent double cropping rate suggest that farmers participating in the project with all double cropping should be able to easily attain the projected levels of 70 cavans per hectare per cropping season. The assumption of cropping intensity reaching 1.5 in the first year appears realistic for the project as a whole based upon FSDC's empirical studies of first full year of operations.

TABLE C

Cropping Intensity Index of Farms of ISA Farmers With/Without ISA Irrigation Input According to Area, CY 1976

| Area | With ISA Irrigation | Without ISA Irrigation |
|---|---|---|
| I | 1.51 | 0.98 |
| II | 1.12 | 1.10 |
| III | 1.69 | 1.56 |
| IV | 1.73 | 1.08 |

It should be noted that in Area II there was serious flood damage in crop year 76. Area III represents the traditional "rice basket" of the Philippines where double cropping is often possible under rainfed irrigation conditions. The analysis assumes "without project status" to be one cropping and the "with project status" to reach 2 crops within three years. The net change in cropping intensity (or effective area harvested) is assumed to be a net change of + 1.0. In reality, however, cropping intensity is affected by the following: a) natural disasters such as floods, typhoons and droughts, which frequently occur in many regions during the wet season, b) unreliable water source due to pump breakdown or disaster damaged systems and c) a trade-off between work and leisure. The base analysis, therefore, assumes double cropping only 50% of the time throughout the project life. This has the impact of reducing the irrigation IRR from 84% to 45% and the combined (irrigation and farm support systems) IRR from 83% to 51%.

2. Projected Labor Requirements

Labor has been valued near its opportunity cost which has been approximated by national averages for the specific labor operations performed by hired labor in rice production. Due to the seasonal shortage and surplus of productive labor (as indicated by seasonal fluctuation in the market price) this should give an indication of the average

value of labor in its best alternative use. These values range from approximately ₱4 to ₱7 per work day (See Table 14, Annex J).

Data from Central Luzon, Laguna and Rizal have been used to validate the assumptions used in the analysis (See Table 15, Annex J). Due to similar cropping conditions, Thailand's labor requirement for traditional varieties was compared. The labor required for traditional varieties (as in Central Luzon and Laguna) is the labor requirement which would occur without the project.

The analysis also assumes that all threshing is commercially contracted. The labor required using HYV's is higher due to additional land preparation, transplanting, weeding and harvesting.

TABLE D

Work Day Requirements: Irrigation

Total work-day crops requirements are estimated as follows:

| | | |
|---|---|---|
| Traditional Varieties | - | 71 |
| Irrigated HYV | - | 98 |
| x 2 cropping seasons | - | 196 |

The employment effect due to irrigation in conjunction with HYV's can be estimated at 2.76 times the "without project" requirements.

Employment Effect: Irrigation and Farm Support

However, with the farm support components which enable farmers to grow 2 crops of rice with irrigation, the employment effect can be calculated as follows:

TABLE E

Word Day Requirements: Irrigation and Farm Support

| | | |
|---|---|---|
| Traditional Varieties | - | 71 |
| Irrigation | - | 52 |
| x 2 cropping seasons | - | 104 |

The employment factor of the project as a whole is then estimated at 1.44. Thus we expect the project create employment and reduce underemployment.[1]

An uncalculated indirect employment effect would be the increase in demand for labor for agricultural supplying and processing enterprises.

3. Sensitivity Analysis

Due to the large variation in prices received, yields achieved, in addition to the range in irrigation construction costs and operating costs, sensitivity tests were based on five different combinations of assumptions. Through this process the boundaries of actual investment return might be defined (See Annex B-1).

TABLE F

Internal Rate of Return

| | |
|---|---|
| Base Case: Internal Rate of Return<br>Yield: 36-53, Price: ₱55, Capital Costs: ₱150,000 | 51% |
| Case I: Internal Rate of Return<br>Yield: 23-35, Price: ₱40, Capital Costs: ₱100,000 | 47% |
| Case II: Internal Rate of Return<br>Yield: 23-35, Price: ₱55, Capital Costs: ₱100,000 | 88% |
| Case III: Internal Rate of Return<br>Yield: 23-35, Price: ₱55, Capital Costs: ₱250,000 | 23% |
| Case IV: Internal Rate of Return<br>Yield: 45-100, Price: ₱55, Capital Costs: ₱250,000 | 148% |
| Case V: Internal Rate of Return<br>Yield: 45-100, Price: ₱40, Capital Costs: ₱250,000 | 101% |
| Estimated Boundaries | |
| 23% | 148% |
| Case III | Case IV |

1/ Family labor in the economic analysis is valued.

4. Output Valuation

The base case analysis assumes a constant price for a standard quality of unmilled rice of ₱55/cavan. This approximates shadow price for rice discounted for moisture and foreign matter content.

The current support price of unmilled rice (₱55/cavan) is slightly below parity on the world market. To this extent and to the extent that the long run trend in rice prices appears higher, the IRR is understated.

5. Foreign Exchange Components

Capital and production inputs with foreign exchange components have not been shadow priced due to their limited impact upon the internal rate of return. However, an attempt has been made to identify the impact of the project on the foreign exchange requirements of the country. The results of the analysis indicate approximately 20% of the total requirements exclusive of production inputs will require foreign exchange. Based upon increased production, the potential exists for foreign exchange savings/earnings as a result of increased exports or decreased imports. In summary, the project should have little if any adverse effects on the balance of trade of the country.

6. Cost Effectiveness Analysis

The project has several purposes of which equity is primary. Increased production is a mechanism for increasing the incomes of the project target group. Agricultural productivity presumably would be more efficient and consequently more cost-effective for the economy if corporate or capital intensive farming were undertaken. However this might well preclude the direct involvement of the project target beneficiaries.

FSDC's average cost per hectare for irrigation systems of approximately ₱1,500 - 2,000 is perhaps one of the lowest in the world. NIA large scale systems approximate ₱5,000 - 10,000 per ha. As a consequence, the return on investment is higher with small scale irrigation.

7. Indirect Benefits

Secondary project beneficiaries include suppliers and processors of agricultural inputs and outputs. Increased production will require increased agribusiness. This in turn, should require increased labor use.

Value-added will accrue to the agricultural processing, storage, transport and marketing sectors of the economy due to higher domestic production. (This contrasts with the situation when the Philippines was a net importer of milled rice.) Given existing high levels of underemployment, this provides an additional net gain to the economy. As the farmers mature on their organization and their risk taking capability increases, many of the indirect benefits of the program are expected to become direct benefits to the farmer beneficiaries since it is anticipated that ISAs, or

groups of ISA's will themselves become involved in small agribusiness in the future. The innovative packages (e.g. seed production, institutional buying and selling) are for the most part a transfer from one segment of the economy to another and not a new benefit to society. It, however, should be clearly recognized that this transfer is a real benefit to the target beneficiaries of the BISA program.

8. Non-Monetary Benefits

The benefits accruing from the training, organization and building of farmer leadership are a direct project benefit. These are not included in the internal rate of return calculations due to the difficult task of quantifying a value for these benefits.

The benefits of improved health, nutrition, and family planning activities that generally accompany increased income have been omitted, again due to difficulty in valuation and measurement.

## B. TECHNICAL FEASIBILITY

The proposed Small Farmer Systems (SFS) Project will assist FSDC in funding both physical and institutional infrastructure. The physical infrastructure components are irrigation systems, farm tools and machinery, storage and transportation facilities and water management devices. The institutional infrastructure consists of a series of training courses for FSDC field staff and ISA members, so that the physical components can be effectively used. Total costs of physical and institutional components are presented at the end of this section, together with a breakdown of AID loan and grant fund applications.

### 1. Physical Infrastructure

#### a. Irrigation

The BISA program irrigation projects consist of equipment and structures for new or rehabilitated pump or gravity diversion irrigation systems. The pump system includes pumps and pipes and are powered by either electric motors or diesel engines, while gravity systems usually consist of low concrete structures to divert water from nearby streams. Both systems include canals, farm ditches and related structures, and drainage facilities where needed. The cost per hectare of pump sytems ranges from ₱1,000-₱2,500, while the cost of gravity systems varies from ₱1,000-₱3,200. (See Table G on following page.

The crucial elements of satisfactory irrigation systems for groups of small farmers are reliability and efficiency. Equitable distribution is also critical; farmers must be reasonably sure that they can count on receiving water when they need it. Reasons for poor distribution may be: 1) unreliable water sources due to drought or salinity, and 2) mechanical breakdown of pump sets. The causes of mechanical breakdown may involve one or more of the following: (a) natural disaster, (b) poor equipment, and (c) poor maintenance.

The energy costs of a pump system will depend on the efficiencies of the components of the pump system. Efficiency ranges for pump components can be seen in Part A of Table H. For a given ISA, if the actual efficiencies are in the upper ranges, i.e. if the correct size and quality of pump is selected; and the prime mover and drive mechanism are as efficient as possible, energy bills will be minimized. On the other hand poorly designed and installed pump sets can result in as much as twice the energy bill of a well designed/built pump set. Operations and maintenance costs for pump irrigation systems can be found in Table 21 in Annex J. Annual pumping hours required for delivery to all farmers in a typical 100 hectare ISA, based on current practices may be found in Table 24, Annex J.

TABLE G

Construction Costs[1/]
of Pump and Gravity Projects

Pump Projects

| Components | Project Area = 82 Has. (Min. Cost) | Project Area = 89 Has. (Max. Cost) |
|---|---|---|
| A. Water Supply | | |
| 1. Pump, Prime Mover, Pipe | ₱ 41,500 | ₱ 170,800 |
| 2. Pumphouse, Supports, Stilling Pool | 12,400 | 12,800 |
| B. Conveyance System | | |
| 1. Earth Canals | 17,500 | 20,500 |
| 2. Canal Drainage Structures | 12,400 | 19,200 |
| TOTAL COST---------- | ₱ 83,800 | ₱ 223,300 |
| COST PER HECTARE------ | 1,022 | 2,509 |

Gravity Projects

| Components | Project Area = 317 Has. (Min. Cost) | Project Area = 100 Has. (Max. Cost) |
|---|---|---|
| C. Diversion Intake Works | ₱ 4,200 | ₱ 70,900 |
| D. Conveyance System | | |
| 1. Canal Structures | 329,500 | 233,100 |
| 2. Terminal Facilities | 60,700 | 20,200 |
| TOTAL COST---------- | ₱394,400 | ₱ 324,200 |
| COST PER HECTARE ---- | 1,240 | 3,240 |

1/Source: FSDC and NIA Engineers Cost Estimates of Actual ISAs.

Sections B and C of Table H, following page, showing water delivery and application efficiencies, apply to both pump and gravity systems. If water conveyance efficiencies are low, farmers will be paying for water that does not actually get to the farm plot. Section C describes the degree to which the water that arrives in a farmer's field is more than needed for the growth of his crop. In other words, Section A describes mechanical efficiencies; Section B describes canal seepage and other water losses and Section C relates to management of water on individual farm paddies. In addition to the extra cost to the ISA of pumping more water than needed, there may be an external cost to other farmers in terms of oversubscribed water on a given stream.

In order for all farmers in an ISA to receive sufficient water, there must be a reliable source and pump, an adequately sized system of canals and ditches, plus an enforced water delivery schedule that is appropriate to the soil and crop needs on the one hand and the needs and expectations of the farmers on the other. The problems associated with reliability, efficiency and equitable water distribution are being addressed by FSDC as follows:

(i) Unreliability due to salinity or perennial drought.

Preliminary site investigation by FSDC engineers eliminate such problem sites as technically marginal or not feasible. A few earlier sites with this problem were deferred for further study. An examination of potential drought periods of streams and rivers is included in the pre-feasibility studies.

(ii) Unreliability due to mechanical breakdown.

Mechanical breakdowns have happened because of poor quality of locally manufactured pumps and drive transmission components, e.g. inadequate bearings or couplings, poor alignment and poor maintenance. In addition breakdowns occurred due to poor foot valves. The problem of pump quality is largely being solved by specifying better quality components and working with local manufacturers to improve the local pump industry over time. Over 120 early pump sites with these problems have been included in an upgrading program. This program consists of replacing faulty pumps, bearings, chain sprocket couplings, and foot valves with better ones. The poor maintenance problem began to be addressed in July 1976 with the start of a training program for all pump operators. This

# TABLE H

## Irrigation Efficiency Ranges

| | | Percent |
|---|---|---|
| A. | Pumpset Efficiency | |
| | 1. Pump | 50 - 80 |
| | 2. Prime Mover | |
| | a. Electric Motor | 85 - 90 |
| | b. Diesel Engine | 70 - 80 |
| | 3. Power Transmission | |
| | a. Direct Coupled | 95 - 99 |
| | b. V-Belts | 90 - 95 |
| | c. Flat Belt | 70 - 90 |
| | 4. Overall Efficiency (1x2x3) | 25 - 70* |
| B. | Water Delivery Efficiency | |
| | 1. Pipe Lines | 90 - 95 |
| | 2. Concrete Lined Canals/Ditches | 80 - 90 |
| | 3. Earth Canals/Ditches | 40 - 80 |
| | 4. Structures | 80 - 90 |
| C. | Water Application Efficiency (on farm) | 30 - 90 |

*Reasonable pumping plant efficiency is 60 to 65%.

training is conducted by FSDC mechanic/electrician trainors and consists of a three-day course on simple repairs and routine maintenance. In addition a follow-on three-day training is planned wherein the FSDC mechanic gives additional training for the operator on his own pump set. Where the breakdown is caused by natural disaster, the system is rehabilitated by FSDC with labor contributed by ISA members.

(iii) Low mechanical efficiency.

Many of these difficulties are being solved by the upgrading and training programs described above. Primarily, pumps are relocated closer to the prime mover and the flat belt drives are replaced by more efficient direct drives where possible or V-belt drives with different size pulleys to run the pump at better rpm ranges to improve efficiency. Flat belts may be used on ISAs with the lowest pumping lifts and fewest hours of pumping needed. Additionally, two engineers from Camp Dresser and McKee International, Inc. (CDM) are providing technical assistance to FSDC to improve the engineering and selection of new pump sets.

(iv) Water losses due to seepage.

With early and correct emphasis on developing the organizational capability of groups of small scale farmers and the concomitant investment in very low cost infrastructure, items such as concrete lined canals were left out. As individual ISAs become viable and additional investments like farm support systems become less risky, further investment in irrigation infrastructure for concrete linings make sense where they are deemed needed. FSDC is now developing a suitable strategy which is described in the water management section, page 51.

(v) Inequitable distribution of water.

The solution to this critical problem involves a major effort to improve water management based upon on-site studies and training and is described in the water management section.

Although the FSDC plans a few irrigation systems, based upon water impoundment (i.e., in 1978 they will experiment with six small dam/reservoir projects), and may in the future experiment with shallow wells, their experience over the past three years has indicated that pump and gravity diversion systems are the most suitable and economically viable irrigation methods for remote small groups of farmers in the Philippines. In the long run, other technologies presently being considered by FSDC's Research and Development Division may prove to be feasible. Such technologies may draw their energy source from

mini-hydropower, bio-gas fuel sources, solar energy and the use of small tree plantations for wood fuel for producing gas to fuel internal combustion engines.

b. Farm Support Systems

Farm Support Systems consist of production, post-harvest and marketing tools, equipment and facilities: sprayers, tillers, threshers, dryers, storage facilities and transportation equipment to support appropriate ISA level two-crop irrigated farming. The tools and equipment are jointly owned, shared and managed by the ISA members.

Farm tools and equipment are introduced to the ISAs in response to the farmers' actual needs. Current items desired and available include backpack sprayers, 10 hp hand tillers and 20 cavan per hour threshers. A vertical column 4-ton batch dryer is being fabricated for testing in an ISA. The costs, maximum number and mix of units for a typical 100-hectare ISA are shown in Table I.

TABLE I

Farm Tools and Equipment
(100 Ha. ISA)

| Item | Capacity | Number Required | Unit Cost (₱) | Total Cost (₱) |
|---|---|---|---|---|
| Sprayer, Knapsack | 3-7 ga. | 10 | 450.00 | 4,500.00 |
| Tiller[1/] | 3.5-11 HP | 4 | 22,000.00 | 88,000.00 |
| Thresher Axial Flow | 20 cavan/ha. | 1 | 14,500.00 | 14,500.00 |
| Dryer-Flat Bed[2/] | 60 cavan/day | 2 | 11,000.00 | 22,000.00 |

1/ Locally fabricated tillers, 8 to 10 hp cost ₱10,000; imported tillers cost up to ₱32,000.

2/ A larger capacity vertical column batch dryer to be tested should reduce this cost.

It should be noted that the introduction of hand tillers does not necessarily displace labor. Introduced in conjunction with irrigation, such farm equipment allows for double-cropping of high yielding varieties. In areas with short rainfall seasons, it may be impossible for farmers to harvest and replant in time to grow a second crop without mechanization. Annual labor use without project with irrigation and with irrigation plus farm support systems is given in Table E, page 41.

c. Water Management

Consistent with its policy of simple and practical adaptive technology and low cost investments in infrastructure, FSDC's approach to water management for groups of small scale farmers will be to identify the most simple and practical ways for these farmers to measure water flows, schedule and enforce water deliveries, and reduce seepage and other losses that have significant visible pay-offs and thus ready farmer acceptance. IOs will be trained to demonstrate and encourage the farmers in the ISAs to adopt several or all of these improved water management practices in conjunction with the use of high yielding varieties, fertilizers and other irrigated farming practices. For example, demonstration of an improved water management practice may simply be to set up measuring devices at two places in the main canal in order to demonstrate the existence of high seepage losses and show the farmers the need for and estimated savings in pumping costs by filling the holes made by rats.

In some ISAs with diesel engines ad hoc water management consists of individual farmers bringing cans of diesel fuel to the engine and hence "paying" directly for irrigation of their plots. In the case of one ISA with an electric motor, each farmer is alloted 20 hours of pump-time per hectare for a flat irrigation fee; additional hours cost proportionately more. Obviously, in these cases, the farmers farthest from the canal pump must pay more for seepage that occurs in the long path to their plot than do farmers nearest the pump. This rather common problem is one in which FSDC's capability to organize and train farmers can be directed to assist less advanced ISAs provide more equitable water deliveries through an effective water management program.

For ISAs that have established their viability and have excessive canal seepage, FSDC will make loans and provide designs and construction supervision for concrete or other appropriate linings

for sections of canals, enlarge earth canals and to upgrade or add control structures such as junction boxes, turnouts, inverted siphons and drop structures. Land leveling may be developed on a pilot basis and expanded when and as appropriate. A small, i.e. one cubic meter scraper or earth mover which can be pulled by a 25-35 hp farm tractor is being built for FSDC use and demonstration. The estimated cost of water management infrastructure ranges from ₱100 to ₱500 per hectare.

d. Storage and Transportation Facilities

FSDC anticipates that an ISA will be ready to borrow for storage and/or transportation facilities in the 4th, 5th or subsequent years of its life. However, many original well-established ISAs are approaching this stage, and it is anticipated that these ISAs will feel that such equipment will help to solve marketing problems resulting from increases in production. Under this program, loans will be made for warehouses and supporting equipment such as scales, direct reading moisture meters, a set of small sieves and a gram-weight balance to give ISA's members an accurate measure of the quality and quantity of their palay. Loans for farm-to-market trucks will also be made. Specific needs will vary from ISA to ISA and loans will be made to meet unique infrastructure or equipment needs of individual ISAs within the small scale concept of FSDC's program and the felt needs of the small farmers. In February, 1977 ground was broken to start the construction of the initial 5,000 cavan capacity Intermediate Storage Facility (ISF); 5 more are planned in the other FSDC regional areas.

e. ISA Enterprises

Traditionally, small farmers have supplemented their incomes by a wide variety of off-farm jobs. It is therefore anticipated that once an ISA is well established with a reliable, efficient and equitable irrigation system, a suitable farm support system package and adequate marketing facilities, there will be a desire on the part of ISA members to use their non-farming skills to expand into secondary activities that will either increase their incomes or directly improve their quality of life. Examples of the former might include poultry-raising, craft industries, carpentry shops, carpet weaving and animal husbandry, while examples of the latter might involve upgrading of houses or the introduction of domestic water supplies. Once an ISA identifies a profitable expansion activity, FSDC will provide technical assistance for feasibility studies and financing for hardware.

## 2. Institutional Infrastructure - the Diffusion of Technology to the Farmer

Training in the effective use of the physical infrastructure by ISA members is undertaken through a series of courses described in Table J, next page. The training programs are an integral part of FSDC's efforts to fulfill its purposes and goals. Since farmer training is undertaken primarily by IOs, their training receives the highest priority.

Institutional Officers are typically college graduates in their early 20's, recruited from the area in which they will work. Currently half are women. In the early years when the institutional development of ISAs was a prime focus of FSDC, most IOs had social science backgrounds. Now the needs of the BISA program are changing and IOs with agricultural or financial degrees are being recruited.

IO training begins with the field exposure that is an integral part of the recruitment process. Some 7-9 days are spent in the province in which the new IO will work. Activities vary, but most IOs are expected to conduct a baseline survey of potential members of the association they are to help establish.

The IO's first task is the establishment of the Irrigator Service Association (ISA). Hence within IO training, priority has been given to "Basic Institutional Development Training (BIDT)". This 21-day course is designed to prepare the IO to undertake Phase I tasks - i.e. the establishment of an ISA and the construction of an irrigation system by the ISA members.

Once the ISA has a functioning irrigation system, the IO is again exposed to training - the "Basic Management Training (BMT)" - which is a 26-day course designed to prepare IOs to train farmers to run the ISA as a farm systems development unit. Usually immediately following BMT, IOs receive 12 days of training in Rice Production.

Once the ISA is firmly established, and irrigation has been used for a second crop within an agricultural year, the IO is trained again, this time as a participant in a 13-day course on "Management Training for Innovation Packages (MTIP)". This prepares the IOs to assist farmers in diversifying the activities of the ISA into such areas as organized purchasing and sales. (It should be noted that although it is the IOs that receive the training, it is the needs and developmental stage of the ISA that dictates the content and timing of courses.)

TABLE J

Training for the Use of Physical Infrastructure

| Hardware | Trainers (Trg) | Trainees | Content |
|---|---|---|---|
| Irrigation | IO (BIDT/BMT*) | General Membership | Institutional Aspects and Construction of System and its Operation |
| Irrigation | FSDC Mechanic/Electrician | Pump Operators | Servicing, maintenance and minor repairs |
| Irrigation | IO Specialists - financial management, water management | General Membership may be special board member | Establishing and monitoring of bookkeeping and water scheduling |
| Farm Support Systems | IO (MTIP*) | General Membership | Benefits and use of farm tools and equipment in general |
| Farm Support Systems | Manufacturers | General Membership | On Farm Sales Demonstrations; post-purchase training in tool use and repair |
| Storage & Transport/ Small Cottage Industry/ ISA Improvements | IO Specialists | General Membership | Content depending on expressed interests of individual farmers |

*IO - Institutional Officer BMT - Basic Management Training
BIDT - Basic Institutional Development Training
RPWM - Rice Production and Water Management
MTIP - Management Training for Innovation Packages

This IO training translates into the following farmer training:

Phase I - Preparation for Establishment of Irrigation System

a. Pre-Organizational Training
b. Board of Directors (BOD)
c. General Membership
d. Irrigation Management Committee
e. Business Management Committee
f. Audit and Inventory Committee
g. Education and Training Committee
h. Grievance Committee

(As of December 31, 1977, well over 2,000 of Phase I training sessions had been undertaken for almost 40,000 farmers.)
(Note: Some farmers will receive more than one type of training.)

Phase II - Development of ISA Entrepreneurship

a. Operation and Maintenance of Pump Sets
b. Management for BOD and Committee
c. Irrigation Management
d. Pesticide, Insecticide and Fertilizer Application
e. Rice Production
f. Water Management Training

(As of December 31, 1977, over 600 sessions had reached over 6,000 participants.)

Some 200 training sessions have also been conducted for farmers in the management of the following innovation packages: institutional credit, organized buying, seed production, organized rice production, farm tools and equipment pool, and organized selling.

The content and methodology of the above farmer training is the province of each IO. IOs have been given formal inputs in the theory of training, and have been exposed to a variety of methodologies in their own BIDT or BMT. They can therefore apply these tools to the varied needs of the farmers in their ISAs.

In the field staff organization (see charts on pages 66-68 below), IOs are supervised by Senior Institutional Officers (SIOs) who are chosen from the ranks of the IOs with whom they share common formal training. All IOs and SIOs report to a Program Manager (PM). There is one PM for each province; in many cases the PM was recruited from the local provincial government. Pressure of time in the past has allowed for

little specific formal training for the PM who normally received on-the-job training except for attendance at the BIDT and BMT courses. Key management staff members have received participant training under SSI, 38 having attended short-term training in the U.S. and Third World Countries.

Up till now most formal training (i.e., BIDT, BMT, MIPT) has been undertaken in Manila by the FSDC training division. This work was greatly facilitated by the establishment of a Training Center for Area II in Valenzuela, Bulacan just north of Metro-Manila in February, 1977. This center houses the training division and has full facilities for live-in training for up to 60 participants. There is also a small demonstration farm adjacent. In addition, Rice Production and Water Management Training for IOs and PMs has been undertaken in cooperation with the U.P. College of Agriculture at Los Banos with the assistance of IRRI.

As of January, 1978 most training activities have devolved on the Area Offices; only the first IO training, BIDT, will continue to be held in Manila. To support training courses given at the area level, AID proposes to fund four demonstration farms for Areas I, III, IV and V.

In training IOs, FSDC is undertaking an activity unique in the Philippines. In a sense, an IO is very similar to a VISTA worker in the U.S. Although the IO is not a volunteer, his salary is low, and his prime motivation must come from his idealism, caring and commitment to the program and to the farmers which it serves. The job is strenuous and often lonely, frequently frustrating, and unlikely to be rewarded by salary increases or promotions within the corporation. Thus IO training has a two-fold emphasis: on the one hand it must acquaint participants with the information and practical skills they need to undertake their work, and on the other, it must foster and expand the spirit of commitment and independence of the field workers.

FSDC is fortunate in having a large pool of able young graduates to draw from, but they are also to be commended on their ability to harness and develop these young people's talents to serve the BISA program. Some elements that have contributed to his success are listed below:

- training staff, and indeed all FSDC staff, including the Administrator, are young, enthusiastic and professional.

- strenuous efforts are made to base training and planning on evaluation of previous courses (by staff or participants)

together with feedback from the field (from field staff themselves or field visits by trainors).

- non-formal education is an integral part of all live-in training: participants are encouraged to set up their own discipline procedures and organize their free time. This development of self-discipline and independence contributes significantly to IO spirit and morale.

- training courses are very demanding. Hours are long and participants are frequently quizzed and tested. This continuous challenge and hard work sets a good example for job performance and also fosters morale - IOs feel busy, important and needed.

- there is a notable absence of authoritarianism in training courses and within FSDC as a whole.

- there is an equally notable absence of "double standard" - i.e., the farmers, the raison d'etre of the agency, are poor, and live in simple houses - similarly the FSDC training center is simple, and staff and participants live under the same conditions.

- the use of devices such as diaries, reflection papers, evaluation of group dynamics encourages IOs to introspect, identify, and improve their attitudes and abilities and hence their job performance.

An area that has caused considerable concern within FSDC and AID is the development of a system to assure a reliable water supply to all the farmers within an ISA. For 1978, FSDC is committed to the development of a strong and practicable training course in water management for IOs and specialists. This course will be based on experiences gained in a few pilot ISAs, and supported by technical assistance financed by grant funds.

The course content for IO water management training has yet to be finalized, but will include the following elements:

- effective use of simple water-management technology

- development of suitable cyclical water delivery schedules that ensure reliable and equitable distribution and encourage reduced consumption.

- method and content of ISA member training in water management.

3. Costs

a. Physical Infrastructure

During the life of the SFS loan, FSDC will spend $15.6 million on physical infrastructure. Of this, $1.9 million will be in the form of Danish pump sets purchased under the Danish loan. GOP will spend $1.3 million for the remaining components of the systems using the Danish pumps. Of the remaining $12.4 million, AID will reimburse 50% under a FAR Agreement. Based on current costs, and assuming at least 7% inflation per year, it is anticipated that the following components of physical infrastructure will be installed:

TABLE K

Total Life of Project Costs of Physical Infrastructure

| Type | No. of ISAs | (Millions $) Total Costs | (Millions $) AID Contribution |
|---|---|---|---|
| Gravity Irrigation Systems 1/ | 160 | $ 7.4 | $ 3.7 |
| Pump Irrigation Systems 2/ | 260 7/ | 6.2 | 1.5 |
| Upgrading and Rehabilitation of Irrigation Systems 3/ | 200 | 0.8 | 0.4 |
| Farm Support Systems 4/ | 100 | 0.8 | 0.4 |
| Water Management Infrastructure 5/ | 160 | 0.4 | 0.2 |
| ISA Contribution 6/ | | 1.5 | |
| Total Cost | | $ 17.1 | $ 6.2 |

1/ Based on costs of ₱2,000/ha. over the life of the loan; average gravity ISA size = 175 hectares.
2/ Based on ₱1,500/ha. over the life of the loan; average pump ISA size = 120 hectares.
3/ Based on ₱250/hectare average costs.
4/ For unit costs, see Table I, p. 50.
5/ Based on ₱150/hectare average costs.
6/ ISA contribution or farmers' equity is 10% of the direct cost of the loan for irrigation systems and is given in self-help labor to dig canals, build structures and assist install equipment.
7/ Includes 140 Danish-assisted ISAs.

b. Institutional Infrastructure

During the life of the SFS loan, FSDC will spend $2.8 million on institutional infrastructure. The AID loan will be used to reimburse the direct costs of the following activities, using FARA procedures:

Training for FSDC field staff, i.e. IOs, SIOs and PMs.

Training courses for farmers. 1/

Establishment of demonstration centers for the Area Offices serving Northern Luzon, Visayas and Eastern and Western Mindanao. 2/

Training courses for IOs, SIOs and PMs will include the following:

Basic Institutional Development Training
Basic Management Training
Management Training for Innovation Packages
Entrepreneurial Training
Rice Production
Water Management.

Training courses for farmers and farm families will include:

Pre-organizational Training
Basic Director and Officers Training
Pump Operators Training
ISA Basic Management Training
Water Management
Pesticide, Insecticide & Fertilizer Application
Rice Production.

FSDC training costs are low; costs for 1978-1980 are estimated as follows:

| | | |
|---|---|---|
| Farmer training | - | ₱150 ($20) per participant per week. |
| IO training | - | ₱450 ($60) per participant per week. |
| PM training | - | ₱525 ($70) per participant per week. |

1/ Where these are formal and not routinely part of IOs normal daily work load.

2/ Area II has a demonstration center in Bulacan Province.

Training will be undertaken simultaneously at the five Area Offices, with BIDT for new IOs scheduled in Manila. Since IO training is scheduled according to ISA development needs, it is difficult to predict the exact timing of courses. Over the life of the loan, however, it is anticipated that some 600 IOs (presently employed or new recruits) will receive 15 weeks of training each, for a total life of project cost of $0.545 million. Some 100 PMs will receive 9 weeks of training, for a total life of project cost of $0.065 million. Approximately $1.0 million will be spent on farmer training, each of 50,000 ISA members receiving a week's training. Total LOP training costs therefore equal $1.61 million. $130,000 will be spent on simple measuring devices and other equipment needed to support the water management pilot studies, demonstration and training programs. The remaining $1.06 million will be spent on the establishment of 4 demonstration centers in support of the Area Offices, with an average cost of $265,000 each.

TABLE L

Total LOP Costs of AID Supported Institutional Infrastructure

| Activity | | Costs (US $) |
|---|---|---|
| Training | | 1,610,000 |
| Institutional Officers | 545,000 | |
| Program Managers | 65,000 | |
| Farmers | 1,000,000 | |
| Water Management Devices Used in Conjunction with Water Management Program | | 130,000 |
| Establishment of 4 Demonstration Centers | | 1,060,000 |
| Total | | 2,800,000 |

c. Commodity Procurement

The sum of $1.0 million is earmarked for commodity procurement in support of FSDC operations. Items to be procured include vehicles, trucks, scientific equipment, construction and communications equipment. (For details see Tables 22 and 23, Annex J.)

d. Technical Assistance

To support the technical aspects of FSDC's program $1.0 million of grant funds will be provided over the life of the project. Grant funds are budgeted as follows:

TABLE M

SFS Grant Fund Allocations

| | LOP Costs US $ | |
|---|---|---|
| Technical Assistance | | |
| Short-Term | | 160,000 |
| Water Management Specialist | 40,000 | |
| Farm Systems Specialist | 40,000 | |
| Marketing Specialist | 40,000 | |
| Irrigation Engineer | 40,000 | |
| Long-Term | | 555,000 |
| Water Management Advisor (8 w/m) | 54,000 | |
| Operations Advisor (18 w/m) | 126,000 | |
| Farm Mechanization Advisor (8 w/m) | 54,000 | |
| Training & Information Advisor (24 w/m) | 174,000 | |
| Engineering Advisor (21 w/m) | 147,000 | |
| Participant Training | | 100,000 |
| Research & Development/Demonstration Centers | | 100,000 |
| Regional Seminar | | 40,000 |
| Prototype Equipment | | 10,000 |
| Invitational Travel | | 35,000 |
| | | 1,000,000 |

The need for technical assistance personnel has been mutually agreed on by AID and FSDC. Grant funds will be used to finance dollar costs of hiring technical assistance personnel, and will be used to finance some or all of the local currency costs of this assistance. It is felt that the local cost burden on FSDC's budget would consume too much of its budgeted resources for this purpose. The Administrator of FSDC feels that budgeting to pay for expatriate housing, schooling, etc., would be awkward and inappropriate in the early life of the organization.

Due to reduced ceilings on AID direct-hire personnel, the services of 1 direct-hire engineering advisor and 1 direct-hire farm mechanization advisor will have to be replaced by contracted personnel. The short-term Water Management Specialist will advise on the establishment of the water management pilot projects and training courses; the long-term advisor will assist and monitor the implementation. It is anticipated that a specialist will be needed to advise on means of overcoming marketing difficulties of established ISAs. At least one local engineer will be needed to monitor the progress of the irrigation systems as they are turned over to the ISAs by FSDC and NIA. The Training and Information Advisor will advise on institutional infrastructure components of the program and assist in improving the management data collection system of the corporation. The Operations Advisor will be needed to monitor the implementation and evaluation of the project.

Participant Training funds will be used primarily for short course training in the U.S. and in Asia. At an average cost of $2,000 per month, this will allow about 25 members of FSDC staff to attend 6-7 week courses on irrigation, water management, financial management, contracts, data collection, credit policy, and related subjects. Since FSDC in principle prefers to keep its staff over-rather than underemployed, it would be unrealistic to expect more personnel to be released for short-term training.

Research and Development funds of $100,000 will be used to support the innovative activities undertaken by the FSDC R & D Division. Such activities include investigation of the feasibility of rice-fish, or fish farming and the potentials of shallow wells as an irrigation source and information systems. Portions of these funds may be used for components of the 4 regional demonstration centers.

$40,000 will also be used to pay the costs of a seminar, to be hosted by FSDC, for participants from other ASEAN countries. The seminar would focus on the problems of small farmer development systems, and would include areas of particular interest to FSDC, such as water management, data collection and institutional development.

Prototype models of farm tools and accessories will be imported to support R & D in this field. Examples include hand-tiller planting and fertilizer applicator accessories. A total of $10,000 will be spent in this category.

$35,000 is earmarked for invitational travel. Areas targeted for travel are the Peoples Republic of China, Thailand and Israel for FSDC field and management personnel to study small farmer institutions, different irrigation methods, and types of farm support systems.

## C. ADMINISTRATIVE FEASIBILITY

The Small Farmer Systems Loan will support a single institution, FSDC. The charts at the end of this section show the present organizational structure of the Corporation's Central Office, Area Offices and Provincial Offices. As of January 1978, FSDC had 1,251 employees; they were located as follows:

| Category | Location | | |
|---|---|---|---|
| | Central | Area | Total |
| Management[1] | 50 | 21 | 71 |
| Line Positions[2] | 14 | 599 | 613 |
| Staff Positions[3] | 224 | 82 | 306 |
| Support Staff[4] | 147 | 114 | 261 |
| Totals --- | 435 | 816 | 1,251 |

It should be noted that 65% of the entire staff are located in the field Area Offices, and that almost 50% are in line positions. FSDC is committed to maintaining a low profile and thus keeps its salaries and staffing levels low. Early in its history, the Corporation undoubtedly suffered from the youth and inexperience of its staff, most notably its field engineers and institutional officers, yet despite its short history, a viable and expanding program has been established in 70 provinces all over the country. It is a tribute to FSDC's leadership and management staff that so early in its life it has not only been able to create and operationalize a viable yet flexible organizational structure, but also, during August-December 1977, has had the confidence to decentralize and delegate considerable authority and responsibility to the field.

With respect to the viability and integrity of FSDC, the draft report of the recent external AID evaluation noted:

> "The striking feature of the FSDC is the idealism and the commitment of its personnel. Many employees have joined FSDC at considerable financial sacrifice, and others have joined when it meant transfer out of Manila to one of five area offices; in many cases wives and children have remained behind. This dedication is illustrative of the high regard in which the organization and its Administrator are held.

1/ Directors, Assistant Directors, Section Heads.
2/ Includes Area Coordinators, Program Managers, Institutional Officers, Engineers, Mechanics and Training Officers.
3/ Includes Project Officers, Research Officers, Engineering Designers, Procurement Assistants, Financial Analysts and Legal Staff.
4/ Includes Clerks and Typists, draftsmen and drivers.

"It is safe to say that this sort of devotion to an organization and its mandate to help small farmers is extremely rare. The long term viability is more difficult to judge, and most certainly this sort of devotion will subside somewhat as the program moves into subsequent stages. However, it is difficult to imagine FSDC ever losing all of its commitment to small farmers, and hence vis-a-vis other agricultural organizations in developing countries, the outlook for FSDC is indeed encouraging."

In its almost 3 years of dealing with FSDC, USAID staff members have been impressed by the quality of management. Clear cut policy decisions are made and implemented, while a remarkable flexibility on the part of the Administrator and his senior staff has allowed for rapid responses to implementation difficulties. Detailed examples of this have been noted elsewhere in this paper; the following list may be illustrative here:

1. The decentralization of FSDC organizing, construction, training and financial functions has allowed for more rapid decisions on implementation problems in the field.

2. The streamlining and consolidation of divisions within central office, most notably with respect to acquiring and distributing hardware and supplies, will speed up appropriate delivery to the field.

3. IO training content is increasingly practical and farmer-oriented.

4. IO recruitment has shifted towards hiring of financial and agricultural undergraduate majors in response to needs of established ISAs.

5. A more flexible approach to ISA organizational structure has allowed farmers to operate within institutions that reflect regional, cultural and individual differences.

6. A new emphasis on the subdivision of the ISA into kaisahan (of about 10 farmer families each) has allowed information and training to be conducted on the closest possible level to the ISA farmer and his family.

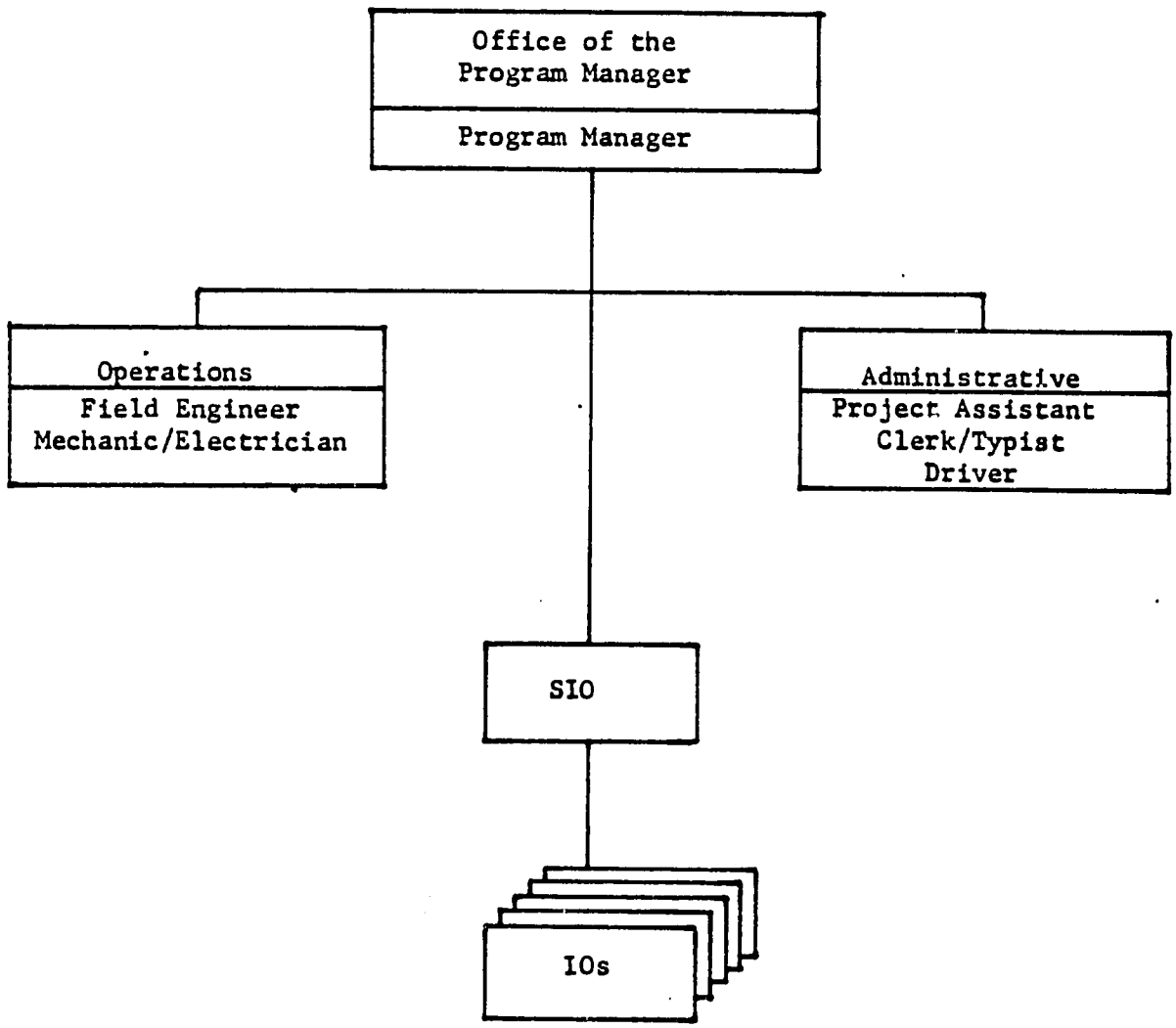
AID staff enjoy excellent relations with FSDC. In the words of the evaluation:

"The team was struck by the extent to which AID personnel are considered as colleagues -- and the subsequent opportunity to openly discuss management and technical problems within FSDC. The FSDC staff is genuinely interested in discussion, debate, brainstorming and experimentation on a variety of management and technical issues."

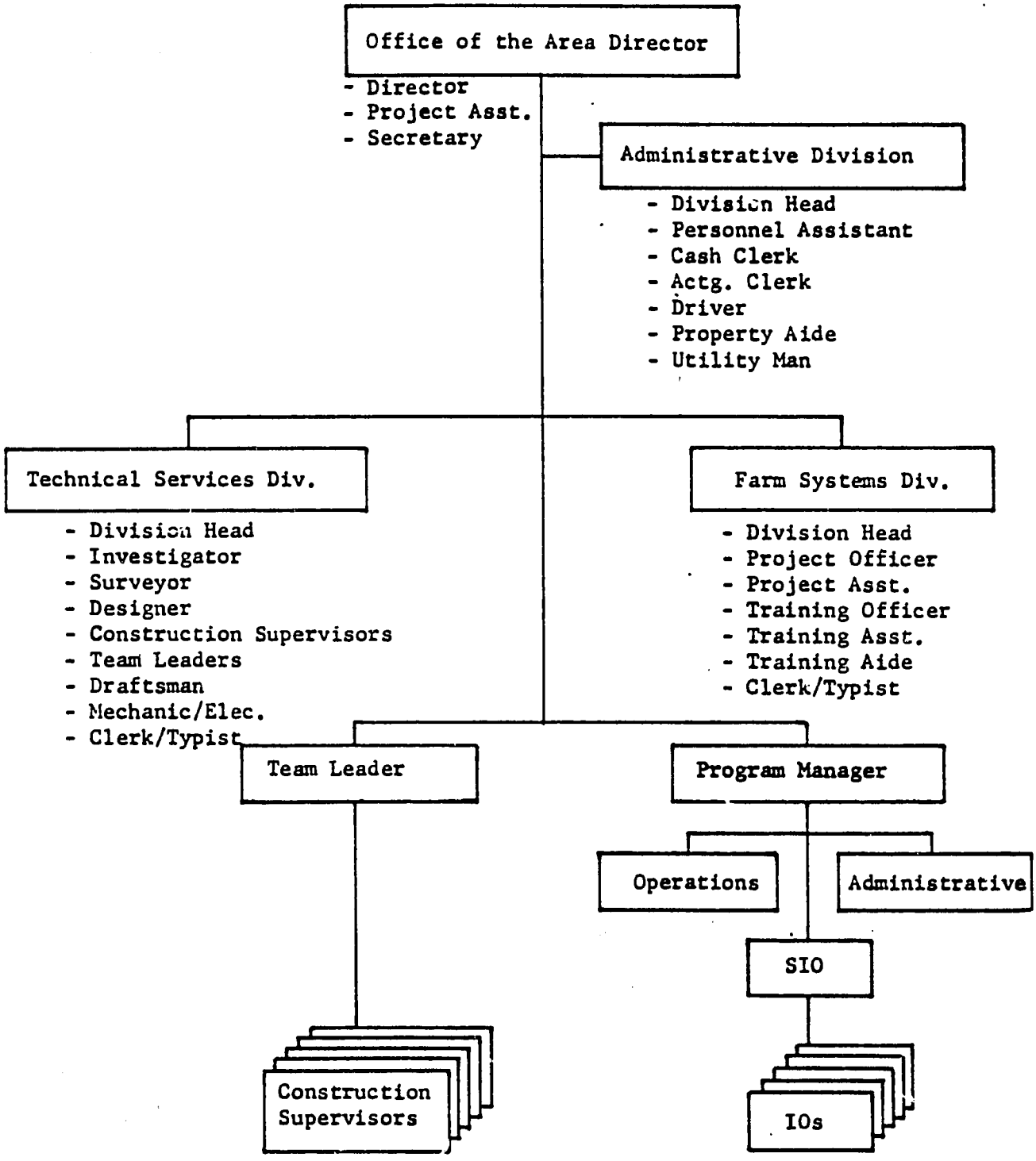
Based upon the foregoing comments AID/Manila feels that FSDC is administratively capable of implementing the project.

The present organizational structure of FSDC Provincial, Central and Area Offices may be seen from the charts below:

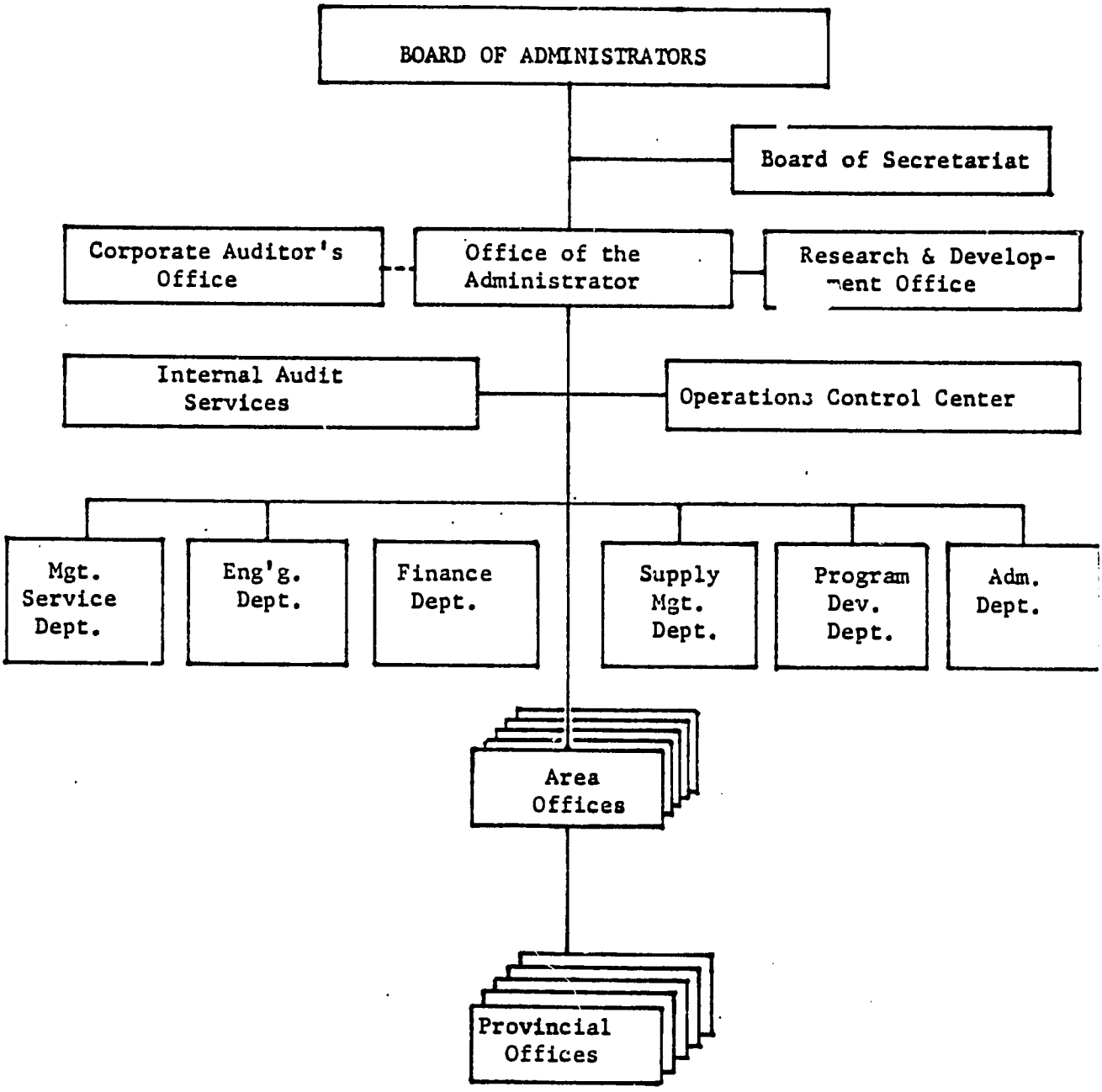
PROVINCIAL ORGANIZATIONAL STRUCTURE



AREA OFFICES ORGANIZATIONAL STRUCTURE



CENTRAL OFFICE ORGANIZATIONAL STRUCTURE



# PART V

# FINANCIAL ANALYSIS AND PLAN

## A. FINANCIAL VIABILITY

### 1. Farm Family Income

Analysis of the potential financial impact of the BISA program for individual farmers of a typical ISA[1] indicates an initial increase in income of ₱1,863 with irrigation and an additional increase of ₱473 with the farm support systems. Annual net income derived from increased agriculture production is projected as follows:

TABLE N

Projected Increase in Income[2]
(1.5 Ha)

| | | |
|---|---|---|
| Without Project | - | ₱1,086 |
| With Irrigation | - | 2,949 |
| With Farm Support System | - | 3,422 |

The above results are derived using the assumptions made in the economic analysis section.[2] However, two differences exist: 1) the farm gate price of rice is assumed to be ₱40 and in financial analysis[3] family labor is not costed. Empirical data indicates approximately 10% of the land preparation work is undertaken by hired labor and harvesting is undertaken through cooperative effort and thus has been costed, giving rise to the following incremental labor pattern:

1/ Assumptions for a Typical ISA Farmer
- a. A typical ISA farmer will cultivate 1.5 hectare of land.
- b. Cultivation will increase 1 to 2 crops of rice per year.
- c. The farmer will receive ₱40/cavan of palay and his yield will increase from 36 to 53 cavans/ha/crop, i.e. with 106 cavans/ha/year irrigation and will increase to 70, i.e. 140 cavans/ha/year with the introduction of the farm support system.

2/ Refer to Table I. Annex J.

3/ For financial analysis returns to family labor are calculated.

TABLE O

Annual Labor Use (1.5 Ha)[1]

| | Without Project (1 Crop) | With Irrigation (2 Crops) | With Farm Support Systems (2 Crops) |
|---|---|---|---|
| Hired Labor, workdays | 28 | 81.0 | 31.5 |
| Family Labor, workdays | 78.5 | 213.0 | 124.5 |
| Total - | 106.5 | 294.0 | 156.0 |

Thus both hired labor and family labor will increase by 53 work days per 1.5 ha. farm annually or 35 work days per hectare during the irrigation phase to prepare, weed and harvest a second crop; with the use of farm support systems, the use of both hired and family labor declines. However, there is still a net increase in labor used. Farm support systems are not expected to be used in all ISAs. For further discussion, see page 73.

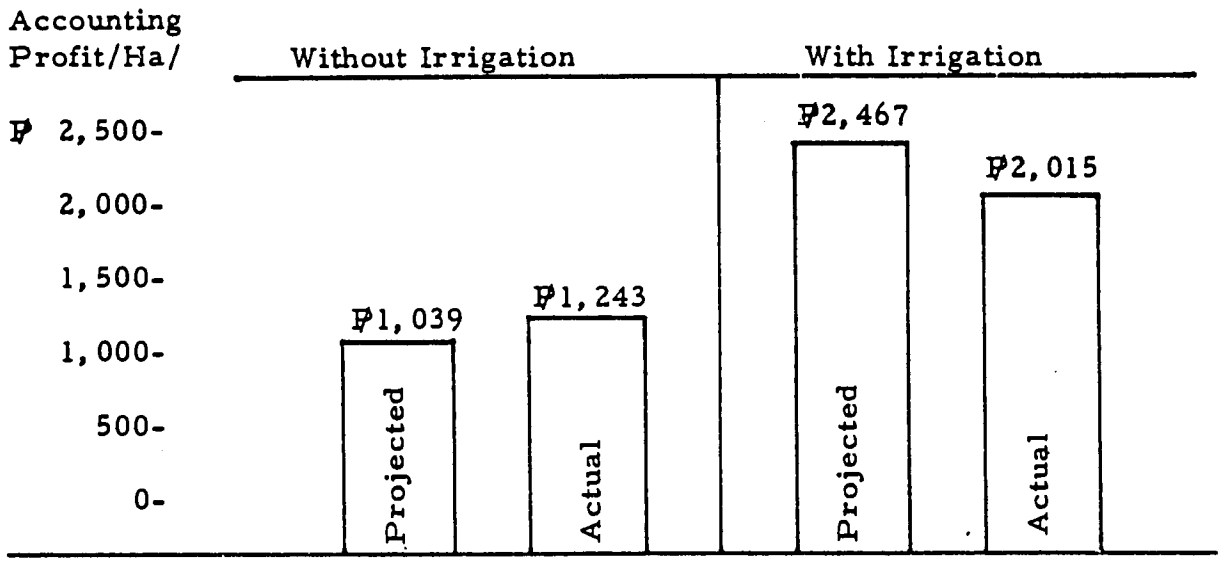
FSDC's internal assessment of the BISA program includes net incomes close to the projected level for ISAs experiencing a full year of operating in CY 76. The actual annual accounting profit[2] per hectare per crop was ₱2,015 for the "with irrigation" group compared to a projected target of ₱2,467 per hectare.

1/ Refer to Table 17., Annex J.

2/ Computation of annual accounting profit.
Annual accounting profit = accounting profit per cropping times cropping intensity index.

TABLE P

Comparison of Projected and Actual Accounting Profit of "With Irrigation" Group and "Without Irrigation" Group, CY 1976[1]
(One Hectare)




The study was based upon a random sample of 42% of farm families on 41 ISA's which were operational for all CY 1976. The projected accounting profit with irrigation did not take into account that only a portion of farmers in an ISA have water available the first year and this at least partially explains the lower actual than projected figures.

2. Financial Incentive of Program

The farmers willingness to participate may be gauged by the additional income they can expect compared to the additional workdays received.

1/ Source: FSDC Evaluation, Coop Year 1976.

TABLE Q

| Annual Farm Income[1] / Annual Family Labor | | | = | ₱ Return per workday |
|---|---|---|---|---|
| 1,086 / 78.5 | - | ₱13.8/day | - | Without Project |
| 2,949 / 213 | - | ₱13.8/day | - | With Irrigation |
| 3,422 / 124.5 | - | ₱27.5/day | - | With Farm Support Systems |

The above Table Q shows that while returns per day worked are similar with and without irrigation, in general the farm family incomes are doubling through increased on-farm employment. A significant income increase in returns per day worked occurs when two irrigated crops that can be grown with irrigation are enhanced by the use of appropriate tools and technologies.

It should be noted that the total farm support system used in the analysis is not intended for all ISAs. Of the total project funds, only $400,000 is expected to be used for reimbursement of farm support systems. This is due to the diversity of conditions existing in different parts of the country. For example, in Mindanao, where labor is scarce relative to land there is a greater need for tillers and other labor-savings implements. In addition, in some areas the rainfall distribution requires that the irrigation systems be combined with tools and equipment in order to cultivate two crops.

1/ Derived from Table N and O.

As noted in the Economic Analysis, the expectation of a stream of benefits as approximated by the cash flow analysis is a more appropriate tool for assessing program participation than the increase in income per day worked or the conventional value/cost analysis. (See Table 17, Annex J.)

3. Financial Viability of the ISAs

The ISA as an organization is a non-stock, non-profit entity. As such, it is a flow through mechanism for resources to move from FSDC to the farmers.

Financial projections for the ISA show that in the first year of operations an ISA will be both in a negative profit position and more importantly in a deficit cash position. However, in the second year while there is still no profit, the cash flow becomes positive with increased water coverage and revenues. In the third year, after amortization payments, the ISA is slightly above a breakeven point.

More importantly, aggregate earnings to the ISA members projected for the three year period are ₱362,000 after payment of irrigation fees estimated at 14 cavans/year/member - with half the members paying during the first year of operations, 75% the second year of operations and all paying the third year. We, thus, can conclude under normal conditions an ISA and its members have the capacity to pay. (See Table 18, Annex J.)

An overview of the financial statements of approximately 40 ISA's in three areas indicate that the majority of the ISA's are in a positive cash position. However, most are in a negative profit position. Several balance sheets are included in Annex B-3. This tends to corroborate the projections in the ISA financial analysis. However, the ISA statements of financial position do not tell us why certain ISA's have had the capacity and willingness to pay and others have not. FSDC realizes that a farm-level reporting mechanism is essential to monitoring the progress and problems of the ISA's. This would also allow FSDC to account separately for national disasters which may impede the ISA's capacity to make amortization payments.

A farm-level reporting system can be a simple combination of technical, financial and institutional profiles of the ISA and its members. The information for the most part exists in the heads of the IO's. To be useful as a tool in problem solving and as a response

function it needs to be organized in a consistent fashion (with a statement of common measures.) In this way, common constraints existing in the ISAs can be ascertained. With the existence of the area offices, the establishment of such a mechanism becomes feasible. Using grant funds, AID will assist FSDC with the development and implementation of such a system.

4. Loan Repayment and the Financial Viability of FSDC

Based upon the fact that only a portion of the farmers within an ISA receive water the first year and that it was reasonable to expect all of the farmers to avail of water only in the third year, FSDC reexamined its debt structuring policy.

In March of 1977, the Board of Directors approved the following policy[1]. FSDC recognizes that farmers who do not receive water will not pay irrigation fees to the ISA, therefore, during the first two years of operation an ISA is obligated to pay only the interest on its irrigation loan with principal payments beginning in the third year and continuing through the life of the loan. However, to the extent ISAs have the capacity to prepay principal payments, they are encouraged to do so. AID concurs and supports this policy. While we recognize that one might argue that this speaks of subsidy and encourages non-repayment in the future, we cannot overlook the basic fact that without having water delivered on a timely basis, farmers will not have the money to pay.

As of December 31, 1977, FSDC had received 105 irrigation payments in the amount of US$72,000 and 28 farm support system payments in the amount of $6,000. However, of this amount $38,000 represents prepayments. An unadjusted schedule at 12/31/77 for irrigation projects indicates that approximately $30,000 in irrigation payments are overdue. While the schedule has not been adjusted for the change in loan policy described above for the older ISA's, it does indicate (1) that some ISA's have experienced financial difficulties in the early years due to poor technical design and due to the frequency and effects of natural disasters, (2) that the change in loan policies was necessary to the viability of the ISA; and (3) that both the upgrading of earlier systems and disaster

1/ Loan terms are discussed in detail in the financial plan. (See page 84.)

damaged systems will continue to be a prerequisite of FSDC's successful operations.

FSDC and AID recognize the importance of the repayment in developing self-reliant farmers and consequently has put much emphasis on the delivery of workable technical systems. An unwillingness to pay and/or corresponding lax collection procedures so often found in government credit programs is credibly absent within FSDC and the ISAs if the system is providing reliable services. The project agreement will contain a condition precedent and a covenant strengthening the accounting, reporting and collection procedures.

In addition, FSDC has recognized that financial management is important to the ISA's viability. The recent external evaluation stated:

> "FSDC appears to be providing appropriate assistance to the ISA's in financial management and it places a great deal of emphasis on such training. It is important that it continues to do so from the very beginning of an ISA's operation. Initially, the financial management of an ISA is relatively simple compared to what it would become in the later stages of development of the ISA. In the first stage of an ISA's development, financial management may require little more than keeping records on irrigation pump costs and farmers contribution to those costs. As the ISA purchases farm equipment and/or undertakes marketing activities, the financial management becomes more complex and the early financial training more important."

FSDC's collection performance and its viability as a corporate entity is a function of ISA viability in terms of repayment performance. While the current financial performance of FSDC's overall collections appear impressive, an analysis of their loan accounting and reporting procedures reveal a number of reporting and repayment problems. As the financial management of the ISA is relatively simple in its early stages, so is the accounting, reporting and monitoring of a loan portfolio; improved financial management of the program's funding and collection performance appears essential. Monitoring and evaluation of FSDC's financial performance requires the development of a statement of common measures (and the factors behind the construction of these measures).

It is recorgnized that FSDC will, in the very near future, have to improve its financial reporting and controls if it is to retain good management of its expanding portfolio. Areas that need to be strengthened include use of collection ratios, percent of loans past , ageing of past due accounts, and development of ISA collection policies.

In order to insure that this important matter receives the prompt and high level attention it deserves, the AID Project Agreement will contain a Condition Precedent stating that FSDC will develop an accounting, reporting and monitoring plan that is satisfactory to AID. The Agreement will also contain a Covenant stating that FSDC will install and utilize the approved accounting, reporting and monitoring system.

## B. BUDGET ANALYSIS OF FSDC

Based upon the expectation of continued program expansion, the financial costs of FSDC's program for the next ten years is roughly $350 million dollars. (See Table 19, Annex J.) All things remaining equal approximately $80 million will need to come from external assistance funds, increased capitalization or domestic borrowings.

AID's assistance in this second loan represents a funding arrangement indicative of the changing organizational tasks of FSDC and its evolutionary relationship with the ISA's. In all probability, if a third loan is made to FSDC, it too will be indicative of the process inherent in ISA development.

For certain projects, it is more effective to commit substantial resources in a fixed period of time, i.e. for programs that can accomplish its objectives within the time frame and then self-destruct or evolve into a different structure with new tasks and objectives. The ten year financial plan presented here suggests that FSDC in all likelihood does not plan to self-destruct. To the extent that it accomplishes its objectives, defines acceptable new objectives to support small farmer development, and changes its structure to accomplish these tasks, FSDC would merit continued financial assistance from GOP and external donors.

FSDC has taken advantage of the willingness of small farmers to organize around a reliable supply of water. AID has supported this rural infrastructure project which so importantly is organized both around and with the farmers. A project with such heavy emphasis on social goals through direct farmer participations is apparently rare within AID. Tendler makes mention of this.

> "Up to now, AID has financed infrastructure projects almost completely separately from cooperative programs. This pattern is in considerable part a result of the fact that infrastructure projects have been the domain of the engineers and group projects have been the domain of the coop contractors. Neither group is used to, or has been forced to, plan projects that bring both activities together. Thus, infrastructure projects are designed to a scale and a technology that precludes the possibility of group participation; and group projects are designed around ongoing organizational activities that preclude such temporary activities as infrastructure

projects. Since AID has control over the funding of so many infrastructure projects, it has within its hands the power to bring the two activities together in a way that would be highly beneficial to both the target group and AID itself." [1]

This small farmer support program is a demonstration of how AID can assist an economically and socially egalitarian project.

ISA loan repayments become increasingly important as a source of funds in the next ten years. Past experience does not provide a clear indication of whether or not we may expect repayments at the projected levels. However, both FSDC and AID recognize the importance of this area and are taking appropriate steps to assure a maximum level of performance. To the extent that the projections fall short of the anticipated level, FSDC will be in a position to categorize past due accounts and explain their financial performance. Please refer to the discussion on page 76.

Analysis of FSDC's financial requirements for the next ten years indicate that the capitalization of the corporation will approach its authorized limit of ₱800 million. These funds are approved annually by GOP appropriation in three categories: (1) loan program; (2) operating expenditures and (3) capital expenditures. If past experience is any indicator of the priority the GOP gives to the funding of this program, we can expect continued capitalization at the projected levels.

Domestic loans as a constant source of funds are well assured through an agreement with NIA concerning gravity projects. These systems are budgeted to NIA and turned over to FSDC upon completion of construction. In summary, we can conclude that the overall sources of funds are adequate for a continued program subject to reasonable repayment performance.

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1/ Judith Tendler, "Inter-Country Evaluation of Small Farmer Organizations" (Final Report), November, 1976.

## C. FINANCIAL PLAN/BUDGET TABLES

The loan will assist in funding additional irrigation systems including the rehabilitation of old systems. These funds will be made available on a fixed amount reimbursement of 50% of the direct costs for infrastructure work. In addition to the irrigation systems, farm support systems including production, post-harvest and marketing tools, equipment and facilities will be reimbursed on the basis of 50% of direct costs. Also, loan funds will be used to financed 100% of the direct costs of training of FSDC staff and ISA farmer families, water management training include measuring devices in conjunction with the training, and certain data collection and analysis activities supporting the Research and Development Unit. Additionally, the loan will be used for off-shore commodity procurement of items necessary to the administrative and operational support of the program. Such items may include vehicles, engineering and farm equipment and tools. The overall AID financial support of this project is estimated to be 44%, but in accordance with FAA Section 110, in no case will AID support exceed 75% of total project cost.

It is anticipated that a signing of the loan agreement will be accomplished so that the loan funds will be obligated by July 1, 1978 with Conditions Precedent met by mid-August. However, as this project follows the assistance provided to FSDC under AID's Small Scale Irrigation project, previously incurred costs will be eligible for reimbursement. And in order to provide faster drawdown and close-out of Loan 038, the offshore commodities procured under IFB #1 and #2 will be shifted to this proposed loan. The "freed-up" funds under this arrangement then would go to local currency financing of the SSI project.

As of January 31, 1978, disbursements under the SSI loan totalled $2.6 million. An additional $1.4 million has been approved for reimbursement, and $.5 million is currently being processed for reimbursement. Out of the $2 million balance, $1.5 million is programmed for commodities. The remaining $.5 million will probably be approved for reimbursement by May, 1978.

The following Table R is an illustrative LOP budget by activity. It is based upon FSDC's work plan for CY 1978. However, the timing of these activities has been extended one full year in the LOP budget. The Danish Government has negotiated a commodity loan for irrigation pumps which should be available for CY 1979 projects. The level of funding by the Danish Government is estimated at 60% of the direct costs of the pump systems.

Loan funds thus will fund 50% of the local currency cost of approximately 120 pump systems covering 15,000 has. with an average cost of ₱1,500/ha. Farm support systems for existing ISA's, in addition to field staff and farm family training, will be provided for under this proposed loan. In total over 25,000 new farm families will be assisted by new irrigation systems and 25,000 existing ISA farm families will be strengthened with training and farm support.

1. AID Reimbursement Scheme:

   A. Local Costs

      1. Irrigation Systems (50% Reimbursement)

         a. Pump Systems* - including pumps, motors/accessories, construction of irrigation system infrastructure, and diesel fuel for first cropping season.

         b. Gravity Systems including construction of lateral and structures.

         c. Land improvement including costs of land clearing, leveling and drainage.

         d. Infrastructure upgrading of existing systems and rehabilitation of disaster damaged systems.

*Excluding systems with Danish pumps.

TABLE R

AID Loan

Estimated Drawdown By Activity

(Millions of US$)

| | Total | 4th Quarter FY 78 July-Sept. '78 | 1st Quarter FY 79 Oct-Dec '78 | 2nd Quarter FY 79 Jan-Mar '79 | 3rd Quarter FY 79 Apr-Jun '79 | 4th Quarter FY 79 Jul-Sept '79 | 1st Quarter FY 80 Oct-Dec '79 |
|---|---|---|---|---|---|---|---|
| Gravity Irrigation Systems | 3.7 | .3 | .4 | 1.0 | 1.0 | .5 | .5 |
| Pump Irrigation Systems | 1.5 | .7 | .8 | - | - | - | - |
| Upgrading & Rehabilitation | .4 | - | .1 | .1 | .1 | .1 | - |
| Farm Support Systems | .6 | .1 | .1 | .1 | .1 | .1 | .1 |
| Commodities | 1.0 | - | - | .5 | .5 | - | - |
| Training & Demonstration Centers | 2.8 | .3 | .3 | .6 | .6 | .6 | .4 |
| Total - | 10.0 | 1.4 | 1.7 | 2.3 | 2.3 | 1.3 | 1.0 |

TABLE S

Illustrative Activity Budget

Sources and Applications of Funds
(Millions of US$)

| | Total Life of Project Applications | 4th FY 78 Jul-Sept '78 | 1st FY 79 Oct-Dec '79 | 2nd FY 79 Jan-Mar '79 | 3rd FY 79 Apr-Jun '79 | 4th FY 79 Jul-Sept '79 | 1st FY 80 Oct-Dec '79 |
|---|---|---|---|---|---|---|---|
| Gravity | 7.4 | .6 | .8 | 2.0 | 2.0 | 1.0 | 1.0 |
| Pump | 6.2 | 1.4 | 1.6 | 1.0 | 1.0 | .6 | .6 |
| Up & Rehab | .8 | - | .2 | .2 | .2 | .2 | - |
| FSS | 1.2 | .2 | .2 | .2 | .2 | .2 | .2 |
| Commodities | 1.0 | - | - | .5 | .5 | - | - |
| Training & Demonstration Training | 2.8 | .3 | .3 | .6 | .6 | .6 | .4 |
| Administrative | 3.0 | .5 | .5 | .5 | .5 | .5 | .5 |
| | 22.4 | 3.0 | 3.6 | 5.0 | 5.0 | 3.1 | 2.7 |
| **Sources** | | | | | | | |
| AID | 10.0 | 1.4 | 1.7 | 2.3 | 2.3 | 1.3 | 1.0 |
| Danish | 1.9 | - | - | .6 | .7 | .2 | .4 |
| GOP | 10.5 | 1.6 | 1.9 | 2.1 | 2.0 | 1.6 | 1.3 |
| | 22.4 | 3.0 | 3.6 | 5.0 | 5.0 | 3.1 | 2.7 |

2. Farm Support Systems (50% Reimbursement)

a. On-Farm tools and equipment including sprayers, plows, harrows, cultivators, weeders, hand tillers and tractors including attachments and accessories.

b. Post Harvest Facilities/Equipment including threshers, grain driers, rice mills, and storage facilities.

c. Farm to market transport equipment including trucks, jeeps, and trailers.

d. Market support infrastructure such as an isolated feeder road, small bridge or small boat.

3. Training, Water Management Training Devices, Demonstration Centers and Data Collection & Analysis Costs (100% Reimbursement).

2. Foreign Exchange Costs

Commodities and operational program support will be funded. An illustration list can be found in Tables 22 and 23, Annex J.

Eligible Borrowers and Qualifications

Eligible borrowers are irrigation or related farmer-associations or cooperatives owned and managed by farmers, and duly registered with the Securities and Exchange Commission (SEC).[1]

Subloan (ISA Loans) Limitation

1. The amount of the loan to be granted will depend upon the actual needs of the project, and the borrower's paying capacity and credit worthiness. The borrower's equity contribution can take the form of cash, construction materials or labor inputs supplied during the construction of the project.

1/ This language comes from FSDC's charter, P.D. 681. At present, all eligible borrowers are members of irrigator association. If other related farmer associations or cooperatives are beneficiaries of farm support systems, AID's total contribution to such entities would not exceed $250,000.

2. The amount approved for financing represents a ceiling beyond which no disbursements may be made. This is the amount stated in the Temporary Loan Agreement (TLA) and/or Contract of Loan to be entered into by and between the Farm Systems Development Corporation and the ISA beneficiary.

3. Schedule of Payment - The loan shall be repaid in equal semi-annual or annual installments, the option to be exercised by FSDC based on the ISA's financial capability. Amortization shall commence 2 years after the start of normal operations of the project. In justifiable cases, prepayment is encouraged.

4. Rate of Interest - Interest shall be computed at the rate of 8% per annum for irrigation component and 12% for farm support component. Interest shall accrue from the date of the start of the normal operations of the project. No commitment charge shall be imposed on the unused portion of the loan.

5. Extension Periods - In cases of defaults on the service of the loans arising from fortuitous events or force majeure, or in other cases clearly justified in the opinion of FSDC, reasonable extension periods may be granted.

Loan Application and Processing

1. All applications for loans are made by submitting a properly accomplished application form prescribed by FSDC together with the necessary documents required to support such application.

2. The application, together with the credit report and supporting documents, is forwarded to the FSDC for approval. FSDC acts on the application within two (2) weeks from date of receipt.

3. Upon approval of the loan applications, the ISA is informed (and the electric cooperative, if appropriate).

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 with certain requirements, e.g., formalizing loan contracts, putting up equity participation, etc.

2. Repayment - The repayment period has been based on the expected cash flow generation of the project and the debt capacity of the ISA. Loans granted have maturities of 10 and 25 years respectively for pump and gravity system.

## D. IMPACT OF FSDC'S PROGRAM

### a. Beneficiaries - Economic Gains

The direct and indirect project beneficiaries are shown in Annex J Table 20. It indicates the following tenure status of ISA farmers:

| | |
|---|---|
| Owner-Cultivator | 38% |
| Lessees | 24% |
| Share Tenants | 34% |

and further indicates that the most common arrangement is a 70-30 distribution. The landlord fraction is based upon gross production value with the farmer paying all production costs. The results confirm that the largest gains are to the owner-cultivator and the lessees. The landlord of the share tenant gains more than his tenant. It may be mentioned that even the least advantageous group benefits considerably; the difference to a family of an income of ₱1,034 to one of ₱440 can hardly be imagined.

The FSDC internal assessment gives the averages of actual returns for 1976 for all members surveyed regardless of status. The average tends to lower the 70-30 distribution and further illustrates the hired labor share.

TABLE T

Distribution of Farm Income Per Hectare, Wet and Dry Season, 1976

| | With ISA | | Without ISA | |
|---|---|---|---|---|
| | Irrigation | Input | Irrigation | Input |
| | Wet Season | Dry Season | Wet Season | Dry Season |
| Gross farm income | ₱ 2757 | ₱ 2731 | ₱ 1974 | ₱ 1560 |
| Payments to current inputs | 504 | 495 | 250 | 184 |
| Gross value added | 2252 | 2236 | 1723 | 1375 |
| Landlord share | 25% | 22% | 23% | 23% |
| Hired labor share | 14% | 16% | 12% | 22% |
| Operator share | 61% | 62% | 65% | 55% |
| T O T A L | 100% | 100% | 100% | 100% |

When wet and dry seasons are combined into share of annual income, the empirical evidence indicates the largest gains have remained with the farmer. The landlord share increases from ₱698 to ₱1,032; hired labor share from ₱491 to ₱672, and operator share from ₱1,875 to ₱2,737.1/

Besides these "on farm" groups, there are many more that will be affected by the project. As farmers move from one to two crops, they will hire additional labor, thus providing much-needed income to rural agricultural workers who suffer great unemployment and underemployment. Table T indicates a 12 percent gain to hired labor with irrigation and

1/ Derived from Table T.

farm support systems. The construction of the irrigation system also gives rise to some employment for rural artisans. Middlemen selling inputs to farmers and buying farm products will be affected. Although in the long run, it is expected that farmers will take over some of the marketing themselves, it is likely that increased activity will more than compensate the middlemen for this.

b. Impact on Basic Rights

The Declaration of Cocoyoc (1974) was a statement issued by a group of social scientists, natural scientists and economists at the end of a seminar organized under the joint auspices of UNCTAD and UNDP on Patterns of Resource Use, Environment and Development Strategies.

This dealt with environment, natural resources, national and international development patterns. On basic needs, the Declaration states:

> "Our first concern is to redefine the whole purpose of development. This should not be to develop things but to develop man. Human beings have basic needs: food, shelter, clothing, health, education. Any process of growth that does not lead to their fulfillment - or, even worse, disrupts them - is a travesty of the idea of development."

In another document "Employment, Growth and Basic Needs", basic needs are defined to include several elements:

> "First, they include certain minimum requirements of a family for private consumption: adequate food, shelter and clothing are obviously included, as would be certain household equipment and furniture.
>
> "Second, they include essential services provided by and for the community at large, such as safe drinking water, sanitation, public transport, and health and educational facilities.
>
> "A basic-needs oriented policy implies the participation of the people in making the decisions which affect them. Participation interacts with the two main elements of a basic-needs strategy. For example, education and good health will facilitate participation, and participation in turn will strengthen the claim for the material basic needs.
>
> "The satisfaction of an absolute level of basic needs as so defined should be placed within a broader framework - namely the fulfillment of basic human rights, which are not only ends in themselves but also contribute to the attainment of other goals.

"In all countries employment enters into a basic-needs strategy both as a means and as an end. Employment yields an output. It provides an income to the employed. And it gives a person the recognition of being engaged in something worth his while."

The ILO summarizes 1/ some common features of the above approaches:

"There is general agreement that the meeting of basic needs of the poor should become the core of development planning and policy. Secondly, basic needs are not confined to only material needs but embrace other dimensions such as fundamental human rights and freedoms, participation, self-reliance, etc. Thirdly, basic needs are not presented in a static manner to be frozen once and for all at fixed levels but as evolving over time in line with the growth of the economy and the aspirations of the people. Fourthly, there is a general consensus that the core material needs should consist of food, education, health and housing sanitation. Fifthly, there is no single, royal road to achieving basic forging of new processes and institutions in accordance with differing cultural traditions and other circumstances of individual countries and regions."

The ILO came to the unequivocable conclusion that the people themselves should decide on the scope, content and priority of their own grounds, representative institutions can perform this function. The important point is that these institutions should be representative of the people, especially the poorer people.

What can be said of FSDC's role as an institution representative of the farmers and the degree to which FSDC's small farmers participate in the decisions which directly affect their well-being?

The recent evaluation team responded somewhat to the above question with the following:

"Two aspects of FSDC's organizational assistance merit discussion. First, FSDC started with an organizational structure for the ISA's (Board of Directors, committees, officers, sub-project divisions) which is not only highly imaginative with respect to irrigation systems around the world, but extremely logical as well. Secondly, after several years, FSDC modified its organizational model to allow for variation across ISA's to reflect local conditions. The structure is highly egalitarian in nature, and is designed to assure all farmers of equal participation in the affairs of the ISA."

---

1/ A Basic Needs Approach to Development, ILO.

The concepts of economic improvement, participation and self-reliance form the basic tenets of FSDC's program. The ISA as an organization is the mechanism through which small farmers can cooperate for their own economic gain; through which these farmers can actively participate in the decisions which affect their livelihood and as a group can impact upon their local environment. Self-reliance is a gradual process. One cannot expect change to occur in a short time frame. It should be stressed that FSDC's program is not the delivery of optimum irrigation systems, optimum water management or optimum agricultural production. Rather, it is the gradual development of the increased self-reliance among the farm families and an improved capacity for the farmer organizations to promote their economic well-being.

c. Are the ISA's Viable?

A recent AID-sponsored study by Judith Tendler[1/] examined nine programs in Ecuador and Honduras looking for lessons about what did - and didn't - work in efforts to organize farmers in development efforts. In the following set of cases small farmer organizations worked:

1. -- when they were organized around a concrete goal which could be achieved in a limited time;

2. -- when they focused on one task which could not be done unless individuals cooperated, but which minimized needs for non-farmer skills; and

3. -- when the groups were small and insulated from other groups.

In short, the effective arrangements were direct, necessary and exclusive.

Tendler's findings emphasize a point which is often ignored: "setting up an organization" is not the same as applying for credit for a group, as building a piece of road, or as arranging the distribution of water among a small number of contiguous farmers. "Organizing" is, if not incidental, then clearly instrumental.

The difference is between a path and a payoff. When people work together to achieve a simple, concrete benefit, the aim is the incentive and the cause-effect relations are clear. Paths into novel futures are less likely to be clear. At the outset they can at best offer promises - promises which are seldom powerful inducements when compared with palpable payoffs from the possession of some land, the acquisition of some water, or the improvement of a needed, useful road.

The Tendler studies show a positive relationship between the simplicity of the initial undertaking and its success. But successful organization to achieve a short-term tangible goal can help lay a foundation for expansion into other, more complex activities.

1/ Inter-Country Evaluation of Small Farmer Organizations - Final Report by Judith Tendler, November 1976.

Necessity was one important factor in the success of organizing efforts in the cases studied: the task had to be something which required cooperation, and couldn't be done by individuals acting along.

Insularity, or exclusivity, was the third correlate of organizational success. Tendler found two reasons for this: smallness allows for peer pressure to sustain group cohesion, and rivalry is sometimes important in getting groups to form and continue. Success can also promote exclusiveness: the "winners" see themselves as something special and separate from others.

Organizational factors are crucial elements in the design of effective development efforts especially in those fields of action where client participation is crucial. The factors which determined success in the cases studied by Tendler are largely matters of incentives - incentives that first of all are relevant to the actors/beneficiaries. What they can't comprehend or believe doesn't impel them. What they can do alone they are less inclined to do together. When a commitment is embraced by the group, for the group, then group sanctions over individual members can be powerful.

The ISA's are clearly organized with the direct incentive of the acquisition of water. The task of building the system does require cooperative effort and in addition continued cooperation is required for the equal distribution of the water. In addition, the ISA's are small enough to function as a decision making body with popular participation.

The ISA's offer a variety of examples of basic rights in operation. With the collective use of water and contiguity of land emerge both individual and group use rights - rights which often reinforce one another. The water rotation team is composed of 15-20 families who are allocated water collectively. The crops which the water make possible are owned by the individual farmers - however, a fixed portion is paid to the organization to pay its amortization and to the landlord.

The design of the BISA program promotes thrift in the present because it brings forth greater expectation and aspiration for the future. It is not the collective use of water in itself that accomplishes the above but the structure of that use. That the water use rights cannot be removed does indeed provide greater security for the cultivators. But apparently it has also provided an impetus for innovation. The water rotation team can use water relatively equitably because no one farmer must depend upon himself to secure the scarce resources. Risks if not lowered are spread - hence the openness to try new technologies. Thus tenants do not fear losing their land/water resource to mechanization and small farmers find themselves in a position to risk abandonment of traditional varieties. The crucial elements of innovation (or self-realization, if you will) and thrift are found in the size of the group and the decision functions accorded to it.

Twenty or so families all of whom know each other well and many of whom are related easily establish necessary working relations and easily apply peer pressure. The ISA's can define and articulate interests in common. Organization and mobilization of labor is facilitated. Given the incentive of reaping rewards from their labor, there is an inclination to use it as long as there is positive productivity. Information is a collective good. The structure of the ISA and the integration and participation of its members appear to be the key.

# PART VI

# IMPLEMENTATION PLAN

## A. LOAN SCHEDULE

### 1. Drawdown Schedule of Preceding SSI Loan

As of January 31, 1978, disbursements under the SSI Loan totalled $2.6 million. An additional $665,000 was approved in January and paid in February; $710,000 was approved in February and paid in March; and in early March, FSDC is preparing a reimbursement request for approximately $500,000. When paid this will bring the total to roughly $4.5 million for local currency reimbursement of irrigation and farm support systems. Out of the $2.0 million balance, $1.5 million is now programmed for commodity procurement, leaving only $500,000 for additional reimbursements under FAR. The current rate of FSDC activity suggests that future reimbursement requests will average approximately $300,000 per month.

### 2. Implementation Schedule for SFS

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

| | |
|---|---|
| Loan Authorized (AID/W) | April 30, 1978 |
| Loan/Agreement Negotiated and Signed (GOP/AID) | June 30, 1978 |
| Conditions Precedent to Opening Letters of Commitment (GOP) | August 15, 1978 |
| Project Assistance Completion Date | August 15, 1981 |

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 estimated at $1.0 million, plus the approximately $1.5 million worth of commodities that will be transferred from the SSI loan (See page 80 for additional details.) Standard IFB documents that have been successfully used under the previous loan will be used in this project. FSDC's Procurement Officer will prepare the IFB's as they did under SSI. The first IFB's will be preapred within 120 days after loan CP's have been satisfied. It is expected that the first loan financed commodities will arrived in early CY 1979.

The AID loan funds to be allocated for local currency reimbursement will be disbursed as follows:

a. FSDC will initially use its own funds to extend credit for physical or institutional infrastructure components of the program.

b. FSDC will submit periodic requests for reimbursement.

c. Reimbursements will be made by the Fixed Amount Reimbursement (FAR) method presently in use under SSI. In the case of irrigation systems, no reimbursement is made until the system has been test run and is operational. For farm tools and equipment reimbursement is made when the equipment has been received by the ISA.

d. The construction activity and equipment deliveries to ISA's during the past six months indicates that FSDC is doing approximately $300,000 worth of loan reimbursable work per month. This rate may fluctuate depending on weather conditions but over time the average should be maintained.

B. GRANT SCHEDULE

The AID grant funds will be used for 1) acquiring the services of U.S. technical personnel to assist FSDC, 2) training FSDC personnel in third world countries and in the U.S., 3) procurement of commodities for pilot projects and prototype demonstration, 4) project related research and evaluation, 5) invitational travel and 6) a regional ASEAN workshop on small farmer organizations development. The disbursement period for the grant funds will be three years.

Grant contracts will be negotiated in each of the three years as funds are made available. A condition precedent to the grant will require that FSDC submit a draft contract for AID approval to ensure that contracting may be undertaken in a timely fashion. Upon AID approval of FSDC selected contractors, FSDC will execute contracts. Participants will be selected in each of the three years at times when personnel can be spared from project activities. Commodities for pilot projects and prototype demonstrations will be procured by FSDC as required. Project-related research will be undertaken by FSDC's Research and Development Division on a continuing basis; FSDC may contract with local firms for services they cannot undertake themselves. Invitational travel will occur throughout the three year period. The regional workshop will be held either in late 1978 or early 1979 as activity schedules permit.

Special Arrangements

a. $35,000 of grant funds are allocated for invitational travel over the life of the project. FSDC personnel intend to visit Thailand, Israel and the People's Republic of China. FSDC's Administrator visited China in 1977 and feels very strongly that members of his policy and planning staff would benefit from observing small farmer development efforts, small irrigation projects and institutional development in that country. USAID would like to accommodate the Administrator's request for funding for this trip, on the understanding that no U.S. personnel would be included. An AID waiver will be needed to authorize financing of travel to the People's Republic of China.

b. The SFS Loan includes $1.0 million to be spent on commodity procurement. Table 23 in Annex J describes vehicle and communications and material handling equipment requirements for FSDC's program. Included is a projected need for 25 air-conditioned 4-wheel drive vehicles; 20 for the Area Offices and 5 for Central Office. Air-conditioned vehicles are needed for long and frequent trips on hot and dusty roads. Further justification can be found in Annex H, covering the need for air-conditioned vehicles ordered under SSI. **Approval of the PP will authorize the purchase of air-conditioned vehicles.**

C. SCHEDULE OF PROJECT ACTIVITIES

Project activities may be classified as institutional, technical and financial. These are: a) institutional - all activities relating to organizing and training of ISA members and FSDC field staff; b) technical - all activities to complete irrigation systems including area surveys, designs, estimates, feasibility studies, construction and water rights application; c) financial - all activities such as credit, marketing processes, agribusiness and other economic ventures.

For any given ISA, the schedule for the first 3 years will involve a mix of institutional, technical and financial activities. Briefly, these are:

a. The organization of farmers into an ISA.

b. The construction and operation of the farmer-built, owned, operated and maintained irrigation systems.

c. The intensive education and training of ISA officers and members in association and water management.

d. The introduction and development of practical financial systems.

e. Evaluation and refinement (debugging or perfecting) of irrigation systems.

f. Introduction and implementation of appropriate management schemes for production, credit, group buying and selling, and the use of farm tools and equipment.

g. Credit extended for purchase of farm equipment.

h. Marketing facilities, such as warehouses, for groups of ISAs.

A detailed description of the schedule of activities may be found for FSDC staff, provincial personnel and ISA members in **Annex B-4.**

FSDC has annual targets, and these may be taken as milestone against which success and planned implementation and completion may be measured. These targets are listed below:

TABLE U

FSDC Targets 1978

| | Projected Work Load CY 1978 | Projected Cumulative Total by Dec. 1978 |
|---|---|---|
| I. Irrigation Development | | |
| A. Pump Irrigation Project Completed | | |
| 1. Project (No.) | 123 | 508 |
| 2. Area (Hectares) | 15,000 | 61,000 |
| B. Communal Irrigation Project Completed | | |
| 1. Project (No.) | 187 | 287 |
| 2. Area (Hectares) | 33,000 | 51,000 |
| II. Institutional Development | | |
| A. Irrigation Association Organization | | |
| 1. Project (No.) | 43 | 1,066 |
| 2. Farm-members (No.) | 43,000 | 75,000 |
| 3. Area (Hectares) | 68,000 | 161,000 |
| B. Association Training | | |
| 1. Organizational Management | | |
| a. Project (No.) | 322 | 844 |
| b. Participants (No.) | 32,000 | 45,000 |
| 2. Water Management | | |
| a. Project (No.) | 383 | 505 |
| b. Participants (No.) | 35,000 | 36,000 |
| 3. Rice Production Training | | |
| a. Project (No.) | 357 | 484 |
| b. Participants (No.) | 34,000 | 36,000 |
| 4. Seed Production Training | | |
| a. Project (No.) | 357 | 374 |
| b. Participants (No.) | 34,000 | 35,000 |
| C. Federation Organization | | |
| 1. Federation (No.) | 3 | 4 |
| 2. Farmer-Beneficiaries (No.) | 1,000 | 1,500 |
| 3. Area (Hectares) | 2,000 | 3,000 |
| III. Adaptive Farm Technology | | |
| 1. Organized Rice Production Project (No.) | 39 | 57 |
| 2. Organized Selling Production Project (No.) | 18 | 23 |
| 3. Seed Production Project (No.) | 27 | 31 |
| 4. Equipment Pool Project (No.) | 27 | 113 |
| 5. Institutional Credit Project (No.) | 5 | 11 |
| 6. Organized Buying Project (No.) | 5 | 9 |

Source: FSDC Work Programs 1978

N.B. FSDC's target figures are in excess of those anticipated in the financial plan. To the extent that these targets are reached, it will accelerate drawdown and will require additional **external funding at an earlier date.**

## D. REPORTS FROM FSDC TO AID

### 1. Progress Report on Status of Institutional, Technical and Financial Activities

AID has, and will continue to receive monthly progress reports that 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 reports also indicate by geographic area and type the number and amount of credits granted during the period.

### 2. Annual Reports

FSDC also furnishes an end of year report indicating the status of completion of prior and the present year's activities, and projected program targets for the ensuing year. These reports include details on number of ISAs organized, number operational, area covered, locations, number of farmers served and cost details.

The quality of information from FSDC to AID will improve as the plan to upgrade data collection and reporting from the field, through the Area Offices to Central Office, is implemented.

## E. AID MONITORING

AID monitoring during the disbursement period will take the following forms:

1. The technical aspects of the program will be reviewed from feasibility stage through construction, and upgrading or rehabilitation where applicable. This will be accomplished by working closely with FSDC engineers in Manila and the field to the extent that direct hire or PSC staff is available. It should be noted that projected reductions in both U.S. and Filipino AID staff will reduce monitoring capability.

2. The training aspects of the program, including content and methodology, will be reviewed by interaction with FSDC Area and Central Office training officers.

The above activities, together with standard AID requirements will be monitored on a continuous basis. As mentioned in the administrative feasibility section of this paper, AID enjoys excellent working relations with FSDC central, area and field staff. This is evidenced by the fact that offices have been set aside for AID use in several locations and access to people and information is good. In this working environment, monitoring and evaluation can be constructive and mutually beneficial.

## F. EVALUATION

There is, and will continue to be, an annual internal FSDC evaluation of the impact of the entire program. Additionally there will be a formal external AID evaluation during the life of the loan. The evaluation plan for this project is given in Part VII.

## G. CONTRACTING

As described in Technical Analysis Section, $715,000 has been allocated for Technical Assistance. It is AID policy that the borrower procure services required for AID-financed projects, thus under SFS, FSDC will undertake the contracting for both long and short-term advisory personnel financed by both the loan and the grant. FSDC has already had experience of contracting for 20 work months of technical assistance from Camp Dresser & McKee International, Inc. (CDM). The technical assistance needs of the program presently envisaged by FSDC and AID are: short-term - Water Management Specialist, Farm Systems Specialist, Marketing Specialist, Gravity Systems Engineer; Long-term - Operations Advisor, Field Engineering Advisor, Water Management Advisor, Farm Mechanization Advisor, Training and Information Advisor. In some instances, notably the short-term Water Management and Farm Systems Specialists, qualified individuals have already been identified from previous association with the project. In other instances, AID will assist FSDC in the procedures necessary to identify personnel from either private company sources or universities.

## H. PARTICIPATION OF PROJECT BENEFICIARIES

Since small farmer involvement in his own destiny is a goal of both FSDC and AID, great emphasis is placed on beneficiary participation. The ways in which participation is encouraged have been described in the Project Description. Briefly, all elements of the program are undertaken only with the full cooperation of project beneficiaries. Farmers exercise choice with respect to whether they participate, acceptance of the system, the water delivery schedule, the type and brand of farm and other equipment, and the entrepreneurial activities the ISA may wish to undertake.

## I. CONDITIONS, COVENANTS, AND NEGOTIATING STATUS

### 1. Conditions Precedent to Initial Disbursement of Funds:

a) The standard conditions precedent to disbursement regarding the opinion of the Secretary of Justice and the statement of names of the representatives of the Borrower and FSDC and evidence of their authority will be included in the loan agreement.

b) In addition to the standard conditions, the following condition precedent is proposed: A plan for the development of an improved system for accounting, reporting and monitoring will be developed by FSDC. The plan must indicate how the system will facilitate the flow of better quality reporting from the ISAs

to the Area Offices to be assimilated in the Central Office. It should include procedures for gathering and forwarding information on amounts of loans authorized, amounts of loans disbursed, interest and principal payments due, amounts of advance payments, interest and principal over-due, reasons for over-due or non-payments, and expectation for the resumption of timely payments in full.

2. Conditions Precedent to Initial Disbursement of Grant Funds

It is proposed that precedent to the initial disbursement of grant funds, FSDC is required to submit a draft contract for AID approval. This will help ensure that FSDC can contract for overseas technical assistance personnel on a timely basis.

3. Special Covenants:

a) The Borrower will make available to FSDC on a timely basis pesos funds required for the implementation of the project.

b) The Borrower will absorb any maintenance of value, risks on behalf of FSDC and the irrigator service associations.

c) FSDC will implement an AID approved evaluation plan.

d) FSDC will incorporate the results and recommendations of an Environmental Assessment (EA) conducted by the Philippine Inter-Agency Committee of Ecological Studies (ICES) into their training programs.

e) FSDC will install and utilize the information system developed as a condition precedent.

# PART VII

# EVALUATION PLAN

A. FSDC

FSDC produces an internal evaluation each year. The "Assessment of the Impact of BISA Program's Irrigation Input on Farmer Beneficiaries, Crop Year 1976" is the most recent. A random sample of 1,367 ISA farmers were interviewed and the effects of the program on cropping intensity, farm employment and distribution of farm income were examined. The objectivity of the evaluation is evidenced by a number of sharp criticisms and recommendations, which resulted in the following actions by FSDC in 1977:

a. Decentralization of authority to area offices.

b. Re-examination and subsequent concentration of procurement function into a single department.

c. Redesign of Institutional Officer training emphasizing practical approaches to training farmers.

d. Recruitment of new institutional officers with agricultural or technical education.

FSDC will conduct annual evaluations, similar in scope of work and modified to reflect program changes.

B. AID

It is anticipated that there will be a formal external AID evaluation of the project sometime between July and December 1979. This will allow for timely input to a follow-on loan to ensure the smooth flow of activities in the project. At present it is estimated that $15.0 million will be needed in the second quarter of FY 19780, if AID support is to continue.

DEPARTMENT OF STATE

# TELEGRAM

INCOMING
Amembassy, MANILA



ACTION:
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UNCLASSIFIED
Classification

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AIDAC

E.O. 11652:N/A

TAGS:

SUBJECT: FY 1977 PRP FOR SMALL SCALE IRRIGATION II

REF: MANILA 16896

1. AID/W APPROVES PRP FOR FY 77 LOAN FUNDING SMALL SCALE IRRIGATION II IN AMOUNT DOLS 10.0 MILLION. GRANT COMPONENT TOTAL DOLS 400,000 (DOLS 230,000 IN FY 77 AND COMMITMENT FOR GRANT FUNDING OF DOLS 170,000 IN FY 78 SUBJECT TO AVAILABILITY OF FUNDING ALSO APPROVED). IN VIEW OF CONSTRAINT ON AVAILABILITY OF GRANT FUNDS FOR T.A. COMPONENT FOR THIS PROJECT, USAID SHOULD EXPLORE WITH GOP LOAN FINANCING THIS ELEMENT. AID/W VIEWS LOAN FINANCING A HIGHLY PREFERABLE OPTION. DISCUSSION AT APAC CENTERED MAINLY ON CONCERN THAT MOST OF ANALYTICAL WORK FOR THE PP WILL BE BASED ON COMPLETION AND REPORT OF FINDINGS RE RESEARCH PROJECT AND EVALUATION REPORT CONTAINING ECONOMIC, TECHNICAL, FINANCIAL, POLICY AND ENVIRONMENTAL ANALYSES WHICH NOT EXPECTED UNTIL AUGUST 1976. THE RESULTING DATA FROM THIS EVALUATION WILL BE A KEY FOCAL POINT OF THE PP REVIEW.

2. IN THIS REGARD PP SHOULD RECONFIRM, INTER ALIA, (1) RE PROJECT PURPOSE AND LOG FRAME MATRIX, IDENTIFICATION

OF DIFFERENCES SMALL SCALE IRRIGATION I VERSUS SMALL SCALE IRRIGATION II, NOT ONLY INPUTS-OUTPUTS. SUGGEST DRAW DISTINCTION BETWEEN BOTH PROJECTS, EACH BEING SEPARATE AND DISTINCT FOR GOOD PROJECT MANAGEMENT AND EFFECTIVE EVALUATION MEASUREMENT PURPOSES; (2) RE EVALUATION, APAC WILL EXPECT TO HAVE OPPORTUNITY TO REVIEW AT PP STAGE, AT A MINIMUM, AN INTERIM EVALUATION REPORT DESCRIBING RESULTS OF OPERATING EXPERIENCES TO DATE OF FSDC, ISA'S, BENEFITS TO SMALL FARMERS (I.E., INCREASES IN RICE PRODUCTION, INCREASES IN NET FARMER IN-

Irrigation /Ee//

UNCLASSIFIED
Classification

COME, DEVELOP A PROFILE OF FARMER MEMBERSHIP IN TYPICAL ISAS, DEMONSTRATE WHAT CLASSES OF THESE FARMERS ARE BENEFITING MOST AND LEAST BY ADEQUATE RANDOM SAMPLING TECHNIQUES, ETC.); (3) RE PAGE 10, PARA 3 OF PRP, APAC STILL CONCERNED THAT EVALUATION CRITICALLY EXAMINE IN DETAIL IRR ECONOMIC ANALYSIS DATA OF SEVERAL SUB-PROJECTS SHOWING RATES OF RETURN ON CAPITAL INVESTMENT OF 85 TO 115 PERCENT, BOTH TO VERIFY THESE HIGH LEVELS AND TOWARD POSSIBLE TRANSFER OF UNDERLYING CONCEPTS TO OTHER MISSIONS; (4) PP SHOULD DEMONSTRATE HOW FSDC REVOLVING FUND WILL CONTRIBUTE OVER TIME TO PROGRAM FINANCIAL VIABILITY, WHICH WOULD OBVIATE OR REDUCE NEED FOR GOP GENERAL REVENUE AND/OR EXTERNAL DONOR SUBSIDY. REQUEST PP INCLUDE JUSTIFICATION FOR ULTIMATE BORROWER INTEREST RATE (PER LOAN 038 PP, NOW SET AT 12 PERCENT); POSITIVE INTEREST RATE WOULD APPEAR TO BE ESSENTIAL TO ENSURE PROGRAM VIABILITY; (5) RE PAGE 16, PARA 3 OF PRP, PUMP/GRAVITY PROJECT COSTS PER HECTARE APPEAR TOO LOW. PLEASE REVIEW WHETHER ELECTRIC LINE EXTENSIONS BY NEA INCLUDE BUILT-IN SUBSIDY (WHERE DIESELS ARE NOT USED); PLEASE ALSO ADDRESS QUESTION OF RELATED INVESTMENTS WHICH ENHANCE ECONOMICS OF PROPOSED SUBPROJECTS, INCLUDING ACCESS AND FARM ROAD IMPROVEMENTS, RICE AND MATERIALS STORAGE FACILITIES, CONSTRUCTION OF LATERAL AND TERTIARY CANALS, DRAINAGE IMPROVEMENTS, FLOOD PROTECTION. (6) AS IN CASE PP FOR IRRIGATION I, PLEASE INSURE PP CLEARLY SHOWS DISTINCTION BETWEEN REHABILITATING EXISTING SYSTEMS AS OPPOSED TO DEVELOPING NEW SYSTEMS; SUGGEST THIS BE CLARIFIED IN PP; (7) RE OUTLINE FOR TECHNICAL ANALYSIS IN PRP, PAGE 32, QUESTION WHY OUTLINE FOR PRE-CONSTRUCTION FEASIBILITY STUDY NOT INCLUDED; PP SHOULD PRESENT SUFFICIENT DATA TO DETERMINE OVERALL PROJECT FEASIBILITY AND FEASIBILITY OF SAMPLE SUBPROJECTS. APAC ALSO EX-PRESSEDONCERN AS TO ADEQUACY OF USAID STAFF TO MONITOR INCREASED SMALL SCALE IRRIGATION ACTIVITIES;

REQUEST THIS BE ADDRESSED IN PP (8) RE IMPACT ON ENVIRONMENT AND SOCIOLOGICAL ASPECTS OF PROJECT WERE LACKING IN PRP; ENVIRONMENTAL CONSIDERATIONS LIKELY TO INVOLVE SOME SPECIFIC SITE QUALITIES WHICH NEED TO BE ADDRESSED FOR EACH SUBPROJECT AT SOME STATE OF FEASIBILITY PLANNING; RE ROLE OF WOMEN DISCUSSION ON PAGE 9 OF PRP WILL NEED TO BE EXPANDED IN PP: SOCIAL

SOUNDNESS ANALYSIS SHOULD INCLUDE POTENTIAL FOR INVOLVEMENT OF TARGET GROUP IN PROBLEM IDENTIFICATION, AS WELL AS, PROFILE OF BENEFICIARY; (9) RE PAGE 8, PARA 1, LAST SENTENCE, SUGGEST THAT ESTIMATED IMPACT OF INCREASED PALAY PRODUCTION DUE TO SMALL SCALE IRRIGATION WILL INCREASE DEMAND FOR LABOR BY FACTOR OF 2.15 BE SUPPORTED BY AN ANALYSIS; IN ADDITION POTENTIAL ADVERSE IMPACT ON EMPLOYMENT OF PROPOSED MECHANIZATION (SEE P. 10) SHOULD BE ADDRESSED IN PP

3. RE PRP FACESHEET, SUGGEST USAID CABLE CHANGES TO INCLUDE IN SECTIONS 11 AND 12 AID FINANCED LOCAL CURRENCY REQUIREMENTS IN FY 77, ALL YEARS, AND (REVISED) TOTALS IN BOTHSECTIONS, AS APPROPRIATE. NEED DATA FOR FY 77 CP, REPEAT , NEED DATA FOR FY 77 CP. KISSINGER

**Response to Issues Raised to AID/Washington PRP Approval Message - 12/23/75**

1. **Distinction Between Small Scale Irrigation and Small Farmer Systems Projects**

These two projects are distinguished throughout the paper, specifically in Part II, page 5 - Project Background and Detailed Description. SSI supported FSDC during its first 3 years when the construction of irrigation systems was of prime importance. SFS will continue to support the construction of new irrigation systems, but additionally will assist in the funding of diversified activities of already established ISAs, in line with the diversification of FSDC programs.

2. **Evaluation**

An AID external evaluation of SSI was undertaken in January 1978. APAC will be reviewing this evaluation in March.

3. **IRR**

The internal rate of return to the project under varying conditions is discussed in Part IV, Section A.1. page 38. The IRR for the project under the base case is 51%. A sensitivity analysis has been completed and the IRR ranges from 23 to 148% under varying assumptions.

FE

4. FSDC Revolving Fund/Borrower Interest Rate

The issue of loan repayments and the financial viability of FSDC is discussed in Part V, Section A.4 page 75. The discussion shows that FSDC has recognized the long-run viability problems that will be caused by delinquencies in amortization payments. FSDC has made this issue a top priority for all Area Offices. FSDC can significantly improve repayments from its present rate of 53% to approximately 80% during CY 1978. The inclusion of a CP and covenant regarding the development of an improved system of accounting, reporting and monitoring, will assist in the improvement of this situation. In regard to borrower interest rates, FSDC remains committed to a "subsidized" rate of, at present, 8% over ten years as part of its development philosophy. In a national context, the fact that National Irrigation Administration (NIA) loans are given at 6% over twenty-five years for their large scale irrigation systems, makes it politically almost impossible for FSDC to charge a market rate for its loans.

5. Irrigation Costs/NEA Subsidies/ISA Support Activities

For per hectare irrigation costs see Part IV, Section B.1.a page 45. An indirect subsidy in interest rates exists in NEA electric charges. This is due to the fact that the concessional terms of AID loans are passed through the government to the electric coops.

In order for groups of small farmers to establish their organizational viability initial investments in irrigation are kept low with the intent of improving these systems as the ISAs become more mature over time and as the ISAs accept the need to improve their systems.

In the same way related investments in facilities and irrigation system improvements will gradually be introduced on a pilot basis and expanded as ISAs desire and can afford them.

6. Rehabilitation Vs. Construction of New Systems

No distinction between rehabilitation of existing systems and the construction of new systems is made in the PP. A separate line item within the SFS project plans upgrading and rehabilitation in the amount of $400,000. See Table A page 17 and preceding discussion in Part II, Section B.3 page 16 and Part IV, Section B.1 page 45.

7. Pre-Construction Feasibility Study/Project and Sub-Project Feasibility/ Adequacy of USAID Staff

Pre-construction feasibility studies are carried out by FSDC staff before FSDC Board approval is given for the construction of an ISA irrigation system. For data on project and sub-project feasibility

see Part IV, Section A, page 38 and Part V, Sections A, B, and C, page 70.

USAID is also concerned with the adequacy of staff to monitor the SFS project. A local engineer, employed by USAID has been able to undertake 289 site inspections in a period of 90 days. However, the reduced ceiling on direct hire personnel will certainly affect the capability of US staff to monitor the project.

8. Environmental Impact and Social Awareness/Role of Women

For details, see Part III, page 20, which incorporates the Social Analysis and a summary of the Environmental Analysis. The full text of the latter is appended to the PP as a supplement. As a result of the Environmental Analysis, a CP will be included requiring FSDC to incorporate the results and recommendations into its project implementation plan. The involvement of the target group in problem identification is discussed in the Social Analysis, the Project Description and summarized in Part VI, Section H, page 99. A profile of beneficiaries is given in the Social Analysis. The role of women is addressed on page 30. FSDC's program is addressed to small farmer families, and recognizes the important role of women as family financial managers, contributors to family labor or to the farm, and frequently as family representative at group meetings. A number of ISAs have females as presidents and other board members. Within FSDC's staffing pattern, approximately 50% of the Institutional Officers are women.

9. Demand for Labor as Affected by Increased Rice Production and Mechanization

A discussion of these issues can be found in Part V, Sections A.1 and A.2 pages 70 to 74.

<u>Response to Issues Raised in STATE 251247, 20 October 1977</u>

A. 1) Institutional Development of FSDC and ISAs Including FSDC Decentralization/Institutional & Technical Requirements for FY 78 and Beyond

For details see Part IV, Section C - Administrative Feasibility - page 61. Other relevant discussion in the PP may be found in Part II, Sections A and B - Project Background and Detailed Description - and Part IV, Section B.2 - Institutional Infrastructure - page 59.

2) Additional Technical Assistance

For details please see Part IV, Section B, page 45.

3) Assessment and Evaluation

See Supplement (published separately) "Program Evaluation, Philippine Small Scale Irrigation, January 1978".

B. Cost Breakdowns of Grant Funds and Commodities Under SFS

Illustrative breakdowns of expenditures of grant funds can be found in Part IV, Section B, page 45. For illustrative lists of commodities to be procured under SFS see Tables 22 and 23, Annex J. Research and Development activities are diverse; a discussion of some may be found on page 58 (Part IV, B.1.A).

## SENSITIVITY ANALYSIS

### IRRIGATION - CONSTRUCTION AND EQUIPMENT COST

Case I: Low Yield, Low Price, Low Project Cost

| | Without Irrigation Package | 1 | 2 | 3 | 4 - 10 |
|---|---|---|---|---|---|
| Total Benefits | 92 | 92 | 180 | 233 | 280 |
| Incremental Benefits | - | - | 94 | 141 | 188 |
| A. Production Cost (Total) | 77.35 | 77.35 | 120.52 | 144.08 | 165.35 |
| I. Materials | 35.4 | 35.4 | 55.5 | 66.15 | 75.6 |
| Incremental Materials | - | 0 | 20.1 | 30.75 | 40.2 |
| II. Other Non-Labor Cost | 9.7 | 9.7 | 17.98 | 22.11 | 26.25 |
| Incremental Other Non-Labor | - | 0 | 8.28 | 12.41 | 16.55 |
| III. Labor Cost | 32.25 | 32.25 | 47.04 | 55.82 | 63.5 |
| Incremental Labor | - | 0 | 14.79 | 23.57 | 31.25 |
| NET FARM BENEFITS | 14.65 | 14.65 | 65.48 | 88.92 | 114.65 |
| NET ICNREMENTAL BENEFITS | 0 | 0 | 50.83 | 74.27 | 100.00 |
| B. ISA Project Cost | | | | | |
| I. Construction | - | 100 | - | - | - |
| II. O & M | 0 | 0 | 24.1 | 24.1 | 24.1 |
| Total ISA Cost | 0 | 100 | 24.1 | 24.1 | 24.1 |
| Incremental ISA Benefits | 0 | -100 | 26.73 | 50.17 | 75.9 |
| C. Program Management | - | 5.2 | 6.5 | 0.8 | 0.8 |
| NET INCREMENTAL BENEFITS OF PACKAGE | - | -105.2 | 20.23 | 49.37 | 75.1 |

Yield without irrigation - 23
Yield with irrigation - 35

Price - ₱40/cavan
Project Cost - ₱1,000/ha.

$$IRR = 45 + 5 \left[\frac{2.14}{2.76}\right] = 46.58$$

# SENSITIVITY ANALYSIS

**Case II: Low Yield, High Price, Low Project Cost**

| | Without | 1 | 2 | 3 | 4-10 |
|---|---|---|---|---|---|
| Total Benefits | 126.5 | 126.5 | 255.75 | 320.37 | 38.5 |
| Incremental Benefits | - | 0 | 129.25 | 193.87 | 258.5 |
| A. Production Cost-(Total) | 77.35 | 77.35 | 120.52 | 144.08 | 165.35 |
| I. Materials Incremental | | | | | |
| II. Other Non-Labor | | | | | |
| Net Benefits | 49.15 | 49.15 | 135.23 | 176.29 | 219.65 |
| Net Incremental Benefits | - | 0 | 86.08 | 127.14 | 170.5 |
| B. ISA Project Cost | | | | | |
| I. Construction | - | 100 | | | |
| II. O & M | 0 | 0 | 24.1 | 24.1 | 24.1 |
| Total ISA Cost | 0 | 100 | 24.1 | 24.1 | 24.1 |
| Incremental ISA Benefits | | -100 | 61.9 | 103.04 | 146.4 |
| C. Program Management | - | 5.2 | 6.5 | 0.8 | 0.8 |
| Net Incremental Benefits of Package | | -105.2 | 55.4 | 102.24 | 145.6 |

$$IRR = 85 + 5 \left[ \frac{-2.160}{4.28} \right]$$

$$= 87.52$$

Yield without irrigation - 23
Yield with irrigation - 35
Price - ₱55/cav.
Project Cost - ₱1,000/ha

# SENSITIVITY ANALYSIS

Case III Low Yield, High Price, High Project Cost

| | Without | 1 | 2 | 3 | 4-10 |
|---|---|---|---|---|---|
| Total Benefits | 126.5 | 126.5 | 255.75 | 320.37 | 385 |
| Incremental | - | 0 | 129.25 | 193.87 | 258.5 |
| A. Production Cost | 77.35 | 77.35 | 120.52 | 144.08 | 165.05 |
| Net Benefits | 49.15 | 49.15 | 135.23 | 176.29 | 219.65 |
| Net Incremental Benefits | - | 0 | 86.08 | 127.14 | 170.5 |
| B. Project Cost | | | | | |
| I. Construction | - | 250 | | | |
| II. O & M | 0 | 0 | 73.91 | 73.91 | 73.91 |
| Total ISA Cost | | 250. | 73.91 | 73.91 | 73.91 |
| Incremental ISA Benefits | | -250 | 12.17 | 53.23 | 96.29 |
| C. Program Management | | 5.2 | 6.5 | 0.8 | 0.8 |
| Net Incremental Benefits | | -255.2 | 5.67 | 52.43 | 95.79 |

$$IRR = 20 + 10 \left[ \frac{21.43}{68.34} \right]$$

$$= 23.136$$

Yield without irrigation - 23
Yield with irrigation - 35

Price - ₱55/cav.
Project Cost - ₱2,500/ha.

Case IV: High Yield, High Price, High Project Cost

| | Without | 1 | 2 | 3 | 4-10 |
|---|---|---|---|---|---|
| Total Benefits | 247.5 | 247.5 | 673.75 | 886.75 | 1,100 |
| Incremental Benefits | - | 0 | 426.25 | 639.25 | 852.5 |
| A. Production Cost | 88.02 | 88.02 | 157.37 | 194.03 | 228.4 |
| Materials | 39.8 | 39.8 | 70.7 | 86.75 | 101.6 |
| Other Non-Labor | 15.97 | 15.97 | 39.63 | 51.46 | 63.3 |
| Labor | 32.25 | 32.25 | 47.04 | 55.82 | 63.5 |
| Net Farm Benefits | 159.48 | 159.48 | 516.38 | 692.72 | 871.6 |
| Net Incremental Farm Benefits | - | 0 | 356.9 | 533.24 | 712.12 |
| B. ISA Project Cost | | | | | |
| I. Construction | | 250 | | | |
| II. O & M | | | 73.91 | 73.91 | 73.91 |
| III. Total ISA Cost | 0 | 250 | 73.91 | 73.91 | 73.91 |
| Incremental ISA Benefits | 0 | -250 | 282.99 | 459.33 | 638.21 |
| Program Management | - | 5.2 | 6.5 | 0.8 | 0.8 |
| Net Incremental Benefits of Package | 0 | -255.2 | 276.43 | 458.53 | 637.41 |

$$IRR = 145 + 2 \left[ \frac{-0.29}{1.63} \right]$$

$$= 148.35$$

Yield without irrigation - 45
Yield with irrigation -100
Price - ₱55/cav.
Project Cost - ₱ 2,500/ha.

**Case V: High Yields, Low Price, High Project Cost**

| | Without | 1 | 2 | 3 | 4-10 |
|---|---|---|---|---|---|
| Total Benefits | 180 | 180 | 490 | 645 | 800 |
| Incremental Benefits | - | 0 | 310 | 465 | 620 |
| Production Cost (Total) | 38.02 | 88.02 | 157.37 | 194.03 | 228.4 |
| Net Farm Benefits | 91.98 | 91.98 | 332.63 | 450.97 | 571.6 |
| Net Incremental Farm Benefits | - | 0 | 240.65 | 358.99 | 479.62 |
| TOTAL PROJECT COST | 0 | 250 | 73.91 | 73.91 | 73.91 |
| Incremental ISA Project | | -250 | 166.74 | 285.08 | 405.71 |
| Program Management | | 5.2 | 6.5 | 0.8 | 0.8 |
| Net Incremental Benefit of Package | 0 | -255.2 | 160.24 | 284.28 | 404.91 |

$$IRR = 100 + 10 \left[ \frac{-1.78}{-16.74} \right]$$
$$= 101.06$$

Yield without irrigation - 45
Yield with irrigation -100

Price - ₱40/cav.
Project Cost - ₱2,500/ha

# ISA Financial Analysis - Case Studies

## CASE STUDY 1

**MALUNGON ISA**

Area: 50

### I. TOTAL PROJECT COST

| | | |
|---|---|---|
| IMA | 17,201.31 | |
| Civil Works | 5,925.88 | ₱ 23,127.19 |

Breakdown of Sources of Financing

| | | |
|---|---|---|
| PSDC Loan (Total Release) | 21,202.26 | |
| ISA Equity | 1,924.93 | ₱ 23,127.19 |

### II. CASH FLOW STATEMENT FOR:

| | Pre-Implem. | I - 1976 | II - 1977 | III - 1978 | IV - 1979 | V - 1980 |
|---|---|---|---|---|---|---|
| **Inflows:** | 15 | 15 | 10 | 7.5 | 7.5 | 7.5 |
| Cash Revenues (Irrigation Fees) | - | 16,875.00 | 16,875.00 | 16,875.00 | 16,875.00 | 16,875.00 |
| Membership Fees 10/member | - | 340 | - | - | - | - |
| Semestral Fees 5/member | - | 340 | 340 | 340 | 340 | 340 |
| Others - Cash Loan | 4,000.95 | - | - | - | - | - |
| TOTAL | 4,000.95 | 17,555.00 | 17,215.00 | 17,215.00 | 17,215.00 | 17,215.00 |
| **Outflows:** | | | | | | |
| Construction Cost | 4,000.95 | - | - | - | - | - |
| Supplies/Trans/Comm | | 600.00 | 600.00 | 600.00 | 600.00 | 600.00 |
| Repair & Maintenance 2% | | 463.00 | 463.00 | 463.00 | 463.00 | 463.00 |
| Amortization | | 4,072.37 | 4,072.37 | 4,072.37 | 4,072.37 | 4,072.37 |
| Fuel/Oil/Lubricant (...) | | 10,833.00 | 11,149.11 | 11,103.83 | 11,157.99 | 11,157.[illegible] |
| Miscellaneous | | 500.00 | 500.00 | 500.00 | 500.00 | 500.00 |
| TOTAL | 4,000.95 | 16,488.37 | 16,685.03 | 16,739.20 | 16,793.36 | 16,793.36 |

Annex B-2
Page 1 of 13

| | | | | | | |
|---|---|---|---|---|---|---|
| Net Cash | - | 1,086.63 | 529.97 | 475.80 | 421.64 | 421.64 |
| Beginning Balance | - | - | 1,086.63 | 1,616.60 | 2,092.40 | 2,514.04 |
| Ending Cash | - | 1,086.63 | 1,616.60 | 2,092.40 | 2,514.04 | 2,935.68 |

| Ratios: | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| (1) Pre-service Cover | 1.27 times | 1.40 | 1.51 | 1.62 | 1.77 |
| (2) Return on Equity | 18% | 2% | 8% | 3% | 6% |
| (3) Return on Assets | 2% | - | 1% | 3% | 6% |
| (4) Net Profit Margin | 2% | - | 1% | 2% | 4% |

## III. INCOME STATEMENT

| | | | | | |
|---|---|---|---|---|---|
| **Revenues** | | | | | |
| Irrigation Fee | 16,875.00 | 16,875.00 | 16,875.00 | 16,875.00 | 16,875.00 |
| Membership Fee | 340.00 | - | - | - | - |
| Semestral Fee | 340.00 | 340.00 | 340.00 | 340.00 | 340.00 |
| TOTAL | 17,555.00 | 17,215.00 | 17,215.00 | 17,215.00 | 17,215.00 |
| **Operating Expenses** | | | | | |
| Supplies | 600.00 | 600.00 | 600.00 | 600.00 | 600.00 |
| Interest | 1,696.18 | 1,506.09 | 1,300.78 | 1,079.06 | 839.59 |
| Depreciation-PMA (7) | 2,457.33 | 2,457.33 | 2,457.33 | 2,457.33 | 2,457.33 |
| Depreciation-CW (10) | 592.59 | 592.59 | 592.59 | 592.59 | 592.59 |
| Fuel | 463.00 | 463.00 | 463.00 | 463.00 | 463.00 |
| Miscellaneous | 500.00 | 500.00 | 500.00 | 500.00 | 500.00 |
| TOTAL | 17,142.10 | 17,168.67 | 17,017.53 | 16,849.97 | 16,610.50 |
| | + 412.90 | + 46.33 | 197.47 | 365.03 | 604.50 |

Annex B-2
Page 2 of 13

## IV. AMORTIZATION

| Year | Amortization | Interest | Principal | Balance |
|---|---|---|---|---|
| 1 | 4,072.37 | 1,696.18 | 2,376.19 | 21,202.26 |
| 2 | 4,072.37 | 1,506.09 | 2,566.28 | 18,826.07 |
| 3 | 4,072.37 | 1,300.78 | 2,771.59 | 16,259.79 |
| 4 | 4,072.37 | 1,079.06 | 2,993.31 | 13,488.20 |
| 5 | 4,072.37 | 839.59 | 2,232.78 | 10,494.89 |
| 6 | 4,072.37 | 580.97 | 3,491.40 | 7,262.11 |
| 7 | 4,072.37 | 301.66 | 3,770.71 | 3,770.71 |
| | | | | - |

## V. BALANCE SHEET

| | | | | | |
|---|---|---|---|---|---|
| Cash | 1,086.63 | 1,616.60 | 2,092.40 | 2,514.04 | 2,935.68 |
| Pump Motor Accessories | 17,201.31 | 17,201.31 | 17,201.31 | 17,201.31 | 17,201.31 |
| Less Accum. Depreciation | ( 2,457.33) | ( 4,914.66) | ( 7,371.99) | ( 9,829.32) | (12,286.65) |
| Civil Works | 5,925.88 | 5,925.88 | 5,925.88 | 5,925.88 | 5,925.88 |
| Less Accum. Depreciation | ( 592.59) | ( 1,185.18) | ( 1,777.77) | ( 1,2370.36) | ( 2,962.95) |
| TOTAL | 21,163.90 | 18,643.95 | 16,069.83 | 13,441.55 | 10,813.27 |
| FSDC Loan | 18,826.07 | 16,259.79 | 13,488.20 | 10,494.89 | 7,262.11 |
| ISA Equity | 2,337.83 | 2,384.16 | 2,581.63 | 2,946.66 | 3,551.16 |
| TOTAL | 21,163.90 | 18,643.95 | 16,069.83 | 13,441.55 | 10,813.27 |

Annex B-2
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CASE STUDY II

ISABELA

BUMEG-FUGU IRRIGATORS SERVICE ASSOCIATION
160 Has

| CASH FLOW STATEMENT | PRE-OPERATING | 1976 13 cav. | 1977 9 cav. | 1978 7 cav. | 1979 7 cav. | 1980 7 cav. |
|---|---|---|---|---|---|---|
| INFLOWS | | | | | | |
| Membership Fees | | 600 | | | | |
| Semestral Fees | | 600 | 600 | 600 | 600 | 600 |
| Irrigation Fees | | 47,840 | 49,680 | 51,520 | 51,520 | 51,520 |
| Cash Loan | 8,992 | | | | | |
| Total | ₱ 8,992 | 49,040 | 50,280 | 52,120 | 52,120 | 52,120 |
| OUTFLOWS | | | | | | |
| Construction Cost | ₱ 8,887 | | | | | |
| Supplies/Transp/Communication | | 425 | 425 | 425 | 425 | 425 |
| Fuel/Oil/Lubricants | | 29,436 | 30,075 | 30,223 | 30,370 | 30,370 |
| Repairs and Maintenance | | 1,715 | 1,715 | 1,715 | 1,715 | 1,715 |
| Amortization | | 15,220 | 15,220 | 15,220 | 15,220 | 15,220 |
| Miscellaneous Expenses | | 690 | 690 | 690 | 690 | 690 |
| Total | 105 | 47,536 | 48,126 | 48,273 | 48,421 | 48,421 |
| Beginning | | 1,503 | 2,153 | 3,846 | 3,698 | 3,698 |
| Ending | | 105 | 1,608 | 3,761 | 7,608 | 11,307 |
| Balance | ₱ 105 | ₱ 1,608 | 3,761 | 7,608 | 11,307 | 15,306 |

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ISABELA
BUMEC-FUGU IRRIGATORS SERVICE ASSOCIATION
160 Has.

**Total Project Cost & Sources of Financing**

A. Total Project Cost

| | |
|---|---|
| Civil Works | ₱ 21,451 |
| Machinery & Equipment | 70,251 |
| Working Capital | 105 |
| Total | ₱ 91,807 |

B. Source of Financing

| | |
|---|---|
| FSDC Loan | ₱ 79,243 |
| ISA Contribution | 12,564 |
| Total | ₱ 91,807 |

**Operating & Maintenance Schedule**

| | |
|---|---|
| Supplies/trans/communication | 425 |
| Fuel/Oil/Lubricants | 29,486 |
| Repairs & Maintenance | 1,715 |
| Interest Expense | 6,339 |
| Depreciation Expense | 12,181 |
| Miscellaneous Expense | 690 |
| Total | ₱ 50,836 |

Annex B-2
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ISABELA
BUMEG-FUGU IRRIGATORS SERVICE ASSOCIATION
160 Has

**Amortization Schedule**

| Year | Amortization | Interest | Principal | Balance |
|---|---|---|---|---|
| 0 | | | | 79,243 |
| 1 | 15,220 | 6,339 | 8,881 | 70,362 |
| 2 | | 5,629 | 9,591 | 60,771 |
| 3 | | 4,861 | 10,358 | 50,412 |
| 4 | | 4,032 | 11,187 | 39,224 |
| 5 | | 3,137 | 12,082 | 27,142 |
| 6 | | 2,171 | 13,049 | 14,093 |
| 7 | 15,220 | 1,127 | 14,093 | |

**Depreciation Schedule**

| Asset: | Structures | Machinery & Equipment |
|---|---|---|
| No. of Years: | 10 | 7 |
| Cost of Asset: | ₱21,451 | ₱70,251 |
| Accum. Depn. | | |
| 1 | 2,145 | 10,035 |
| 2 | 4,290 | 20,071 |
| 3 | 6,436 | 30,107 |
| 4 | 8,581 | 40,143 |
| 5 | 10,726 | 50,179 |
| 6 | 12,870 | 60,215 |
| 7 | 15,015 | 70,251 |
| 8 | 17,161 | |
| 9 | 19,306 | |
| 10 | 21,451 | |

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CASE STUDY III

**SAN LORENZO ISA**

**Area: 73**

**Electric - 20 HP**

**I. TOTAL PROJECT COST - P/M/A** ₱ 25,541.19

Civil Works 4,705.55

TOTAL ₱ 30,246.74

Breakdown of Financing:

| | |
|---|---|
| FSDC Loan | ₱ 28;674.74 |
| ISA Equity | 1,572.00 |
| TOTAL | ₱ 30,246.74 |

**II. PROJECTED INCOME STATEMENT**

| | 1 (8 cavans) | 2 (5 cavans) | 3 (4 cavans) | 4 (4 cavans) | 5 (4 cavans) |
|---|---|---|---|---|---|
| Revenues: | | | | | |
| Irrigation Fee | 14,800.00 | 15,125.00 | 14,600.00 | 14,600.00 | 14,600.00 |
| Membership Fee | 365.00 | | | | |
| Semestral Fee | 182.50 | 273.75 | 365.00 | 365.00 | 365.00 |
| TOTAL REVENUE | 15,347.50 | 15,398.75 | 14,965.00 | 14,965.00 | 14,965.00 |
| Expenses: | | | | | |
| Salaries & Wages | 1,130.00 | 1,130.00 | 1,130.00 | 1,130.00 | 1,130.00 |
| Supplies/Trans/Comm. | 80.70 | 80.70 | 80.70 | 80.70 | 80.70 |
| Fuel/Oil/Lubricant/Current | 6,266.40 | 6,391.72 | 6,551.51 | 6,748.05 | 6,748.05 |
| Repair & Maintenance | 1,060.60 | 1,060.60 | 1,060.60 | 1,060.60 | 1,060.60 |
| Miscellaneous Expense | 60.25 | 60.25 | 60.25 | 60.25 | 60.25 |
| Interest Expense | 2,293.97 | 2,036.88 | 1,759.23 | 1,459.35 | 1,135.49 |
| Depreciation Expense | 4,119.29 | 4,119.29 | 4,119.29 | 4,119.29 | 4,119.29 |
| TOTAL EXPENSE | 15,011.21 | 14,879.44 | 14,761.58 | 14,658.24 | 14,334.38 |
| Net Income (Loss) | 336.29 | 519.31 | 203.42 | 306.76 | 630.62 |

Annex B-2
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CASE STUDY 2

TABUSAO SUR ISA
AREA - 148

I. Total Project Cost

| | | |
|---|---|---|
| PMA | 71,163 | |
| Civil Works | 85,260 | |
| Work Capital | 195 | 156,620 |

Breakdown of Sources of Financing

| | | |
|---|---|---|
| FSDC loan (total releases) | 148,191 | |
| ISA Equity | 8,428 | 156,619 |

II. Cash Flow Statement

| Inflow: | Pre-Operating Period | 1976 | 1977 | 1978 | 1979 | 1980 |
|---|---|---|---|---|---|---|
| | | 25 cav/ha | 19 cav/ha | 15 cav/ha | 15 cav/ha | 15 cav/ha |
| Cash revenues (irrigation fees) | | 98,050 | 111,722 | 111,766 | 111,766 | 111,766 |
| Membership fees | | 350 | | | | |
| Semestral Fees | | 850 | 850 | 750 | 850 | 850 |
| Other - Cash Loans | 77,027 | | | | | |
| Total | 77,027 | 99,750 | 112,627 | 118,510 | 118,510 | 118,510 |

Annex B-2
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## III. AMORTIZATION SCHEDULE - ₱28,674.74

| Year | Amortization | Interest | Principal | Balance |
|---|---|---|---|---|
| | | | | ₱ 28,674.74 |
| 1 | ₱5,507.62 | ₱22,397.97 | ₱ 3,213.65 | 25,461.09 |
| 2 | | 2,036.88 | 3,470.74 | 21,990.35 |
| 3 | | 1,759.23 | 3,748.39 | 18,241.96 |
| 4 | | 1,459.35 | 4,048.27 | 14,193.69 |
| 5 | | 1,135.49 | 4,372.13 | 9,821.56 |
| 6 | | 785.73 | 4,721.89 | 5,099.67 |
| 7 | 5,507.64 | 407.97 | 5,099.67 | - |

## IV. ACCUMULATED DEPRECIATION SCHEDULE

| | PMA 7 Years | CIVIL WORKS 10 Years |
|---|---|---|
| | ₱ 25,541.19 | ₱ 4,705.55 |
| 1 | 3,648.74 | 470.55 |
| 2 | 7,297.48 | 941.10 |
| 3 | 10,946.22 | 1,411.65 |
| 4 | 14,594.96 | 1,882.20 |
| 5 | 18,243.70 | 2,352.75 |
| 6 | 21,892.44 | 2,823.30 |
| 7 | 25,540.19 | 3,293.85 |
| 8 | | 3,764.40 |
| 9 | | 4,234.95 |
| | | 4,704.55 |

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Page 9 of 13

ABUSAO SUR ISA
AREA - 148

| | Pre-Operating Period | 1976 | 1977 | 1978 | 1979 | 1980 |
|---|---|---|---|---|---|---|
| Outflow: | | | | | | |
| Construction Cost | 76,832 | | | | | |
| Supplies/transp/comm. | | 600 | 600 | 600 | 600 | 600 |
| Repair & maintenance | | 3,129 | 3,129 | 3,129 | 3,129 | 3,129 |
| Amortization | | 28,463 | 28,463 | 28,463 | 28,463 | 48,463 |
| Fuel/Oil/Lubricant | | 64,256 | 77,107 | 80,320 | 83,533 | 83,533 |
| Miscellaneous | | 500 | 500 | 500 | 500 | 500 |
| Organizational Expense | 71 | | | | | |
| | 76,903 | 96,948 | 109,799 | 113,012 | 116,225 | 116,225 |
| Net Flow | 123 | 2,801 | 2,827 | 5,497 | 2,284 | 2,284 |
| Beginning | - | 123 | 2,924 | 5,752 | 11,249 | 13,534 |
| | 123 | 2,924 | 5,750 | 11,249 | 13,534 | 15,819 |

CASE STUDY V

PROJECTED INCOME STATEMENT

| Revenues | 1976 (21.5 Cav) | 1977 (14.5 Cav) | 1978 (11.0 Cav) | 1979 (11.0 Cav) | 1980 [illegible] Cav) |
|---|---|---|---|---|---|
| Membership Fees | 200 | | | | |
| Semestral Fees | 200 | 200 | 200 | 200 | 200 |
| Irrigation Fees | 34,400 | 34,800 | 35,200 | 35,200 | 35,200 |
| Total | 34,800 | 35,000 | 35,400 | 35,400 | 35,400 |
| Expenses | | | | | |
| Supplies/Transp/Communication | 152 | 152 | 152 | 152 | 152 |
| Electric Bill | 20,992 | 21,412 | 21,317 | 21,622 | 21,622 |
| Repair & Maintenance | 528 | 528 | 528 | 528 | 528 |
| Miscellaneous | 1,090 | 1,090 | 1,090 | 1,090 | 1,090 |
| Interest Expense | 4,176 | 3,708 | 3,203 | 2,657 | [illegible] |
| Depreciation | 7,661 | 7,661 | 7,661 | 7,661 | 7,661 |
| Total | 34,600 | 34,552 | 34,152 | 33,711 | 33,121 |
| NET INCOME (Loss) | 199 | 447 | 1,247 | 1,688 | 2,278 |

BOGO-CHIQUITO ISA
Area - 80 Has

| | | |
|---|---|---|
| I. Total Project Cost | | |
| FMA | 38,850 | |
| Civil Works | 21,116 | |
| Work Capital | 2,102 | 62,069 |
| Breakdown of Sources of Financing | | |
| FSDC Loan | 52,209 | |
| ISA Equity | 9,860 | 62,069 |
| II. Operating & Maintenance Expenses | | |
| Supplies/Transp/Communication | 152 | |
| Electric Bill | 20,992 | |
| Repair & Maintenance | 528 | |
| Miscellaneous Expense | 1,090 | |
| Interest Expense | 4,176 | |
| Depreciation: | | |
| Structure | 2,111 | |
| Machinery & Equipment | 5,550 | |
| | ₱ 34,600 | |

BOGO-CHIQUITO ISA
AREA - 80 Has

AMORTIZATION SCHEDULE

Amount of Loan = ₱50,209

| Year | Amortization | Interest | Principal | Balance |
|---|---|---|---|---|
| 0 | | | | 52,209 |
| 1 | 10,028 | 4,176 | 5,851 | 46,358 |
| 2 | | 3,708 | 6,319 | 40,038 |
| 3 | | 3,203 | 6,821 | 33,214 |
| 4 | | 2,657 | 7,370 | 25,843 |
| 5 | | 2,067 | 7,960 | 17,882 |
| 6 | | 1,430 | 8,597 | 9,285 |
| 7 | 10,028 | 742 | 9,285 | |

Depreciation Schedule

| Asset: | Structures | Machinery & Equipment |
|---|---|---|
| Cost | ₱21,116 | ₱38,950 |
| | 10 years | 7 years |
| Accum. Depn.: | | |
| 1 | 2,111 | 5,550 |
| 2 | 4,223 | 11,100 |
| 3 | 6,334 | 16,650 |
| 4 | 8,446 | 22,200 |
| 5 | 10,558 | 27,750 |
| 6 | 12,669 | 33,300 |
| 7 | 14,781 | 38,300 |
| 8 | 16,893 | |
| 9 | 19,004 | |
| 10 | 21,116 | |

## Sample ISA Financing Statements

### ANTIQUERA ISA
### Interim Income Statement
### For the Period Ending July 30, 1977

| | | |
|---|---|---|
| **INCOME:** | | |
| Membership Fees | ₱ 70.00 | |
| Irrigation Fees | 653.85 | |
| Contribution & Donation | 230.00 | |
| Other Income | 237.00 | ₱ 1,190.85 |
| **EXPENSES:** | | |
| Supplies, Transportation, Commission | ₱ 230.95 | |
| Gas, Oil, Power | 297.10 | |
| Representation Expense | 296.00 | |
| Repairs and Maintenance | 184.80 | |
| Organizational Expenses | 369.00 | |
| Miscellaneous Expenses | 106.00 | ₱ 1,483.85 |
| **NET LOSS:** | | ₱ 293.00 |

### ANTIQUERA ISA
### Interim Balance Sheet
### As of July 30, 1977

| | | |
|---|---|---|
| **ASSETS** | | |
| **CURRENT ASSETS** | | |
| Cash on Hand | ₱ 200.75 | |
| Receivables | 103.00 | ₱ 303.75 |
| **FIXED ASSETS:*** | | |
| Building | ₱ 760.75 | |
| Irrigation Equipment | 30,094.45 | |
| Structures & Land Improvement | 23,043.99 | ₱ 53,899.19 |
| **TOTAL ASSETS** | | ₱ 54,202.94 |
| **LIABILITIES & EQUITY** | | |
| **LIABILITIES:** | | |
| Accounts Payable | ₱ 264.60 | |
| Loans Payable - FSDC | 47,091.34 | ₱ 47,355.94 |
| **ISA EQUITY** | ₱ 7,140.00 | |
| Less; Deficit | ( 293.00) | 6,847.00 |
| **TOTAL LIABILITIES & EQUITY** | | ₱ 54,202.94 |

*Depreciation was not included because the system was completed just prior to preparing the financial statement.

# ESPERANZA ISA
## Interim Balance Sheet
## As of July 30, 1977

**ASSETS:**

| | | |
|---|---|---|
| **CURRENT ASSETS:** | | |
| Cash on Hand | ₱ 1,424.30 | |
| Receivables | 49.00 | ₱ 1,473.30 |
| **FIXED ASSETS:*** | | |
| Irrigation Equipment | ₱279,902.55 | |
| Structure and Land Improvement | 100,788.65 | 380,691.20 |
| Other Assets | | 14.00 |
| TOTAL ASSETS | | ₱ 382,178.50 |

LIABILITIES & EQUITY

| | | |
|---|---|---|
| LIABILITIES: | | |
| Accounts Payable | ₱ 6,520.00 | |
| Loans Payable - FSDC | 350,896.63 | ₱ 350,961.83 |
| ISA EQUITY | ₱ 37,454.00 | |
| Less Deficit | ( 6,237.33) | 31,216.67 |
| TOTAL LIABILITIES & EQUITY | | ₱ 382,178.50 |

*Depreciation was not included because the system was completed just prior to preparing the financial statement.

DATU ABDUL DADIA ISA
Interim Income Statement
For The Period Ending July 31, 1977

| | | |
|---|---|---|
| **INCOME:** | | |
| Membership Fees | ₱ 364.50 | |
| Semestral Fees | 110.00 | |
| Contributions & Donations | 617.00 | ₱ 1,091.50 |
| **EXPENSES:** | | |
| Supplies, Transportation, Communication | 3,821.95 | |
| Representation Expense | 703.85 | |
| Organizational Expense | 60.00 | |
| Repair and Maintenance | 29.90 | |
| Depreciation | 764.82 | |
| Miscellaneous | 24.50 | 5,405.02 |
| **NET LOSS** | | (₱ 4,313.52) |

DATU ABDUL DADIA ISA
Interim Balance Sheet
As of July 31, 1977

A S S E T S

| | | | |
|---|---|---|---|
| **CURRENT ASSETS:** | | | |
| Cash on Hand | | ₱ 9.90 | |
| Receivables | | 170.50 | ₱ 180.40 |
| **FIXED ASSETS:** | | | |
| Structures & Land Improvements | ₱37,745.70 | | |
| Less: Accumulated Dep. | 314.55 | 37,431.15 | |
| Irrigation Equipment | 54,032.48 | | |
| Less: Accumulated Dep. | 450.27 | 53,582.21 | 91,013.36 |
| | | | ₱ 91,193.76 |

L I A B I L I T I E S & E Q U I T Y

| | | |
|---|---|---|
| **LIABILITIES:** | | |
| Loans Payable - FSDC | | ₱ 78,107.28 |
| ISA EQUITY | ₱17,400.00 | |
| Less: Deficit | (4,313.52) | 13,086.48 |
| **TOTAL LIABILITIES AND EQUITY** | | ₱ 91,193.76 |

# FSDC Implementation Model

This Annex contains a proposed Model of Provincial Schedule of Activities for calendar year 78. These activities will be implemented in the ISAs in the provinces, depending on the different stages of individual ISAs.

| Major Activity | Responsibility | Brief Description |
|---|---|---|
| I. Technical | | |
| A. Identification of possible areas for 1978 | Provincial Staff | Inform and promote the BISA Program in areas without irrigation. Conduct preliminary agricultural investigation of potential areas of applicants. |
| B. Technical investigation of potential areas for 1978 | FSDC/ISA | Conduct ocular technical investigation of sites to find out:<br>1. Suitability of water (quality and quantity).<br>2. Approximate size of irrigable area.<br>3. Probable water diversion site and type.<br>4. Availability and costs of construction materials.<br>5. Others |

| MAJOR ACTIVITY | RESPONSIBILITY | | |
|---|---|---|---|
| | FSDC | PROVINCE | FARMERS/ISA |
| | H. Schedules investigation of proposed areas. | I. Notifies farmers of schedule and required manpower and materials. | J. Farmers prepare requirements. |
| | K. Conducts Technical investigation. | L. Accompanies investigator to area. | M. Assist investigator. |
| II. Engineering Survey and Studies (For projects recommended as feasible) | A. Sends schedule of survey and manpower and material requirements. | B. Informs farmers of schedule and requirements. | C. Prepare requirements |
| | D. Sends surveyor. | E. Accompanies surveyor | F. Assist surveyor in identifying owner/tiller of land affected and in the general conduct of survey. |
| | G. Prepares Topo map and layout of system. Sends copies to province. | H. Conducts briefing of farmers on layout of the system. (Refer to organization of ISA) | I. Secure right-of-way commitments and labo contribution commitments. |
| | -1. Designs and Estimates the Projects. | | |
| | -2. Prepares Feasibility Study. | | |
| | -3. Presents to [illegible] for approval. | | |

| MAJOR ACTIVITY | RESPONSIBILITY: PSDC | RESPONSIBILITY: PROVINCE | RESPONSIBILITY: FARMERS/ISA |
|---|---|---|---|
| III. Organization of ISA | A. Notifies province of technically feasible areas & sends layout of irrigable area. | B. Informs farmers and prepares schedule of pre-organization training with emphasis on:<br>1. BISA Concepts<br>2. BISA Features<br>3. BISA requirements | C. Attends Pre-Organization Training. Discuss Articles of Incorporation, By-Laws. |
| | D. Sends completed feasibility studies and schedule of construction | E. Conducts Pre-Organization Training. Discusses feasibility study. | F. Discuss Feasibility Study. Agree to organize ISA. Identify and secure right of way. Discuss system of providing free labor. |
| | I. Registers ISA with Securities and Exchange Commission | H. Checks registration papers right of way documents. Sends the same together with reports on Pre-Organization Training conducted for ISA | G. Organize, pay membership fees, complete registration papers. |
| IV. Construction of Project | A. Sends notice of Board Approval | B. Notifies ISA of loan approval. Asks ISA to complete loan agreement. | C. Complete Pre-Construction requirements. Organize construction crew. Work on canals. |

| MAJOR ACTIVITY | RESPONSIBILITY | | |
|---|---|---|---|
| | FSDC | PROVINCE | FARMERS/ISA |
| | | | Organized procurement committee, canvasses construction materials. |
| | D. Sends construction supervisor | E. Sends completed Pre-Construction requirements. | |
| | F. Construction supervisor finalizes construction schedules including manpower requirements. Asks ISA to appoint Timekeepers of free labor. | | |
| | G. Supervises construction work. | | H. Accepts completed Projects. |
| VI. Financial Management of ISA | A. Trains Provincial Staff on Financial Management (Budgeting, Financial Record Keeping) | B. Prepares schedules of ISA Training and informs ISA of Schedules. | C. Attends scheduled Training. |
| | | | D. Sets up books of accounts. Appoints and trains Bookkeeper and other business management and audit inventory committee members. |

| MAJOR ACTIVITY | RESPONSIBILITY: FSDC | PROVINCE | FARMERS/ISA |
|---|---|---|---|
| | | E. Checks correctness of accounting entries and conducts periodic refresher courses. | |
| | H. Conducts ISA audit and financial record examination | G. Checks completeness of ISA financial reports. Sends to FSDC. | F. Prepares ISA Financial Report and Budget. |
| | I. Gives Provincial Staff and ISA Feedback. | | |
| IV. Agricultural Production | A. Trains Provincial Staff on innovation packages. Water Management and water scheduling. | B. Prepares schedule of ISA Training using ISA Reports as basis for selection of priorities. | C. Attends Training. |
| | | | D. Forms Kaisahan and Trains members on Organized Rice Production. Trains Business Management Committee, Irrigation Management Committee and Production Management Committee on different packages. |
| | G. Prepares Feasibility Studies on Farm Tools and Equipment | F. Checks reports and coordinates with other agencies on | E. Prepares Information Reports on Requirements for Institutiona Credit Project, Farm |

| MAJOR ACTIVITY | RESPONSIBILITY: FSDC | RESPONSIBILITY: PROVINCE | RESPONSIBILITY: FARMERS/ISA |
|---|---|---|---|
| | Project and approves an application. | Implementation of Institutional Credit Project, Organized Project, Organized Rice Production Project, and Seed Production Project. Sends data for Farm Tools and Equipment Project to FSDC. | Tools and Equipment Project. |
| | | | H. Avails Institutional Credit Project and Implements Organized Rice Production Project, Organized Buying Project. Prepares periodic report on operation. |
| | | I. Conducts spot checks and coordinates with production technician. | J. Harvest crop and pays power bills and Institutional Credit Project loan and 1st amortization. Prepares report on harvest. |
| | L. Sends Farm Tools and Equipment Project loan for use of ISA next cropping. | K. Transmits reports | |
| VII. Operation, Repair and Maintenance | A. 1. Schedules Pump Operator Training. | B. 1. Informs ISA about schedule and prepares | C. 1. Sends system Superintendent and Operator to Training. |

| MAJOR ACTIVITY | RESPONSIBILITY | | |
|---|---|---|---|
| | FSDC | PROVINCE | FARMERS/ISA |
| | 2. Sends Engineer to assist in completion of distribution system. | Training Requirement.<br>2. Asks ISA to prepare schedule of distribution system completion. | 2. completes distribution system. |
| | E. Sends Mechanic/Electrician for regular maintenance check. | | D. Operates system reports major troubles. |
| | | G. Hires Provincial Mechanic | F. Contributes fund for hiring of Provincial Mechanic. |
| | H. Trains Provincial Mechanic | | |
| | J. Procedures spare parts for system if required. | | I. Buys spare parts if, locally available. Request from FSDC if not. |

With these redefined responsibilities it is clear that the farmers or ISA will have to initiate action if they want to avail of the program. Also that the provincial staff will have to be re-organized if they are to react to these new set-up.

| Major Activity | Responsibility | Brief Description |
|---|---|---|
| C. Topographic survey of remaining areas for construction in 1977 and areas for 1978 | FSDC/ISA | Conduct detailed topo survey to come up with the following: 1. topo map 2. parcellary map |
| D. Construction of new projects | FSDC/ISA | Construct projects whose financing have been approved. This will include areas carried over from last year's operation. |
| E Upgrading of old projects | FSDC/ISA/ PROVIN. | Upgrading and improvement of the irrigation facilities of the old ISAs. The old ISAs should be able to serve the design service area by the end of this activity. |
| F. Repair and maintenance | ISA/PROVINCE | Continuous repair and maintenance of the pumping system as well as the water distribution system of the operational ISAs. FSDC maintenance man will assist in major repair. |
| II. Institutional Development | | |
| A. Organization of ISA | PROV. STAFF/ FARMERS | All projects identified as feasible will be organized. |
| B. Training of ISA officers and members | PROV. STAFF/ ISA | Continuous training of ISA officers and members on the different association management systems. On-the-job training and actual demonstration of effectiveness and usefulness of these different systems will be used. |
| C. Refresher Courses | | |

| Major Activity | Responsibility | Brief Description |
|---|---|---|
| 1. Provincial Staff | FSDC | Periodic refresher courses will be conducted for all Institutional Officers to update knowledge on BISA concepts, principles, features. This will also serve as a forum for introducing improvements in the program. |
| 2. ISA officers and members | PROVINCIAL STAFF | Periodic refresher courses for ISA officers and members. This will also serve as a time for a review of the operations of the association. |
| D. Management Training on Innovation Packages | FSDC | IOs will be given training on the different systems of operation of the different innovation packages in the ISAs in accordance with BISA Prog. requisites. |
| E. Implementation of innovation packages qualified [illegible] | PROVINCIAL STAFF/ISAs | IOs will evaluate state of development of ISAs and will train ISA officers and members to meet criteria for adopting the different innovation packages. |
| F. Creation of repair and maintenance fund | PROVINCIAL STAFF/ISAs | The Prov. Staff will motivate the ISAs to contribute to a repair and maintenance fund from which the province can draw funds to hire and maintain a provincial mechanic/s to undertake repair and maintenance of the pumpsing systems. This fund can also be used to secure an available inventory or stock pile of spare parts in the province. |
| G. Training in Federation of ISAs | FSDC | FSDC shall conduct training of selected IOs to form the core group for the organization of |

| Major Activity | Responsibility | Brief Description |
|---|---|---|
| | | a federation of ISAs. These federation will be composed of a group of 5 to 10 ISAs. The federation will eventually take over the Repair and Maintenance fund aside from providing other services to the member ISAs. |
| H. Pilot test of federation concept | PROVINCIAL STAFF | IOs trained on federation concept will organize selected ISAs into the federation. |

AGENCY FOR INTERNATIONAL DEVELOPMENT

# PROJECT AUTHORIZATION AND REQUEST FOR ALLOTMENT OF FUNDS PART I

1. TRANSACTION CODE: A (A = ADD, C = CHANGE, D = DELETE)

PAF

2. DOCUMENT CODE: 5

3. COUNTRY/ENTITY: Philippines

4. DOCUMENT REVISION NUMBER:

5. PROJECT NUMBER (7 digits): 492-0301

6. BUREAU/OFFICE: A. SYMBOL: ASIA; B. CODE: 04

7. PROJECT TITLE (Maximum 40 characters): Small Farmer Systems

8. PROJECT APPROVAL DECISION — ACTION TAKEN: A = APPROVED, D = DISAPPROVED, DE = DEAUTHORIZED

9. EST. PERIOD OF IMPLEMENTATION: YRS. 03 QTRS

10. APPROVED BUDGET AID APPROPRIATED FUNDS ($000)

| A. APPROPRIATION | B. PRIMARY PURPOSE CODE | PRIMARY TECH. CODE C. GRANT | PRIMARY TECH. CODE D. LOAN | E. 1ST FY F. GRANT | E. 1ST FY G. LOAN | H. 2ND FY I. GRANT | H. 2ND FY J. LOAN | K. 3RD FY L. GRANT | K. 3RD FY M. LOAN |
|---|---|---|---|---|---|---|---|---|---|
| (1) FN | B 213 | 010 | 010 | 155 | 3,000 | 350 | 7,000 | 495 | - |
| (2) | | | | | | | | | |
| (3) | | | | | | | | | |
| (4) | | | | | | | | | |
| TOTALS | | | | | | | | | |

| A. APPROPRIATION | N. 4TH FY O. GRANT | N. 4TH FY P. LOAN | Q. 5TH FY R. GRANT | Q. 5TH FY S. LOAN | LIFE OF PROJECT T. GRANT | LIFE OF PROJECT U. LOAN |
|---|---|---|---|---|---|---|
| (1) FN | - | - | - | - | 1,000 | 10,000 |
| (2) | | | | | | |
| (3) | | | | | | |
| (4) | | | | | | |
| TOTALS | | | | | | |

11. PROJECT FUNDING AUTHORIZED (ENTER APPROPRIATE CODE(S)) 1 - LIFE OF PROJECT; 2 - INCREMENTAL, LIFE OF PROJECT

| A. GRANT | B. LOAN |
|---|---|
| 2 | 2 |

C. PROJECT FUNDING AUTHORIZED THRU FY

12. INITIAL PROJECT FUNDING ALLOTMENT REQUESTED ($000)

B. ALLOTMENT REQUEST NO.

| A. APPROPRIATION | C. GRANT | D. LOAN |
|---|---|---|
| (1) | | |
| (2) | | |
| (3) | | |
| (4) | | |
| TOTALS | | |

13. FUNDS RESERVED FOR ALLOTMENT

TYPED NAME (Chief, SER/FM/FSD)

SIGNATURE

DATE

14. SOURCE/ORIGIN OF GOODS AND SERVICES: 000 941 LOCAL OTHER

15. FOR AMENDMENTS, NATURE OF CHANGE PROPOSED

| FOR PPC/PIAS USE ONLY | 16. AUTHORIZING OFFICE SYMBOL | 17. ACTION DATE MM DD YY | 18. ACTION REFERENCE (Optional) | ACTION REFERENCE DATE MM DD YY |
|---|---|---|---|---|
| | | | | |

AID 1350-6 (7-70)

PROJECT AUTHORIZATION FOR REQUEST FOR ALLOTMENT OF FUNDS

PART II

Philippines

Small Farmer Systems

Number of Project: 492-0302

Pursuant to Part I, Chapter 1, Section 103 of the Foreign Assistance Act of 1961, as amended, I hereby authorize a Loan and a Grant to the Philippines the "Cooperating Country" of not to exceed Three Million One Hundred Fifty Five Thousand United States Dollars ($3,155,000) the ("Authorized Amount") to help in financing certain foreign exchange and local currency costs of good and services required for the project as hereafter described. The project consists of establishing small farmer associations so that members may own, operate and maintain irrigation and other farm support systems under the GOP's program for assisting small farmers. It is anticipated that approximately 280 new ISAs will be developed and some 600 existing ISAs further assisted as a result of this loan. Of the Authorized Amount, three million dollars ("Loan") will be loaned to the Cooperating Country to assist in financing certain Foreign Exchange and local currency costs of goods and services required for the Project.

I approve the total level of A.I.D. appropriated funding planned for this project of not to exceed Eleven Million United States Dollars ($11,000,000), (Loan) (Grant) of which $10.0 million will be Loan funded and $1.0 million Grant funded including the funding authorized above, during the period FY 1978 (through FY 80. I approve further increments during that period of funding up to $7,845,000, subject to the availability of funds in accordance with A.I.D. allotment procedures.

I hereby authorize the initiation of negotiation and execution of the Project Agreement by the officer to whom such authority has been delegated in accordance with A.I.D. regulations and Delegation of Authority subject to the following essential terms and covenants and major conditions; together with such other terms and conditions as A.I.D. may deem appropriate.

a. Interest Rate and Terms of Repayments

The Cooperating Country shall repay the Loan to A.I.D. in United States Dollars within twenty (20) years from the date of first disbursement of the Loan, including a grace period of not to exceed ten (10) years. The Cooperating Country shall pay to A.I.D. in United States Dollars interest from the date of first disbursement of the Loan at the rate of (a) two percent (2%) per annum during the first ten (10) years, and (b) three percent (3%) per annum thereafter, on the outstanding disbursed balance of the Loan and on any due and unpaid interest accrued thereon.

b. Source and Origin of Goods and Services

Except for Ocean Shipping, goods and services financed by A.I.D. under the project shall have their source and origin in the Cooperating Country or in countries included in A.I.D. Geographic Code 941 except as A.I.D. may otherwise agree in writing. Ocean Shipping financed under the Loan shall be procured in any eligible source country except the Cooperating Country.

c. Prior to any disbursement, or the issuance of any commitment documents under the Project Agreement, the Cooperating Country shall furnish in form and substance satisfactory to A.I.D., a plan for the development of an improved system for Project accounting, reporting and monitoring.

d. Prior to any disbursement, or the issuance of any commitment documents under the Project Agreement to finance activities with Grant funds, the Cooperating Country shall furnish in form and substance satisfactory to A.I.D., an example of the contract format to be used with individuals or firms for short and long term technical advisory services.

e. The Cooperating Country shall covenant and agree:

(1) To make available to FSDC on a timely basis peso funds required for the implementation of the Project;

(2) To absorb any maintenance of value risks on behalf of FSDC and the Irrigator Service Associations;

(3) To ensure that FSDC will incorporate the results and recommendations of an Environmental Assessment conducted by the Philippine Inter-Agency Committee of Ecological Studies into the implementation of the Project;

(4) To ensure that FSDC will install and utilize the Project accounting, reporting and monitoring system supplied in satisfaction of the condition precedent mentioned in paragraph c. above.

Signature _____

_____

# PROJECT DESIGN SUMMARY
## LOGICAL FRAMEWORK

Project Title & Number: SMALL FARMER SYSTEMS

Life of Project:
From FY 78 to FY 80
Total U S Funding $11.8 MILLION
Date Prepared: FEBRUARY 24, 1978

| NARRATIVE SUMMARY | OBJECTIVELY VERIFIABLE INDICATORS | MEANS OF VERIFICATION | IMPORTANT ASSUMPTIONS |
|---|---|---|---|
| **Program or Sector Goal: The broader objective to which this project contributes: (A-1)**<br><br>AN IMPROVED SOCIOECONOMIC SITUATION AND QUALITY OF LIFE FOR SMALL FARMER FAMILIES IN PROJECT AREAS, AND AN INCREASE IN FARMERS' PARTICIPATION AND LEADERSHIP IN THEIR OWN SOCIAL AND ECONOMIC DEVELOPMENT. | **Measures of Goal Achievement: (A-2)**<br><br>INCREASES IN CONSUMPTION OF GOODS AND SERVICES THAT SMALL FARM FAMILIES PERCEIVE TO BE IMPROVING THE QUALITY OF THEIR LIVES, SUCH AS IMPROVED DIET, HOUSING EDUCATION, AGRICULTURAL INPUTS AND DECLINES IN FAMILY DEBTS. FARMERS TAKING DECISIONS WITH REGARD TO DIVERSIFYING ISA ACTIVITIES. | (A-3)<br><br>UPDATING OF BENCHMARK STUDIES UNDERTAKEN REGULARLY BY FSDC AND BY OUTSIDE CONSULTANTS IN SPECIFIC AREAS. | **Assumptions for achieving goal targets: (A-4)**<br><br>1. SMALL FARM FAMILIES WILL HAVE ACCESS TO GOODS AND SERVICES TO IMPROVE THE QUALITY OF THEIR LIVES.<br><br>2. STABLE POLITICAL AND ECONOMIC CONDITIONS WILL PREVAIL DURING THE LIFE OF THE PROJECT. |
| **Project Purpose: (B-1)**<br><br>TO INCREASE THE INCOMES OF SMALL FARMER FAMILIES IN PROJECT AREAS.<br><br>SUB-PURPOSE: TO INCREASE AGRICULTURAL PRODUCTION AND OTHER INCOME-GENERATING ACTIVITIES IN THE PROJECT AREA. | **Conditions that will indicate purpose has been achieved: End-of-Project status. (B-2)**<br><br>SEE ANNEX D, PAGE 2 OF 2 | (B-3)<br>PURPOSE<br>SOURCE: FSDC/AID EVALUATION<br>CONTENT: FARM PRODUCTION COSTS AND RETURNS & CULTIVATION PRACTICES<br>SELECTIONS: SAMPLE SURVEY AND/OR CASE STUDY<br>FREQUENCY: ANNUALLY<br>SUB-PURPOSE<br>SOURCE: FSDC/AID EVALUATION<br>CONTENT: CAVANS HARVESTED AND PROCESSED; MARKET PRICES RECEIVED<br>SELECTIONS: SAMPLE SURVEY AND/OR CENSUS REPORTING<br>FREQUENCY: ANNUALLY | **Assumptions for achieving purpose: (B-4)**<br>PURPOSE<br>1. FARM GATE PRICES FOR PALM AND OTHER CROPS WILL NOT DECLINE WITH INCREASED SUPPLY. COST/RETURN MARGINS WILL REMAIN STABLE.<br>2. NATURAL DISASTERS WILL NOT EXCEED THE AVERAGE OF THE LAST 5 YEARS.<br><br>SUB-PURPOSE<br>1. AGRICULTURAL INPUTS ARE AVAILABLE AT REASONABLE COSTS. |
| **Project Outputs: (C-1)**<br>INSTITUTIONAL INFRASTRUCTURE:<br>ORGANIZATION OF ISA'S<br>TRAINING OF FSDC STAFF<br>TRAINING OF FARMERS AND FARM FAMILIES<br>PHYSICAL INFRASTRUCTURE:<br>IRRIGATION SYSTEMS INSTALLED AND OPERATIONAL<br>ADEQUATE WATER DELIVERED TO ALL FARMERS IN ISA'S.<br>IRRIGATION SYSTEMS DAMAGED BY NATURAL DISASTER REHABILITATED.<br>FARM SUPPORT SYSTEMS ESTABLISHED AND USED.<br>AREA LEVEL DEMONSTRATION FARMS ESTABLISHED. | **Magnitude of Outputs: (C-2)**<br><br>400 NEW ISAs ORGANIZED<br>700 FSDC FIELD STAFF TRAINED<br>50,000 MEMBERS OF FARM FAMILIES TRAINED<br><br>200 IRRIGATION SYSTEMS INSTALLED AND OPERATIONAL<br>160 ISAs BENEFITING FROM WATER MANAGEMENT INPUTS<br>200 ISA SYSTEMS UPGRADED OR REHABILITATED<br>100 ISAs WILL RECEIVE FARM SUPPORT SYSTEMS PACKAGES<br>4 AREA LEVEL DEMONSTRATION FARMS | (C-3)<br>INSTITUTIONAL INFRASTRUCTURE<br>TRAINING DIVISION REPORTS<br>SOURCE: AREA OFFICE & CENTRAL OFFICE TRAINERS<br>CONTENTS: STATUS OF INSTITUTIONAL ACTIVITIES<br>FREQUENCY: QUARTERLY<br>PHYSICAL INFRASTRUCTURE<br>ISA PROGRESS REPORT<br>SOURCE: INSTITUTIONAL OFFICERS<br>CONTENTS: STATUS OF TECHNICAL ACTIVITIES<br>FREQUENCY: MONTHLY | **Assumptions for achieving outputs: (C-4)**<br>INSTITUTIONAL INFRASTRUCTURE<br><br>PHYSICAL INFRASTRUCTURE<br>1. PHYSICAL INFRASTRUCTURE COMPONENTS ARE AVAILABLE IN A TIMELY MANNER.<br>2. PRICE INCREASES DO NOT EXCEED 10% PER ANNUM |
| **Project Inputs: (D-1)**<br>AID GRANT:<br>TECHNICAL ASSISTANCE<br>PARTICIPANT TRAINING<br>INVITATIONAL TRAVEL<br>PROTOTYPE EQUIPMENT<br>REGIONAL SEMINAR<br>RESEARCH & DEVELOPMENT<br>TOTAL<br>LOAN<br>PHYSICAL INFRASTRUCTURE 50% REIMB. FAR'S<br>INSTITUTIONAL INFRASTRUCTURE 100% REIMB. FAR<br>COMMODITIES<br>TOTAL<br>GOP<br>PROGRAM ADMINISTRATION<br>CREDIT<br>TOTAL | **Implementation Target (Type and Quantity) (D-2)**<br>AID GRANT LOP ($)<br>715,000<br>100,000<br>35,000<br>10,000<br>40,000<br>100,000<br>1,000,000<br>LOAN<br>6,200,000<br>2,800,000<br>1,000,000<br>10,000,000<br>GOP<br>8,350,000<br>52,500,000<br>60,850,000 | (D-3)<br><br>AID RECORDS AND REPORTS | **Assumptions for providing inputs: (D-4)**<br><br>FUNDS AND QUALIFIED PERSONNEL AVAILABLE IN A TIMELY MANNER.<br>FUNDS AND QUALIFIED PARTICIPANTS AVAILABLE. |

## CONDITIONS THAT WILL INDICATE PURPOSE HAS BEEN ACHIEVED: END-OF-PROJECT STATUS. (B-2)

Farmer incomes will increase as follows:

With Irrigation:

| Year | Net Increase in Income* (₱/ha.) | % of Each ISA Farmers With Increased Income |
|---|---|---|
| 1 | 1861 | 50** |
| 2 | 1861 | 75 |
| 3 | 1861 | 100 |

* Increases due to adoption of HYV and fertilizer in conjunction with irrigation.

** Water coverage increases as canals are completed and water reaches the most distant farms.

With Farm Support Systems:

| Year | Net Increase in Income (₱/ha.) | % of Each ISA Farmers With Increased Income |
|---|---|---|
| 2 | 473 | 50 |
| 3 | 473 | 75 |
| 4 | 473 | 100 |

Sub-Purpose:

1. Average cropping intensity per ISA will increase by 0.5.
2. Yield/ha. increased from 36 to 53 to 70 cavans/ha. with implementation of irrigation and farm support systems, respectively.

## Statutory Checklist

I. Country Checklist - See Project Paper for Project No. 492-0308, Participant Training II

II. Project Checklist:

A. General Criteria for Project

| | |
|---|---|
| 1. App. Unnumbered: FAA Sec. 653(b)<br><br>(a) Describe how Committees on Appropriations of Senate and House have been or will be notified concerning the project; (b) is assistance within (Operational Year Budget) country or international organization allocation reported to Congress (or not more than $1 million over that figure plus 10%)? | The House and Senate Appropriations Committees have been notified of the project in AID Congressional Presentations and in special notifications to Congress. The assistance is within the country program level. |
| 2. FAA Sec. 611(a)(1). Prior to obligation in excess of $100,000, will there be (a) engineering, financial, and other plans necessary to carry out the assistance and (b) a reasonably firm estimate of the cost to the U.S. of the assistance? | Yes |
| 3. FAA Sec. 611(a)(2). If further legislative action is required within receipient country, what is basis for reasonable expectation that such action will be completed in time to permit orderly accomplishment of purpose of the assistance? | None required. |

| | | |
|---|---|---|
| 4. | FAA Sec. 611(b); App. Sec. 101. If for water or water-related land resource construction, has project met the standards and criteria as per Memorandum of the President dated Sept. 5, 1973 (replaces Memorandum of May 15, 1962; see Fed. Register, Vol 38, No. 174, Part 111, Sept. 10, 1973)? | Yes |
| 5. | FAA Sec. 611(e). If project is capital assistance (e.g., construction), and all U.S. assistance for it will exceed $1 million, has Mission Director certified the country's capability effectively to maintain and utilize the project? | Yes |
| 6. | FAA Sec. 209, 619. Is project susceptible of execution as part of regional or multilateral project? If so why is project not so executed? Information and conclusion whether assistance will encourage regional development programs. If assistance is for newly independent country, is it furnished through multilateral organizations or plans to the maximum extent appropriate? | The small farmer systems program has received and will continue to receive assistance from other bilateral donors. It is believed that as the program grows, multilateral organizations will provide resources. |
| 7. | FAA Sec. 601(a); (and Sec. 201 (f) for development loans). Information and conclusions whether project will encourage efforts of the country to: (a) increase the flow of international trade; (b) foster private initiative and competition; (c) encourage development and use of cooperatives, credit unions, and savings and loan associations; (d) discourage monopolistic practices; (e) improve technical efficiency of industry, agriculture and commerce; and (f) strengthen free labor unions. | Since the project involves credit to the small farmers, the project will foster initiative and competition, cooperation, and credit. It will improve the efficiency of these farmers, and strengthen their market position. |

| | |
|---|---|
| 8. FAA Sec. 601(b). Information and conclusion on how project will encourage U.S. private trade and investment abroad and encourage private U.S. participation in foreign assistance programs (including use of private trade channels and the services of U.S. private enterprise). | Since some commodities will be purchased in the U.S. under the project, to a limited degree US private trade will be arranged. Indirectly, as these farmers became more market-conscious, their spending habits may result in stimulated exports of U.S. materials and equipment. |
| 9. FAA Sec. 612(b); Sec. 636(h). Describe steps taken to assure that, to the maximum extent possible, the country is contributing local currencies to meet the cost of contractual and other services, and foreign currencies owned by the U.S. are utilized to meet the cost of contractual and other services. | Since the loan will finance only foreign exchange costs of commodities or reimbursement for no more than fifty percent of local costs, we are assured of local currency contributions to the project. |
| 10. FAA Sec. 612(d). Does the U.S. own excess foreign currency and, if so, what arrangements have been made for its release? | N.A. |

B. Funding Criteria for Project

1. Development Assistance Project Criteria

| | |
|---|---|
| a. FAA Sec. 102(c), Sec. 111, and Sec. 281a. Extent to which activity will (a) effectively involve the poor in development, ... by extending access to economy at local level, increasing labor-intensive production, spreading investment out from cities to small towns and rural areas; and (b) help develop cooperatives, especially by technical assistance, to assist rural and urban poor to help themselves toward better life, and otherwise encourage democratic private and local governmental institutions? | The beneficiaries of the project are poor rural farmers. As a result of the project, they will manage, operate, and maintain their own irrigation system. They will be trained in new technologies, and through cooperation will be better able influence their markets and direct their lives. |

| | |
|---|---|
| b. FAA Sec. 103, 103A, 104, 105, 106, 107. Is assistance being made available: (include only applicable paragraph -- e.g., a. b., etc. --- which corresponds to source of funds used. If more than one fund source is used for project, include relevant paragraph for each fund source.) | Yes, agriculture. |
| (1) /103/ for agriculture, rural development or nutrition; if so, extent to which activity is specifically designed to increase productivity and income of rural poor; /103A/ if for agricultural research, is full account taken of needs of small farmers; | The project will deliver an installed irrigation systems, improved production technologies and improve marketing techniques. The combinations of increased production and better marketing should result in increased incomes for the participating farmers. |
| c. FAA Sec. 110(a) & Sec. 208(e). Is the recipient country willing to contribute funds to the project, and in what manner has or will it provide assurances that it will provide at least 25% of the costs of the program, project, or activity with respect to which the assistance is to be furnished (or has the latter cost-sharing requirement been waived for a "relatively least-developed" country)? | The Government of the Philippines will contribute more than half of the costs of project. They will pay for half the cost of each system, and will bear the entire cost of the supervising agency (FSDC). |
| d. FAA Sec. 110(b). Will grant capital assistance be disbursed for project over more than 3 years? If so, has justification satisfactory to Congress been made, and efforts for other financing? | Grant funds will be necessary for more than 3 years. Every effort has been made, however, to keep grant assistance to a minimum, and it will be phased out as soon as possible. |

| | | |
|---|---|---|
| e. | FAA Sec. 207 & Sec. 113. Extent to which assistance reflects appropriate emphasis on; (1) encouraging development of democratic, economic, political, and social institutions; (2) self-help in meeting the country's food needs; (3) improving availability of trained worker-power in the country; (4) programs designed to meet the country's health needs; (5) other important areas of economic areas of economic, political, and social development, including industry; free labor unions, cooperatives, and Voluntary Agencies; transportation and communication; planning and public administration; urban development, and modernization of existing laws; or (6) integrating women into the recipient country's national economy. | The project focuses assistance on an irrigator's association of poor farmers (associations which would not exist without the project). The project will develop the ability of these farmers to grow and market crops (predominately rice). The farmers will be trained in new technologies, and will be exposed to better environmental and health standards. |
| f. | FAA Sec. 281(b). Describe extent to which program recognizes the particular needs, desires, and capacities of the people of the country; utilizes the country's intellectual resources to encourage institutional development; and supports civic education and training in skills required for effective participation in governmental and political processes essential to self-government. | The project is designed to increase the productivity of poor rice farmers. These people desperately desire to improve their standard of living, but historically have been unable to do so. This project opens a door for them; it draws upon their abilities and desires, and improves and focuses their efforts. By joining the irrigators association the individual farmers try to combine their strengths and minimize their weaknesses -- in an effort to deal with their world on a more equal and competitive basis. |

| | |
|---|---|
| g. FAA Sec. 201(b)(2)-(4) and (8); Sec. 201(e); Sec. 211(a)(1)-(3) and -(8). Does the activity give reasonable promise of contributing to the development: of economic resources, or to the increase of productive capacities and self-sustaining economic growth; or of educational or other institutions directed toward social progress? Is it related to and consistent with other development activities, and will it contribute to realizable long-range objectives? And does project paper provide information and conclusion on and activity's economic and technical soundness? | Yes |
| h. FAA Sec. 201(b)(6); Sec. 211(a)(5), (6). Information and conclusion on possible effects of the assistance on U.S. economy, with special reference to areas of substantial labor surplus; and extent to which commodities and assistance are furnished in a manner consistent with improving or safeguarding the U.S. balance-of-payments position. | The project will not significantly affect the U.S. economy nor the balance-of-payments. |
| 2. Development Assistance Project Criteria (Loans Only) | |
| a. FAA Sec. 201(b)(1). Information and conclusion on availability of financing from other free-world sources, including private sources within U.S. | Other free-world countries are interested in financing components of FSDC's program, but to date the only agreement signed has been for $2.6 million for the import of pumps with the Government of Denmark. |

| | | |
|---|---|---|
| b. | FAA Sec. 201(b)(2) & 201(d). Information and conclusion on (1) capacity of the country to repay the loan, including reasonableness of repayment projects, and (2) reasonableness and legality (under laws of country and U.S.) of lending terms of the loan. | The Government of the Philippines is capable of repaying the loan, and we have no reason to expect that it will not be repaid. The relending to ISAs is within the laws and regulations of the Philippines and U.S. |
| c. | FAA Sec. 201(e). If loan is not made pursuant to a multilateral plan, and the amount of the loan exceeds $100,000, has country submitted to AID an application for such funds together with assurances to indicate that funds will be used in an economically and technically sound manner? | GOP has requested loan, and the project analysis indicates that it will be used in an economically and technically sound manner. |
| d. | FAA Sec. 201(f). Does project paper describe how project will promote the country's economic development taking into account the country's human and material resources requirements and relationship between ultimate objectives of the project and overall economic development. | Yes |
| e. | FAA Sec. 202(a). Total amount money under loan is going directly to private enterprise, is going to intermediate credit institutions or other borrowers for use by private enterprise, is being used to finance imports from private sources, or is otherwise being used to finance procurements from private sources? | N.A. |

| | |
|---|---|
| f. FAA Sec. 620(d). If assistance is for any productive enterprise which will compete in the U.S. with U.S. enterprise, is there an agreement by the recipient country to prevent export to the U.S. of more than 20% of the enterprise's annual production during the life of the loan? | N.A. |

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

I, PETER M. CODY, the principal officer of the Agency for International Development in the Philippines, having taken into account, among other things, the maintenance and utilization of the 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 Farm Systems loan.

Peter M. Cody
Director
USAID/Manila

3-3-79
Date

REPUBLIC OF THE PHILIPPINES
Department of Agrarian Reform
OFFICE OF THE SECRETARY
MANILA

February 6, 1978

MR. PETER CODY
Mission Director
United States Agency for
International Development
Metro Manila

Dear Sir:

The Government of the Republic of the Philippines, through the Farm Systems Development Corporation (FSDC), expresses its gratitude to the United States government for the various forms of support it has extended to its rural development program.

Since the creation of FSDC in 1975, it has pursued its projects along the objectives of increased productivity and employment generation. Despite these efforts, there is still much to be done. FSDC's program thrust for the next five years is geared towards the establishment of 2,571 additional Irrigators' Service Associations (ISAs) affecting some 171,400 small farmers. FSDC also plans to continue its assistance to existing ISAs which are now in various stages of development. Needless to say, massive funding is necessary to achieve these objectives.

In view of the foregoing, the Farm Systems Development Corporation wishes to apply, through the National Economic and Development Authority, for a USAID development loan in the amount of US$10 Million. The loan will be used for the establishment of new irrigation systems, the rehabilitation of previously built irrigation systems and for the provision of farm support facilities needed to modernize farm production and processing methods.

Moreover, FSDC wishes to avail of the loan on the same terms given under the US$6.5 Million -- 40 years repayment with a grace period of 10 years and with interest rates of 2% during the grace period and 3% during the remaining 30 years.

To further strengthen the institutional base of FSDC, a grant assistance of US$1 Million is also being requested for personnel training and technical support.

We look forward to the early implementation of this project through your valuable assistance. Again, we thank you for your continued support.

Very truly yours,

ALFREDO L. JUINIO
Chairman of the Board
Farm Systems Development Corporation

## Justification for the Provision of Airconditioning for Some Vehicles Procured Under Small Scale Irrigation (SSI)

In January 1978, USAID/Manila sent a telegram justifying the provision of airconditioning in 25 of the 85 vehicles being procured by IFB under the Small Scale Irrigation Loan. The telegram made the following points:

1. The 60 unairconditioned vehicles were to be used at the provincial level for numerous short trips, rarely exceeding 30 minutes driving time.

2. The 25 airconditioned vehicles were to be used by Area or Central Office staff for travel to ISAs throughout their areas of authority. The areas are large, and travel often involves up to five hours of continuous travel over hot, dusty and bumpy roads. If the trip is undertaken in an airconditioned vehicle, it is possible for staff members to commence work at the project site upon arrival; without airconditioning, staff members are hot and exhausted, and work activities have to be delayed until staff has recovered from the trip.

3. The Philippines climate qualifies for the procurement of airconditioning equipment for US-owned vehicles, and all USAID/Manila vehicles are airconditioned.

4. USAID/Manila recognizes that there may be differences of opinion applied in determining what constitutes luxury items. But it is our conclusion that the AID Handbook does not specifically preclude loan financing of airconditioned passenger vehicles. Therefore, we strongly recommend approval, under this loan, of the implementing arrangements listed in page 4, paragraph 9.D of the Project Paper.

## Draft Project Description

It is estimated that there are some 750,000 farmers cultivating 5 hectares or less of potentially irrigable land in the Philippines. These people are poor, and the low quality of their lives is regulated by a cycle of debt, low yields, low income and high risks with few opportunities to control and improve their situations.

Since 1972, the Government of the Republic of the Philippines (GOP) has been committed to a policy of increasing the self reliance and productivity of the small farmer, and expanding his participation in the development of the country. The Government realized, however, that the provision of irrigation water through infrastructure schemes alone would not be sufficient in themselves to increase production, and hence incomes, and hence the quality of farmers' lives. To achieve this end, it was felt that farmers would need an institution tailored to their specific needs through which information and training on the best way to use such irrigated water could be channeled.

Thus in April 1975, the Farm Systems Development Corporation (FSDC) was created by Presidential Decree No. 681. Its task was to promote the organization and development of small scale irrigation and other farm-based associations. Its objective was to increase small farmers' incomes and hasten rural development by enlisting the farmers' commitment in efforts to improve agricultural productivity.

Since mid-1975, FSDC has, in its own words, been undertaking integrated rural development at the lowest level - in the fields of the small scale farmers of the Philippines. By so doing, it is in pursuit of the twin project purposes of increased productivity and employment generation and hence of increased incomes for small farmers and their families. During the past three years FSDC has established over 600 ISAs comprised of some 45,000 small farmers whose land can technically be irrigated by pump or gravity systems. These ISAs are located in all regions of the country and on average consist of some 70 farm families cultivating about 1.5 hectares each. For pump systems, including hardware as well as technical assistance in the form of feasibility studies and construction engineering, inputs are supplied by FSDC. For gravity diversion systems, design and construction are undertaken by NIA and institutional development of the ISAs is done by FSDC. In both cases labor, for at least 10% of the cost of the irrigation system, is provided by ISA members to construct irrigation canals and farm ditches. Each ISA is also viewed as a mechanism through which a wide range of farm inputs and training can be channeled to small farmers once an irrigation system has been completed.

Existing ISAs are now in various stages of development; a few have had several irrigated cropping seasons, many are completing the construction of their systems, and others are in the early stages of organization. FSDC plans to continue to assist established and operating ISAs by providing training and/or loans for farm inputs, other than the irrigation infrastructure, as such needs are expressed by ISA members to their IOs.

Examples of inputs include appropriate tools such as sprayers, threshers, dryers, hand tillers, and storage, transportation and marketing facilities. Training programs undertaken by FSDC for farmers on a grant basis include use of adaptive farm equipment and irrigated farming practices, farm record keeping, water resource management, group buying and selling, seed production, crop diversification and other on hand off-farm income generating activities. Newer ISAs will continue to be assisted to construct, maintain and operate their irrigation systems, and to use the water effectively once it has been delivered. Under strong pressure from the government to expand even further and faster, FSDC plans to help establish an additional 420 ISAs in 1978, affecting some 30,000 small farmers. About 280 of these ISAs will directly benefit from this loan.

The proposed Small Farmer Systems (SFS) Project will assist FSDC in funding both physical and institutional infrastructure. The physical infrastructure components are irrigation systems, farm tools and machinery, storage and transportation facilities and water management devices. The institutional infrastructure consists of a series of training courses for FSDC field staff and ISA members, so that the physical components can be effectively used.

AID CONTRIBUTION TO THE PROJECT

Funds contributed by AID for this Project will be used for reimbursement of fifty percent of the direct costs of physical infrastructure following the same Fixed Amount Reimbursement (FAR) system developed for the Small Scale Irrigation loan; for farm support systems which include farm equipment like threshers and hand-tillers or storage and marketing improvements; for commodities such as vehicles and construction and communication equipment; for technical assistance; and for the establishing and equipping of regional demonstration centers. The amount of the AID contribution will be in accordance with the attached table.

GOP CONTRIBUTION TO THE PROJECT

The Government of the Philippines will make available the counterpart funds needed for the timely implementation of the Project, in the amounts indicated on the attached table. Under the Project, FSDC will provide loan or grant funds to the individual ISAs so that they can acquire physical infrastructure components including irrigation systems, farm tools and machinery, storage and transportation facilities, and water management devices; and avail themselves of institutional development programs including training programs in water management, maintenance and minor repair of pumps and equipment, bookkeeping, and other areas related to the successful implementation of the Project. To this end, FSDC will procure and supply to the ISAs the necessary equipment and materials for the irrigation and farm support systems, will obtain and provide technical assistance to the ISAs especially as it relates to construction and operation of the irrigation systems, will conduct research into and development of the basic methodologies and instrumentalities used or proposed to be used in the Project, will develop demonstration farms illustrating the techniques expounded under the Project, and will generally monitor and be responsible for the implementation of the Project.

## SMALL FARMER SYSTEMS PROJECT BUDGET
(All figures in millions, $1 = ₱7.5)

| | U.S. AID | | GOP |
|---|---|---|---|
| | Dollars | Pesos ($ Equiv.) | Pesos ($ Equiv.) |
| Gravity Irrigation Systems | - | 27.750 (3.7) | 27.750 (3.7) |
| Pump Irrigation Systems | - | 11.250 (1.5) | 21.000 (2.8) |
| Upgrading and Rehabilitation | - | 3.000 (.4) | 3.000 (.4) |
| Farm Support Systems Systems | - | 3.000 (.4) | 3.000 (.4) |
| Water Management Infrastructure | - | 1.500 (.2) | 1.500 (.2) |
| Commodities | 1.000 | - | - |
| Training and Demonstration Centers | .285 | 21.000 (2.8) | - |
| Administration/Technical Assistance | .415 | 2.250 (.3) | 22.500 (3.0) |
| Total - | 1.700 | 69.750 (9.3) | 78.750 (10.5) |

Total U.S.AID Contribution - - $11,000,000.

Total G.O.P. Contribution - - ₱78,750,000.

## AUXILIARY TABLES

1. Economic Analysis: Internal Rate of Return
2. Summary IRR - Irrigation
3. Summary IRR - Farm Support Systems
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5. Production Costs/Hectare - Price and Quantity
6. Pump Irrigation System Construction Cost
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11. Yield Projects - Philippine Rough Rice
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14. Employment Effect - Increase in Work-days/Hectare
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18. ISA Financial Analysis
19. Recurrent Budget Analysis
20. Gains Among Different Groups
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23. FSDC Vehicle & Equipment Requirements
24. Regional Annual Pump Operation Irrigation Requirements
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Table I

ECONOMIC ANALYSIS - INTERNAL RATE OF RETURN

| | Without Project | | Year Zero | | Year One | | Year Two | | Year Three | | Year Four-Ten | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Units | Value | Units | Value | Units | Value | Units | Value | Units | Value | Units | Value |
| Benefits ₱55 | 3,600 | 198,000 | 3,600 | 198,000 | 10,600 | 583,000 | | | | | | |
| Production Costs | | | | | | | | | | | | |
| Materials Cost | | | | | | | | | | | | |
| Seeds ₱60 | | 6,000 | | 6,000 | | 12,000 | | | | | | |
| Fertilizer (100/70 subsidy) | | 18,400 | | 18,400 | | 36,800 | | | | | | |
| Insecticides | | 3,200 | | 3,200 | | 6,400 | | | | | | |
| Herbicides | | 3,200 | | 3,200 | | 6,400 | | | | | | |
| Sacks | | 7,200 | | 7,200 | | 21,200 | | | | | | |
| Total Materials | | 38,000 | | 38,000 | | 82,800 | | | | | | |
| Experimental | | - | | - | | 44,800 | | | | | | |
| Other Non-Labor Costs | | | | | | | | | | | | |
| Land Preparation ₱3 | 1,700 AD | 5,100 | 1,700 AD | 5,100 | 4,000 AD | 12,000 | | | | | | |
| Seed Bed Preparation | 100 AD | 300 | 100 AD | 300 | 400 AD | 1,200 | | | | | | |
| Threshing @2.85 | 3,600 Cav | 10,260 | 3,600 Cav | 10,260 | 10,600 Cav | 30,210 | | | | | | |
| Transportation | - | - | - | - | - | - | | | | | | |
| Total Non-Labor | | 15,660 | | 15,660 | | 43,410 | | | | | | |
| Incremental Non-Labor | | - | | - | | 27,750 | | | | | | |
| Labor Costs | | | | | | | | | | | | |
| Land Preperation | 1,700 WD | 11,200 | 1,700 | 11,200 | 4,000 | 26,400 | | | | | | |
| Seed Bed Preparation | 100 WD | 400 | 100 | 400 | 400 | 1,600 | | | | | | |
| Transplanting | 1,600 WD | 6,100 | 1,600 | 6,100 | 3,800 | 13,800 | | | | | | |
| Weeding | 600 | 2,200 | 600 | 2,200 | 3,200 | 11,600 | | | | | | |
| Spraying & Fertilizer | 600 | 2,400 | 600 | 2,400 | 1,000 | 4,000 | | | | | | |
| Harvesting | 1,700 | 7,400 | 1,700 | 7,400 | 5,000 | 21,600 | | | | | | |
| Threshing | - | - | - | - | - | - | | | | | | |
| Drying | 800 | 3,200 | 800 | 3,200 | 2,400 | 9,600 | | | | | | |
| Total Labor Costs | | 32,900 | | 32,900 | | 88,600 | | | | | | |
| Incremental Labor | | - | | - | | 55,700 | | | | | | |
| Total Production Costs | | 86,500 | | 86,500 | | 214,810 | | | | | | |
| Incremental Production Costs | | - | | - | | 128,850 | | | | | | |
| Production Benefits | | 111,440 | | 111,440 | | 368,190 | | 368,190 | | 368,190 | | |
| Water Coverage Factor | | - | | - | | .5 | | .75 | | 1.0 | | |
| Net Incremental Benefits | | - | | - | | 184,095 | | 276,142 | | 368,190 | | |
| Production Benefit | | - | | - | | 7,255 | | 164,702 | | 256,750 | | |
| Project Costs | | | | | | | | | | | | |
| Construction: Irrigation | | | | (150,000) | | (-15,000) | | (-20,000) | | (-30,000) | | |
| O & M | | | | | | | | | | | | |
| Net Incremental Benefits: Irrigation | | | | (150,000) | | 57,655 | | 144,702 | | 226,750 | | |

| FARM SUPPORT SYSTEMS | | |
|---|---|---|
| Production @₱55 | 14,000 | 770,000 |
| Incremental Production Benefits | 3,400 | 187,000 |
| | | |
| Production Costs | | |
| Materials Costs | | |
| Seeds ₱90 | | 18,000 |
| Fertilizer | | 48,000 |
| Insecticide | | 25,200 |
| Herbicide | | 13,000 |
| Sacks ₱2 | | 28,000 |
| Total Materials | | 132,200 |
| Incremental Materials | | 49,400 |
| | | |
| Non-Labor Costs | | |
| Land Preparation | | - |
| Seed Bed Preparation | | - |
| Threshing | @ 1.50 | 21,000 |
| Transportation | | - |
| Total Non-Labor | | 21,000 |
| Incremental Non-Labor | | (22,410) |
| Labor Costs | | |
| Land Preparation | 1,000 WD | 6,600 |
| Seed Bed Preparation | 200 | 800 |
| Transplanting | 3,800 | 13,800 |
| Weeding | 1,200 | 4,400 |
| Spraying & Fertilizer | 1,800 | 7,200 |
| Harvesting | 2,000 | 8,600 |
| Threshing | - | - |
| Drying | - | - |

| | | | | | | |
|---|---|---|---|---|---|---|
| Total Labor | | | 4,400 | | | |
| Incremental Labor | | | (47,200) | | | |
| Total Production Costs | | | 194,000 | | | |
| Incremental Production Costs | | | (20,210) | | | |
| Net Production Benefits | | | 575,400 | | | |
| Without Farm Support Benefits | | | 368,190 | | | |
| Incremental ISA-FSS Benefits | | | 207,210 | | 207,210 | 207,210 |
| Adoption Factor | | | | .5 | .75 | 1.0 |
| Net Incremental ISA Benefits-FSS | | | | 103,605 | 155,408 | 207,210 |
| Project Costs | | | | | | |
| 1) Sprayers | | | 10 | 4,500 | | |
| Hand Tillers | | | 4 | 88,000 | | |
| Thresher | | | 1 | 14,000 | | |
| Dryer | | | 1 | 22,000 | | |
| 2) Operation & Maintenance | | | | 27,660 | 27,660 | 27,660 |
| Total Project Costs - FSS | | | | (156,160) | (27,660) | (27,660) |
| Net Incremental Benefits-FSS | (150,000) | 57,655 | | (52,555) | (27,748) | 179,550 |
| Net Irrigation & FSS Benefits | | | | 92,147 | 354,498 | 406,300 |
| Program Administration (FSDC Budget) | (10,000) | (10,000) | | (20,000) | (20,000) | (20,000) |
| | (160,000) | 47,655 | | 72,147 | 334,498 | 386,300 |
| Cropping Intensity | | .5 | | .5 | .5 | .5 |
| Net Benefits | | 23,828 | | 36,074 | 167,244 | 143,150 |

IRR = 51%[1/]

| | | |
|---|---|---|
| * Tillers | - | 15,000 |
| Thresher | - | 4,460 |
| Dryer | - | 8,200 |
| | | 27,660 |

1/ Capital costs for farm support equipment have been added to year 7 due to assumed 5 year life.

TABLE 2

Economic Analysis Summary
Internal Rate of Returns - Irrigation
(Refer Table 1)

| BENEFITS | W/O | ZERO | ONE | TWO | THREE - TEN | | | |
|---|---|---|---|---|---|---|---|---|
| | ₱ 198,000 | ₱ 198,000 | ₱ 583,000 | ₱ 583,000 | ₱ 583,000 | | | |
| Production Costs: | | | | | | | | |
| Materials | 38,000 | 38,000 | 82,800 | | | | | |
| Non-Labor | 15,660 | 15,660 | 43,410 | | | | | |
| Labor | 32,900 | 32,900 | 88,600 | | | | | |
| TOTAL | 86,560 | 86,560 | 214,810 | | | | | |
| Prod. Benefit | 111,440 | 111,440 | 368,190 | 368,190 | 368,190 | | | |
| Water Coverage | | | .5 | .75 | 1.0 | | | |
| Net Prod. Benefit | | | 184,095 | 276,142 | 368,190 | | | |
| Incremental | 0 | 0 | 72,655 | 164,702 | 256,750 | | | |
| Project Costs | | | | | | | | |
| Construction | 0 | 150,000 | | | | | | |
| O & M | 0 | 0 | -15,000 | -20,000 | -30,000 | | | |
| Program Costs | 0 | -10,000 | -10,000 | -10,000 | -10,000 | | | |
| NET IRRIGATION BENEFIT | 111,440 | -160,000 | 47,655 | 134,702 | 216,750 | = | IRR = | 84% |
| Crop Intensity | | | .5 | .5 | .5 | | | |
| | | | 23,828 | 67,351 | 108,375 | = | IRR = | 45% |

TABLE 3
Economic Analysis Summary
Internal Rate of Returns: Farm Support Systems
(Refer Table 1)

| INCREMENTAL BENEFITS | W/O | ZERO | ONE | TWO | THREE | FOUR - TEN |
|---|---|---|---|---|---|---|
| | | | | ₱ 187,000 | ₱ 187,000 | ₱ 187,000 |
| Incremental Production | | | | | | |
| Materials | | | | 49,400 | 49,400 | |
| Non-Labor | | | | (22,410) | (22,410) | |
| Labor | | | | (47,200) | (47,200) | |
| | | | | (20,210) | (20,210) | (20,210) |
| FSS Benefits | | | | 207,210 | 207,210 | 207,210 |
| | | | | .5 | .75 | 1.0 |
| | | | | 103,605 | 155,408 | 207,210 |
| Project Costs | | | | | | |
| Equipment | | | | 128,500 | | |
| O & M | | | | 27,660 | 27,660 | 27,660 |
| Total FSS Costs | | | | 156,160 | 27,660 | 27,660 |
| Program Costs | | | | 10,000 | 10,000 | 10,000 |
| Net FSS Benefit | | | | (62,555)1/ | 117,748 | 169,550 = IRR = 82% |

1/ Capital costs for farm support equipment have been added to year 7 due to assumed five-year life.

TABLE 4
Economic Analysis Summary
Internal Rate of Returns: Irrigation & Farm Support Systems
With Cropping Intensity of .5*
(Refer Table 1 )

| BENEFITS | W/O | ZERO | ONE | TWO | THREE | FOUR - TEN |
|---|---|---|---|---|---|---|
| Net Irrigation | 0 | (160,000) | 47,655 | 134,702 | 216,750 | 216,750 |
| Net FSS | | 0 | 0 | (62,555) | 117,748 | 169,550 |
| Net Project Benefits | | (160,000) | 47,655 | 72,147 | 334,498 | 386,300 |
| /E/Risk/Disaster/Leisure | | | .5 | .5 | .5 | .5 |
| Net Benefits after expected loss | | | 23,828 | 36,074 | 167,249 | 143,150 |

| | SEVEN | EIGHT - TEN | | |
|---|---|---|---|---|
| Net Irrigation | 216,750 | 216,750 | | |
| Net FSS | (62,555) | 169,550 | | |
| Net Project Benefits | 154,195 | 386,300 | = | IRR of 83% |
| /E/Risk/Disaster/Leisure | .5 | .5 | | |
| Net Benefits after expected loss | 77,098 | 143,150 | = | IRR of 51% |

* Cropping Intensity = Expectation of risk/disaster/leisure.

# Table 5

## PRODUCTION COSTS/HECTARE - PRICE AND QUANTITY

| Materials | Without Project Units | Without Project Value | Year Two Irrigation: 2 crops | Year Two Irrigation: 2 crops | Year Three Farm Support System | Year Three Farm Support System |
|---|---|---|---|---|---|---|
| Seeds | | 60 | | 120 | /certified seeds/ | 180 |
| Fertilizer (Subsidy 100/70) /Urea @ ₱92/ | 2 | 184 | 4 | 368 | /16-20: 6 bags/ | 480 |
| Insecticides /Folidol/ | 1 | 32 | 2 | 64 | /Faradan: 2 bags<br>/Gama BHC: 64 kg.<br>/Folidol: 2 | 180<br>8<br>64 |
| Herbicides /2-4-D EC/ | 1 | 32 | 2 | 64 | /2-4-0 25 kg/ | 130 |
| Sacks @ ₱2 | | 72 | | 212 | | 280 |
| Total Materials | | 380 | | 828 | | 1,322 |
| Incremental | | -0- | | 448 | | 494 |
| **Other Non-Labor Costs** | | | | | | |
| Land Preparation/A.d. | 17 | 51 | 40 | 120 | | -0- |
| Seed Bed/A.d. | 1 | 3 | 4 | 12 | | -0- |
| Threshing | ₱2.85/cav | 103 | ₱2.85/cav. | 302 | | 210 |
| | | 157 | | 434 | | 210 |
| | | -0- | | 277 | | /224/ |

1/ The opportunity cost of land utilized for canals and ditches represents approximately 1% of a typical ISA and therefore is not costed.

2/ An impact of foreign exchange requirements is discussed in the section on Economic Analysis. The foreign exchange component of fertilizers, insecticides and herbicides have not been shadow priced. The official exchange rate in the Philippines is assumed to approximate the true cost of imports/exports to the economy.

3/ For discussion of fertilizer subsidy, see section on Policy Analysis.

Table 6

PUMP IRRIGATION SYSTEM CONSTRUCTION COST
(100 HA ISA)

| | | |
|---|---|---|
| Pump, Prime Mover | ₱ 84,500 | |
| Pump House, Foundation, Pipe Supports, Stilling Pool | 12,500 | |
| Earth Canals and Structures | 53,000 | |
| T o t a l | ₱ 150,000 | = ₱1,500/ha |

TABLE 7

Typical ISA Operation and Maintenance

Irrigation

Operations and Maintenance Schedule

Power: Fuel /Oil Consumption

₱1.3/liter

1500 hs/yr - running time

(10 hrs/day)

60 hp load

18.93 liters/hr 1/12 hp-hr/gal. = .32 liter hp/hr.

28,387 liter/yr (142 bbl.)

₱36,903/yr

1,800/yr Lube oil @ 5%

₱38,703

Electric

₱.60/KWH, ₱10/HP/Mo.

60 hp load, 75 hp rated

₱9,000 demand charge

1500 hrs/yr running time

(10 hr/day)

.746 KW

₱40,284

1,200 lube oil @ 3%

₱40,484

Repair

5700/yr, diesel

4300/yr, electric motor

Operators Wages

1500 @ ₱.5 = ₱750/yr

| ₱750 | |
|---|---|
| Electric | Diesel |
| ₱55,650 | ₱39,450 |

Typical ISA - Operation & Maintenance Cost - ₱60,000

Table 8

Farm Support System
Capital Costs & Operations & Maintenance Costs
(100 Ha. ISA)

| | Quantity | Unit Cost | Total Capital Cost | Fuel Cost | Lube Oil, 5% | Repair & Maintenance | Operator | Total Operations & Maintenance |
|---|---|---|---|---|---|---|---|---|
| Thresher | 1 | P 14,000 | P14,000 | P2,350 | P 150 | P 700 | P 1,260 | P 4,460 |
| Dryer, Kerosene | 1 | 22,000 | 22,000 | 6,000 | 300 | 500 | 1,400 | 8,200 |
| Tiller | | | | | | | | |
| Gasoline | 4 | 15,000 | 60,000 | 14,400 | 700 | 3,000 | - | 18,100 |
| Diesel | 4 | 26,000 | 104,000 | 8,500 | 400 | 1,800 | - | 10,700 |
| Average | 4 | 22,000 | 88,000 | 12,200 | 600 | 2,200 | - | 15,000 |

**Table 9**

THRESHER

OPERATING COST

(100 ha.)

Unit Cost : ₱ 14,000

Capacity : 25 cavan/mo.

Type : Gasoline, air cold ₱1.5/liter

1. Running Time $\frac{2 \times 100 \times 70}{1 \times 25}$ = 560 hours

2. FSOC recommended ISA rental rate - ₱1.07 to ₱1.50/cavan

3. ISA rental income - 2 x 100 x 700 x 1.5 = ₱ 21,000

4. Annual Open Cost

| | |
|---|---|
| Fuel consumption 2.8 x 560 | = 1570 liters |
| Fuel Cost 1570 x ₱ 1.5 | = ₱ 2350 |
| Lube and oil, 5% | 150 |
| Repaid and maintenance, 5% | 700 |
| Operator 560 x $\frac{3 \text{ men @ ₱6/day}}{8}$ | 1260 |
| Annual O & M Cost | ₱ 4,460 |

Table _10

DRYER
OPERATING COST
(100 ha.)

Unit Cost : ₱ 22,000

Capacity : 60 cavans/day

Type : Kerosene ₱ 1.1/liter

Life : 5 years

1. Running Time $2 \times 100 \times 70 \frac{8}{60}$ = 1870 hours

2. FSDC recommended ISA rental rate ₱ 1/cavan

3. ISA rental income ₱ 14,000

4. Annual Operating Cost

Fuel consumption 29 x 1870 = 5,400 liters

| | |
|---|---|
| Fuel cost 5,400 x 1.1 | ₱ 6000 |
| Lube & oil 5% | 300 |
| Repaid and Maintenance 2% | 500 |
| Operator | 1400 |
| Annual O & M Cost | ₱ 8,200 |

Table 11

YIELD PROJECTIONS: PHILIPPINE ANNUAL ROUGH RICE

IBRD 1973 Sector Survey National Projects/Cavan/Hectare

| | 1976 | 1979 |
|---|---|---|
| a. Lowland | | |
| Irrigated | | |
| HYV | | |
| Cavans | 69 | 72 |
| Rainfed | | |
| HYV | | |
| Cavans | 42 | 45 |
| Traditional | 26 | 26 |
| b. Upland | | |
| Traditional | 18 | 18 |

R. Barker Study (1966-1967) (90 Farmers)

| Laguna | 1966 | 1967 | |
|---|---|---|---|
| Rainfed | | | |
| HYV-MT | - | 4.8 | |
| Cavans | | 96 | (Single wet season crop) |
| Traditional-MT | 2.6 | 2.4 | |
| Cavans | 52 | 48 | |

R. Barker-E. Abarientos Study (1969-1970) (204 Farmers)

| Bicol (Albay | Yield/Ha in Cavan | No. of Farms | Ave. Yield Per Ha. |
|---|---|---|---|
| Camarines | Below 50 | 111 | 36 |
| Norte & | 50 to 79 | 55 | 61 |
| Camarines Sur) | 80 & above | 38 | 102 |
| Average | | | 55 |

Table 11a

SSRU Study (1973-74) (402 Farmers)

| Camarines Sur | Yield/Ha in Cavans |
|---|---|
| Dry Season | |
| Partially Irrigated | 29 |
| Rainfed | 26 |
| Wet Season | |
| Partially Irrigated | 33 |
| Rainfed | 26 |
| Partially Irrigated Total | 62 |
| Rainfed Total | 52 |

## Table 12

### VARIATIONS IN AREA, PRODUCTION AND YIELD

| | | 1970-1971 | | | 1971-1972 | | | 1972-1973 | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | (Mil) Area | (Mil) Production | Yield | (Mil) Area | (Mil) Production | Yield | (Mil) Area | (Mil) Production | Yield |
| Philippines - | Lowland 1 | 1.697 | 71.434 | 25.69 | 1.746 | 65.778 | 37.67 | | | |
| | Lowland 2 | 1.050 | 41.501 | 39.50 | 1.134 | 43.016 | 37.92 | | | |
| | Irrigated | 1.470 | 66.610 | 45.30 | 1.332 | 59.484 | 44.70 | | | |
| | Non-irrigated | 1.647 | 54.820 | 33.40 | 1.914 | 56.427 | 29.50 | | | |
| | Total | 3.113 | 121.430 | 39.00 | 3.246 | 115.911 | 35.70 | 3.112 | 100.333 | 32.24 |
| Ilocos | Lowland 1 | 0.010 | 3.574 | 35.40 | .118 | 4.322 | 36.65 | | | |
| | Lowland 2 | 0.021 | .889 | 41.60 | .024 | .979 | 41.40 | | | |
| | Irrigated | 0.082 | 3.141 | 38.12 | .083 | 3.404 | 41.15 | | | |
| | Non-irrigated | 0.045 | 1.431 | 31.79 | .063 | 1.977 | 31.44 | | | |
| | Total | 0.127 | 4.572 | 35.88 | .146 | 5.381 | 36.95 | .150 | 4.669 | 31.22 |
| Cagayan Valley | Lowland 1 | .140 | 6.175 | 44.18 | .130 | 5.900 | 45.51 | | | |
| | Lowland 2 | .206 | 9.339 | 45.39 | .232 | 8.905 | 38.32 | | | |
| | Irrigated | .213 | 8.852 | 46.35 | .199 | 9.229 | 46.47 | | | |
| | Non-irrigated | .149 | 6.068 | 40.83 | .185 | 6.184 | 33.37 | | | |
| | Total | .361 | 15.920 | 44.08 | .383 | 15.413 | 40.15 | .624 | 13.087 | 36.42 |
| Central Luzon | Lowland 1 | .509 | 25.996 | 51.02 | .552 | 19.075 | 34.57 | | | |
| | Lowland 2 | .122 | 6.994 | 57.39 | .116 | 5.329 | 45.95 | | | |
| | Irrigated | .354 | 19.368 | 54.66 | .289 | 12.153 | 42.01 | | | |
| | Non-irrigated | .287 | 13.923 | 48.49 | .381 | 12.315 | 32.26 | | | |
| | Total | .641 | 33.291 | 51.90 | .671 | 24.468 | 36.46 | .623 | 22.962 | 36.80 |
| Southern Tagalog | Lowland 1 | .177 | 6.766 | 38.23 | .179 | 6.358 | 35.51 | | | |
| | Lowland 2 | .129 | 5.094 | 39.48 | .124 | 4.228 | 38.23 | | | |
| | Irrigated | .181 | 7.905 | 43.70 | .175 | 7.404 | 42.27 | | | |
| | Non-irrigated | .206 | 6.669 | 32.35 | .234 | 5.806 | 24.85 | | | |
| | Total | .387 | 14.574 | 37.65 | .409 | 13.210 | 32.32 | .432 | 18.099 | 32.60 |

Table 12a

VARIATIONS IN AREA, PRODUCTION AND YIELD

| | | 1970-1971 | | | 1971-1972 | | | 1972-1973 | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | (Mil) Area | (Mil) Production | Yield | (Mil) Area | (Mil) Production | Yield | (Mil) Area | (Mil) Production | Yield |
| Luzon | Lowland 1 | .122 | 3.695 | 30.26 | .122 | 5.991 | 49.21 | | | |
| | Lowland 2 | .118 | 4.064 | 34.41 | .119 | 5.836 | 49.11 | | | |
| | Irrigated | .155 | 5.739 | 37.02 | .137 | 7.612 | 55.49 | | | |
| | Non-irrigated | .144 | 2.857 | 19.88 | .136 | 4.775 | 35.07 | | | |
| | Total | .298 | 8.587 | 28.77 | .214 | 12.387 | 45.28 | .306 | 9.947 | 32.51 |
| Eastern Visayas | Lowland 1 | .094 | 3.486 | 37.00 | .095 | 3.151 | 35.08 | | | |
| | Lowland 2 | .130 | 3.687 | 28.40 | .144 | 3.805 | 26.36 | | | |
| | Irrigated | .75 | 3.307 | 44.30 | .074 | 2.568 | 34.80 | | | |
| | Non-irrigated | .178 | 4.289 | 34.00 | .197 | 4.731 | 24.0 | | | |
| | Total | .252 | 7.596 | 30.03 | .271 | 7.299 | 26.96 | .232 | 6.118 | 26.33 |
| Western Visayas | Lowland 1 | .268 | 10.560 | 39.35 | .267 | 9.156 | 34.34 | | | |
| | Lowland 2 | .112 | 3.695 | 33.01 | .122 | 3.948 | 32.49 | | | |
| | Irrigated | .135 | 4.428 | 33.50 | .100 | 4.080 | 40.80 | | | |
| | Non-irrigated | .285 | 10.514 | 36.80 | .235 | 9.547 | 29.40 | | | |
| | Total | .421 | 15.042 | 35.80 | .425 | 13.627 | 32.06 | .371 | 11.827 | 31.92 |
| Northern & Eastern Mindanao | Lowland 1 | .083 | 3.867 | 46.70 | .086 | 2.926 | 41.13 | | | |
| | Lowland 2 | .095 | 3.551 | 30.83 | .096 | 3.021 | 31.45 | | | |
| | Irrigated | .102 | 9.824 | 47.37 | .096 | 4.235 | 44.29 | | | |
| | Non-irrigated | .111 | 2.918 | 26.26 | .134 | 3.406 | 25.37 | | | |
| | Total | .213 | 7.742 | 36.35 | .230 | 7.641 | 33.2[illegible] | .251 | 5.398 | 21.49 |
| Southern & Western Mindanao | Lowland 1 | .202 | 7.291 | 36.02 | .186 | 8.269 | 44.57 | | | |
| | Lowland 2 | .118 | 4.835 | 41.00 | .158 | 6.465 | 40.99 | | | |
| | Irrigated | .174 | 7.953 | 45.70 | .175 | 8.799 | 49.03 | | | |
| | Non-irrigated | .237 | 6.152 | 26.01 | .258 | 7.685 | 29.73 | | | |
| | Total | .411 | 14.105 | 34.35 | .438 | 16.484 | 37.64 | .386 | 12.226 | 31.63 |

Table 13

Random Sample of Baseline ISAs Yields 1976

| PROVINCE | ISA | PRODUCTION (CAV/HA) BEFORE IRRIGATION |
|---|---|---|
| Ilocos Norte | Tonoton Mangitayag | 35 |
| | Minori | 57 |
| | Liknaoan - Dalao | 40 |
| Capiz | Tabuc-Calitan | 35 |
| | Bago-Chiquito | 40 |
| | Calitan Anhaon | 33 |
| | Tabuc | 45 |
| | Tabuc Norte | 34 |
| | Capagao | 21 |
| | Manhoy | 32 |
| Lanao del Sur | Pagalongan Miondas | 50 |
| | Borlongan | 12 |
| La Union | Bucayab | 40 |

TABLE 14

EMPLOYMENT EFFECT INCREASE IN WORK DAYS PER HECTARE

COSTS OF PRODUCTION/HA.

LABOR REQUIREMENTS: Price and Quantity

| | Price[1] | Without Project Quantity | Without Project Cost | With Irrigation[2] Quantity | With Irrigation[2] Cost | With Farm Support[3] Quantity | With Farm Support[3] Cost |
|---|---|---|---|---|---|---|---|
| Land Preparation | 6.62 | 17 wd | ₱ 112 | 20 wd | ₱ 132 | 5 wd | ₱ 33 |
| | 3.00 | 17 ad | 51 | 20 ad | 60 | - | - |
| Seed Bed | 4.00 | 1 wd | 4 | 2 wd | 8 | 1 wd | 4 |
| | 3.00 | 1 ad | 3 | 1 ad | 3 | - | - |
| Transplanting | 3.84 | 16 wd | 61 | 18 wd | 69 | 19 wd | 69 |
| Spraying & Fertilization | 4.00 | 6 wd | 24 | 5 wd | 20 | 9 wd | 36 |
| Weeding | 3.62 | 6 wd | 22 | 16 wd | 58 | 6 wd | 22 |
| Harvesting | 4.33 | 17 wd | 74 | 25 wd | 108 | 10 wd | 43 |
| Drying | 4.00 | 8 wd | 32 | 12 wd | 48 | 2 wd | 8 |
| Total Work Days | | 71 wd | ₱ 329 | 98 wd | ₱ 443 | 51 wd | ₱ 215 |
| Total Animal Days | | 18 ad | ₱ 54 | 21 ad | ₱ 63 | | |

1/ Average hired labor prices: Palay IRRI/Stanford Research, 1973
2/ Per Cropping Season
3/ Includes weeders, sprayers, tillers, dryers
4/ Farming Today (IRRI, September 1975)

## COMPARATIVE LABOR REQUIREMENT

| Farm Activity | Traditional Variety/Without Irrigation | | | | Improved Variety/With Irrigation | | | |
|---|---|---|---|---|---|---|---|---|
| | Without the Project | Central Luzon Laguna | Rizal | Thailand | With the Project* | Central Luzon Laguna | Rizal | Thailand |
| | | | | Man Day/Hectare | | | | |
| Land rreparation | 17 md<br>17 ad | 17<br>17 | 15.7 md<br>17.9 ad | 15.0 md<br>15.0 ad | 20 md<br>20 ad | 18<br>-- | 16.9 md<br>14.4 ad | 21.9 md<br>20.0 ad |
| Seed Bed Preparation | 1 md<br>1 ad | 1<br>1 | 3.7 md<br>1.0 ad | 2.0 md | 2 md<br>1 ad | 1 | 4.2 md<br>1.5 ad | 4.7 md<br>1.0 ad |
| Transplanting | 16 | 16 | 12.9 | 16.0 | 18 | 16 | 17.3 | 21.8 |
| Weeding and Replanting | 6 | 6 | 13.7 | 12.0 | 16 | 16 | 29.3 | 15.6 |
| Spraying ) | 6 | 5 | 1.0 | 2.0 | 5 | 6 | 2.5 | 7.8 |
| Fertilizing ) | | 2 | 1.2 | 2.0 | | 6 | 2.3 | 2.0 |
| Harvesting | 17 | 17 | 25.9[a] | 25.0[a] | 25[b] | 27 | 30.7[a] | 35[b] |
| Drying | 8 | | | | 12 | | | |
| Total Man-Days | 71 | 64 | 74.1 | 74.0 | 95 | 90 | 103.2 | 108.8 |

* Per Cropping Season

[a] Harvesting includes threshing, drying and hauling

[b] Excludes labor requirement for threshing

Table 16

**FARM FINANCIAL ANALYSIS***
**(1.5 ha, 1 Farm Family)**

| | WITHOUT PROJECT | | IRRIGATION SYSTEM | | | | FARM SUPPORT SYSTEM | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | YEAR ZERO | | YEAR ONE | | YEAR TWO | | YEAR THREE | | YEAR FOUR-TEN | |
| | UNITS | VALUE | UNITS | VALUE | UNITS | VALUE | UNITS | VALUE | UNITS | VALUE | UNITS | VALUE |
| Benefits ₱40 | 54 | 2,150 | 54 | 2,150 | 159 | 6,360 | 210 | 8,400 | 210 | 8,400 | 210 | 8,400 |
| Incremental Benefits | | - | | - | | 4,210 | | - | | - | | - |
| Production Costs | | | | | | | | | | | | |
| Materials | | 570 | | 570 | | 1,242 | | 1,983 | | 1,983 | | 1,983 |
| Other Non-Labor Costs | | 236 | | 236 | | 651 | | 315 | | 315 | | 315 |
| Hired Labor | | 127.8 | | 127.8 | | 363.6 | | 138.9 | | 138.9 | | 138.9 |
| Land Preparation[1] | 2.5 | 16.8 | | 16.8 | 6 | 39.6 | 1.5 | 9.9 | 1.5 | 9.9 | 1.5 | 9.9 |
| Harvesting[2] | 25.5 | 111 | 25.5 | 111 | 75 | 324 | 30.0 | 129.0 | 30.0 | 129.0 | 30.0 | 129.0 |
| Total Production Cost | 28.0 | 933.8 | 25.5 | 933.8 | 81 | 2,256.6 | 31.5 | 2,436.9 | 31.5 | 2,436.9 | 31.5 | 2,436.9 |
| Incremental Production Costs | | | | - | | 1,322.8 | | - | | - | | - |
| Return to Family Labor & Capital | | 1,216.0 | | 1,216.0 | | 4,103.0 | | 5,963.0 | | 5,963.0 | | 5,963.0 |
| Incremental Return | | | | - | | 2,887.0 | | - | | - | | - |
| Interest on Farm Credit[3] | | 130.0 | | 130.0 | | 316.0 | | 341.0 | | 341.0 | | 341.0 |
| Payments to ISA[4] | | - | | | | | | | | | | |
| Irrigation Fee | | - | | - | | 840.0 | | 840.0 | | 840.0 | | 840.0 |
| Sprayer Rental | | | | | | | | 48.0 | | 48.0 | | 48.0 |
| Thresher Rental | | | | | | | | 315.0 | | 315.0 | | 315.0 |
| Tiller Rental | | | | | | | | 315.0 | | 315.0 | | 315.0 |
| Dryer ₱3.00 | | | | | | | | | | | | |
| Total Payments to ISA | | | | | | 840 | | 2,200.0 | | 2,200.0 | | 2,200.0 |
| Net Return to Family Labor After Interests & Fees | | 1,086 | | 1,083 | | 2,949 | | 3,422.0 | | 3,422.0 | | 3,422.0 |
| Incremental Return | | | | | | 1,861 | | 473.0 | | 473.0 | | 473.0 |

1/ Assumes 10% of Land Preparation is performed by hired labor and 90% by family labor.
2/ Assumes 100% Harvesting is performed by hired labor.
3/ Assumes 14% production credit on production inputs excluding family labor
4/ Assumes ISA payments as follows:

Average Irrigation Fee - 14 cav./ha./yr.
Average Sprayer Rental - ₱32.16/ha./yr. - 1.5/ha.
Average Thresher Rental - ₱1.50/cavan
Average Tiller Rental - ₱455/ha./yr. - 1.5/ha. (P22,000 tiller)
Average Dryer Rental - ₱1.50/cavan

* This analysis is of a farm family who is among the first 50% to receive water and is among the first 50% to adopt the new agricultural practices.

Table 17

ANALYSIS OF FAMILY LABOR - 1.5 Ha.

| P | | Without Project Units | Without Project Value | With Irrigation Units | With Irrigation Value | With Farm Support System Units | With Farm Support System Labor |
|---|---|---|---|---|---|---|---|
| | Family Labor | | | | | | |
| 6.22 | Land Preparation | 23.0 | 151.0 | 54.0 | 357.0 | 13.5 | 89.0 |
| 4.00 | Seed Bed | 1.5 | 6.0 | 6.0 | 24.0 | 3.0 | 12.0 |
| 3.84 | Transplanting | 24.0 | 92.0 | 54.0 | 207.0 | 57.0 | 219.0 |
| 3.62 | Weeding | 9.0 | 33.0 | 48.0 | 174.0 | 18.0 | 65.0 |
| 4.00 | Spraying-Fertilization | 9.0 | 36.0 | 15.0 | 60.0 | 27.0 | 108.0 |
| 4.33 | Harvesting | - | - | - | - | - | - |
| 4.00 | Drying | 12.0 | 48.0 | 36.0 | 144.0 | 6.0 | 24.0 |
| | Management | - | - | | | | |
| | Total Family Labor | 78.5 | 366.0 | 213.0 | 966.0 | 124.5 | 517.0 |
| | Incremental Family Labor | | | 134.5 | | (88.5) | |
| | Net Return to Family Labor / Man-Days Required | - 1086 / 78.5 | = 13.8/day | 2947 / 218 | = 13.8/day | 5522 / 124.5 | = 44.4/day |

* Has not addressed question - to whom do benefits occur at farm level.

TABLE 18

ISA FINANCIAL ANALYSIS (100 HAS. - 66 MEMBERS)

| | Year Zero | Year One | Year Two | Year Three |
|---|---|---|---|---|
| **Irrigation Revenues:** | | | | |
| **Membership Fee** | 660 | | | |
| **Irrigation Fees** | | 55,440 | 55,440 | 55,440 |
| **Water Coverage Factor** | | .5 | .75 | 1.0 |
| **Net Irrigation Fees** | | 27,720 | 41,580 | 55,440 |
| **Irrigation Expenses:** | | | | |
| Supplies | 1,200 | 1,200 | 1,200 | 1,200 |
| Interest | | 9,000 | 9,000 | 9,000 |
| Power (electric) | | 30,000 (.5) 15,000 | 30,000 (.75) 20,000 | 30,000 |
| Repair | | 4,300 | 4,300 | 4,300 |
| Operator Wages | | 750 | 750 | 750 |
| Depreciation[1] | | 15,000 | 15,000 | 15,000 |
| | | 45,250 | 50,250 | 55,250 |
| Profit/Loss on Irrigation Operations | (540) | (17,530) | ( 8,670) | 190 |
| Add: Non-Cash Expenditures | - | 15,000 | 15,000 | 15,000 |
| Cash Operating Surplus/Deficit[2] | | 2,530 | 6,330 | 15,190 |
| Net Incremental Return to ISA Farmers After Irrigation Fees[3] (₱3,789/1.5 ha. farm) | | 124,971 | 187,456 | 249,942 = 362,369 |
| Net Incremental Return to ISA Farmers Before Irrigation[4] Fees[4] (₱2,949/1.5 ha. farm) | | 97,250 | 145,877 | 194,520 = 437,630 |

1/ Straight Line - 10 year life

2/ Note: The cash flow analysis does not include principal payments on the capital investment. The P/L would approximate the cash requirements of the ISA to amortize its loan.

3/ Has not addressed question - to whom do benefits accrue at farm level. (See Table 34)

4/ Derived from Farm Level Financial Analysis. (See Table 31)

Table 18a

ISA FINANCIAL ANALYSIS: FARM SUPPORT SYSTEMS (100 has. - 66 members)

| | TOTAL | SPRAYER | TILLER | THRESHER | DRYER |
|---|---|---|---|---|---|
| **Revenue** | | | | | |
| Rental Income | 89,760 | 3,168 | 45,012 | 20,790 | 20,790 |
| **Expense** | | | | | |
| Fuel Costs | 20,550 | - | 12,200 | 2,350 | 6,000 |
| Lube Oil | 1,050 | - | 600 | 150 | 300 |
| Repair | 3,500 | 100 | 2,200 | 700 | 500 |
| Operator Wages | 2,660 | - | - | 1,260 | 1,400 |
| Depreciation 1/ | 26,300 | 1,500 | 17,600 | 2,800 | 4,400 |
| Interest, 12% | 15,420 | 540 | 10,560 | 1,680 | 2,640 |
| TOTAL EXPENSES | 69,480 | 2,140 | 32,160 | 8,940 | 15,240 |
| ISA NET INCOME 2/ | 20,280 | 1,028 | 1,852 | 11,852 | 5,550 |

1/ Straight Line - Sprayer, 3 yr.; tiller, 5 yr.; thresher, 5 yr.; dryer, 5 yr.

2/ Income Statement represents Farm Support Systems, in full operation - assuming divisibility of sprayers and tiller and tillers the spread between commercial and ISA threshing costs, no financial difficulties are anticipated in years of adoptions.

TABLE 19

RECURRENT BUDGET ANALYSIS ($000) 1978-1987

| | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 |
|---|---|---|---|---|---|---|---|---|---|---|
| **SOURCES:** | | | | | | | | | | |
| Capitalization | 9600 | 9200 | 9000 | 9000 | 9000 | 9000 | 9000 | 9000 | 9000 | 9000 |
| ISA Amortization | 390 | 1980 | 3900 | 6700 | 9900 | 12800 | 15300 | 18300 | 20700 | 25000 |
| Interest Income | 750 | 860 | 990 | 1100 | 1300 | 1500 | 1700 | 2000 | 2300 | 2600 |
| | 10740 | 12040 | 13890 | 16800 | 20200 | 23300 | 26000 | 29300 | 32000 | 36600 |
| Domestic Loans | 5000 | 5000 | 5000 | 5000 | 5000 | 5000 | 5000 | 5000 | 5000 | 5000 |
| | 15740 | 17040 | 18890 | 21800 | 25200 | 28300 | 31000 | 34300 | 37000 | 41600 |
| **USES:** | | | | | | | | | | |
| Irrigation & Farm Infrastructure | 13000 | 17300 | 22200 | 24500 | 27500 | 30000 | 32000 | 33000 | 33000 | 32500 |
| Training | 2200 | 2600 | 2950 | 3400 | 3900 | 4500 | 4500 | 4500 | 4500 | 4500 |
| Administration | 2400 | 2800 | 3150 | 3600 | 4100 | 4700 | 4800 | 4800 | 4800 | 4800 |
| Interest Expense | 150 | 450 | 450 | 450 | 450 | 450 | 500 | 500 | 500 | 500 |
| Principal Payments | - | - | - | - | - | - | 150 | 280 | 300 | 300 |
| | 17750 | 23150 | 28750 | 32250 | 35950 | 39650 | 42150 | 43080 | 43100 | 42600 |
| Projected Deficit Without External Assistance | 2010 | 6110 | 9860 | 10450 | 14750 | 11350 | 11150 | 8780 | 6100 | 1000 |
| External Assistance | | | | | | | | | | |
| AID | 3000 | 7000 | 7000* | 8000* | - | - | - | - | - | - |
| Danish | - | 1900 | 600 | - | - | - | - | - | - | - |
| Projected Cash Balance | 990 | 3780 | 1520 | (930) | (15680) | (27030) | (38180) | (46960) | (53060) | (54060) |

*Projected $15 Million USAID Loan

Table 20

**GAINS AMONG DIFFERENT GROUPS**
(1.5 Ha, 1 Farm Family)

| | Without Project | With Irrigation | With FSS |
|---|---|---|---|
| Gross Value of Production 1/ | ₱ 2150 | ₱ 6360 | ₱ 10500 |
| Owner Cultivator (26.2%) | 1086 | 2947 | 5364 |
| Lessee (22.8%) 10% 2/ | 871 | 2311 | 4314 |
| Share Tenant (46.6%) 1) 70-30 3/ | 441 | 1039 | 2214 |
| Lessor | 215 | 636 | 1050 |
| Landlord 1) 70-30 | 645 | 1908 | 3150 |
| Hired Labor | 111 | 324 | 129 |
| Commercial Threshers | 1026 | 3021 | - |

1/ Gross value of production is four financial analysis.
2/ Lessee is assumed to pay 10% gross production
3/ Share tenant, 70-30 arrangements
4/ Value of hired labor/1.5 ha.
5/ Cost of threshing/ha (i.e. does not represent net return)

## TABLE 21

## Annual Operation and Maintenance Cost of Pump Irrigation Systems (Average[1] 100 Ha ISA)

### A. Diesel Engine

60 hp capacity, 45 hp average operating load; fuel consumption rate, 1/12 hp-hr/gal or .32 liters/hp. hr; daily operation, 10 hrs; annual running time, 1200 hrs; diesel fuel price including transportation to site, ₱1.3/liter.

| | | |
|---|---|---|
| 1. Fuel Consumption | | |
| 45 hp x 1200 hrs x .32 1/hp-hr = 17,280 liters x ₱1.3 | - | ₱22,550 |
| 2. Lube and oil @ 5% of diesel fuel | - | 1,100 |
| 3. Repairs | - | 5,700 |
| 4. Operator Wages[2] - ₱.5/hr. x 1200 hrs. | - | 600 |
| Annual O & M Costs | - | ₱29,900 |

### B. Electric Motor

60 hp capacity, 45 hp load; demand charge, ₱10/hp/mo; power rate, ₱.60/KWH; daily operation, 10 hrs; annual running time, 1200 hrs.

| | | |
|---|---|---|
| 1. Power Consumption; 45 hp x 1200 hrs x .754 x ₱.60/KWH | - | ₱24,400 |
| 2. Power demand charge; 60 hp x ₱10 x 12 mo | | 7,200 |
| 3. Lube and oil @ 3% of power consumption | - | 700 |
| 4. Repairs | - | 4,300 |
| 5. Operator Wages - ₱.5 hr x 1200 hrs | - | 600 |
| Annual O & M Costs | - | ₱37,200[3] |

1/ Pumping costs vary widely depending on the water lift from source to field and prime movers range in size from 20 hp to 100 hp for the typical 100 hectare ISA.

2/ ISAs make their own arrangements to compensate pump operators; ranging from no cost to a modest honorarium to payment in kind from each farmer to a full time salary.

3/ Economic and financial analyses use an electric motor with a rounded ₱30,000/year for power costs including demand charges plus ₱750 for operators wages and ₱4,300 for repairs.

TABLE 22

Illustrative List of Commodities
to be Purchased under SFS Loan

| | | |
|---|---|---|
| Vehicle | | 600,000[1] |
| Material & Construction Handling | 250,000 | |
| Passenger Vehicles | 350,000 | |
| Pumps and Related Equipment | | 300,000 |
| Irrigation and Agriculture Measuring Devices[2] | | 50,000 |
| Communications Equipment[3] | | 50,000 |
| | | 1,000,000 |

1/ For details, see Table .
2/ Includes soil moisture meters, scales and dryers, water measuring devices and engineering levels and transits.
3/ **Base and Mobile Stations.**

TABLE 23

FSDC Vehicle and Equipment Requirements
(5 Years)

| | Program Requirements (CY 1982) | On Hand Excess Property & Local Purchase CY 77 | 78 | 79 | On Order SSI Loan IFB #1 (ETA 10/78) | To be Ordered SFS IFB |
|---|---|---|---|---|---|---|
| **Vehicles:** | | | | | | |
| Province | 210[1] | 64 | 25 | 10 | 60[8] | 60 |
| Area Office | 45[2] | 21[6] | 13 | 9 | 20[8] | 20[9] |
| Central Office | 36[3] | 24[7] | 16 | 10 | 5[8] | 5[9] |
| **Materials Handling Equipment:** | | | | | | |
| Area Office | 42[4] | 28 | 12 | 6 | - | 20 |
| Central Office | 24[5] | 8 | 4 | 2 | - | 10 |
| **Communication Equipment (sets)** | 70 | - | - | - | 40 | 10 |

1/ Three four-wheel drive vehicles in each of 70 provinces.
2/ 40 four wheel drive vehicles, 20 with air-conditioners, and 5 air-conditioned 8 to 12 passenger vans.
3/ 16 sedans, 8 with A/C; 3 buses (44 passengers); 2 air-conditioned vans (8 to 12 passengers); 17 four-wheel drive vehicles, 8 with A/C.
4/ 21 stakebed trucks; 21 pick-ups.
5/ 2 cranes (five-ton), 4 fork-lifts (two-ton) and 9 stakebed trucks and 9 pick-ups.
6/ Including 7 air-conditioned 4-wheel drive vehicles.
7/ Including 8 air- conditioned sedans and 6 air-conditioned 4-wheel drive vehicles.
8/ 85 4-wheel drive vehicles, 25 air-conditioned, under SSI Loan IFB #1.
9/ Air-conditioned sedans and 4-wheel drive vehicles to be purchased under SFS IFB with a waiver for air-conditioning.

TABLE 24

REGIONAL ANNUAL PUMP OPERATION IRRIGATION REQUIREMENTS

| Region | Average TDH, ft. | Season | | Total, hrs. |
|---|---|---|---|---|
| | | Dry, hrs. | Wet, hrs. | |
| I - Ilocos | 48 | 1,401 | 275 | 1,676 |
| II - Cagayan Valley | 65 | 529 | 342 | 871 |
| III - Central Luzon | 49 | 1,156 | 137 | 1,293 |
| IV - Southern Tagalog | 42 | 694 | 26 | 720 |
| V - Bicol | 53 | 630 | 88 | 718 |
| VI - Western Visayas | 48 | 553 | 280 | 853 |
| VII - Central Visayas | 33 | 637 | 27 | 664 |
| VIII - Eastern Visayas | 44 | 621 | 445 | 1,066 |
| IX - Western Mindanao | 67 | 317 | 196 | 513 |

Note: Total Dynamic Head (TDH) equals static lift plus pipe friction and other losses.

Table 25

NGA[1/] PALAY PRICING CHART[2/]

| | % Purity | % MOISTURE CONTENT | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 14% | 14.1 to 15% | 15.1 to 16% | 16.1 to 17% | 17.1 to 18% | 18.1 to 19% | 19.1 to 20% | 20.1 to 21% | 21.1 to 22% | 22.1 to 23% | 23.1 to 24% | 24.1 to 25% | 25.1 to 26% |
| A) | 95% to 100% | 100 | 0.99 | 0.98 | 0.95 | 0.94 | 0.92 | 0.90 | 0.88 | 0.87 | 0.86 | 0.84 | 0.82 | 0.81 |
| B) | 90% to 94.9% | 0.97 | 0.96 | 0.95 | 0.92 | 0.91 | 0.88 | 0.87 | 0.86 | 0.84 | 0.82 | 0.81 | 0.80 | 0.78 |
| C) | 85% to 89.9% | 0.92 | 0.91 | 0.90 | 0.87 | 0.86 | 0.84 | 0.82 | 0.80 | 0.79 | 0.78 | 0.76 | 0.74 | 0.73 |
| D) | 80% to 84.9% | 0.87 | 0.86 | 0.85 | 0.82 | 0.81 | 0.78 | 0.77 | 0.76 | 0.74 | 0.72 | 0.71 | 0.70 | 0.68 |

Revised instruction in determining Peso Value of the Palay:

1. Determine the gross weight (GW) of the palay.
2. Determine the net weight (NW) of the palay by subtracting the weight of container from the Gross Weight.
3. Determine % moisture content and the % purity of the palay.
4. Based on the % moisture content and % purity, determine the equivalent net weight factor (ENWF).
5. Multiply the equivalent net weight factor to the net weight of the palay to get the equivalent net weight (ENW) or the Basic Weight (BW).
6. Peso Value - Equivalent Net Weight of Palay x Buying Price.

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1/ National Grains Authority, current top price is ₱55/cavan of palay (rough rice).

2/ For example, if the farmer delivers 100 cavans of palay (rough rice) of 85% purity and 20% moisture content to the NGA warehouse in his province he will receive ₱45 (.82 x ₱55) per cavan or ₱ 4,500 for his 100 cavans.