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

PROJECT PAPER

Proposal and Recommendations
for the Review of the
Development Loan Committee

PHILIPPINES - Small Farmer Systems

492-0301

ANNEXES A, B, E, H, I and J

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PAGE 2

Annex A
Page 2 of 6

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 OBLVIATE 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 EXPRESSED CONCERN 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

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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 BOTH SECTIONS, 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.

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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.

Response to Issues Raised in STATE 251247, 20 October 1977

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 INCREMENTAL 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 - P40/cavan
Project Cost - P1,000/ha.

$$\text{IRR} = 45 + 5 \left[\frac{-2.14}{2.767} \right]$$

$$= 46.58$$

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

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

$$= 87.52$$

Yield without irrigation - 23
 Yield with irrigation - 35

Price - ₱55/cav.

Project Cost - ₱1,000/ha

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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 - P55/cav.
 Project Cost - P2,500/ha.

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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

$$\text{IRR} = 148 + 2 \left[\frac{-0.29}{1.63} \right]$$

$$= 148.35$$

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

$$IRR = 100 + 10 \frac{-1.78}{-16.74}$$

$$= 101.06$$

Yield without irrigation - 45
 Yield with irrigation - 100

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

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ISA Financial Analysis - Case Studies

CASE STUDY I

MALUNGON ISA

Area: 50

I. TOTAL PROJECT COST

FMA	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
<u>Inflows:</u>	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	-	-	-	-	-
T O T A L	4,000.95	17,555.00	17,215.00	17,215.00	17,215.00	17,215.00
<u>Outflows:</u>						
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 (1.5%)		10,833.00	11,149.11	11,103.83	11,157.99	11,157.99
Miscellaneous		500.00	500.00	500.00	500.00	500.00
T O T A L	4,000.95	16,488.37	16,685.03	16,739.20	16,793.36	16,793.36

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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:	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>
(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
T O T A L	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
T O T A L	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

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)	(12,266.65)
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)
T O T A L	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
T O T A L	21,163.90	18,643.95	16,069.83	13,441.55	10,813.27

CASE STUDY II

ISABELA

BUMEG-FUGU IRRIGATORS SERVICE ASSOCIATION
160 Has

CASH FLOW STATEMENT	PRE-OPERATING	1976	1977	1978	1979	1980
		13 cav.	9 cav.	7 cav.	7 cav.	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						
Supplies/Transp/Communication	₱ 8,887	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	15,006

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ISABELA
BUMEC-FUGU IRRIGATORS SERVICE ASSOCIATION
160 Has.

Total Project Cost & Sources of Financing

A. Total Project Cost

Civil Works	P 21,451
Machinery & Equipment	70,251
Working Capital	<u>105</u>
Total	P 91,807 VVVVVVV

B. Source of Financing

FSDC Loan	P 79,243
ISA Contribution	<u>12,564</u>
Total	P 91,807 VVVVVVV

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	<u>600</u>
Total	P 50,836

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BUMEG-FUGU IRRIGATORS SERVICE ASSOCIATION
160 Has

Amortization Schedule

<u>Year</u>	<u>Amortization</u>	<u>Interest</u>	<u>Principal</u>	<u>Balance</u>
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

<u>Asset:</u>	<u>Structures</u>	<u>Machinery & Equipment</u>
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	

BASE PLAN III

SAN LORENZO ISA

Area: 73

Electric - 20 HP

I. TOTAL PROJECT COST - P/M/A	₱ 25,541.19
Civil Works	<u>4,705.55</u>
TOTAL	₱ 30,246.74

Breakdown of Financing:

FSDC Loan	₱ 28,674.74
ISA Equity	<u>1,572.00</u>
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	<u>15,347.50</u>	<u>15,398.75</u>	<u>14,965.00</u>	<u>14,965.00</u>	<u>14,965.00</u>
Expenses:					
Salaries & Wages	1,130.00	1,130.00	1,130.00	1,130.00	1,130.00
Supplies/Trans/Comm.	30.70	80.70	30.70	80.70	30.70
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	1,155.49
Depreciation Expense	4,119.29	4,119.29	4,119.29	4,119.29	4,119.29
TOTAL EXPENSE	<u>15,011.21</u>	<u>14,879.44</u>	<u>14,761.58</u>	<u>14,658.24</u>	<u>14,334.38</u>
Net Income (Loss)	<u>336.29</u>	<u>519.31</u>	<u>203.42</u>	<u>306.76</u>	<u>630.62</u>

BASE STUDY I

CABUSAO SUR ISA
AREA - 148

I. Total Project Cost

PMA	71,163	
Civil Works	85,260	
Work Capital	195	<u>156,620</u>

Breakdown of Sources of Financing

FSDC loan (total releases)	148,191	
ISA Equity	8,428	<u>156,619</u>

II. Cash Flow Statement

Inflow:	Pre-Operating Period	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>
		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	350	750	850	350
Other - Cash Loans	<u>77,027</u>					
Total	77,027	99,750	112,627	118,510	113,510	113,510

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III. AMORTIZATION SCHEDULE - P28,674.74

Year	Amortization	Interest	Principal	Balance
1	P5,507.62	P22,397.97	P 3,213.65	P 28,674.74
2		2,036.88	3,470.74	25,461.09
3		1,759.23	3,748.39	21,990.55
4		1,459.35	4,048.27	18,241.96
5		1,135.49	4,372.13	14,193.69
6		785.73	4,721.89	9,821.56
7	5,507.64	407.97	5,099.67	5,099.67

IV. ACCUMULATED DEPRECIATION SCHEDULE

	PMA 7 Years	CIVIL WORKS 10 Years
	P 25,541.19	P 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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ABUSAO SUR ISA
AREA - 148

	Pre-Operating Period	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>
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	28,463
Fuel/Oil/Lubricant		64,256	77,107	80,320	83,533	83,533
Miscellaneous		500	500	500	500	500
Organizational Expense	<u>71</u>					
	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	<u>-</u>	<u>123</u>	<u>2,924</u>	<u>5,752</u>	<u>11,249</u>	<u>13,534</u>
	123	2,924	5,750	11,249	13,534	15,819

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CASE STUDY V

PROJECTED INCOME STATEMENT

Revenues	1976 (21.5 Cav)	1977 (14.5 Cav)	1978 (11.0 Cav)	1979 (11.0 Cav)	1980 (11.0 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	21,517	21,522	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	2,267
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

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BOGO-CHIQUITO ISA
Area - 80 Has

I. Total Project Cost			
PMA	38,850		
Civil Works	21,116		
Work Capital	<u>2,102</u>	<u>62,069</u>	
Breakdown of Sources of Financing			
FSDC Loan	52,209		
ISA Equity	<u>9,860</u>	<u>62,069</u>	
III. 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	<u>5,550</u>		
	<u>34,600</u>		

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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:	<u>Structures</u>	<u>Machinery & Equipment</u>
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

Annex B-3
Page 1 of 3

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	<u>237.00</u>	₱ 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	<u>106.00</u>	₱ 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	<u>103.00</u>	₱ 303.75
FIXED ASSETS:*		
Building	₱ 760.75	
Irrigation Equipment	30,094.45	
Structures & Land Improvement	<u>23,043.99</u>	₱ 53,899.19
TOTAL ASSETS		₱ 54,202.94
LIABILITIES & EQUITY		
LIABILITIES:		
Accounts Payable	₱ 264.60	
Loans Payable - FSDC	<u>47,091.34</u>	₱ 47,355.94
ISA EQUITY		
Less; Deficit	<u>(293.00)</u>	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	<u>49.00</u>	₱ <u>1,473.30</u>

FIXED ASSETS:*

Irrigation Equipment	₱279,902.55	
Structure and Land Improvement	<u>100,788.65</u>	380,691.20

Other Assets		<u>14.00</u>
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TOTAL ASSETS		₱ <u>382,178.50</u>
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LIABILITIES & EQUITY

LIABILITIES:

Accounts Payable	₱ 6,520.00	
Loans Payable - FSDC	<u>350,896.63</u>	₱ 350,961.83

ISA EQUITY	₱ 37,454.00	
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Less Deficit	<u>(6,237.33)</u>	<u>31,216.67</u>
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TOTAL LIABILITIES & EQUITY		<u>₱ 382,178.50</u>
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*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	<u>617.00</u>	₱ 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	<u>24.50</u>	<u>5,405.02</u>

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	<u>170.50</u>	₱ 180.40

FIXED ASSETS:

Structures & Land		
Improvements	₱37,745.70	
Less: Accumulated Dep.	<u>314.55</u>	37,431.15
Irrigation Equipment	54,032.48	
Less: Accumulated Dep.	<u>450.27</u>	<u>53,582.21</u>
		<u>91,013.36</u>
		<u>₱ 91,193.76</u>

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	<u>(4,313.52)</u>	<u>13,086.48</u>

TOTAL LIABILITIES AND EQUITY

₱ 91,193.76

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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. T e c h n i c a l		
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: <ol style="list-style-type: none"> 1. Suitability of water (quality and quantity). 2. Approximate size of irrigable area. 3. Probable water diversion site and type. 4. Availability and costs of construction materials. 5. Others

RESPONSIBILITY

MAJOR ACTIVITY	F S D C	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. D. Sends surveyors. G. Prepares Topo map and layout of system. Sends copies to province. -1. Designs and Estimates the Projects. -2. Prepares Feasibility Study. -3. Presents to and for approval.	B. Informs farmers of schedule and requirements. E. Accompanies surveyor H. Conducts briefing of farmers on layout of the system. (Refer to organization of SA)	C. Prepare requirements F. Assist surveyor in identifying owner/ tiller of land affected and in the general conduct of survey. I. Secure right-of-way commitments and labor contribution commitments.

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RESPONSIBILITY

MAJOR ACTIVITY : S D C : PROVINCE : FARMERS/ISA

<p>III. Organization of ISA</p>	<p>A. Notifies province of technically feasible areas & sends layout of irrigable area.</p>	<p>B. Informs farmers and prepares schedule of pre-organization training with emphasis on:</p> <ol style="list-style-type: none"> 1. BISA Concepts 2. BISA Features 3. BISA requirements 	<p>C. Attends Pre-Organization Training. Discuss Articles of Incorporation, By-Laws.</p>
	<p>D. Sends completed feasibility studies and schedule of construction</p>	<p>E. Conducts Pre-Organization Training. Discusses feasibility study.</p>	<p>F. Discuss Feasibility Study. Agree to organize ISA. Identify and secure right of way. Discuss system of providing free labor.</p>
	<p>I. Registers ISA with Securities and Exchange Commission</p>	<p>H. Checks registration papers right of way documents. Sends the same together with reports on Pre-Organization Training conducted for ISA</p>	<p>G. Organize, pay membership fees, complete registration papers.</p>

<p>IV. Construction of Project</p>	<p>A. Sends notice of Board Approval</p>	<p>B. Notifies ISA of loan approval. Asks ISA to complete loan agreement.</p>	<p>C. Complete Pre-Construction requirements. Organize construction crew. Work on canals.</p>
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R E S P O N S I B I L I T Y			
MAJOR ACTIVITY	F S D C	PROVINCE	FARMERS/ISA
			Organized procure- ment committee, solicits construc- tion materials.
	D. Sends construc- tion supervisor	E. Sends completed Pre-Construction requirements.	
	F. Construction Supervisor fina- lizes construc- tion schedules including man- power require- ments. Asks ISA to appoint Time- keepers of free labor.		
	G. Supervises cons- truction work.		H. Accepts completed Projects.
VI. Financial Management of ISA	A. Trains Provincial Staff on Finan- cial Management (Budgeting, Finan- cial Record Keep- ing)	B. Prepares sche- dules 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.

R E S P O N S I B I L I T Y			
MAJOR ACTIVITY	F S D C	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.
	C. Prepares Feasibility Studies on Farm Tools and Equipment	F. Checks reports and coordinates with other agencies on	E. Prepares Information Reports on Requirements for Institutional Credit Project, Farm

R E S P O N S I B I L I T Y			
MAJOR ACTIVITY	F S D C	PROVINCE	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 check 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 repairs	C. 1. Sends system Superintendent and Operator to Training.

R E S P O N S I B I L I T Y			
MAJOR ACTIVITY	F S D C	PROVINCE	FARMERS/ISA
	2. Sends Engineer to assist in completion of distribution system.	Training Requirement. 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. Procures 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 this new set-up.

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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/ PROVINCE	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 staff	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 pumping 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.

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) 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.
(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%)?
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 recipient 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 multi-lateral 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 multi-lateral 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).
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.
10. FAA Sec. 612(d). Does the U.S. own excess foreign currency and, if so, what arrangements have been made for its release?

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.

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.

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 (FSEC).

- 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 multi-lateral 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.

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- 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.

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 air-conditioning 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 Demons- tration Centers	.285	21.000 (2.8)	-
Administration/Techni- cal 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.

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AUXILIARY TABLES

1. Economic Analysis: Internal Rate of Return
2. Summary IRR - Irrigation
3. Summary IRR - Farm Support Systems
4. Summary IRR - Irrigation & Farm Support
5. Production Costs/Hectare - Price and Quantity
6. Pump Irrigation System Construction Cost
7. Typical ISA Operation and Maintenance
8. Farm Support System - Capital Costs & Operations & Maintenance Costs
9. Thresher Operating Costs
10. Dryer Operating Costs
11. Yield Projects - Philippine Rough Rice
12. Variations in Area, Production and Yield
13. Random Sample of Baseline ISA Yield
14. Employment Effect - Increase in Work-days/Hectare
15. Comparative Labor Requirement
16. Farm Financial Analysis
17. Analysis of Family Labor
18. ISA Financial Analysis
19. Recurrent Budget Analysis
20. Gains Among Different Groups
21. Annual Operations and Maintenance of Pump Irrigation Systems
22. Illustrative List of Commodities to be Purchased Under SFS Loan
23. FSDC Vehicle & Equipment Requirements
24. Regional Annual Pump Operation Irrigation Requirements
25. NGA Palay Pricing Chart

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 Preparation	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)								
O & M						(-15,000)	(-20,000)	(-30,000)				
Net Incremental Benefits: Irrigation				(150,000)		57,655	144,702	226,750				

FARM SUPPORT SYSTEMS

	14,000	770,000
Production @P55	3,400	187,000
Incremental Production Benefits		
Production Costs		
Materials Costs		18,000
Seeds #90		48,000
Fertilizer		25,200
Insecticide		13,000
Herbicide		28,000
Sacks #2		132,200
Total Materials		49,400
Incremental Materials		
Non-Labor Costs		-
Land Preparation		-
Seed Bed Preparation	@ 1.50	21,000
Threshing		-
Transportation		21,000
Total Non-Labor		(22,410)
Incremental Non-Labor		
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	-	-
Drving	-	-

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		207,210	207,210
Incremental ISA-FSS Benefits			207,210		.75	1.0
Adoption Factor				.5		
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			
			27,660			
2) Operation & Maintenance			(156,160)		27,660	27,660
Total Project Costs - FSS			(52,555)		(27,660)	(27,660)
Net Incremental Benefits-FSS	(150,000)	57,655	92,147		(27,748)	179,550
Net Irrigation & FSS Benefits			(20,000)		354,498	406,300
Program Administration (FSDC Budget)	(10,000)	(10,000)	72,147		(20,000)	(20,000)
	(160,000)	47,655			334,498	386,300
		.5			.5	.5
Cropping Intensity		23,828		36,074	167,244	143,150
Net Benefits						

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			
	P 198,000	P 198,000	P 583,000	P 583,000	P 583,000			
Production Costs:								
Materials	38,000	38,000	82,800					
Non-Labor	15,660	15,660	43,410					
Labor	<u>32,900</u>	<u>32,900</u>	<u>88,600</u>					
TOTAL	86,560	86,560	214,810					
Prod. Benefit	111,440	111,440	368,190	368,190	368,190			
Water Coverage								
Net Prod. Benefit			184,095 ^{.5}	276,142 ^{.75}	368,190 ^{1.0}			
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	<u>0</u>	<u>-10,000</u>	<u>-10,000</u>	<u>-10,000</u>	<u>-10,000</u>			
NET IRRIGATION BENEFIT	111,440	-160,000	47,655	134,702	216,750	=	IRR =	<u>84%</u>
Crop Intensity	<u> </u>	<u> </u>	<u> </u> ^{.5}	<u> </u> ^{.5}	<u> </u> ^{.5}	=	IRR =	<u>45%</u>
			23,828	67,351	108,375			

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				<u>(47,200)</u> (20,210)	<u>(47,200)</u> (20,210)	<u>(20,210)</u>
FSS Benefits				207,210	207,210	207,210
				<u>103,605</u> ^{.5}	<u>155,408</u> ^{.75}	<u>207,210</u> ^{1.0}
Project Costs						
Equipment				128,500		
O & M				<u>27,660</u>	<u>27,660</u>	<u>27,660</u>
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 = <u>82%</u>

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

df

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 <u>83%</u>
/E/Risk/Disaster/Leisure	.5	.5	
Net Benefits after expected loss	77,098	143,150	= IRR of <u>51%</u>

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

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Table 5

PRODUCTION COSTS/HECTARE - PRICE AND QUANTITY

Materials	Without Project		Year Two		Year Three	
	Units	Value	Irrigation:	2 crops	Farm Support System	
Seeds		60		120	[certified seeds]	180
Fertilizer (Subsidy 100/70) /Urea @ P92/	2	184	4	368	/16-20: 6 bags/	480
Insecticides /Folidol/	1	32	2	64	/Faradan: 2 bags /Gama BHC ⁴ 64 kg. /Folidol: 2	180 8 64
Herbicides /2-4-D EC/	1	32	2	64	/2-4-0 25 kg/	130
Sacks @ P2		<u>72</u>		<u>212</u>		<u>280</u>
Total Materials		380		828		1,322
Incremental		-0-		448		494
<u>Other Non-Labor Costs</u>						
Land Preparation/A.d.	17	51	40	120		-0-
Seed Bed/A.d.	1	3	4	12		-0-
Threshing	P2.85/cav	<u>103</u>	P2.85/cav.	<u>302</u>		<u>210</u>
		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.

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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
	<hr/>
T o t a l	₪ 150,000 = ₪1,500/ha

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TABLE 7
Typical ISA Operation and Maintenance

Irrigation

Operations and Maintenance Schedule

Power: Fuel /Oil Consumption

₱1.3/liter

1500 hrs/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

<u>₱750</u>	
Electric	Diesel
₱55,650	₱9,450

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 Tiller	1	22,000	22,000	6,000	300	500	1,400	8,200
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 - $2 \times 100 \times 700 \times 1.5 = ₱ 21,000$

4. Annual Open Cost

Fuel consumption $2.8 \times 560 = 1570$ liters

Fuel Cost $1570 \times ₱ 1.5 = ₱ 2350$

Lube and oil, 5% 150

Repaid and maintenance, 5% 700

Operator $560 \times \frac{3 \text{ men} @ ₱6/\text{day}}{8} 1260$

Annual O & M Cost ₱ 4,460

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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 $29 \times 1870 = 5,400$ liters

Fuel cost $5,400 \times 1.1$ ₱ 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

a. <u>Lowland</u>	<u>1976</u>	<u>1979</u>
Irrigated		
HYV		
Cavans	69	72
Rainfed		
HYV		
Cavans	42	45
Traditional	26	26
b. <u>Upland</u>		
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

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Table 11a

SSRU Study (1973-74) (402 Farmers)

<u>Camarines Sur</u>	<u>Yield/Ha in Cavans</u>
Dry Season	
Partially Irrigated	29
Rainfed	26
Wet Season	
Partially Irrigated	33
Rainfed	26
Partially Irrigated Total	62
Rainfed Total	52

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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
Palawan	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	5.733	37.02	.137	7.612	55.40			
	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	.7074	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	26.90	.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	.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		With Irrigation ²		With Farm Support ³	
		Quantity	Cost	Quantity	Cost	Quantity	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, 1973²/ Per Cropping Season³/ Includes weeders, sprayers, tillers, dryers⁴/ Farming Today (IRRI, September 1975)

TABLE 15
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 Preparation	17 md 17 ad	17	15.7 md 17.9 ad	15.0 md 15.0 ad	20 md 20 ad	18 --	16.9 md 14.4 ad	21.9 md 20.0 ad
Seed Bed Preparation	1 md 1 ad	1	3.7 md 1.8 ad	2.0 md	2 md 1 ad	1	4.2 md 1.5 ad	4.7 md 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)		5	1.0	2.0	5	6	2.5	7.8
))	5							
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 ^b	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

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Table 16

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

	WITHOUT PROJECT		IRRIGATION SYSTEM				FARM SUPPORT SYSTEM					
	UNITS	VALUE	YEAR ZERO		YEAR ONE		YEAR TWO		YEAR THREE		YEAR FOUR-TEN	
			UNITS	VALUE	UNITS	VALUE	UNITS	VALUE	UNITS	VALUE	UNITS	VALUE
Benefits ¹⁴⁰	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		-		-		840.0		840.0		840.0		840.0
Irrigation Fee		-		-				48.0		48.0		48.0
Sprayer Rental								315.0		315.0		315.0
Thresher Rental								315.0		315.0		315.0
Tiller Rental												
Dryer ₱3.00						840		2,200.0		2,200.0		2,200.0
Total Payments to ISA						840		2,200.0		2,200.0		2,200.0
Net Return to Family Labor						2,949		3,422.0		3,422.0		3,422.0
After Interests & Fees		1,086		1,083		1,861		473.0		473.0		473.0
Incremental Return												

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.

	Without Project		With Irrigation		With Farm Support System	
	Units	Value	Units	Value	Units	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	$\frac{1086}{78.5}$	= 13.8/day	$\frac{2947}{218}$	= 13.8/day	$\frac{5522}{124.5}$	= 44.4/day
Man-Days Required						

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

TABLE 18

ISA FINANCIAL ANALYSIS (100 HAS. - 66 MEMBERS)

	<u>Year</u>	<u>Zero</u>	<u>Year</u>	<u>One</u>	<u>Year</u>	<u>Two</u>	<u>Year</u>	<u>Three</u>
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 (P3,789/1.5 ha. farm)				124,971		187,456		249,942 =
								362,369
Net Incremental Return to ISA Farmers								
Before Irrigation ⁴								
Fees ⁴ (P2,949/1.5 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)

<u>Revenue</u>	<u>TOTAL</u>	<u>SPRAYER</u>	<u>TILLER</u>	<u>THRESHER</u>	<u>DRYER</u>
Rental Income	89,760	3,168	45,012	20,790	20,790
 <u>Expense</u>					
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 <u>1/</u>	26,300	1,500	17,600	2,800	4,400
Interest, 12% <u>2/</u>	<u>15,420</u>	<u>540</u>	<u>10,560</u>	<u>1,680</u>	<u>2,640</u>
TOTAL EXPENSES	69,480	2,140	32,160	8,940	15,240
ISA NET INCOME <u>2/</u>	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

Annex J

RECURRENT BUDGET ANALYSIS (\$000) 1978-1987

	<u>1978</u>	<u>1979</u>	<u>1980</u>	<u>1981</u>	<u>1982</u>	<u>1983</u>	<u>1984</u>	<u>1985</u>	<u>1986</u>	<u>1987</u>
<u>SOURCES:</u>										
Capitalization	9600	9200	9000	9000	9000	9000	9000	9000	9000	9000
Depreciation	390	1980	3900	6700	9900	12800	15300	18300	20700	25000
Interest Income	<u>750</u>	<u>860</u>	<u>990</u>	<u>1100</u>	<u>1300</u>	<u>1500</u>	<u>1700</u>	<u>2000</u>	<u>2300</u>	<u>2600</u>
	10740	12040	13890	16800	20200	23300	26000	29300	32000	36600
Domestic Loans	<u>5000</u>									
	15740	17040	18890	21800	25200	28300	31000	34300	37000	41600
<u>USES:</u>										
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%) ^{2/} 10%	871	2311	4314
Share Tenant (46.6%) 1) ^{3/} 70-30	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)

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TABLE 21

Annual Operation and Maintenance Cost of Pump Irrigation Systems
(Average¹ 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 l/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 Wages² - ₱.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 = ₱37,200³

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.

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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
		<u>1,000,000</u>

1/ For details, see Table 23.

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)

	<u>Program Requirements (CY 1982)</u>	<u>On Hand</u>			<u>On Order SSI Loan IFB #1 (ETA 10/78)</u>	<u>To be Ordered SFS IFB</u>
		<u>Excess Property & Local Purchase</u>				
		CY				
		<u>77</u>	<u>78</u>	<u>79</u>		
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.*

*Note: With regard to air-conditioned vehicles, please see note on pages 95 and 96 of Project Paper.

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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	833
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.

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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.

^{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.