6. PROJECT COST ESTIMATE

6.1 Implementation Schedule

(1) Project works

Improvement works of the Jalaur proper RIS are scheduled to be executed since 1998 under the WRDP fund, but the improvement works proposed by NIA are minor works for canal and related structures such as canal desilting works, minor rehabilitation works of related structures, etc. Allocated budget for the works is about 23 million pesos for the 3 years from 1998 to 2000. The works to be covered by the WRDP are excluded in the Study. The Project works are summarized as follows.

Description	Unit	Jalaur proper RIS	Suague RIS	Total
Improvement Plan of Irrigation/Dra	inage	and Rural B	load	
1 Diversion Dam				
1.1 Replacement of slide gate for ma	in gate,			
scouring sluice gate, intake gates	nos.	20	4	24
1.2 River Treatment				
Length of river treatment	m		280	280
Gabion mattress & groins	m		350	350
1.3 Trashrack	nos.	2	1	3
2 Main/Lateral Canals and Related Struct	ures			
2.1 Improvement of canals	km	121.3	39.4	160.7
2.2 Feeder canals	km	24.3	7.4	31.7
2.3 Canal lining	km	29.3	6.3	35.6
2.4 Settling basin	nos.	1	1	2
2.5 Replacement and installation of g	ates			
at head gate/turnout	nos.	52	19	71
2.6 Additional turnout	nos.	76	41	117
2.7 Additional related structures	nos.	102	33	135
2.8 Farm pond (supplemental facilities) nos.	13	7	20
2.9 Pond (supplemental facilities)	nos.	4	2	6
3 Main/Secondary Drains and Related Str	uctures			
3.1 Additional secondary drains	km	53.9	common for both	n the RIS
3.2 Enlargement of Abangay creek	km		8	8
3.3 Bridge	nos.	I	1	2
3.4 Cross drain	nos.	11	1	12
4 Service road and rural road				
Service road				
4.1 Improvement of gravel pavement	km	36.1	8	44.1
4.2 Improvement of road	km	73.3	26.5	99.8
4.3 New construction	km	17.5	10.2	27.7
Rural road				
4.4 Improvement of road	km	3.6	1.2	4.8
4.5 New construction	km	1.3	0.7	2
5 Procurement of O & M equipment				_
5.1 Construction equipment	nos,	16	common for both	h the RIS
5.2 Vehicle and motorcycle	nos.	44	common for bot	
5.3 Office equipment and others	nos.	63	common for both	
Institutional Development Plan				
1 Buildings				
1.1 Renovation of NIA training center	m2	730	common for bot	h the RIS
1.2 IA office	nos.	20	common for bot	
2 Procurement of equipment and facilitie		20		
2.1 Training and communication	L.S.		common for bot	h the RIS
2.2 Transport facilities	L.S.		common for bot	
2.3 Office equipment and facilities	L.S.		common for bot	a an rio

(2) Implementation schedule

The implementation of the Project is divided into three stages: (i) pre-construction period including detailed design and tender administration, etc., (ii) construction period involving the full implementation of the Project, and (iii) sustainability period involving the O&M of irrigation facilities by the IAs. Main components of the Project implementation are construction of civil works and institutional development.

(a) Construction time schedule

Construction time schedule is made based on the estimated quantity of main works, workable days in the site, construction method and program, anticipated capacities of construction equipment, and physical site condition.

Workable days for the construction are very limited because of the situation of irrigation activities and rehabilitation project. Current idle period of irrigation water supply is about 2 months from March to May for NIA's periodical maintenance works, but the Jalaur -Suague RIS office can enhance the irrigation water supply to stop actual delivery for the 4 months from January to April in view of current farming practices in the study area. Based on the result of hydrological analysis using the rainfall data for the recent twelve years, the days with rainfall of less than 5 mm are estimated at 114 days during the 4 months, and the workable days are estimated at 97 days, assuming a 6-working days per week. As for the other 8 months, the workable days can be estimated at about 130 days deducting the holidays, and the Jalaur -Suague RIS office can also suggest to carry out partly suspension on the irrigation water supply.

Construction works on main canal and big lateral canals such as the lateral canal E of the Jalaur proper RIS, settling basin and canal lining, etc. are scheduled to be carried out only during the full suspension period of water supply, and the construction works on other lateral canals and related structures are scheduled to be executed for the partly suspension period, operating the rotational irrigation water supply.

Main construction works such as earth and concrete works are planned to be carried out by mechanical construction method. Embankment materials is principally excavated materials, but necessary amount of embankment materials are planned to be hauled from the currently approved borrow areas. The materials of road pavement and gabion are also hauled from the approved quarry area.

Based on these assumptions, the necessary work days are estimated, and construction time schedule which covers 3-year construction for the Jalaur proper RIS and 2-year construction for the Suague RIS are prepared.

The most critical path of the schedule is construction of settling basin, and rehabilitation and concrete lining of main canal in both the RISs.

Construction of the settling basin is scheduled to be executed in the 4 months from January to April of the first year of the construction stage. Rehabilitation and concrete lining of main canal is scheduled to be carried out for the 4 months of the 3 years for the Jalaur proper RIS and the 2 years for the Suague RIS. River treatment works for the Suague diversion dam are scheduled to be carried out during the 4 months of the second year after the commencement of construction.

In addition, construction of IA offices and renovation of NIA regional training center is scheduled to be executed during the first to the second years of the pre-construction period, taking into consideration the schedule and program of the training work for IAs and NIA staff.

(b) Implementation schedule of the institutional development plan

The implementation of the institutional development plan is scheduled to be divided into two phases based on the basic development concept discussed in Section 5.5:

- (i) preparatory phase which will involve the setting up of the required physical facilities, Project organizations and management systems for the proper start up activities on the IA institutional strengthening and the rehabilitation of farmers' cooperatives, and
- (ii) implementation and sustainability phase which will carry out the partial system management implementation by the IAs, the federation of the IAs, etc.

The gradual implementation of the plan is essential to give ample time for the IAs to develop their technical skills and acquire the necessary financial resources from the improvement of farmers' income and hence capacity to pay the ISF.

The first phase is scheduled on the first 4 years of the Project. The renovation of the NIA regional training center which will be the main venue for training of the IAs, NIA staff and MAO personnel will be carried out. The IA offices will also be constructed at this phase for the development of records management system and regular on-site training and meeting of the IAs. The required training equipment will also be procured to make the NIA training center and IA offices fully operational for the scheduled institutional development activities such as the strengthening of the IAs, rehabilitation of farmers' cooperatives, and development of women service cooperatives. Establishment of the proposed Project organizations such as the Project Steering Committee and Project Technical Committee, activation of IA committees, development of IA education clusters and preparation of monitoring and evaluation system are also essential to be carried out during this phase to provide sufficient guidance and extension services to the IAs, NIA and other agencies involved in the Project. Technical assistance will also be provided by recruitment of consultants and locally-based NGOs to prepare training material and carry out the training of the IAs, NIA staff and MAO personnel for the first 5 years of the Project including the frist year of the second phase.

The second phase is scheduled to start on the fifth year of the Project by which time most of the IAs would have been institutionally and technically strengthened, and will carry out the partial system management and the federation of the IAs for each RIS. The farmers' cooperatives are envisioned to procure and manage their owned post-harvest facilities to control the integrated rice business in the project area.

In the second phase, the IA committees and education clusters are expected to carry out the continuing education development program for the members at the TSAG level through the guidance of the consultants, NGOs, NIA staff, MAO personnel, etc. This approach will prepare the IAs to sustain the training and extension activities after the construction period.

The implementation schedule of the Project is shown in Table 6.1.1.

6.2 Organization and Management

(1) Executing agencies related to project implementation

The executing agencies for the Project implementation for the three (3) stages mentioned in Section 6.1 are as follows:

Development Stage	Major Activities	Lead Agencies	Cooperating Agencies
Pre-construction	D/D, tender administration, preparation of O&M manual and training materials, start up of training program, construction of IA office and NIA training center	NIA	
Construction	Construction works, irrigated agriculture development, water management and O&M practice, institutional development of the IAs and NIA, agricultural support services, watershed management, etc.	NIA, LGUs (7 Municipal Governments) through the MAO, DENR	DA, Provincial Government through PAO, WESVIARC, LBP, DAR, CDA, NGO
Sustainability	O&M of irrigation facilities and continuous management of business activities by the IAs	IAs, NIA	MAO, PAO, DA, LBP

The NIA will be the overall lead implementing agency for the implementation of the Project. The other agencies which will take the lead role and cooperating role for the implementation of specific prospective plans of the Project are shown in Fig. 6.2.1 in conformance with their present mandated functions.

As for the implementation of irrigated agriculture development plan, the LGUs of the concerned 7 municipalities will be the lead agency and the NIA, DA and PAO will be the cooperating agencies.

In the implementation of improvement plans of irrigation and drainage facilities and rural infrastructure, and water management and O&M practices, the NIA will be the lead agency. The provincial and municipal LGUs will be the cooperating agencies.

The NIA and LGUs will be the lead agencies for the implementation of the institutional development plan with the support of NGOs to carry out the institutional strengthening of the IAs and rehabilitation of farmers' cooperatives, etc. The DAR will be the cooperating agency to accelerate the implementation of CARP in the project area. The NIA and LGUs through the NGOs will also be the lead agencies for the implementation of the improvement plan of agricultural support services, and DA, CDA and LBP will be the cooperating agencies.

As for the implementation of the watershed management plan, the DENR will be the lead agency and the LGUs and NIA will be the cooperating agencies.

Proper cooperation and coordination among the implementing agencies will be ensured by the development of the multi-agency Project Steering and Technical Committees as described below.

(2) Project organization and management

The proposed organization of the Project is divided into three groups: (i) Project Management Office to be operated through the NIA Jalaur-Suague RIS (JSRIS) office, (ii) Project Steering Committee, and (iii) Project Technical Committee, as shown in Fig. 6.2.2. This organizational set-up is essential to pool the resources and skills of all the agencies concerned for the effective and systematic implementation of the Project.

(a) JSRIS office

This office will act as the Project Management Office which will be responsible for the supervision, monitoring and evaluation of the implementation of the prospective plans of the Project. The major functions of this office will be as follows:

- i) Prepare and implement the annual work and financial plan of the Project,
- ii) Coordinate with other concerned agencies for the implementation of the prospective plans,
- iii) Follow-up and release budget requests on time with the concerned units of NIA and other agencies such as NGOs and MAO,
- iv) Supervise, monitor and evaluate the Project implementation, and
- v) Submit regular monthly, quarterly and annual progress reports to the Project Steering and Technical Committees, NIA Regional and Central Office, funding institutions, etc.

The six sections of the JSRIS office will carry out their present mandated functions, and the proposed functions for the new Water Management Section and Operation and Maintenance Section as referred to in Section 5.4. The JSRIS office will also supervise and coordinate the activities of the Technical Assistance (consultants and NGOs). Sufficient administrative support to the proposed Project Steering Committee and Project Technical Committee by the JSRIS office shall be ensured for the effective and proper operations of such committees.

(b) Project Steering Committee (PSC)

A multi-agency PSC will be established to serve as the policy making group of the Project to be consist of the following:

Agency/Representative	Position in the PSC
Provincial Governor of Hoilo	Chairman
NIA Regional Irrigation Manager, Region VI	Co-Chairman
DA Regional Director, Region VI	Member
DAR Regional Director, Region VI	Member
DENR Regional Executive Director, Region VI	Member
NEDA Regional Executive Director, Region VI	Member
Municipal Mayors (7) concerned	Member
LBP Regional Manager, Region VI	Member
NGO Representative	Member
NIA JSRIS Irrigation Superintendent	Member

The PSC will meet every quarter for the entire duration of the Project, or as the need arises as requested by the Chairman or any member of the PSC. The functions of the PSC are as follows:

- i) Review and approve the annual work and financial plan submitted by the JSRIS office,
- ii) Formulate, improve and approve policies and procedures on the implementation of the Project, and
- iii) Acknowledge the progress reports of the Project, etc.

The proposed chairmanship position of the PSC for the Provincial Governor of Hoilo takes full cognizance of the LGUs' important role in the Project implementation such as the development of irrigated agriculture, improvement of agricultural extension services to the IAs, farmers' cooperative development, maintenance of rural infrastructure, etc.. This greater role of the LGUs (provincial and municipal governments) in the Project is essential to support their new mandate under the 1991 Local Government Code. The JSRIS office will provide the secretariat services to the PSC for the proper recording of the quarterly meeting of the PSC.

(c) Project Technical Committee (PTC)

The PTC will also be established to provide technical support to both the PSC and the JSRIS office, particularly on matters related to the implementation of the prospective plans of the Project by the respective field offices of the PTC member-agencies. This group is essential for the smooth and timely execution of the Project in view of the proximity of the field offices of the proposed PTC members to the project area. The proposed members of the PTC are as follows:

Agency/Representative	Position in the PTC
NIA JSRIS Irrigation Superintendent	Chairman
Provincial Agriculturist, LGU-PAO	Member
PARO, DAR	Member
PENRO, DENR	Member
MAO, LGU (7)	Member
NGO (4)	Member
LBP Provincial Manager	Member
IA Representative (4)	Member

The main functions of the PTC will be the following:

- (a) Review the major technical plans contained in the Project's annual work and financial plan, and endorse the reviewed plans to the PSC for approval,
- (b) Provide technical advice on requests of the JSRIS office, IAs, etc. on a regular basis,
- (c) Render monitoring support to the JSRIS office with respect to the performance of the PTC members' respective staff to be designated to the Project, etc.

The JSRIS office will provide secretarial services to the PTC meeting. The meeting of the PTC will be scheduled every month to render more effective technical support to the PSC and the JSRIS office.

(3) Funds flow

Since the JSRIS office will be the Project Management Office, the existing flow of funds of NIA for the JSRIS office will be adopted for the Project. A separate book of financial accounts solely for the Project will be established at the JSRIS office for proper and transparent accounting.

6.3 Cost Estimation

(1) Basic assumptions

Construction costs are estimated at the price level of December 1997 using the unit prices of labor, construction materials and equipment in and around the Project area. The cost estimation is based on the international competitive condition. Procurement costs of the O & M equipment and training facilities, etc. are estimated based on the CIF Hoilo prices. Land acquisition costs are estimated to refer to the provincial tax ordinance of lloilo. Engineering service costs for the civil work and administration costs are respectively assumed at 10% and 2% of the sum of the direct construction and procurement costs.

Physical contingency is assumed at 10% of the sum of direct construction, procurement, engineering services, administration and land acquisition costs. Price contingency is assumed to be 1.8% per annum for the foreign currency portion and 5.3% per annum for local currency portion based on the statistic data 1997 of Philippines. The exchange rate used in the cost estimation is US \$ 1.0 = Pesos 35.10.(December 1997)

In addition, the construction costs of the WRDP of about 29.4 million pesos are deducted from the total direct construction cost estimated in the Plan.

(2) Project costs

Total project cost of both the RIS is estimated at 1,573.3 million pesos, and each project cost is respectively estimated at 1,186.2 million pesos for the Jalaur proper RIS and 387.1 million pesos for the Suague RIS.

The common costs for both the RIS such as the procurement cost for O & M work and institutional development, construction cost of IA offices and the fund for irrigators' association development (IADF) are shared in accordance with the numbers of irrigators' association of each RIS area. The detailed is shown in Tables 6.3.1 to 6.3.4.

Summary of Project Cost

			(Unit: 1,000	pesos)
	Description	L/C	F/C	Total
1.	Construction Costs	436,954	492,382	929,336
	1.1 Improvement of Diversion Dam	27,468	45,894	73,362
	1.2 Irrigation Canal and Related Structures	329,196	357,568	686,765
	1.3 Drainage Canal and Related Structures	19,451	40,651	60,102
	1.4 Service Road	33,233	14,185	47,418
	1.5 Rural Rood and Related Structures	23,192	29,672	52,864
	1.6 IA Office	3,500	3,500	7,000
	1.7 Training Center	913	913	1,825
2.	Procurement Cost	0	60,050	60,050
	2.1 O & M Equipment	0	50,371	50,371
	2.2 Institutional Dev. & Agr. Extension	0	9,680	9,680
3.	Cost & Expenditure of Training Materials	6,672	6,672	13,344
4.	Engineering Services Costs	78,975	115,543	194,519
	4.1 Civil Works	43,695	49,238	92,934
	4.2 Training	35,280	66,305	101,585
5.	Irrigators' Association Development Fund	0	8,200	8,200
6.	Administration Costs	8,873	11,182	20,055
7.	Land Acquisition Costs	44,375	0	44,37
8.	Physical Contingency	57,585	68,583	126,168
9.	Price Contingency	128,139	49,149	177,288
	Grand Total	761,572	811,762	1,573,334

Summary of Project Cost (Jalaur proper RIS)

(Unit: 1,000 pesos)

	Description	1/C	F/C	Total
1.	Construction Costs	325,390	374,169	699,560
	1.1 Improvement of Diversion Dam	1,443	5,773	7,216
	1.2 Irrigation Canal and Related Structures	262,343	296,227	558,570
	1.3 Drainage Canal and Related Structures	18,375	39,616	57,992
	1.4 Service Road	25,807	11,015	36,821
	1.5 Rural Raod and Related Structures	13,885	18,000	31,885
	1.6 IA Office	2,625	2,625	5,250
	1.7 Training Center	913	913	1,825
2.	Procurement Cost	0	\$6,053	56,053
	2.1 O & M Equipment	0	48,793	48,793
	2.2 Institutional Dev. & Agr. Extension	0	7,260	7,260
3.	Cost & Expenditure of Training Materials	5,004	5,004	10,008
4.	Engineering Services Costs	58,999	73,172	132,171
	4.1 Civil Works	32,539	37,417	69,956
	4.2 Training	26,460	35,755	62,215
5.	Irrigators' Association Development Fund	0	6,150	6,150
6.	Administration Costs	6,608	8,705	15,312
7.	Land Acquisition Costs	37,174	0	37,174
8.	Physical Contingency	43,318	51,710	95,028
9.	Price Contingency	97,714	37,054	134,767
<u>.</u>		574,207	612,016	1,186,223

Summary of Project Cost (Suague RIS)

(Unit: 1,000 pesos)

Description LIC F/C Total 1 Construction Costs 111,563 118,213 229.776 1.1 Improvement of Diversion Dam 26.025 40.121 66,146 1.2 **Irrigation Canal and Related Structures** 66,854 61,341 128,195 1.3 Drainage Canal and Related Structures 1,076 1,035 2,110 1.4 Service Road 7.426 3,170 10.596 1.5 Rural Rood and Related Structures 9.307 11,672 20,979 1.6 IA Office 875 875 1.750 1.7 Training Center ĥ 0 0 2. Procurement Cost 0 3.998 3.998 2.1 O & M Equipment 0 1,578 1,578 2.2 Institutional Dev. & Agr. Extension 0 2,420 2,420 3. Cost & Expenditure of Training Materials 1,668 1,668 3,336 4. Engineering Services Costs 19,976 42,371 62,347 4.1 Civil Works 11,156 11,821 22,978 4.2 Training 8.820 30,550 39,370 Irrigators' Association Development Fund 5. 2,050 0 2,050 Administration Costs б. 2,265 2.478 4,742 7. Land Acquisition Costs 7,201 0 7,201 8 **Physical Contingency** 14,267 16.873 31,140 9. Price Contingency 30,425 12,095 42,520 Grand Total 187,365 199,746 387,111

(3) O & M cost

Total O & M costs for both the RIS are respectively estimated at 17.0 million pesos/year for the first to fourth year of the Project, 13.6 million pesos/year for the fifth to eighth year, and 10.2 million pesos/year for the ninth year and thereafter, taking into consideration the implementation schedule of the Project.

(4) Total costs for institutional development and O & M works

Total costs for the institutional development, water management and O & M works, and agriculture extension works are estimated at about 211.1 million pesos including construction costs of irrigators' association offices, renovation cost of the NIA training center, procurement costs of O & M equipment and training equipment, the fund for irrigators' association development (IADF), etc. as summarized below.

		(Unit: 1,000 p	esos)
• • • • • • •		1./C	F/C	Total
1	Construction Works			
1.1	Construction of IA Office	3,500	3,500	7,000
1.2	Renovation of Training Center	<u>913</u>	913	1,825
	Sub-total	4,413	4,413	8,825
2	Procurement of Equipment			
2.1	O & M Works			
	(1) O & M Equipment	0	50,371	50,371
2.2	Institutional Development & Agr. Extension			
	(1) Training & Communication	0	1,190	1,190
	(2) Office equipment	0	510	510
	(3) Transport facilities	0	5,000	5,000
	(4) Techno-demo farms	0	2,980	2,980
	Sub-total	0	9,680	9,680
3	Cost & Expenditure of Training Materials	6,672	6,672	13,344
4	Engineering Services Costs	35,280	66,305	101,585
4.1	for implementation of training program	35,280	60,300	95,580
4.2	for procurement of equipment	0	6,005	6,005
5	Irrigators' Association Development Fund (IADF)	0	8,200	8,200
6	Administration Cost for Institutional	133	1,334	1,468
	Development and Procurement			
7	Physical Contingency	4,209	13,436	17,645
	Total	50,707	160,410	211,117

Total Costs For Institutional Development and O & M Works

.

7. PROJECT EVALUATION

7.1 Economic Evaluation

7.1.1 General

The following basic conditions are applied in the derivation of economic costs and benefits.

- a) All costs and benefits are expressed in 1997 constant prices.
- b) A standard conversion factor of 0.83 is applied to non-traded goods and skilled labour to convert financial prices to economic prices.
- c) Economic prices of traded agricultural products (rice) and inputs (urea, triple super-phosphate, muriate of potash) are defined to be the import parity prices derived from the long-term international market price forecast by the World Bank for the year 2005 based on 1990 constant prices, after converting them to the 1997 price level. Transfer payments such as taxes, irrigation fees, subsidies, interests, etc. are deducted from the costs.
- d) A specific conversion factor of 0.6 is used for the estimation of market wage rate of unskilled labor.
- e) Imported goods are valued at the foreign exchange rate of 35.1 pesos per US \$.

7.1.2 Economic Benefits

Agricultural benefits would be obtained from the increment of crop production and the improvement in agricultural productivity due to the improvement in irrigation and drainage facilities, the operation and maintenance of irrigation systems, crop husbandry, and agricultural support services such as agricultural credit and agricultural extension, and the institutional strengthening of the IAs.

With the Project, cropping intensity will be increased from 197% to 218%, and cropped area will be increased by 2,490 ha. Economic incremental benefit by the Project in crop production is estimated at 258 million pesos. The summary of the calculation is shown in the Table 7.1.1. The basis on calculating the economic prices of paddy and fertilizers is shown in Table 7.1.2. Future economic crop budgets is given in Tables 7.1.3, 4 and 5.

On the 4th year of the Project, the irrigation benefit from incremental agricultural production will increase progressively and reach the full scale on the 8th year.

7.1.3 Economic Costs

The economic costs of the Project are calculated by multiplying the project costs estimated in chapter 6 by the standard conversion factor of 0.83. The replacement costs of metal works, stoplog and O/M equipment are calculated in the same manner. The annual O/M costs such as personnel costs, rehabilitation costs and maintenance costs are also included in project costs. In the calculation, the land acquisition cost and price contingency cost are excluded from the costs. The total initial economic costs are as follows:

	(Unit: million pesos)
Description	Amount
Jalaur proper	839
Suague	279
Total	1,118

7.1.4 Economic Evaluation

Economic evaluation is made to determine the economic viability of the Project. Economic opportunity cost of the capital expressed by an internal rate of return is used for the evaluation. The Project is evaluated by integrating the Jalaur proper and Suague RIS areas because of the following:

- the irrigation canal system of the Suague RIS is connected with the irrigation main canal system of the Jalaur proper RIS, and
- 200 ha in Suague RIS will be provided with irrigation water through the main canal of Jalaur Proper RIS.

The internal rate of return of the Project is estimated at 16.4%. Thus, the project is economically viable with the economic internal rate of return of more than 15%, which is the threshold of economic viability stipulated by NEDA. Details of the calculation are shown in Table 7.1.6.

A sensitivity analysis is conducted to examine the viability of the Project under the following adverse conditions.

- (1) Increase of the initial cost by 20%
- (2) Decrease of benefit by 20%
- (3) Combination of (1) and (2).

The analysis results are as follows:

			Case (2)	
EIRR	16.4%	14.8%	15.1%	13.6%

As shown above, the Project can be considered economically viable even under the moderate adverse conditions except in the case (3).

7.1.5 Financial Evaluation

The future farm budget is analyzed as a financial evaluation of the Project. The farm income consists of the net crop income and non-crop income which includes the incomes from non-farm activities. The net farm income is estimated based on the future crop budget mentioned in section 5.2.6. While, the non-crop income is estimated by adjusting the present condition on the basis of the results of household interview survey in Phase II, taking consideration into the reduction in family labor. The expenditures are assumed to be the same amount as those of the present condition to be able to evaluate the direct impact on the net crop income. The evaluation is made for three typical farm types with average farm size (1.5 ha) and family size (5.3 persons), and the results are summarized as follows :

				(t	Unit: pesos/h.h.)	
	Net Crop Income <1 (1)	Non-crop Income <2 (2)	Household Expenditure <3 (3)	Net Reserve (4) (1)+(2)-(3)	(4)/((1)+(2)) %	
Jalaur proper						
Owner-cultivator	72,082	30,567	50,908	51,741	50	
Leaseholder:	54,062	19,056	46,156	26,962	37	
Tenant farmer	36,041	23,880	37,075	22,846	38	
Suague						
Owner-cultivator	62,531	24,457	45,144	41,844	48	
Leaseholder:	46,898	23,925	39,845	30,978	44	
Tenant farmer	31,267	26,840	33,543	24,564	42	

Reference data : Household Interview Survey by JICA Study Team (1997)

Remarks: <1 The ISF, land tax, etc., are already excluded in the figures.

<2 The figures are adjusted by the factor 0.88, calculated from reduction rate of available family labor.</p>

<3 Same as the present condition.</p>

According to the results of the household interview survey, the net reserves of the farmers are presently in a marginal level (0 to several thousand pesos). By implementation of the Project, at the mature stage, it is estimated that those will significantly increase at about 22,800 to 51,700 pesos. The significant net reserve will result in improvement of their living condition. Therefore, the Project is evaluated as a viable one from the farmers' financial aspect.

7.2 Indirect and Intangible Benefits

In addition to the direct benefits mentioned in the above economic evaluation, it is expected that the Project would generate secondary or intangible benefits.

(1) Employment opportunity

The incremental direct farm employment by the Project is estimated at 2.49 million man-days per year at the full development stage as shown in the Table 7.2.1. At the unit labor cost of 80 pesos per man-day, this incremental labor requirement would generate the real and nominal income of 199.2 million pesos for farm laborers and family laborers. As almost a half of the labor requirement is covered by the hired labor, an additional income of about 100 million pesos will accrue to farm laborers, which would significantly mitigate poverty of landless farm laborers in the project area.

Job opportunities during the construction and rehabilitation period in the Project will also generate additional income for construction workers.

(2) Improvement of transport conditions

The rehabilitation of existing roads and construction of new farm roads under the Project will substantially improve the transport conditions in the project area. This in turn will contribute to more economic activities due to the improved transportation of farm products and inputs as well as personnel movement. Better and timely farm operation will be secured through the improvement of rural road networks.

(3) Generation of post-harvest businesses

The increment of paddy production and improvement of social infrastructures such as cooperatives, credit and agricultural extension services will produce favorable business environment for rice post-harvest businesses such as rice milling and trading by farmers. As the rice market mechanism in the region is not working efficiently due to the rice cartel, the direct involvement in rice business by the farmers through cooperatives would provide significant income to farmers.

7 - 4

8. STRENGTHENING PLAN FOR THE AGANAN RIVER FEDERATION OF IRRIGATORS' ASSOCIATION (ARFIA)

8.1 Background on the ARFIA and the Post-Harvest Facilities

(1) The ARFIA organization and functions

In November 1995 the ARFIA has been registered with the Securities and Exchange Commission, comprising of the existing six irrigators' associations (IAs) in the Aganan RIS. The organization structure of ARFIA is shown in Figure 8.1.1. A Board of Trustees (BOT) consisting of three officers from each IA serves as the policy making body of ARFIA. The board is responsible for managing its organizational affairs consisting of the following functions:

- 1. To promote and coordinate system-wide operation in water delivery and distribution,
- 2. To acquire equipment, machineries and facilities required in the conduct of its farming activities,
- 3. To pool resources of its members for the upliftment of their socio-economic conditions particularly in the processing and marketing of their produce,
- 4. To coordinate the collection of loans, ISF and other dues of the IAs to any financing institution, and
- 5. To serve as a forum to discuss problems/suggestions relative to the O&M works of the IAs.

Four months later, in March 1996, the ARFIA has been provided with postharvest facilities built in the municipality of Oton under the Japan Grant Aid Program. This equipment was intended to meet the requirements of its members for the hauling, drying and storage of paddy to obtain better farmgate prices. These facilities are important to the IA members to give them opportunities to benefit from the value-added derived from drying and storage of paddy.

(2) Present condition of the post-harvest facilities

Presently, the primary post-harvest facilities being operated by the ARFIA are the drying yards, two hauling trucks and two warehouses. The existing policies on the operation of tractors, drying yards and warehouses, particularly on service fee, are shown in **Table 8.1.1**. The capacities and utilization rates are given below:

Description	unit	Capacity	Actual utilization	Rate (%)
Drying yard	ton/day	81	4.0	5
Truck	ton/day	162	1.3	1
Watehouse	ton	2,430	608.0	25

(a) Drying yard

The designed capacity of drying yard is 81 tons/day for a 60-day harvesting period in the wet season. From August 1996 to September 1997, the volume of dried paddy was 1,667 tons including those dried in the dry season, as shown in the table below. This accounts for a low of 5% of the total capacity utilization. The total number of users were 119 as compared to the total ARFIA members of 1,502. Of the reported users, 10 were not ARFIA members.

Month	Dried Paddy (ton)	Capacity Utilization (%)
August, 1996	550	22
September	186	8
October	78	3
November	66	3
December	178	7
January, 1997	82	3
February	28	1
March	10	0
April	4	0
May	26	1
June	0	0
July	0	0
August	6	0
September	453	19
Total	<u>1667</u>	5

The present utilization of the drying yard is biased to MACABITU IA, which is in the same irrigation division as the post-harvest facilities' complex. This IA accounts for 72% of the total volume of dried paddy as shown in the next table.

Name of IA Users	Distribution of Dried Paddy(%)
LAMPACAPA	2
MACABITU	72
MACABITU & LAMPACAPA	3
MACABITU & SALAMBITU	0
SALAMBITU	12
SAMICASA	1
TACAS-BUHANG	l
Unknown	88
Total	100

Farmers and paddy traders are the primary users of the drying yard, accounting for 48% and 47%, respectively, as shown below in terms of the main business of users.

Main Business of Drying Yard Users	Distribution (%)
Creditor	2
Employee	2
Merchant	1
Trader	47
Farmer	48
Total	<u>100</u>

(b) Trucks

The two trucks are currently utilized to transport wet paddy from individual paddy farmers and to ship paddy outside of the post-harvest facilities. These trucks are scheduled to transport incoming and outgoing paddy at 162 tons/day. The actual utilization rate for the period August 1996 to September 1997 is only 1%, or 1.3 tons/day. Sixty four persons have used the trucks.

Month	Incoming(ton)	Outgoing(ton)	Total(ton)	Capacity utilization(%)
August 1996	64	20	84	2
September	87	57	144	3
October	15	5	20	0
November	44	14	58	1
December	54	42	96	2
January 1997	38	14	52	ł
February	0	27	27	1
March	8	13	21	0
April	l	14	15	0
May	0	25	25	0
June	0	10	10	0
July	0	7	7	0
August	0	0	0	0
September	0	0	0	0
Total	311	248	<u>559</u>	1

The MACABITU IA members are also the main users, accounting for 76% of the total paddy handled by trucks, followed by SALAMBITU IA members for 11%. In terms of the main business of users, paddy traders share 43% of the total dried paddy transported by the trucks.

(c) Warehouses

The designed storage capacity of the warehouses is 2,430 tons of the paddy produced in the wet season. The actual volume of incoming paddy per month in the warehouses is given in the table below. The largest volume stored was 353 tons in September 1997. Total throughput from August 6, 1996 to October 18, 1997 was 608 tons. Sixty three persons used the warehouse during the period.

Month	Incoming (ton)	Peak Stock (ton)
August, 1996	33	
September	23	
October	12	
November	101	
December	66	
January, 1997	49	
February	41	
March	2	
April	0	
May	0	
June	0	
July	0	
August	0	
September	229	353
October	53	· · · · · · · · · · · · · · · · · · ·
Total	<u>608</u>	

Of the total deposited paddy, the users from the MACABITU IA area account for 70%. Those from SALAMBITU IA area come next at 10%. Paddy traders and creditors account for 36% and 9%, respectively, of the total paddy deposited to the warehouses.

Generally, the facilities are underutilized.

8.2 Problems

(1) Lack of working funds for the farming activities of the ARFIA members

Farmers in the Aganan area are poor with a little cash. About 51% of the Aganan farmers are indebted. An average debt accounts for 8,420 pesos per farm. Because of this situation, farmers have to sell their paddy immediately after harvesting without drying at rather low prices to get cash for the repayment of debt, education and medicat treatments. Thus, many member farmers can not use the facilities. In addition to these, the shortage of cash prevents most farmers except large farms from usage of tracks, drying yards, dryers, labors and warehouses. The farmers can use the facilities in credit from working funds of the federation but only once because of the small capital of only 5,000 pesos. Farmers have to settle their debt for the subsequent.

(2) Expensive charges for the use of the facilities

Cost saving by drying in the Aganan facilities is only 0.5 pesos per 42 kg of paddy compared with the conventional drying with bamboo mats including transportation costs. This is due to inclusion of salaries for 7 staff who manage and operate the facilities. If member farmers participate in the operation and management through working committees, the charges would become cheaper. Loading, unloading and handling of paddy have to be contracted to particular workers to prevent pilferage instead of using farmers labor force. (3) Farmer's low awareness of economic advantages of the facilities

Most farmers do not understand the economic advantage of the facilities. For example, paddy prices increase by 0.89 pesos per kg of dry paddy by drying from 25% to 14% moisture content. If more than 160 kg of wet paddy is dried, more income will be obtained even farmer's nominal own labor costs of 100 pesos are included in the cost. The low awareness is caused by the lack of participation of member farmers in the guidance of operation and utilization of the facilities.

(4) Low participation of members in the operation and management of the facilities

The low level of participation of IA members in the operation and management of post-harvest facilities is caused by the absence of formal training on such work prior to the turn-over of management responsibilities to the ARFIA.

(5) The first-come-first-served rule

The facilities have been dominated by traders. In term of quantity of paddy processed, they occupy 47% in drying, 43% in hauling and 36% in storage. The dominance is caused by high financial capability of the traders, and by the first-come-first-served rule. The traders dry a large volume of paddy, which includes paddy outside of the Aganan area, resulting in the long time occupation of the facilities. The long occupation deters small farmers who handle small volume of paddy from the utilization of the facilities.

(6) Lack of rice mills and marketing operation of rice

There is a 6 ton circulating dryers given by the Department of Agriculture(DA). The drying charge is 10 pesos per kg of wet paddy including the fuel cost. The utilization has been full even in the first wet season. ARFIA will be granted a rice mill by the DA, although the schedule is not yet decided.. When the value added increased by the joint operation of rice mills and the joint marketing of milled rice after the completion of rice mill complex including drying, milling, storage and marketing, the utilization rate of the facilities would be improved. The training in the marketing of milled rice, such as market promotion, pricing, quality control and ABC analysis, is presently absent.

8.3 Improvement Plan for the Strengthening of the ARFIA

The immediate objective of strengthening the ARFIA is to improve the financial position of its farmer-members to actively participate in the integration of the post-harvest facilities' operation with their farming activities. To achieve this, the following measures will be adopted:

(1) Provision of government loan

ARFIA has been promoting the participation of the federation in the Quedancor paddy collateral loan program since November 1996 but in vain due to some problems such as non-transfer of land ownership of the facilities to NIA. The NIA Aganan-Sta. Barbara RIS (ASBRIS) office has to persuade the Quedancor to accept the application and has to settle the land ownership problem as soon as possible.

(2) Capital build-up

The capital build-up shall be made to accumulate the working fund of the federation. Initially, the payment of membership deposits of at least 60 pesos will be collected twice a year in conformity with the harvest period for wet and dry cropping seasons, or at least 10 pesos per month. This initial capital build-up will be used for the operation of federation or buying farm inputs such as seeds, fertilizers and agro-chemical by members.

(3) Establishment of quota system for the utilization of post-harvest facilities

A quota system for the use of the post-harvest facilities, particularly drying yards and warehouses, will be introduced by the Project to replace the existing "first-comefirst-served" rule in order to give equal opportunities to all the IAs and their members. The utilization schedule will be made based on the individual IA's schedules.

(4) Reduction of service charges by the promotion of group activities

The facilities have not been fully utilized due to the high service charges. The existing policies governing the operation of the facilities will be altered to permit the utilization of farmer' own cheap labor as much as possible. The facilities are seemed to be over-staffed with 1 manager, 1 secretary, 1 cashier, 1 accountant, and 3 security guards. The clerical work has not been well mechanized. Staffing will be adjusted by computerization of clerical work.

(5) Training

Given the lack of training and experience of the ARFIA in the general operation and management of post-harvest facilities, the Project will train the ARFIA members on the following aspects through the NIA IA training programs and the NFA training of post-harvest activities.

- (i) Internal capital build-up (importance and management)
- (ii) Economics and management of post-harvest facilities
- (iii) Economics of agricultural credit and its financial management
- (iv) Records management and computer usage
- (v) Economics of rice marketing and points of its operation

(6) Promotion of rice milling and rice marketing

In order to increase added-value in the rice milling and marketing, the following activities will be done. It has to be stressed that the success in the rice milling and marketing are steady supply of rice to large buyers.

(i) Grant of rice mill from DA

.

- (ii) Selection of traders who buy milled rice from the ARFIA
- (iii) Selection of cooperatives who make joint marketing of rice with ARFIA
- (iv) Selection of large rice buyers and rice wholesalers

If DA will not grant rice mill to ARFIA, ARFIA would select rice mills that will undertake rice milling and marketing, mills that will sell rice mills to ARFIA, or ARFIA will construct a rice mill.

9. CONCLUSIONS AND RECOMMENDATION

9.1 Conclusion

The economic internal rate of return (EIRR) of the Project consisting of the selected priority projects is estimated at 16.4%. The Project is found to be technically sound, economically feasible and financially viable. The feasibility study has specifically clarified the following advantage of the Project:

- (a) Both the Jalaur proper and Suague RISs will be revitalized under the Project and the irrigation performance by both RISs will be remarkably improved. Thus, the revitalized RISs will contribute to improve the regional economy through increase in the agricultural productivity,
- (b) The farm economy will be remarkably improved and stabilized as compared with the present condition,
- (c) The Project will create a demand for farm labor due to the intensive farming activities, more intensive land use, and increase in the agricultural production. The Project will also improve the road network condition and generate the post-harvest business by farmers in the project area. All these will contribute to activating the regional economy, and
- (d) The farmers' income in the project area is expected to increase considerably about 2 to 5 times through increase in crop production, especially paddy rice, under the Project.

The sustainability of O&M activities will be considerably improved with the turn over of management and ownership for sections of the irrigation system of both RISs to the IA through partial system management, and the direct incentives to farmers for owning the system would reduce future O&M cost by NIA.

In addition, the feasibility study has clarified that the Aganan River Federation of Irrigators' Association (ARFIA) should be strengthened through the following measures: i) provision of government loan, ii) capital build up, iii) setting up of quota system for the utilization of post-harvest facilities, iv) reduction of service charges by the promotion of group activities, v) training of the ARFIA members, and vi) promotion of rice milling and marketing.

9.2 Recommendation

(1) As mentioned above, the implementation of the Project is technically sound, economically feasible and financially viable. Moreover, the Project will give many direct and indirect social and economic benefits to farmers in the project area. Thus, it is recommended that the Project shall be implemented as early as possible. (2) In order to ensure the successful and effective implementation of the Project, it is recommended that the proposed integrated-phased development approach be adopted as follows:

First phase covers the development of soft aspects of the prospective plans to carry out in advance the strengthening of the IAs, rehabilitation of farmers' cooperatives, development of women service cooperatives, and activation of agricultural extension services. The first phase also covers a part of rehabilitation/improvement of irrigation facilities and improvement of O&M skills of NIA and the IAs including the preparation of the O&M manual, using the rehabilitated/improved irrigation facilities. This phase coincides with the 4 years of the pre-construction period and partial construction period. Second phase will carry out the full implementation of hard aspects of the prospective plans and the further advancement of the soft aspects. By the time the improvement / rehabilitation of irrigation facilities are completed, the strengthened IAs would have adequate institutional and technical capabilities to effectively and sustainably used the irrigation facilities and start partial system management. This phase coincides with the construction and sustainability period of the Project.

- (3) To sustain the Project, it is recommended that the following proposed activities be taken by NIA and other agencies concerned:
 - (i) The model project for the watershed management and rehabilitation of the Suague sub-watershed area shall be implemented by DENR as early as possible to demonstrate the effects of the model project to the surrounding areas. The model project should be considered to be implemented under the Forest Sector Project, and
 - (ii) The present quarry activity downstream of the Suague RIS diversion dam shall be restricted to prevent the degradation of the river bed.

Tables

		·	F	Existing River In	rigation System		
	unit	Aganan	Sta. Barbara	Jalaur Proper	Jalaur Extn.	Suage	Total
1 Gross Area	ha	6,520	4,820	12,930	5,670	4,280	34,220
2 Service Area	ha	4,863	3,399	8,825	2,616	2,958	22,661
Area which has been converted to non-agricultural utilization	hı	500	400	0	0	0	900
Area after review by team	ha	4,360	3,000	8,820	2,620	2,960	21,760
3 Reported Area by NIA *1	•						
Irrigated area (Planted area)							
Wet season *2	ha	4,050	2,710	6,870	2,310	2,600	18,540
Dry season *3	ha	1,230	2,110	6,450	2,010	2,460	14,260
Benefited Area							
Wet season *2	ha	4,050	2,710	6,120	2,210	2,580	17,670
Dry season *3	ha	1,230	2,110	4,910	1,630	1,870	11,750
Cropping Intensity (benefited area)							
Wet season	%	93%	90%	69%	84%	87%	81%
Dry season	%	28%	70%	56%	62%	63%	54%
Year-round	%	121%	161%	125%	147%	150%	135%
5 Other Cropping Area							
Rainfed paddy (Ist paddy) *4	ha	300	250	2,600	410	380	3,940
Rainfed paddy (2nd paddy) *4	ħa	900	100	1,940	580	610	4,130
3rd Paddy *5	ha	200	200	1,200	250	50	1,900
Diversified Crops							
Mungbean (rainfed)	ha	400	200	600	100	150	1,450
Water melon *6	ha	500	150	100	10	20	780
Total	ha	2,300	900	6,440	1,350	1,210	12,20
6 Cropping Intensity	_						
Cropping Intensity of Paddy	%	153%	179%	190%	194%	185%	1819
Ist Paddy	%	100%	98.7%	98.9%	100%	100%	99 9
2nd Paddy	%	49%	74%	78%	84%	84%	739
3rd Paddy	%	5%	7%	. 14%	10%	2%	99
Cropping Intensity of Diversified Crops	%	21%	12%	8%	4%	6%	109
Total Cropping intensity of Whole Crops	%	174%	1919	198%	198%	191%	1919

Table 3.1.1 Cropped Area and Cropping Intensity in the Study Area

*1 Aganan & Sta. Barbara : 1996, Jalaur Prop., Jalaur Extn. & Suage: Average of 5 years (1992-1996)

*2 Reduced 360 ha of benefited/irrigated area in the Aganan RIS which has been converted to subdivision

*3 Reduced 230 ha of benefited/irrigated area in the Sta. Barbara RIS which has been converted to subdivision

*4 Partially irrigated from shallow tube wells or creeks by pumping

*5 Partially irrigated using canal water and shallow tube well/creek water

*6 Infigated by manual using dug well water

										-	Aver	
	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	5 years	10 years
Production (ton)												:
	534,167	504,763	469,288	352,413	500,749	560,220	682,782	669,467	553,488	608,926	614,977	543,626
Irrigated	161,353	206,00\$	198,483	165,678	193,951	260,914	392,646	390,272	335,339	364,587	348,752	266,923
Rainfed	372,814	298,755	270,805	186,735	306,798	299,306	290,136	279,195	218,149	244,339	266,225	276,70
Jan - Mar	189,039	167,542	191,280	89,763	180,431	134,427	215,481	256,546	145,791	231,770	196,803	180,201
Irrigated	58,187	81,691	64,347	34,560	68,024	57,719	104,471	118,772	98,516	134,940	102,884	82,12
Rainfed	130,852	85,851	126,933	55,203	112,407	76,708	111,010	137,774	47,275	96,830	93,919	98,08
Apr - Jun	20,481	1,409	14,419	1,383	7,145	9,950	14,676	28,008	12,251	27,816	18,540	13,75
Irrigated	14,743	1,256	13,224	1,364	7,096	9,950	14,676	28,008	12,251	27,060	18,389	12,96
Rainfed	5,738	153	1,195	19	49	0	0	0	0	756	151	79
Jul - Sep	29,885	123,755	131,954	144,145	47,543	38,809	62,642	250,870	185,315	195,173	146,562	121.00
Irrigated	6,823	57,985	58,080	62,292	25,787	20,571	48,657	152,520	99,932	116,543	87,645	64,91
Rainfed	23,062	65,770	73,874	81,853	21,756	18,238	13,985	98,350	85,383	78,630	58,917	56,09
Oct - Dec	294,762	212,057	131,635	117,122	265,630	377,034	389,983	134,043	210,131	154,167	253,072	228,65
Inigated	81,600	65.076	62,832	67,462	93,044	172,674	224,842	90,972	124,640	86,044	139,834	106,91
Rainfed	213,162	146,981	68,803	49,660	172,586	204,360	165,141	43,071	85,491	68,123	113,237	121,73
Harvested Area (110,701	(3,005	47,000	112,500	101,000	105/191			00,125	112,201	
naivested Alea (213.870	208,750	190,870	150,680	206,010	203,380	205,100	208,540	194,350	220,254	206,325	200,18
Total and a d	52,460	62,370	62,910	53,890	57,440	67,200	92,230	96,420	93,900	113,310	92,612	75,21
Irrigated Defected	161,410	146,380	127,960	96,790	148,570	136,180	112,870	112,120	100,450	106,944	113,713	124,96
Rainfed	101,410	140,330	121,500	70,770	(48,510	1.0,100	112,070	116,120	100,450	100,344	113,713	124,70
Jao - Mar	81,400	80,440	82,990	61,020	86,710	72,830	77,190	83,760	66,830	87,080	77,538	78,02
Irrigated	21,270	26,270	22,260	18,740	25,000	22,030	29,100	30,770	34,450	44,980	32,266	27,48
Rainfed	60,130	54,170	60,730	42,280	61,710	50,800	48,090	52,990	32,380	42,100	45,272	50,53
Apr - Jun	8,520	610	5,280	1,120	3,380	3,840	4,950	7,780	4,210	8,810	5,918	4,85
Irrigated	6,030	440	4,560	1,100	3,340	3,840	4,950	7,780	4,210	8,430	5,842	4,46
Rainfed	2,490	170	720	20	40	0	0	0	0	380	76	38
Jul - Sep	14,040	46,280	54,560	54,060	16,420	11,910	17,000	74,330	56,300	69,503	45,809	41,44
Irrigated	1,850	16,520	19,740	18,900	7,540	5,130	11,650	36,210	24,080	35,316	22,477	17,69
Rainfed	12,190	29,760	34,820	35,160	8,880	6,780	5,350	38,120	32,220	34,187	23,331	23,74
Oct - Dec	109,910	81,420	48.040	34,480	99,500	114,800	105,960	42,670	67,010	54,861	77,060	75,86
Inigated	23,310	19 ,140	16,350	15,150	21,560	36,200	46,530	21,660	31,160	24,584	32,027	25,56
Rainfed	86,600	62,280	31,690	19,330	77,940	78,600	59,430	21,010	35,850	30,277	45,033	50,30
Unit Yield (ton/	19)											
Palay	2.50	2.42	2.46	2.34	2.43	2.75	3.33	3.21	2.85	2.76	2.98	2.7
Irrigated	3.08	3.30	3.16	3.07	3.38	3.88	4.26	4.05	3.57	3.22	3.80	3.5
Rainfed	2 31	2.04	2.12	1.93	2.07	2.20	2 57	2.49	2.17	2.28	2.34	2.2
Jan - Mar	2.32	2.08	2.30	1.47	2.08	1.85	2.79	3.06	2.18	2.66	2.51	2.3
Irrigated	2.74		2.89		2.72	2.62			2.86	3.00		
Rainfed	2.18		2.09		1.82	1.51	2.31			2.30		
Apr - Jun	2.40					2.59				3.16		
Inigated	2.44					2.59				3.21		
Rainfed	2.30									1.99		
Jul - Sep	2.13					3 26	3.68	3.38	3.29			2
Inigated			- 2.94			4.01						
Rainfed	1.89					2.69						
	2.68					3.28						
	£.00	- Z OU	6.14	3.4V	4.07		2.00	2.64	2.14	4.0	3.21	Э,
Oct - Dec Imigated		3.40	3.84	4.45	4.32	4.77	4.83	4.20		3.50		4.

Table 3.1.2 Paddy Production in Iloilo Province

Average: 5 years (1987 - 1996), 10 years (1992 - 1996) Source : DA Region VI, BAS

Cropped Area											Unit: ha)	
Сторревлена		· · · · · · · · · · · · · · · · · · ·	P	addy Rice					Mong	Water	Sugar	Total of
	 !	Inigated			Rain	fed		Paddy	Bean	Melon	Cane	Cropped
	Wet	Dry	Subtotal	Wet	Dry	310	Subtotal	Total				Area
Exsiting R1S												
Aganan	4,050	1,230	5,280	300	900	200	1 400	6,680	400	500	0	7,580
Sta. Barbara	2,710	2,110	4,820	250	100	200	550	5,370	200	150	0	5,720
Jalaur Proper	6,120	4,910	11,030	2,600	1,940	1,200	5,740	16,770	600	100	0	17,470
Jalaur Extensiom	2.210	1,630	3,840	410	5\$0	250	1,240	5,0\$0	100	10	0	5,190
Suage	2,580	1,870	4,450	380	610	50	1,040	5,490	150	20	0	\$,660
Subtotal	17,670	11,750	29,420	3,940	4,130	1,900	9,970	39,390	1,450	780	0	41,620
Potential Area												
Oton			0	1,250	120		1,370	1,370				1,370
San Muguel			0	2,430	240		2,670	2,670				2,670
Sta. Barbara			0	800	80		880	880				880
New Lucena			0	390	40		430	430				430
Pototan			0	480	50		530	\$30				530
Barotac Nuevo			0	680	70		750	750			2,030	2,780
Subtotal	0	0	0	6,030	600		6,630	6,630	0	0	2,030	8,660
Total	17,670	11,750	29,420	9,970	4,730		16,600	46,020	1,450	780	2,030	50,280

Table 3.1.3 Crop Production in the Study Arca

ŝ

Unit Yield									<u>(U</u>	nit : ton/ha)(
			P	ody Rice					Mung	Water	Sugar
-		Irrigated			Rainf	ied		Paddy	Bean	Melon	Cane
-	Wet	Dry	Average	Wet	Dry	3rd	Average	Average			
Exsiting RIS											
Aganan	3.56	3.40	3.52	2.24	2.24	2.00	2.21	3.25	0.40	4.0	
Sta. Barbara	3.86	3.56	3.73	2.24	2.24	2.00	2.15	3.57	0,40	4.0	
Jalaur Proper	3.40	3.30	3.36	2.24	2.24	2.00	2.19	2.96	0.40	4.0	
Jalaur Extension	3.70	3.43	3.59	2.24	2 24	2.00	2.19	3.25	0.40	4.0	
Suague	3.64	3.41	3.54	2.24	2.24	2.00	2.23	3.29	0.40	4.0	
Average	3.58	3.39	3.51	2.24	2.24	2.00	2.19	3.17	0.40	4.0	
Potential Area											
Oton				2 24	2.24		2.24	2.24			
San Muguel				2.24	2.24		2.24	2.24			
Sta, Barbara				2.24	2.24		2.24	2.24			
New Lucena				2.24	2.24		2.24	2.24			
Pototan				2.24	2.24		2.24	2.24			
Barotac Nuevo				2.24	2.24		2.24	2.24			4
Average				2 24	2.24		2 24	2.24			4
Average	3.58	3.39	3.51	2.24	2 24		2.21	3.04	0.40	4.0	4

Production									(Unit: toa)	
			P	addy Rice					Mung	Water	Sugar
		Irrigated		Rainfed				Paddy	Bean	Melon	Сале
	Wet	Dry	Subtotal	Wet	Diy	3rd	Subtotal	Total			
Exsiting RIS								•			
Aganan	14,418	4,182	18,600	672	2,016	400	3,088	21,688	160	2,000	
Sta. Barbara	10,461	7,512	17,972	560	224	400	1,184	19,156	80	600	
Jalaur Proper	20,808	16,203	37,011	5,824	4,346	2,400	12,570	49,581	240	400	
Jalaur Extensiom	8,177	5,591	13,768	918	1,299	500	2,718	16,486	40	40	
Suage	9,391	6,317	15,768	851	1,366	100	2,318	18,086	60	\$0	
Subtotal	63,255	39,864	103,119	8,826	9,251	3,800	21,877	124,996	580	3,120	0
Potential Area											
Oton			0	2,800	269		3,069	3,069			
San Muguel			0	5,443	538		5,981	5,981			
Sta. Barbara			0	1,792	179		1,971	1,971			
New Lucena			0	874	90		963	963			
Pototan			0	1,075	112		1,187	3,187			
Barotac Nuevo			0	1,523	157		1,680	1,680			91,350
Subtotal	0	0	0	13,507	1,344	0	14,851	14,851	0	0	91,350
Total	63,255	39,864	103,119	22,333	10,595	3,800	36,728	139,847	580	3,120	91,350

Table 3.1.4 Collection of Irrigation Service Fee in the Study Area

			ectibles (Pesos 1,		ISF Actual C	ollection (Pesos		ISF
Year	RIS	Dry Paddy	Wet Paddy	Total	Current	Back	Total	Collection
		_,, . , , n			Account	Account		Efficiency
1992	Jalaur Proper	3,745	3,189	6,934	2,696	423	3,119	39 %
	Jalaur Extension	1,756	1,210	2,966	1.181	221	1,402	40 %
	Suague	1,686	1.426	3,112	858	268	1,126	28 %
	Aganan	497	2,515	3,012	1,084	417	1,501	36 %
	Sta. Batbara	991	1,727	2,718	1,029	545	1,574	38 %
1993	Jalaur Proper	4,304	3,451	7,755	2,583	642	3,225	33 %
••••	Jalaur Extension	1,747	1,216	2,963	1,329	227	1,556	45 %
	Suague	1,368	1,414	2,782	996	434	1,430	36 %
	Aganan	355	2,528	2,883	1,438	172	1,610	50 %
	Sta. Barbara	1,362	1,696	3,058	1,523	470	1,993	50 %
1994	Jalaur Proper	4,252	3,231	7,483	1,797	796	2,593	24 %
	Jalaur Extension	1,375	1,180	2,555	816	245	1,061	32 %
	Suague	1,828	1,340	3,168	1,139	530	1,669	36 %
	Aganan	833	2,533	3,366	891	1,279	2,170	26 %
	Sta. Barbara	1,767	1,661	3,428	1,203	1,179	2,382	35 %
1995	Jalaur Proper	3,273	2,976	6,249	1,300	704	2,004	21 9
	Jalaur Extension	872	1,184	2,056	679	227	906	33 %
	Suague	1,107	1,417	2,524	782	410	1,192	31 %
	Aganan	865	2,331	3,196	520	2,199	2,719	16 %
	Sta. Barbara	1,394	1,649	3,043	1,166	995	2,161	38 %
1996	Jalaur Proper	3,903	4,910	8,813	2,111	1,152	3,263	24 9
	Jalaur Extension	845	1,579	2,424	807	310	1,117	33 9
	Suague	1,601	1,832	3,433	1,306	605	1,911	38 9
	Aganan	996	3,175	4,171	765	946	1,711	18 %
	Sta. Barbara	1,897	1,953	3,850	1,652	2,075	3,727	43 %
Averag	e Jalaur Proper	3,895	3,551	7,447	2,097	743	2,841	28 9
e e	Jalaur Extension	1,319		2,593	962	246	1,208	
	Suague	1,518	1,486	3,004	1,016	449	1,466	
	Aganan	709	2,616	3,326	940	1,003	1,942	
	Sta. Barbara	1,482	1,737	3,219	1,315	1,053	2.367	

Notes: ISF : Irrigation Service Fee

 Current Account (CA)
 : ISF charge for the current cropping (wet & dry) year which such cropping was done.

 Back Account (BA)
 : ISF charge for the previous cropping year which ISF were not collected in the previous year.

 ISF Collection Efficiency = ISF Actual Collection (CA) / ISF Collectibles (CA)

Source: NIA JSRIS Office and ASRIS Office

Year 1994	Region	(Pesos 1,000)	Current	Back	Total	Collection
1994						
1994			Account	Account		Efficiency
1994				2244	4.470	36.01
	i	29,072	10,535	3,941	14,479	36 %
	2	41,474	24,411	4.878	29,289	59 %
	3	45,869	17,439	6,139	23,578	38 %
	4	41,874	22,547	6,316	28,863	54 %
	5	18,809	8,127	3,743	11,870	43 %
	6	48,306	14,652	9,631	24,283	30 %
	7&8	13,104	6,345	1,300	7,645	48 %
	9	12,126	5,330	780	6,110	44 %
	10	21,780	12,511	3,193	15,704	57 %
	11	41,547	21,887	3,778	25,665	53 %
	12	36,704	16,717	5,841	22,558	46 %
	MRIIS	112,517	66,828	11,002	77,830	59 %
	UPRIIS	128,912	58,616	5,267	63,883	45 %
	Total	592,094	285,945	65,812	351,757	47 %
1995	1	29,699	9,509	3,632	13,141	32 %
	2	41,273	23,858	5,549	29,407	58 %
	3	44,568	17,778	7,506	25,284	40 %
	4	38,062	18,060	7,885	25,945	47 %
	5	21,197	9,675	5,441	15,116	46 %
	6	43,922	14,896	8,427	23,323	34 %
	7&8	13,814	6,702	2,730	9,432	49 %
	9	11,945	6,405	2,540	8,945	54 %
	10	21,667	15,225	4,242	19,467	70 %
*1	11			.,	-	
•	12	34,919	15,848	6,230	22,078	45 %
	MRUS	104,542	58,059	10,049	68,108	56 %
	UPRIIS	99,015	44,058	9,884	53,942	44 %
	Total	504,623	240,073	74,115	314,188	48 %
Average	l	29,386	10,022	3,788	13,810	34 %
÷	2	41,374	24,135	5,214	29,348	58 %
	3	45,219	17,609	6,823	24,431	39 %
	4	39,968	20,304	7,101	27,404	51 %
	5	20,003	8,901	4,592	13,493	44 %
	6	46,114	14,774	9,029	23,803	32 %
	7&8	13,459	6,524	2,015	8,539	48 %
	9	12,036	5,868	1,660	7,528	49 %
	10	21,724	13,868	3,718	17,586	64 %
	10	41,547	21,887	3,778	25,665	53 %
	12	35,812	16,283	6,036	22,318	45 %
		108,530	62,444	10,526	72,969	57 %
	MRIIS UPRIIS	113,964	51,337	7,576	58,913	45 %
	Total	569,132	273,953	71,853	345,805	48 %

Table 3.1.5 ISF Collection of All NISs

Notes: ISF : Irrigation Service Fee

Current Account (CA) : ISF charge for the current cropping (wet & dry) year which such cropping was done. Back Account (BA) : ISF charge for the previous cropping year which ISF were not collected in the previous year. ISF Collection Efficiency = ISF Actual Collection (CA)/ISF Collectibles (CA) *1: No available data

Source: NIA Central Office

Crop Categor	Ŋ,	1st P	addy Irriga	ter	26d F	addy Irriga	ited	Veget	bles (Eger	lant)
		Qty	Price	Value	Qty	Price	Value	Qty	Frice	Value
			peso	reso		peso	<u>prso</u>		peso	<u>pes</u>
Seeds	kg	100	15	1,500	100	15	1,500	0.25	4,000	1,00
Fertilizer	-						-		• • • •	
N	kg	100	17	1,700	120	17	2,040	230	17	3,910
P2O5	kg	35	22	770	35	22	770	70	22	1.54
K2O	kg	35	11	385	35	11	385	90	11	99
14-14-14	bag	5	325		5	325		10	325	
Urea	hag	3	340		4	340		7	340	
Chemicals	-									
Herbicide	1	ł	400	400	1	400	400	0.5	400	20
Insecticide	3	1.5	500	750	1.5	500	750	2	500	1.00
Fungicide	1	0.5	500	250	0.5	500	250	2	500	1,00
Others				250			250	-	200	10
Labor										10
Hired	man-day	33	80	2,640	35	80	2,800	52	80	4,16
Family	man-day	31	0	0	32	0	0	43	~~	•,••
Machine/fool/Anima	1 .									
Handtractor				1,600			1,600			1,20
Carabao				0			0			
Thresher				500			500			
Blower				250			250			
Putnp				100			100			5
Others				150			150			10
FueVOil				200			300			20
Infigation Service Fee	peso			800			1,200			60
Harvesters Share	peso			2,360			2,440			
Land Lease	pcso			400			400			40
Land Tax	peso			140			140			14
Interest	Peso			570			600			77
Tetal	Peso			15,715			16,825			17,36

Table 3.2.1 Labor Requirement and Production Cost under With Project Condition

Crop Category		Perennial Fruits (Mango)								
		lst year			2 - 5 year			Bearing year		
		Qty	Price	Value	Qxy	Price	Value	Qty	Price	Value
			peso	peso		peso	peso		peso	peso
Seedling	tree	100	70	7,000	5	70	350	5	70	350
Inter crop seed (Mungbean) kg		20	50	1,000	20	50	1,000			0
Fertilizer										
N	kg	60	17	1,020	150	17	2,550	150	17	2,550
P2O5	kg	60	22	1,320	100	22	2,200	100	22	2,200
K2O	kg	40	11	440	60	11	660	60	11	660
14-14-14	bag		325			325			325	
Urea	bag		340			340			340	
Chemicals										
Herbicide	I	1.0	400	400	1.0	400	400	1.0	400	400
Insecticide	1	1.0	500	500	1.0	500	500	1.0	500	500
Fungicide	1	1.0	500	500	1.0	500	500	1.0	500	500
Others				300			300			300
Labor							•			
Hired	man-day	60	80	4,800	42	80	3,360	66	80	5,280
Family	man-oay	50	0	0	33	0	0	55	õ	0
Machine/Tool/Anin	าสไ				••	Ť			v	v
Handtractor				1,200			1.000			1,000
Carabao				0			0			,0
Thresher				300			300			300
Blower				150			150			150
Pump				50			50			50
Others				100			100			100
Fuel/Oil				200			200			200
Irrig. Service Fee	peso			500			500			500
Harvesters' Share	peso						500			
Land Lease	peso			400			400			400
Land Tax	peso			140			140			400
Interest	Peso			610			660			710
Total	Peso			20,930			15,320			16,290

T - 6

It Cropped Profit Cropped Total Area Profit Area Profit Benefit J Coul Area per ha 1000Perso ha 2.910 Profit Benefit A 1000Perso ha per ha 1000Perso 100Perso 100Perso 100Perso 100Perso 100Perso 100Perso 100Perso 10Perso 10Perso 10Perso		A	Without-Protect			With-Project		Incremental	ental	Incremental
Atta pertia Total Atta pertia Total Atta pertia Total Atta pertia Xioal period Xioal period Xioal period Xioal period Xioal Point Xioal period Xioal			Prof	5		Prot	5	Croppod	Total	Benefit
In pecolin A 1000reso ha pecolin A 1000reso ha X 1000reso X 1000reso X 1000reso <		Area	per ha	•	Area	per ha	Total	Area	Profit	per ha
peret 5.910 14.270 84.36 8.800 2.7180 2.901 2.900 regret 4.600 7.420 8.400 7.420 8.600 2.900 2.900 inted 1.960 7.420 8.800 2.600 2.900 2.900 2.900 inted 1.960 7.420 3.810 2.600 2.900 2.900 2.900 inted 2.00 1.6540 3.813 2.600 8.600 2.900 9.900 inted 2.00 1.6540 2.813 0 7.420 9.900 <	÷		pesovha	x 1000peso	ha	peso/ha	x 1000peso	ct	x 1000peso	1000 peso/ha
generi 5.010 14.270 8.436 8.820 27.180 2.9738 2.910 midei 15.000 7.420 8.436 2.600 2.3110 0 2.600 midei 15.000 7.420 2.813 0 7.430 11.212 3.00 gened 2.000 14.200 3.613 2.620 17.212 3.00 gened 2.000 14.200 3.613 2.620 2.7130 11.212 3.00 gened 3.00 14.200 3.613 2.600 2.1121 3.00 midel 3.00 14.00 5.243 2.00 6.301 5.600 2.600 midel 3.00 17.20 2.815 0 7.420 4.900 -3.00 midel 3.00 15.640 4.520 2.7180 10.651 12.00 -4.916 midel 3.00 15.640 4.500 7.420 4.256 0 -4.916 midel 3.00 <td< td=""><td>Jalaur Proper</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></td<>	Jalaur Proper									
New 4.000 13,110 0.0568 8.80 2.000 2.990 2.000 infect 1.600 7.800 3.033 0 7.400 2.000 2.900 infect 1.600 7.800 3.033 0 7.400 2.900 2.900 infect 1.900 7.800 3.037 2.600 2.100 1.900 2.900 infect 2.100 1.6.80 8.031 2.600 6.301 2.600 2.900 2.900 2.900 2.900 2.900 2.900 2.900 4.90	1st Paddy Irrigated	5,910	14,270	84,336	8,820	27,180	239,728	2,910		
midel 2.000 7.820 20.312 0 -2.000 isted 1.940 7.420 17.431 17.640 7.420 2.570 20004 isted 2.100 16.850 3.8081 2.620 2.570 2.000 2.600 2.570 2.000 midel 2.100 14.200 3.8081 2.620 2.570 2.600 2.570 2.600 2.570 2.600 2.570 2.600 2.570 2.600 2.570 2.600 2.570 2.600 </td <td>2nd Paddy Irrigated</td> <td>4,620</td> <td>011,61</td> <td>60,568</td> <td>8,820</td> <td>26.070</td> <td>229,937</td> <td>4.200</td> <td></td> <td></td>	2nd Paddy Irrigated	4,620	011,61	60,568	8,820	26.070	229,937	4.200		
infect 1,340 7,420 1,430 7,420 1,340 1,340 2,300 1,340 2,300 <t< td=""><td>1st Paddy Rainfed</td><td>2,600</td><td>7,820</td><td>20,332</td><td>0</td><td></td><td></td><td>-1.600</td><td></td><td></td></t<>	1st Paddy Rainfed	2,600	7,820	20,332	0			-1.600		
ISOND 1706/1 17640 405655 2.770 2.000 2.000 genet 2.170 14.200 30.879 2.620 2.6070 65.303 490 genet 2.170 14.200 30.879 2.620 2.6070 65.303 490 genet 2.170 14.200 30.879 2.660 6.303 4.90 genet 2.170 7.820 2.2815 0 7.420 0 -0 genet 2.000 16.30 4.248 2.900 27.180 110.515 0 6.4401 genet 2.000 15.640 46.920 4.720 13.90 -0 -0 -0 genet 5.00 15.670 4.170 7.420 4.525 -10 0 -4.916 15.90 -0 -0 -0 -0 -0 -0 -0 -0 -0 -0 -0 -0 -0 -0 -0 -0 -0 -0 0 0	2nd Paddy Rainfed	1,940	7,420	14,395	¢	7,420	0	-1,940		
gated 2.200 16.8% 36.01 2.6.20 6.9.10 3.1.30 7.1.212 3.0 quarted 2.100 16.8% 36.770 3.8.15 0 7.420 36.970 450 quarted 3.0 7.420 3.8.15 0 7.420 30.879 2.660 68.301 450 visited 3.00 7.420 2.5.00 45.00 16.3.00 4.5.00 5.6.00 4.5.00 5.6.0	Total	15.070		179,631	17.640		469.665	2.570	290,034	32.9
gated 2.200 16.850 38.081 2.620 2.71.212 360 rgated 2.170 14.230 30.579 2.600 68.070 68.071 450 rgated 2.160 14.230 30.579 2.600 2.413 9.0	Jalaur Extension							0		
Mody Imigand 2,10 1,420 36,87 2,620 2,600 68,201 450 Mody Rinifed 360 7,820 2,815 0 7,420 2,815 0 -200 Mody Rinifed 360 7,820 2,815 0 7,420 2,815 0 -200 Mody Rinifed 2,600 16,330 42,458 2,960 27,180 80,453 36,00 Mody Imigated 2,600 16,330 42,248 2,960 27,180 10,651 10 Mody Rinifed 810 7,420 2,815 6,00 15,642 180 249 Mody Rinifed 810 7,420 2,810 7,420 2,552 190 249 Mody Rinifed 3,900 15,540 4,700 7,420 2,552 200 26,55 200 26,55 200 26,56 20 20 26,56 20 20,56 20 20,56 20 20,56 20 20,56 20 26,5	1.4 Boddy Impared	092.6	16.850	38.051	2.620	27.180	71.212	360		
Andry Ranifed -10 7.2.0 -2.00 -3.0 -3.00			020 11	20.870	0 6 2 0	020.92	105,85	450		
addy fragated 400 7,520 7,310 7,420 6 7,420 6 400 addy fragated 420 7,630 7,314 5,340 7,433 5,96 7,433 90 44,915 9 6,4401 addy fragated 420 14,060 5,905 5,000 15,542 130 9 6,4401 addy fragated 420 14,060 5,905 5,000 15,542 190 44,916 addy fragated 300 7,420 4,525 610 1,3055 190 44,916 addy fragated 300 15,640 45,525 610 1,3055 1,30 0 44,916 addy fragated 300 7,420 45,000 1,3055 1,20 0 44,916 addy fragated 300 7,420 45,000 1,3055 1,20 1,305 1,50 7,577 addy fragated 2,700 16,671 5,600 7,420 2,66 7,579 2,00 2	Zha Paday Imgated	2/17		210,00				092-		
Addy Ranfed 4.0 7.4.0 5.4.0 7.4.0 5.4.0 7.4.0 5.4.0 7.4.0 5.4.0 1.0.5.1 0 6.4.01 1.0.5.1 0 6.4.01 1.0.5.1 0 6.4.01 0 0 <th< td=""><td>Ist Paddy Rainted</td><td>3</td><td>1.8.0</td><td>01012</td><td>> <</td><td>007 1</td><td><</td><td>096</td><td></td><td></td></th<>	Ist Paddy Rainted	3	1.8.0	01012	> <	007 1	<	096		
Addy Imigated 2,00 75,11 5,240 75,11 5,240 1,77,513 360 Addy Imigated 2,600 16,350 42,458 2,940 27,130 80,453 360 Addy Imigated 3,00 7,420 2,110 116,652 130 449,16 Addy Imigated 3,00 7,420 4,526 610 7,420 2,567 9 Addy Imigated 3,000 1,570 4,526 610 7,420 2,567 9 Addy Imigated 3,000 1,570 1,564 45,250 610 7,420 5,576 9 Addy Rainfed 3,000 1,570 1,564 45,200 45,305 -1,560 1,560 1,560 1,56	2nd Paddy Rainfed	450	7,420	V55.5		07477		i S c	104 F7	X YC
advy Imgated 2.600 16.530 4.248 2.960 27.130 80.453 350 Nody Imgated 360 7.420 5.915 0 2.607 15.642 180 Nody Rainfed 360 7.420 5.915 610 7.420 2.815 90 Nody Rainfed 310 7.420 5.915 610 7.420 9.500 9.607 9.500	Total	5.240		75.114	047.0		CICASI	>		Ĩ
addy Imgated 2.600 16,530 42,458 2.900 25,1180 80,455 3.90 addy Imgated 300 7,400 5,805 610 7,420 1,900 -300 addy Imgated 610 7,420 5,705 4,170 1,5542 1,90 -300 addy Imgated 3,900 7,420 4,526 4,170 1,6662 1,290 -300 addy Imgated 3,900 7,420 4,520 4,700 1,6662 1,290 -300 addy Imgated 3,900 7,820 6,678 900 7,420 5,576 addy Rainfed 1,000 7,420 6,578 0 1,00621 1,90 addy Rainfed 1,000 7,420 6,578 0 7,203 1,340 addy Rainfed 0 7,00 7,420 5,640 7,228 2,00 addy Rainfed 0 7,00 1,671 5,640 7,228 2,00 addy Rainfed 0 7,210	Suague									
Acidy Targated 420 14,000 5,905 600 7,520 2,815 0 4,90 3,90 7,820 2,80 5,905 3,900 7,820 2,80 3,900 7,820 2,80 3,900 7,820 2,80 4,170 7,420 4,326 0 4,916 3,00 4,916 3,00 4,916 1,006 1,100 4,916 3,00 4,916 3,00 4,916 3,00 4,916 3,00 4,916 3,00 4,916 3,00 4,916 1,006 1,100 4,916 1,00 4,916 1,00 4,916 1,00 4,916 1,00 4,916 1,00 4,916 1,00 1,00 1,100 <th< td=""><td>1st Paddy Imgated</td><td>2,600</td><td>16,330</td><td>42,458</td><td>2,960</td><td>27.180</td><td>80,453</td><td>365</td><td></td><td></td></th<>	1st Paddy Imgated	2,600	16,330	42,458	2,960	27.180	80,453	365		
addy Rainfed 360 7,820 2,815 0 -360 addy Rainfed 3,000 1,570 2,5705 4,170 1,652 0 -360 addy Rainfed 3,000 1,570 4,570 4,170 16,652 1,220 0	2nd Paddy Imigated	420	14,060	5,905	8	26,070	15.642	180		
Addy Rainfed 610 7,420 4,526 610 7,420 4,526 610 7,420 4,506 4,916 0 4,916 0 4,916 0 4,916 0 4,916 0 4,916 0 4,916 0 4,916 0 4,916 0 4,916 0 0 0 0 0 0 0 4,916 0 4,916 0 4,916 0 4,916 0	1st Paddy Rainfed	360	7,820	2,815	0			-360		
(1) 3,90 55,705 4,170 100,621 180 44916 addy irrigated 3,000 15,640 46,920 2,290 25,017 13,035 55 6 Addy irrigated 3,000 15,640 46,920 2,290 25,017 13,035 55 50 Addy irrigated 1,360 7,420 6,678 900 7,420 6,578 0 Addy Rainfed 0 7,420 6,678 900 7,328 200 Addy Rainfed 0 7,420 5,640 7,328 200 Addy Inspaced 2,700 18,220 49,194 2,960 7,328 200 Addy Impated 380 15,440 13,499 1,000 26,070 12,704 15 70 Addy Impated 2,00 7,420 7,420 7,420 70 200 Addy Rainfed 0 7,420 2,740 14,770 15 200 Addy Rainfed 0 7,420	2nd Paddy Rainfed	610	7.420	4.526	610	7.420	4.526	•		
Adv Imgated 3.000 15.640 45.920 4.200 27.180 116.652 1.290 Adv Imgated 3.00 13.970 7.684 500 26.070 13.035 50 Padv Imgated 3.00 7.820 0.6578 500 2.6070 13.035 50 Padv Imgated 1.300 7.820 0.6578 900 7.420 6.678 1.260 Padv Rainfed 9.00 7.420 6.678 900 7.420 6.578 1.260 Padv Rainfed 9.0 7.420 6.678 900 7.420 5.530 1.369 Robin Rainfed 0 7.1917 5.960 27.130 80.453 200 Robin Rainfed 3.00 7.820 2.349 1.000 2.6070 2.60 7.5787 Rody Rainfed 3.00 7.820 2.349 1.000 2.6070 2.60 7.60 Rody Rainfed 3.00 7.420 2.60 2.60 2.60 2.60 2.6070<	Total	3,990		55,705	4,170		100.621	180	44,916	15.2
addy Imigated 1000 15.640 46.920 4.290 27.180 116.602 1.200 Paddy Fingated 550 13.370 7.684 500 26.070 13.035 -6 Paddy Fingated 550 7.820 16.678 900 7.420 6.678 90 Paddy Rainfed 900 7.420 6.678 900 7.328 200 Paddy Rainfed 90 7.420 5.678 0 7.328 200 Paddy Rainfed 90 7.130 86.600 7.328 200 7.5787 Paddy Imigated 2.700 18.220 49.197 5.600 2.5781 70 Paddy Imigated 2.700 18.220 49.197 5.600 2.5787 70 Paddy Imigated 2.700 18.220 2.940 2.000 2.5787 70 Paddy Imigated 2.700 1.349 1.000 2.600 7.20 2.940 Paddy Imigated 0 7.420 7.420 <	Araban							o		
J Paddy Imigated 550 13,970 7,684 500 26,070 13,035 -50 Paddy Rainfed 1,360 7,820 10,655 0 7,420 6,678 0 paddy Rainfed 1,360 7,820 10,655 900 7,420 6,678 0 praddy Rainfed 900 7,420 6,678 900 7,420 6,578 200 praddy Rainfed 0 7,1917 5,960 7,1328 200 70 70 Paddy Irrigated 2,700 18,220 49,194 2,960 27,180 80,453 70 70 70 Paddy Irrigated 2,700 18,220 49,194 700 147,704 150 70 75,787 Paddy Irrigated 2,700 18,220 2,346 0 70 20 75,787 Paddy Irrigated 2,700 742 2,960 2,7180 80,453 70 150 75,787 Paddy Irrigated 3,000 7,420	1st Paddy Imigated	3.000	15,640	46,920	4,290	27.180	116.602	1,290		
Paddy Rainfed 1.360 7,820 10.655 0 -1.360 7.820 10.655 0 -1.360 7.328 200 7.328 200 7.328 200 7.578 200 25.789 200 25.789 200 25.780 200 25.780 200 25.780 200 25.780 200 25.780 200 25.780 200 25.780 <	2nd Paddy Impated	\$50	026.01	7,684	200	26.070	13.035	Ş,		
T Paddy Ranifed 900 7,420 6,678 900 7,420 6,678 0 7,200 5,630 7,328 200 75,787 200 75,787 200 75,787 200 75,787 200 75,787 70<	lst Paddy Rainfed	360	7,820	10,635	0			-1,360		
Second Second 36,640 7,328 200 36,640 7,328 200 Finits 0 71,917 5,960 4,061 70 70 73,787 70 reform 5,810 7,1917 5,960 27,180 80,453 70 75,787 Paddy Imigated 2,700 18,220 49,194 2,960 27,180 80,453 266 Paddy Imigated 2,700 18,220 49,194 2,960 27,180 80,453 266 Paddy Rainfed 300 7,420 7,420 7,420 72 0 getables 0 7,420 2,420 120 300 2,660 96 5,781 2,000 2,000 2,000 2,000 2,000 5,000 5,000 5,000 2,000 2,000 2,000 2,000 2,000 2,000 2,000 2,000 2,000 2,000 2,000 2,000 2,000 2,000 2,000 2,000 2,000 2,000 2,000	2nd Paddy Painfed	С. С	7.420	6.678	8	7.420	6,678	0		
products 0 58.010 4.061 70 prody inigated 5.810 71.917 5.960 27.180 8.043 70 Paddy Inigated 5.810 71.917 5.960 27.180 8.0453 2.66 75.787 Paddy Inigated 2.700 18.220 49.194 2.960 27.180 80.453 2.66 75.787 Paddy Inigated 8.80 15.340 13.499 1.000 2.6070 2.6070 120 Paddy Rainfed 3.00 7.820 2.346 13.499 1.000 2.6070 2.6070 120 Paddy Rainfed 3.00 7.420 7.420 7.420 7.420 7.420 120 Status 3.000 7.420 7.420 7.420 3.00 3.00 Constraine 3.000 7.420 7.420 7.420 4.00 3.00 4.00 Relation 3.000 5.6.640 10.002 2.6.77 4.00 5.7.20 4.706 R	Vacath blac				200	36,640	7,328	200		
Month 5,810 71,917 5,960 147,704 150 75,787 Inbiting 5,810 18,220 49,194 2,960 27,180 80,453 260 75,787 Paddy Imigated 880 15,340 13,499 1,000 26,070 26,070 120 Paddy Rainfed 300 7,820 2,346 0 7,420 120 Paddy Rainfed 300 7,820 2,346 0 2,000 2,000 Paddy Rainfed 100 7,420 7,420 7,420 7,420 300 geubles 0 7,420 7,420 7,420 4,40 5,000 2,300 ef Fruits 0 7,420 7,420 7,420 4,40 5,000 2,000 ef Fruits 0 7,420 7,420 7,420 4,40 5,000 5,000 ef Fruits 0 0 11,8555 11,856 5,8047 5,130 5,006 readdy Rainfed 8,640	Y Chudoles Trans Carity	~ C			20	58.010	4,061	02		
Math 27,180 80,453 260 Paddy Irrigated 2,700 18,220 49,194 2,960 27,180 80,453 260 Paddy Irrigated 880 15,340 13,499 1,000 26,070 26,070 120 Paddy Rainfed 300 7,820 2,346 0 7,420 742 200 Paddy Rainfed 300 7,820 2,346 0 -300 2,6540 10,992 300 gelables 0 7,420 7,420 7,420 7,420 4,40 5,640 10,992 300 ce Fruits 0 3,980 3,501 2,055 300 4,056 4,0 5,180 4,066 6,56,541 </td <td></td> <td>5 810 5 810</td> <td></td> <td>71 017</td> <td>5.960</td> <td></td> <td>147,704</td> <td>150</td> <td>75,787</td> <td>17.4</td>		5 810 5 810		71 017	5.960		147,704	150	75,787	17.4
menta menta 2700 18.220 49,194 2,960 27,180 80,453 260 Paddy Irrigated 880 15,340 13,499 1,000 26,070 120 300 Paddy Rainfed 300 7,820 2,346 0 300 3,6640 120 300 Paddy Rainfed 100 7,420 742 100 7,420 742 0 300 getables 0 7,420 742 100 7,420 742 0 300 getables 0 86,010 2,322 40 2092 300 all 3,980 0 86,010 2,322 40 20 40 all 3,980 13,490 13,650 58,640 12,0577 420 40 all 3,980 13,540 58,640 12,0577 420 40 all 3,644 0 26,0577 420 51,80 54,706 54,706 54,706 </td <td>1 Otal</td> <td>A10'C</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	1 Otal	A10'C								
Padoy Imgated 2.00 1.00 2.00 1.00 2.00 1.00 2.00 1.00 2.00 1.0.0 2.00 1.0.0 2.00 1.0.0 2.00 1.0.0 2.00 1.0.0 2.00 1.0.0 2.00 2.0 <th2.0< th=""> 2.0 <th2.0< th=""> <th2.0< td=""><td>Sta. Barbara</td><td>000</td><td></td><td>10104</td><td>1 060</td><td>77 180</td><td>80 453</td><td>260</td><td></td><td></td></th2.0<></th2.0<></th2.0<>	Sta. Barbara	000		10104	1 060	77 180	80 453	260		
I Paddy Imgated 880 15,440 1,600 2,900 2,900 2,900 2,900 2,900 2,900 2,4,796 2,1300 2,4,796 2,1300 2,4,796 2,1300 2,4,796 2,1300 2,4,796 2,1300 2,4,796 2,4,796 2,1300 2,4,796 2,4,796 2,1300 2,4,796 2,1300 2,4,796 2,1300 2,4,796 2,1300 2,4,796 2,1300 2,4,796 2,1300 2,4,796 2,1300 2,4,796 2,1300 2,4,796 2,1300 2,4,796 2,1300 2,1300 2,1300 2,1300 2,1300 2,1300 2,1300 2,1300 2,1300 2,1300 2,1300 2,1300 2,1300 2,1300 2,1300 2,1300 2,1300 2,1300 2,1000 2,1300	Lst Paddy Imgated	201/7	077.81	<u>k</u> - 4	202. ¹⁷	000 70	020.40	1021 1		
Paddy Rainfed 300 7,820 2,740 0 7,420 7,520 400 5,500 2,500 400 5,500 400 5,130 400 5,130 400 5,130 400 5,130 400 5,130 400 5,130 400 400 5,130 400 400 400 400 400 5,130 400 5,130 400 400 5,130 400 400 400 400 400 400 5,130 400 400 5,130 400 400 5,130 400 400 400 400 400 400 400 400 400 400 400 400 400 50.05	2nd Paddy Imigated	880	045.01	15,499	000'T	0/007		002		
d Paddy Rainfed 100 7.420 7.42 100 7.420 7.42 100 7.420 7.42 100 7.420 7.42 100 7.420 7.42 100 7.420 7.42 100 7.420 7.42 100 7.420 7.42 100 7.420 7.42 100 7.420 100 2.00 300 <td>Lst Paddy Rainfed</td> <td>300</td> <td>7.820</td> <td>2,240</td> <td></td> <td></td> <td>-</td> <td></td> <td></td> <td></td>	Lst Paddy Rainfed	300	7.820	2,240			-			
getables 0 300 36,540 10,972 300 ce Fruits 0 40 58,010 2,320 40 54,70 20 54,796 40 58,010 2,320 40 58,010 2,320 40 58,010 2,320 40 58,010 2,320 40 58,47 5,180 420 58,47 5,180 4706 54,706 <t< td=""><td>2nd Paddy Rainfed</td><td>8</td><td>7.420</td><td>742</td><td>8</td><td>7,420</td><td>747</td><td></td><td></td><td></td></t<>	2nd Paddy Rainfed	8	7.420	742	8	7,420	747			
ce Fruits 0 40 58,010 2.320 40 54,796 tail 3,980 65,781 4,400 720.577 420 54,796 tail 3,980 65,781 4,400 720.577 420 54,796 tail 58,447 5,180 38,447 5,180 54,796 taddy Irrigated 8,540 118,535 13,540 352,988 4,900 taddy Rainfold 4,980 38,944 0 11,946 -2,390 egrables 0 0 1610 11,946 -2,390 certaile 0 0 1010 6,381 110 certailes 0 0 110 6,381 110 certailes 0 0 110 6,381 110 550,955	Vegetables	0			00:	36,640	266'01	3		
(a) 3,980 65,781 4,400 120,577 420 34,00 r Paddy Irrigated 16,470 260,989 21,650 588,447 5,180 34,00 r Paddy Irrigated 8,540 118,535 13,540 352,988 4,900 r Paddy Rainford 4,980 38,944 0 11,946 -2,390 c Paddy Rainford 4,000 29,680 1,610 11,946 -2,390 c Reables 0 100 11,946 -2,390 500 c Fruits 0 110 6,331 110 5,320 c Fruits 0 0 110 6,381 110	Tree Fruits	ò			4	58,010	2,320	9		
Paddy Irrigated 16,470 260,989 21,650 588,447 5,130 d Paddy Irrigated 8,640 118,535 13,540 352,988 4,900 d Paddy Rainfold 4,980 38,944 0 352,988 4,900 d Paddy Rainfold 4,980 38,944 0 11,946 -2,390 c Paddy Rainfold 4,000 29,680 1,610 11,946 -2,390 c genbles 0 0 500 18,320 500 cerbles 0 0 110 6,381 110 ce Fruits 0 0 97,410 97,805 509,555	Total	3,980		65,781	4,400		120.577	420	8	18.
ddy Irrigated 16,470 260,989 21,050 588,44/ 51,050 addy Irrigated 8,640 118,535 13,540 552,988 4,900 addy Irrigated 8,640 118,535 13,540 352,988 4,900 addy Rainfod 4,980 38,944 0 11,946 -2,390 addy Rainfod 4,000 29,680 1,610 11,946 -2,390 ables 0 0 110 6,381 110 ruits 0 9110 6,381 110 500	Total			ì						
addy Irrigated 8,640 118.535 115.540 352.988 4,900 ddy Rainfod 4,980 38,944 0 0 11.946 -2.990 addy Rainfod 4,000 29,680 1.610 11.946 -2.900 ables 0 0 500 18.320 500 ables 0 248.148 37,410 978,082 3.320 529,935	lst Paddy Imgated	16,470		260,989	040,12		1449'000	001.0		
doy Rainfed 4,980 38,944 0 4,980 addy Rainfed 4,000 29,680 1,610 11,946 -2,390 addy Rainfed 4,000 29,680 1,610 11,946 -2,390 ables 0 500 18,320 500 18,320 500 raits 0 0 110 6,381 110 500 raits 24,600 243,120 978,082 3,320 529,935	2nd Paddy Imgated	8,640		118,535	13,540		352,988	964		
addy Rainfed 4,000 29,680 1,610 11,946 -2.390 ables 0 0 500 18,320 500 ables 0 0 110 6,381 110 ruits 24,000 248,148 37,410 978,082 3,320 529,935	1st Paddy Rainfed	4,980		38,944	•			4,980		
ables 0 0 500 18,320 500 Tauits 0 0 110 6,381 110 Tauits 24,000 248,148 37,410 978,082 3,320 529,935	2nd Paddy Rainfed	4,000		29,680	1.610		11.946	-2,390		
Tauits 0 0 110 6,381 110 Tauits 0 248 148 37,410 978,082 3.320 529,935	Vecenties	0		0	<u>8</u>		18.320	88		
24 POS 24 POS 24 POS 24 POS 25 52 52 52 935	T-ao Canito			C	110		6,381	011		
		000 12		248 148	27.410		978,082	3,320	529,935	24.5

Table 3.2.2 Financial Profit and Project Benefit of the Study Area

Table 3.2.3	List of Soil Erosion Control Measures
-------------	---------------------------------------

Descriptions Vegetative Measures	Merits	Demerits
1. Contour hedgerow (Strip cropping)		
Vegetative rows or strips established along the contour. Trees serve as live barrier to surface runoff and soil erosion. If the nitrogen fixing crops or trees such as leguminous crops are used, it can improve soil condition.	 Economical Adaptable to various conditions Easier to establish and repair Durable if maintained properly Improve the soil condition, if nitrogen fixing crops are used 	 It takes some time to attain benefits Less effective when slope is too steep Hedgerows may pose competition with crops
2. Mulching		
The mulching is the covering of the soil with crop residues such as straw, maize stalks, palm fronds or standing stubbles. The effect of mulching is the reducing of raindrop impact and of the velocity of runoff.	 Economical Adaptable to various conditions Easier to establish and repair Keeping of soil moisture and temperature Improve the soil condition 	 Application of mulch may be required on each cropping season in tropical area It requires a large amount of grasses (materials) for mulching
3. Wattling		
It is vegetative structure established in contour line or intermittently along the contour. It is used to trap the soil particles that are eroded down with surface runoff. Cutting of brushwoods are interwoven to form fence.	 Very effective and stable Early achievement of protection When bushwoods sprout, the leaves can be used as green manure or mulching materials 	 Difficult to find suitable sprouting brushwood rods. Difficult to construct
4. Agroforestry		
It is a system to incorporate trees within a farming system by planting them on land.	 Economically Trees can provide fuels, fodder, fruits, etc. to the farmers. 	 It takes some time to attain benefits Trees may pose competition with crops Less effective when slope is too steep
Structural Measures		
5. Contour bunds		
They are earth bunds, 1.5 to 2 m wide, thrown across the slope to act as a barrier to runoff, to form a water storage area on their upslope side and to break up a slope into segments shorter in length than is required to generate overland flow. They are frequently used with strip-cropping system.	 Relatively easier to construct and repair They are suitable for slopes of 1 to 7 degree. 	 The effectiveness is limited when heavy rains continue long. The effectiveness is limited when used in very steep slope.
6. Terraces		
They are series of level or nearly level strips running across the slopes supported by steep risers.	 Most effective measures for minimising soil erosion 	 They require a lot of time and manpower to construct. Soil erosion during construction stage may be high. Not suitable for the sites in which topsoils only have thin layer.
7. Waterways (Contour Ditches and Drainage Canals)		
They are digging structures established in the hillsides to check the erosive power of surface runoff by tapping soil particles. Drainage canal (grass waterways) are used as the outlet for contour ditches. It runs downslope and empty into river system or other outlets.	 Relatively easier to construct and repair Ditches and canals can be good water impoundment structures that can hold water for plants. 	 The effectiveness is timited when heavy rains continue long. The effectiveness is limited when used in very steep slope.
Cultural Measures		
8. Contour Plowing		
It is a plowing method to create furrows following the contour of the land.	 It increases water absorption capacity of the soil. It also reduces both the quantity and velocity of surface runoff. 	 A bit difficult to plow properly.
9. Contour Planting		
It is a planting method following the contour of the land. The crops planted act as barriers to the force of surface runoff.	1. Easy to adopt	 The effect is not high, if only it is adopted.

Tentative Mitigation Measures
bable Environmental Issues and 7
Table 3.2.4 Prol

Significanc Relating e in future project	minor all project	minor all project	minor Aganan, Sta. Barbara	major all project	major all project	
Remedial Measures to be considered	 Agricultural extension service for proper use Introduction of IPM system 	 Use of compost and green manure Introduction of IPM system Proper water management 	 Making a consensus among RIS by using a participatory approach Applying social supports to fill their economical gaps up 	1	, ,	
Significanc e at present	moderate - minor	moderate - minor	minor - moderate	major	major	
Main Causes	Improper use of agro-chemical with introduction of diversified cropping system and increasing crop intensity• Agricultural extension service for proper use • Introduction of IPM system	er use by the introduction of	New construction of farm pond	Drastically increase of farm production Increase of employment opportunity Ripple effect to the regional economy	Stabilization of irrigation water throughout a year	
Environmental Issues	1. Health hazard from	2. Deterioration of Increase of fertiliz downstream water quality intensive farming	3. Loss of farm land	 Beneficial impacts on farm and regional economy 	 Reduction of excessive use of ground water 	

	Jalaur		-	Jalaur									Sta.					
Project			Net	extension								Net	Barbara		Net			4 <u>9</u>
Year	Benefit (Bencht	Benefit		2	Benefit	в В	Benerit	Benefit		Denerit	Deneral	100	Juanad			1 Ialiao
		977	977-		5	- 24		52	1 1 1 1		81	ŝ				2	8	
2		336	-336		159	-159			ō		57	75-			4	c	5	ν 9-
т П	37		37	80		Ø	Ŷ		ŵ	2		01	~	_	7	69		69
4	t 75		75	17		17	12		22	20		20	4		4	137		137
S	112		112	25		25	00 F-		18	30		30	20		20	206		206
9	149		149	34		34	24		24	4		40	27		27	274		274
~	187		187	42		42	30		30	ŝ		SO	34		34	343		343
ø	187		187	42		42	30		30	S		50	34		34	343		343
6	187		187	42		42	80		30	S		So			34	343		343
10	187		187	42		42	30		30	So		50			34	343		343
	187		187	42		42	30		30	So		So	34 4		34	343		343
12	187		187	42		42	30		30	S		50	34		34	343		343
13	137		187	42		42	30		30	S		50	34		34	343		343
4	187		187	42		42	30		30	ŝ		S	34		34	343		343
15	187		187	42		42	ဗ္ဂ		30	50		So	34		34	343		343
16	187		187	42		4	8		30	50		S	34		34	343		343
17	187		187	42		42	30		30	S		20	34		34	343		343
18	187		187	42		42	30		30	50		So	34		34	343		343
19	187		187	42		42	30		30	<u>\$</u> 0		20	94		34	343		343
20	187		187	42		42	80		30	50		ŝ	34		34	343		343
21	187		187	42		42	30		30	So		So	34		34	343		343
22	·		187	42		42	30		30	So		50	34		34	343		343
23			187	42		42	8		30	So		S	34		34	343		343
24			187	42		42	30		80	50		So	34		34	343		343
25	187		187	42		42	30		30	50		So	34		34	343		343
26	187		187	42		42	30		30	50		So	34		34	343		343
27	187		187	42		42	30		30	SO		So	34		34	343		343
28	187		187	42		42	30		30	. 50		So	34		34	343		343
29	187		187	42		42	80		30	So		S	34		34	343		343
30	187		187	42		42	8		30	ß		S	34		34	343		343
	187		187	42		42	30		30	50		So	34		94 4	340		343
IRR			8.49%			9.74%		5.	5.58%			21.68%			4.72%		-	16.42%
the second second					210			101						(,				

Table 3.3.1 Scondic Rate of Return

	1992	~	1993		1994		CK71	 0	1996	9	Average	lfe
Division	Drv	Wet	Dry	Wet	Dry	Wet	Dry	Wet	Dry	Wet	Dz	Wet
Jalaur Proper										.		
-	3.38	3.56	3.45	3.50	3.25	3.27	3.39	2.94	3.4	3.43	3.38	3.34
(1	3.35	3.62	3.40	3.55	3.41	3.36	3.24	3.35	3.41	2.95	3.36	3.37
ო	3.73	3.86	3.64	3.72	3,74	4.09	3.32	3.61	3.48	3.33	3.58	3.72
4	3.33	3.47	3.44	3.51	3.35	3.10	3.34	3.28	3.29	3.30	3.35	3.33
5	3.25	3.54	3.40	3.59	3.38	3.25	3.28	3.47	3.03	3.42	3.27	3,45
9	2.64	3.35	3.20	3.59	3.37	3.34	3.34	3.36	2.63	3.68	3.03	3.46
L	3.06	3.25	3.09	3.23	3.11	2.67	3.20	3.24	3.13	3.07	3.12	3.09
- .	3.39	3.34	3.40	3.34	3.30	3.43	3.25	3.32	3.51	3.31	3.37	3.35
6	2.86	3.74	3.25	4.04	3.47	3.60	3.59	3.37	3.64	3.27	3.36	3.61
10	3.41	3.30	3.22	3.35	3.05	3.23	3.33	3.32	3.19	3.13	3.24	3.27
	3.05	3.39	3.69	3.57	2.33	3.60	3.43	3.26	3.49	3.45	3.20	3.45
Average	3.22	3.49	3.38	3.54	3.25	3.36	3.34	3.32	3.29	3.31	3.30	3.40
Suague												
1	3.57	3.81	3.68	3.87	3.49	3.69	3.51	4.11	3.81	4.07	3.61	3.91
64	3.44	4.08	3.41	4.10	3.37	3.44	3.62	4.43		3.70	3.43	3.95
ŝ	3.44	3.62	3,44	3.66	3.51	3.52	3.40	3.64	3.49	3.47	3.45	3.5
ব	3.31	2.68	3.16	3.39	3.34	3.22	2.79	3.04	3.11	3.22	3.14	3.11
Averare	3.44	3.55	3.42	3.76	3.43	3.47	3.33	3.80	3.43	3.62	3.41	3.64

ŧ

Table 4.3.1 Average Yields of Paddy in the Project Area

Mama	[temc	Present Condition	Problem / Constraint
	ricitis	I LOWING COMPLEXIT	
Jalaur Diversion Dam	Main gate	New machine driven lifting (5 gates) Old machine driven lifting (8 gates, 1968-)	
		Motors are over life duration (8 gates)	Shortage of fund for replacement of motors
	Scouring sluice gate	New machine driven lifting (2 gates)	
	Apron Intake aates (night side)	Fine condition Vivia alore of care is damaged (10 eates) & will be repaired	
	TIMEN BUNG INDIA OF	own practical succession of succession of the su	
		II Odsi	
		Manual lifting system (10 gates)	Shortage of fund for installation of machines
	Intake gates (left side)	Technical trouble of lifting system (2 gates) due to cable	Shortage of fund for replacement of machine &stem
		suspension	
	Trashrack	No installation	
	Communication System	No facilities	
Suague Liversion Lam	scouring sinice gaie	Ruboct sears is rouch Technical transle of lifting system due to cable suspension	Shortage of fund for replacement of machine &stem
		I CHIMINA IL VOULO VI MILLING OF ONLI VOU VANNO MOPPANSION	Chottone of find
	scouring sunce	Floor slap at the scouring stutce is aorageu.	
	Apron	Floor slab at the downstream apron is abraded.	Shortage of rund
		No cut-off wall at the downstream from scouring sluice	Shortage of tund
		(right bank)	
	Retaining wall	Crack of retaining wall (right bank) under repairing (ISOP II)	
-		Damaged retaining wall (right bank) under repairing (ISOP L)	-
		Scouring occurs at righ bank in downsream from rataining wall Additional gabion / concreste revetement, but shortage	Additional gabion / concreste revetement, but shortage
			100 I I I I I
	Riverbed Protection	Steel sheet pile is exposed.	Shortage of fund
		Concrete block length is insufficient along the scouring sluice.	
		Steel cheer wile of drumctream is evinced	
	Triate aster	Titis succession of some and domanda	Chorrage of finnel
			Shorage of find for replacement of machine &stem
	Trechesch		
	LEASTRACK Communication System		
	COMMUNICATION OF COMM		

Table 4.4.1 Present Condition and Constraint of Diversion Dam

Table 4.5.1 Present NIA O&M Staff and IA Contract by Division

	Irrigation	Turnout	Length of			onditions (19	997)	
	Service	Service	Main Canal	IA	Length of	Charge of	No.	No.
RIS Name of IA	Area	Area Group	& Laterals	Contract	Type I	WRF	of	of
	(ISA)	(TSAG)	(km)		Contract	Tender	WRF	WRF
	(ha)	(nos.)			(km)	*1 (km)	Tech.	Tender
laur proper RIS								
Div. 1 SISADA	296	12		Type l≪	3			
BAPZAT	512	24		Type I	9			
(Sub-Total)	(808)	(36)	18		(12)	6	0 *2	2 2
Div. 2 JP-2	714	22	19	Type 1	9	10	1	
Div. 3 JP-3	892	21	10	Type 1	5	5	<u> </u>	3
Div. 4 JADD	572	13		Type I	4			
J-JIN	375	8		Type I	4			
(Sub-Total)	(947)	(21)	13		(8)	5	1	3
Div. 5 POZA	594	9		Type I	4			
JABAFA	160	ł		Type II	0			
(Sub-Total)	(754)		10	••	(4)	6	1	3
Div. 6 CIDD	730			Type I	6	5	1	2
Div. 7 LOJAPRO	755	13	9		7	2	0 *	2 2
Div. 8, 9, 10&11								
Team Leader							1	
Assistant Team Leader							-	1
Div. 8 CAMP	838	23	11	Type I&II	9	2	0 *	2 2
Div. 9 BAMAPA	373			Type I	3			
MACAPA	410			Type I	6			
(Sub-Total)	(783)		10		(9)	1	1	1
Div. 10 CANROSCA	788		10	Type I	5	5	0*	3 1
Div. 11 PAGCAPUSO	811				9	2	0 *	3 2
Total (Jalaur proper RIS)	8.820	200	<u>132</u>		83	<u>49</u>	2	25
juague RIS						·	·····	••••
Div. 1 SMEWBAT	387	ç)	Type l≪				
JEBADA	608	. 14	ŧ	Type I	7			
(Sub-Total)	(995)	(23) 12		(10)	2	1	2
Div. 2 SMEWBAT	67		2	Type I&II				
AGDABASICA	593			Type I	6			
(Sub-Total)	(660)) (19) 8		(8)		0 •	
Div. 3 SUAGUE 3	543	10	5 12		9		0 *	2 3
Div. 4 SMEWBAT	133		2 2	- / 4	0			
DIV. 4 SUAGUE	569			Type I	6			
(Sub-Total)	(702)) (13) 8		(6)	2	0 1	
Total (Suague RIS)	2.900		1 40	Į	33		1	10
Grand-Total	11.720	2 22	1 172	······	116	56	8	35

WRF Tech. : Water Resources Facilities Technician Notes:

WRF Tender : Water Resources Facilities Tender

*1 : Length of canals under charge of WRF Tenders for the works equivalent

to Type I contract by IA.

*2 : WRF Tender is acting for WRF Tech.
*3 : WRF Tender of Div.10 (Jalaur proper) is acting for WRF Tech.

of Div.10&11 (Jalaur proper)

Source : NIA JSRIS Office

RIS		IA Name	a. Main canal	b. Lateral canal	c. Main farm ditch	d. Diversion dam
Jalaur Pr	ope	c RIS				
Div.	1	1 SISADA	1/10years	1/3years	2/1year	
		2 BAPZAT				
	2	3 JP-2	1/5years	1/5years	2/1year	+
	3	4 JP-3	1/7years	1/4years	2/1year	
	4	5 JADD	1/5years	1/5years	1/1ycar	_
	ſ	6 I-IIN	~			
	5	7 POZA	-	1/10years	2/1year	-
		8 JABAFA				
	6	9 CIDD	1/20years	1/20years	2/Lycar	-
	7	10 LOJAPRO	-	1/5years	2/1year	•
	8	11 CAMP	-	1/5years	2/1year	-
	9	12 ВАМАРА	-	I/4years	2/1year	-
		13 МАСАРА				
	10	14 CANROSCA	-	1/5years	2/1year	-
	11	15 PAGCAPUSO	-	1/Syears	2/1year	• ·
Diversio	n D	am	-	-	-	1/7years
Suague	<u>RIS</u>			_		
Div.	1	16 SMEWBAT	1/10years	1/10years	2/1year	-
		17 JEBADA				
	2	18 AGDABASICA	1/10years	1/10years	1/1year	· •
	3	19 SUAGUE 3	-	1/10years	No desilting ir	
	4	20 DIV. 4 SUAGUE	-	1/8years	No desilting in	•
Diversio	on D	am	-	-	-	1/10years

Table 4.5.2 Frequency of the Desilting Work

Note : *1 : WM : WRF Technician, DT : WRF Tender, OP : WRF Operator

Source : Interview Survey on NIA O&M Staff (WRF Technicians, Tenders and Operators)

No.	Name of Ec	pipment	Condition	Acquired	Age (years)	NIA Standard Economic Life (years)	Evaluation for use
A.C	onstruction Equipment						
1.	Crawler Crane	25 t	Operable	1978	19	9	
2.	Bulldozer	9 t	Operable	1981	13	6	-
3.	Backhoe	0.4 m3	Operable	1992	5	10	Useful
4.	Backhoe	0.8 m3	Operable	1978	19	10	-
5.	Motor Grader	L=2.2 m	For Disposal	1987	10	7	-
6.	Motor Grader	L=3.7 m	Operable	1984	13	7	-
7.	Motor Grader	L=3.7 m	Under Repair	1995	2	7	Useful
8.	Wheel Loader	1.5 m3	Under Repair	1987	10	7	Useful
9.	Wheel Loader w/Backhoe	0.670.15 m3	For Disposal	1987	10	7	-
10.	Wheel Loader w/Backhoe	0.870.25 m3	Operable	1992	5	7	Useful
П.	Dump Truck	6 t	Operable	1975	22	8	-
12.	Dump Truck	6 t	Under Repair	1975	22	8	-
13.	Cargo Truck	61	Operable	1986	11	8	Useful
14.	Cargo Truck	61	Operable	1984	13	8	Useful
15.	Electric Generator	75 kVA	Operable	1979	18	6	-
16.	Air Compressor	3 m3/min	Operable	1992	5	6	Useful
17.	Welding Machine	220 A	Operable	1979	18	4	-
<u>B. V</u>	ehicles						
1.	Pick-up Truck-1	Single Cabin, 0.75 t	Operable	1996	1	6	Useful
2.	Pick-up Truck-2	Single Cabin, 0.75 t	Operable	1983	14	6	-
3.	Pick-up Truck-3	Double Cabin, 0.75 t	Operable	1985	12	6	-
4.	Pick-up Truck-4	Single Cabin, 1 t	Under Repair	1981	16	6	-
5.	Station Wagon		Operable	1980	17	7	•
6.	Motorcycle (20 nos.)	100 cc	Operable	1990	7	5	Useful
26.	Motorcycle-21	100 cc	Operable	1984	13	5	-
27.	Motorcycle-22	100 cc	Operable	1984	13	5	-
28.	Motorcycle-23	100 cc	Operable	1980	17	5	-
29.	Motorcycle-24	100 cc	Operable	1980	17	5	-
<u>C. O</u>	Iffice Equipment						
1.	Computer w/Printer		Operable	1997	0	-	Useful
2.	Computer w/Printer		Operable	1995	2	-	Useful
3.	Radio Set		Operable	1990	7	-	Useful
4.	Grass Cutter (Office Main	tenance)	Operable	1997	0	-	Useful

Table 4.5.3 List of Present O&M Equipment

Source : NIA Region VI Office and NIA JSRIS Office

•

			¥		(Unit : Pe	sos 1,00 0)
Description	1992	1993	Year 1994	1995	1996	Tota
Actual Income			1777			1011
A. ISF Collection						
a. Current Account	5,029.8	4,466.2	3,981.8	3,327.1	4,603.9	21,408.8
b. Back Account	924.4	1.885.4	2,333.1	903.2	2,008.3	8,054.4
Total (ISF Collection)	5,954.1	6,351.6	6,314.9	4,230.3	6,612.2	29,463.1
B. Equipment Rental	673.7	311.8	1,015.9	1,073.5	3,362.5	6,437.4
C. Other Incomes *1	20.6	0.3	9.4	7.6	16.0	53.9
Grand Total (Actual Income)	6,618.4	6,663.7	7,340.2	5,311.4	9,990.7	35,954.4
. Actual Expenses						
A. Personal Services						
1. Salaries	2,856.6	2,788.1	4,011.7	5,712.0	6,098.5	21,466.9
2. Wages	37.9	16.2	6.4	1.2	-,	61.7
3. Terminal Leave	270.9	99.5	182.0		185.9	738.3
4. Medical Allowance	201.6	205.3	215.7	267.0	214.7	1,104.3
5. Meal Allowance	63.7	66.1	71.6	84.0	69.5	354.9
6. Children Allowance	69.3	73.4	77.1	92.8	79.1	391.3
7. 13th month pay + P1,000.00 Cash Gift	776.6	418.6	495.7	286.3	1,006.8	3,014.0
8. GSIS Life & Retirement *2	186.3	237.6	291.3	200.0	2,000.0	715.2
9. Medicare Contribution	23.1	29.5	33.9	1.3	0.2	88.0
10. Home Development Mutual Fund	38.6	37.6	74.4		0.2	150.0
11. State Insurance Premium	18.3	23.3	24.8	0.1		66.5
12. Other Personal Services	683.9	954.4	1,329.5	1,781.1	1,489.2	6,238.
a) PERA + ACA *3	497.9	865.4	1,149.5	1,234.0	1,085.9	4.832.1
b) PIB + Loyalty Award *4	186.0	\$9.0	180.0	547.1	206.0	1,208.1
c) Hazard Pay	100.0	69.0	160.0	347.1	200.0 59.3	59.
d) Anniversary Bonus					138.0	138.0
13. Uniform Allowaoce (Industrial Security Guard)	1.0	1.0		3.9	5.4	133.
Total (Personal Services)	5,227.8	4,980.6	6,814.1	8,229.7	9,149.3	34,401.
B. Maintenance & Other Operating Expenses						
1. Contractual Services	217.1	244.1	266.3	177.0	54.9	959.
2. Traveling expenses	34.6	31.4	25.2	14.1	11.1	116
3. Supplies/materials/parts/sundries	102.0	141.7	38.2	20.3	145.4	447
4. Water/Illumination & Power Services	44.0	40.3	33.8	17.0	0.1	135.
5. Fuel and Oil for Vehicles				40.7		40.
6. Communication Expenses				0.8		· 0.
7. RATA/Other Allowances *5	8.4	13.2	32.7	23.4	46.8	124.
8. Auditing Services	0.3	4.8				5.
9. Rehabilitation/Repair of Equipment/Vehicles		0.3		0.6	2.4	3.1
10. Miscellaneous Expenses *6	76.9	81.8	74.7	28.4	47.9	309.
11. Furniture/Equipment		88.0	0.5			88.
12. Losses & Expenses on Collection in Kind	92.8					92.
Total (Maintenance & Other Operating Expenses)	576.1	645.6	471.4	322.3	308.6	2,324.0
Grand Total (Actual Expenses)	5,803.9	5,626.2	7,285.5	8,552.0	9,457.9	36,725.
Ref. Grand Total (Actual Expenses of only JSRIS)	5,803.9	5,626.2	6,201.4	7,160.8	8,146.9	32,939.

Table 4.5.4 Actual Income and Expenses of JSRIS Office

CY 1994 to 1996 includes expenses of Barotac Viejo (BV) RIS Office. Effective April 1994 BVRIS was merged with JSRIS. otes

Data of BVRIS are included from Apr. to Dec. in 1994 and full year in 1995 & 1996.

*1: It consists of certification fees, sale of scrap and rent of office facilities.
*2: GSIS : Government Service Insurance System
*3: PERA : Personal Emergency and Relief Allowance, ACA : Additional Compensation Allowance

*4: PIB : Productivity Incentive Bonus
*5: RATA: Representation Allowance and Transportation Allowance
*6: It consists of insurance/registration of buildings and vehicles, irrigation share in ISF collection, fiscal allowance and collection viability bonus.

Source : NIA Region VI Office

.

Items	Quantity	Year Acquired	Operable	Inoperative (Needing repair)
Equipment				-
1. Construction				
Case backhoe loader	i	1992	I	
Furukawa looder	<u> </u>	1987		<u> </u>
Furukawa backhoe loader	1	1987		<u> </u>
Sumitomo excavator	I	1992	<u> </u>	
Mitsubishi excavator		(978	1	
Fiat Allis buldozer	1	1984	<u> </u>	
Champion grader	1	1995		1
Mitsubishi grader	L L	1987		(For disposal)
Komatsu grader	<u> </u>	1984	11	
Sumitono crane	1	1978	ł	
Fuso dumptrock	2	1975	I	1
Hino cargo truck	1	1984	I	
Hino cargo truck	1	1986		I
UNO air compressor	1	1992	1	
Komatsu electric generator	1	1979	I	
Seinetsu welding machine		1979	I	
Kawasaki grass cutter		1997]	
Sub-total	18		12	6
2. Survey				
Transit		1978		1
Dumpy level		1978		1
Seb-total	2		Û	2
3. Office equipment		1		
Computer set	2	1997	2	
Triumph typewriter	14	1979	14	
Oliveni typewriter	2	1980	I	1
Moster steel safe		n.a.	1	
Carrier aircondition	2	1995	2	
Sony aircondition	1	1995		
Freedor		1980		
Slide projector		1980 .		
Panasonic karaoke		1990	1	
Musicmate public address sing along	1	1990	1	
Olivetti adding machine	2	1977	2	
Canon camera	2	1994		2
· · · · · · · · · · · · · · · · · · ·	1	1995		
Kodak camera	31			5
Sub-total			L'J	
4. Communication]	1994.0	1	•
Neutec transmitter-receiver	52	1274.0	39	13
Total		· · · · · · · · · · · · · · · · · · ·		
B. Vehicles		1981	<u> </u>	1
Nissan patrol				
Nissan pick-up		1985		
Cherokee station wagon	I	1980	<u> </u>	
Toyota pick-up	<u> </u>	1983		· · ·
Toyota pick-up		1996	1	
Suzuki motorcycle	2	1980	2	
Suzuki motorcycle	2	1984	2	
Kawasaki motorcycle		1990	20	
Sub-total	29	<u>_</u>	28	1

Table 4.6.1 Inventory of Existing Equipment and Vehicles of the JSRIS Office

Source: Data provided by the Jalaur-Suague RIS Office, NIA

n.a. not available

Table 5.1.1 Proposed Measures to Implement the Prioritized Solutions by the PRA Sessions and the JICA Study Team

Chronic Instruction Construction	MALACENOR	 Impation Structure 1. repair and rehabilitation of damaged canal 	Water Management and OXM 1. without water distribution	1. URUNDIR UN VAUUE INSTITUTUR	1. organization of devicement for market	1. planting of trees in the watershed area
 Tent distribution Tent distribution<	ADDRAC AN	 repair and rehabilitation of damaged canal 	1. VILINARIA WARE DISTRUMINA			
 Constructions Constructions						
2. Non-special sectors Consider of the sector s		cotes and turbouts	 training of water vestern nunageneral 	2. reorganize the LA	and prodit assistance, and previous at a set of the	12. adoption of organic tanning
 Consider a manuality of second second				1 contractors recorder to farmers of these	of rest-harvest farilities	 revention of sitish and hum farming
Section of function of the matrix yours Construction of the matrix yours Construction of the matrix yours Construction of the matrix yours Construction of the matrix yours Construction of the matrix yours Construction of the matrix yours Construction of the matrix yours Construction of the matrix yours Construction of the matrix yours Construction of the matrix yours Construction of the matrix yours Construction of the matrix yours Construction of the matrix yours Construction of the matrix yours Construction of the matrix yours Construction of the matrix yours Construction of the matrix yours Construction of the matrix yours Construction of the matrix yours Construction of the matrix yours Construction of the matrix yours Construction of the matrix yours Construction of the matrix yours Construction of the matrix yours Construction of the matrix yours Construction of the matrix yours Construction of the matrix yours Construction of the matrix yours Construction of the matrix yours Construction of the matrix yours Construction of the matrix yours Construction of the matrix yours Construction of the matrix yours Construction of the matrix yours Construction of the matrix yours Constreling of the matrix yours Const		2. remove uregel turbouts and construct	(UT N VIVI I MIRKIN)			
5 control water myooning data 6 control water water myooning data 1 mooning data 1 mooning data 2 control water myooning data 7 control water water myooning data 1 mooning data 1 mooning data 2 control water myooning data 7 control water myooning data 1 mooning data 1 mooning data 2 control water myooning data 7 control water myooning data 1 mooning data 1 mooning data 2 control water myooning data 8 control water myooning data 1 mooning data 1 mooning data 2 control water myooning data 8 control water myooning data 1 mooning data 1 mooning data 2 control water myooning data 8 control water myooning data 1 mooning data 1 mooning data 2 control water myooning data 8 control water myooning data 1 mooning data 1 mooning data 2 control water myooning data 9 control water myooning data 1 mooning data 1 mooning data 2 control water myooning data 9 control water myooning data 1 mooning data 1 mooning data 2 control water myooning data 1 mooning data 1 mooning data 1 mooning data 2 control water myooning		legal structures	establishment of monitoring system	obligations as 1A officers and members	The procession subside spectral to a light	
4 constraint constraint constraint constraint constraint 4 constraint constraint constraint constraint constraint constraint 4 constraint constraint constraint constraint constraint constraint constraint 4 constraint			in the second of 14 measured and	14. Continue Advision to trendition and	survativ	
4 control free lang 1 1 control free lang control free lang control free lang control free lang 1 control free lang 1 control free lang 1 control free lang 1 control free lang 1 control free lang 1 control free lang 1 control free lang 1 control free lang 1 control free lang 1 control					1 oradiumisto of rest.	
 Contrast de contrast not exit Contrast de contrast not exit Contrast de contrast de con		4. CONCRETE JUINE	CUPROUTINGS			
1 The character and represent the character of control of the character and the character			5. entrust ISF collection to the IA	5. capital build-up	4. UNC URBERT PERMITARY	
1. 1. Consider production 1. 1. 1. Consider production 1. 2. 1. Consider production 1. 2. Consider production 1. Consider production 2. Consider production <				lo, sustain cooperation	 strengthering of agreetieral extension 	
1. 1. Provide National and information and Control National and Profession in Control National Contro National Control National Control National Control National Cont				7. organize farm worken as nembers"1	services including new familing technology	
 Another Mathematication and form the formation and formatio	A North Control of Con	1) which it is and intervent the existing		itas	Arreuture development	 site applican coordination among concerned
 A consistential of constraints of cons	A AURY LEAD			1	Virgenforth at method belowed with darling the	accurres (DENR, NIA, LGUs, DA, DAR an
 Tartoring SF solution in how yorks characterized in how yorks management of how yorks man		CIVE CAUCH CREAS	Water management and twin work of			
 To prove unserver of Lips' robust in shorts, real interval in the interval in the interval intervension of the intervension		renew the turnouts and provide feeder	improving ISE collection through the following:	1 AS CDROUGH SUITACHERT AND CONTINUES		
 		canel and measuring devices	(u) proper turn-over of ISF collection function	transing program, development of functional	· water	 controunty organization
 An intermented al lar schular in helps for an schulzer and planeters region An intermented al lar schular in helps for an schulzer and planeters region An intermented al lar schular in helps for an schulzer and planeters (SS) and the schulzer schulzer for helps process value in SChulzer for an Schulzer for				comminees, establishment of 1A office	2. Instrase puddy yickis, through uniprocenem	 movide training and extension for staff of
 Antonenterential of logical fractional services and restored of a constraint of logical fractional services and restored of a constraint of logical fractional services and restored of a constraint of logical fractional services and restored of a constraint of logical fractional services and restored of a constraint of logical fractional services and restored of constraint of logical fractional services and restored of constraint of logical fractional services and restored of constraint services and restored of constraints and restored of and restored of constraints and restored of and r		1.2. HILPROVE CRAME SYSTEMS RECORDS CARAG			and the second se	
 argo and far contanton of backfirds argo and far		lining and embankment upgrading	(h) improvement of LSF evoluation policy for	secting up to the rectance standard and a section		
Image: Comparison of hyper crackeds Comparison of hyper crackeds Image: Comparison of hyper crackeds Comparison of hyper crackeds Image: Comparison of hyper crackeds Comparison of hyper crackeds Image: Comparison of hyper crackeds Comparison of hyper crackeds Image: Comparison of hyper crackeds Comparison of hyper crackeds Image: Comparison of hyper crackeds Comparison of hyper crackeds Image: Comparison of hyper crackeds Comparison of hyper crackeds Image: Comparison of hyper crackeds Comparison of hyper crackeds Image: Comparison of hyper crackeds Comparison of hyper crackeds Image: Comparison of hyper crackeds Comparison of hyper crackeds Image: Comparison of hyper crackeds Comparison of hyper crackeds Image: Comparison of hyper crackeds Comparison of hyper crackeds Image: Comparison of hyper crackeds Comparison of hyper crackeds Image: Comparison of hyper crackeds Comparison of hyper crackeds Image: Comparison of hyper crackeds Comparison of hyper crackeds Image: Comparison of hyper crackeds Comparison of hyper crackeds Image: Comparison of hyper crackeds Comparison of hyper crackeds Image: Comparison of hyper crackeds Comparison of hyper crackeds Image: Comparison of hyper crackeds Comparison of hyper crackeds Image: Comparis		4. nowede settling basin and farm road		and business tie-ups with operators of	🕴 application, agmenteroural application, pest	INTUNIONE. WRECKARD RIANAGEMENT and
 Circledabilitetti of Porper Gualdee Circledabilitetti of Porper Gualdee Circledabilitetti of Porper Gualdee Circledabilitetti of Porper Gualdeee Circledabilitetti of		f interne the conferm open statem.		Aret-harvest furthings	control, seeding method and how use of	appropriate upland farming technologies
 (III) A develop wonten werker conjectatives. In the second and any and an in the Staugue constant and antimater restrict and an interspective second and antimater restrict and an interspectives. (A second and antimater restrict and an interspectives with ISC. (A second and antimater restrict and an interspectives with ISC. (A second and antimater restrict and antimate					remined seed	4. develop unoroved soil conservation
 A convertitive structure of constant and market of the during o					The second second of second seco	
 areas with no crusting larrance conjournes conjournes conjournes entry in a new procession in the source conjournes entry and merge and mergenes. A mercayone, a moment of maning and mergenes and mergenes with 15 mercayone, and merge and mergenes and mergenes. A mercayone, and merge and mergenes and mergenes and mergenes and mergenes and mergenes. A more and mergenes and mergenes and mergenes and mergenes and mergenes and mergenes. A more and mergenes and mergenes and mergenes and mergenes and mergenes and mergenes. A more and mergenes and mergenes and mergenes and mergenes and mergenes and mergenes. A more and mergenes and mergenes and mergenes and mergenes and mergenes and mergenes. A more and mergenes and mergenes and mergenes and mergenes and mergenes and mergenes. A more and mergenes and mergenes. A more and mergenes and me			management for ISP billing and collection			
 4. content As and infragram service cuber conditions the formation service cuber and period training and aviatance to the IAA 5. provide training and aviatance to the IAA 1. Subsequest (SCA) and freque cuber (SCA) and freque (SCA) and aviating supports (SCA) and SCA) and SCA an				areas with no existing larmers' compa	through received includent in the bungled	5. Develop appostorestry system such as
 cooperatives (LSC), and merge other covering evolver to be IAN 5. provide training and animater to be IAN 6. fodome the ISCs at the RUS kewil SC to durdraft prantity system management 6. fodome the ISCs at the RUS kewil 6. fodome the ISCs at the RUS kewil 6. fodome the ISCs at the RUS kewil 7. The rest of the				4. convert IAs jato imigation service	KIS during the dry scarm	randomly-mixed and row-interctory agro-
 Cubrany concrantors with ISC. Sprovide training and answamer to the LAN In General De ISCs at the RUS keel Concrete the ISC at the RUS keel Concrete the RUS keel Concrete the RUS keel Concrete the RUS keel Concrete the RUS keel Contract farmers through reversion of revel			tet interne of meaning in the lat for 155	concentives ((SCs) and mente other	4. nontage cross diversificutions up the Sugree	KURTER P
1 According toop convector to the TAX 1 In the first of a convector for the TAX 1 In the first of a convector for the TAX 1 In the first of a convector for the TAX 1 In the first of a convector for the TAX 1 In the first of a convector for the TAX 1 In the first of a convector for the TAX 1 In the first of the					the extension of an operation of the second s	Antelos chamelus antenna actual
An 5, provide transmission for Kavo all (recent the KSA- at the RS Sevel MCC is undertacting provision of transmission MCC is undertacting and (remaining seven) An intrinsmission and internation and complementation of interparticle and supplementation of interparticle and supplementation interpreted and an interparticle and supplementation interpreted and interparticle and supplementation interpreted and and interpreted and interpreted and interpreted and interpreted and interpreted and interpreted and interpreted and interpreted and interpreted and interpreted and interpreted and interpreted and interpreted and interpreted and and interpreted and interpreted and interpreted and and interpreted and interpreted and interpreted and and interpreted and and and and and and and and and an			collection	CONSTRUCT CONSECTION ON AND LOC		
dd Ixa ISCS to undertare partui tystem nawgenon kall Infect maning and communication Infect maning and communication And I. strengthen IDOs separating for merspects Americular submer of new tarming consistent of nerspects Americular submer of new tarming consistent of nerspects Infect maning and communication development of tarmer submersion An provide communication and transpect and provide communication and transpect component of demandiant of new tarming sectors and transpect and transpec			2. improve and strengthen water munuperitent	5, provide transmip and assessance to the IAN	of paddy failure from drought and rest	7. Social development through the adoption
Real 0. federarcher RLS kevit Accordinand subbar services Accordinand se				ISCs to undertake partial system managements	IDCESTION	of party perory approach to planning and
 And Statistical contractions of nerrospenses for an interval i				2 (advantation of the DIC land	A secondariant constant of the second of the	
And And An interpreter JDX-supplity for intervence 1. Richt raining and extimuter By the construction and distorting and extimuter to functorable 2. Romewhalt and the market to an and training conter An impowe database management on the basis 2. Romewhalt and documents An impowe database management on the basis 3. Ruminy of extension and documents An impowe database management on the basis 3. Ruminy of extension and documents An impowe database management on the basis 3. Ruminy of extension and documents An impowe database management on the basis 3. Ruminy of extension and documents An impowe database management on the basis 4. Ruminy of extension and documents An impowe database management on the basis 4. Ruming of extension and documents An impowe database management on the basis 4. Ruming of extension and documents An impowe database management on the basis 4. Ruming of extension and documents An impowe database management on the basis 4. Ruming of the results An impowe database management on the basis 4. Ruming of the results An introduction of impowed and travels 4. Ruming of the results An introduction of extension and documental 4. Ruming of the ruming of ruming			hower affreight truining by using provide	D, rederate the tous at the KUS level		
I. Sutergree JDCX-sepability for interspreet I. Field Intaining and continuent of marchagenet interview of marchanese for eventuation of marchanese powers Marching and marchanese and sepatitisminan of marchanese Centropration of conservation interview of marchanese for eventuation in the marchanese marchanese for some marchanese mar			O&M manual, establishment of computenzed		Agneutiural extension	A. develop model project for sub-weershed
by the and sequilibrance of mercagency poles: eventuation of mercagency poles: and sequilibrance of mercagency poles: a consument of mercanic and merchange evenous by consert transmer and transper and 2. mercane of schwinge evenous by consert transmer and transper and 2. mercane of schwinge evenous by consert transmer and transper and 3. provide communication and transper and 4. more and adoremony of transper and 4. more database management on the hash of computertaxit system and 4. more database management on the hash of computertaxit system and 4. more database management on the hash of computertaxit system and 4. more database management on the hash of computertaxit system and 4. more database management on the hash of computertaxit system and 4. more database and 4			www.mad.communication www.m. and	 surprotes IDOS capability for inter-survey. 	1. field training and extension of new turning	inchehinetion and management
A component of inter-agency provers and stabilishman of inter-agency provers vice-ing and jeckmical committees and stabilish committees A inspected communices and of componentized system interview of the hasis the management on the hasis and of componentized system interview of the hasis and componentized system interview of the hasis interview of th			and These 1.4. If assesses involvements in the	collaboration (howeth arovision of framing	excharingers to contact farmers through	
Lon 2. retrouting and (schmidt committees) from a retering and (schmidt committees) from a remaining contract communes. A removed and random remaining compression of random remaining contract system and random remained to a requirement of the hasis is a requirement of compression of compression of compression of compression of compression of remaining contract system.				and article intervet of interviewer weather	deservant of demonstration of the	
A recent and reconstruction of contracts. A removale contractive design and realing contracts. A removale contraction and realing contracts. A removed database management on the basis. A removed database management on the basis. A remaining contracted system. A remaining contract			A.			
 2. Provate for SNA Kegrona. Teaming Center 3. Provide evintume/action of teampoint 4. Improve database management and transminumes 4. Improve database management on the hash is of compenentical synem. 4. Improve database management on the hash is of compenentical synem. 			3. exablish monitoring system on the busis	steering and technical committees	T. famorie-gamerickingerickaminge exiconen by	
Convide communication and transport cutoment and transport cutoment and transport cutoment and transport cutoment and transport component and transport c			of compactized system and communication	 renovate the NIA Kegional Training Conter 	CONTACT FAITNOTS STRANGO	
Suagoer RLS offices requirement and remining equipment of the signment in-CoRM sections. A improved database management on the hashs distanted CoRM sulf difficuend ORM Nulf & II continues implementation & II continues implementation		-	everyon to be installed	3. provide communication and transport	3. truming of extension staff of the Municipal	
2.0 for Q&M screece. 4. improve database management on the basis datament for Q&M screece. 4. improve database management on the basis datament for Q&M suif & 11 contrast implementation & 12 contrast implementation & 12 contrast implementation			I stratches the fefere function PIC without	equipment and (the state of sources from the state	Autoritium Office (MAO)	
tici i i i i i i i i i i i i i i i i i i			אי אוונווונווננט וווג למושה כפרלת ערכו ווווויו			
			through restructuring of its OKM wothms.	.4. Improve dolanese numbrencer on the nasis	4. Greenheelaland and gissertinguism of bew	
<u>वि गंडा व शिन गंड छोन गंड</u>			proper work load assignment for OKM staff	of computenzed system	fammer sechasologies	
.⊣ <u>गंड. च. श्र</u> ीन. गं <i>र.</i> <u>थिन गंड</u> .			and revinitions of additional OKM vall		Associational condition	
<u>લંદ ન શ્રે</u> ન્ લંદ <u>શ્રેન્ તેલ</u>		-	list introduced Truce I & Il contract introducentation		 Ison restriction of the existing (amore). 	
 2. instructional strengthering of conferatives 3. instructional strengthering of conferatives 4. instructional strengthering of conferatives 5. instructional strengthering of instruction instruction instructional strengthering 6. instructional strengthering 7. instructional strengthering 8. instructional strengthering 9. instruction						
 1. development of conversion of improve of conversion of improve of					NOAT BELLEVILLE	
 Cerviorment of croated financial intermediation annoconstraint annoconstran					2. instructional scorngeheating of comperatives	
 interrectation <					3. development of expanded linuncial	
 4. introduction of intrgaron' advectance coveleptment fund (ADF) divertiging mediators individuality divertiging mediators individuality a vorce in a cruixing mediators individuality a vorce in a cruixing mediators individuality a vorce individuality a vorce individuality a vorte individual			•	-	in the module from	
 A INTOCOMENTATION OF A DEVICE A DEV						
 Geventment Fund (AALDF - Marketing and ANAM Jan (AALDF - Marketing and ANAM Jan (AALDF - Marketing Care) in a service of the and Anam (CAALDF - Norther Network (CAALD						
 Mandoxine.cond.dowu.harcossi.in:the interview of industry. Accoss we canding methanoval facilities. Accoss we canding methanoval facilities. Anarova use-ups, with reperation of weaking capitual Instantion of weaking capitual Instantion of weaking capitual Instantion of the castrong methanoval facilities. Instantion of the castrong methanoval facilities. Instantion of additional methanoval facilities. Instantion of weaking capitual Instantion of the castrong methanoval in weaking capitual Instantion of the castrong methanoval 					development fund (IADF)	
 avec in existing prevaluences factilities and investigation of working capital provision of working capital investigation of working capital investigation 					Marketine and post-hurvest factilities	
and row-turng freet through result hadren of houses the service with some second metal metal of the provision of a metal metal of the control of additional of the control of additional of the control of the control of the control of the control of additional of the control of					 access to existing procedures facilities 	
Instances Instances Instances					and insidence fleet through establishment of	
Backlines 2. Provision of working capital 3. marking 3. marking 5. marking 6. marking 7. linnage of the castism NLAN service for all 8. linnage of the castism PLAN service 3. miner repair of the castism of additional real roads 3. provision of additional real roads				_	Pussings the unservice work emergency of such	
 provission of working capital morensine capacity building on agricultural marketing mustice of the castinguistic things of the casting tarvait must negative of the casting rand marketing must regater of the casting rand marketing provision of additional rule in marketing 						
 2. provision of working capacity building in agricultural intersive capacity building in agricultural intersive capacity building in agricultural intersive of the current proving international internation of additional arcs with the current of the current of additional rule. Intervention of additional rule intervention. 2. minor repair of the current of additional rule. Index holdy: and 						
 markning markning frankning frankning<!--</td--><td></td><td></td><td></td><td></td><td>provision of working capital</td><td></td>					provision of working capital	
marksting Emmuneration and answerk Emmuneration and answerk I. Illinger or and hor anyowner with the curab Answerker 2. Anione repair of the exacting runal reads 3. provision of additional rula runds, bridge and					3. Intersive capacity building on agricultural	
Example and the case of the existing NLA's service and L. Inturge of the existing NLA's service and with the anti-Marinery and after inflormericen 2. minur repair of the existing and a wide 3. provision of additional anti- bridge and					marketing	
 Innarce of the existing NLA's service roads with the oursiblement of the existing road after improvement Innor repair of the existing road roads provision of additional road roads 					Farm-to-market mad activery	
 Intervention of the construction of the construction					1. The first of the function of the first of	
with the curabbarangay wind after infronvention 2. minor repair of the existing numb. 3. provision of additional numb. Profes and			~			
2. minure regrair of the existing number of the existing number of additional number bridge and					with the rural/barangay axid after improvences	
3. provision of additional rural heads, heads, heads					2. minor repair of the existing nural roads	
					7 newision of additional most must. Indee and	

Arca (na) Jataur Proper Ist Paddy 8,820 2nd Paddy 8,820 3rd Paddy 1,200 Watermelon (3rd crop) 100	.				l				1		ç		4
y on (3rd crop) *	Total	Jan.	Feb	Mar	Apr	May	ur,		Aug	yep	5		3
		<	c	c	c	ব	5	91	15	15	16	7	¢
		> <u>'</u>	> -	⊳ r	> <	r C	i c		ç	v.	1	15	5
		<u>.</u>	9	- !	2	Þ t	> <	o <	• C			c	C
		m	ŕ	÷	3	ถู เ	- ·	> <	> <		• <	. <	
	80	<u>11</u>	ខ	54	16	ж,	0	о (⇒ •	⊃ <	.	5 <	> <
Mungbean (rainfed, 3rd crop)* 600		5	-	-	-	er.	•	•	>				
Suague									3	3	\ ,	t	c
Ist Paddy 2,900		0	¢	0	0	4	12	16	2	<u></u>	2 9	- •	> •
		15	16	2	0	0	0	0	¢	n	2	cI	3
	. 00	2	: "	- 00	0	0	0	0	0	0	•	Q	Ξ
		2 0	2 2	, <u>:</u>	' F	-	C	C	c	o	0	0	Ö
3rd Paddy * 50	9	.	2	<u>ر ا</u>	3.	<u>,</u>	> <		o (o c	• <	Ċ	Ċ
Watermelon (3rd crop) * 20	80	12	50	72	0	è e	-	,	، د		• <		
rop)*	17	~		-	4	r.	0	5	°		>		
Planted					Tota	I Labor Re	Total Labor Requirement (man-day)	(man-day)					
Area (ha)	Total	Jan.	Feb	Mar	Apr	May -	Jun	Jul	Aug	Sep	ğ	VoV	å
		4	<	4	¢	20076	106 101	011 011	136 524	128.948	144.119	60.682	0
			>	000,00	> <	07272				15 51	104 103	136 524	136.534
2nd Paddy 8,820	~	128,948	144,119	00,682			> <	2	0			0	
3rd Paddy * 1,200	5	3,960	15,840	15,840	27,720	15.840	э «	0	0 0	> <	> <	> <	
((3rd crop) *	8,000	1,200	2,000	2,400	1,600	2008	o	o I		• •	> (> <	
*(aon	10.200	3,060	510	510	4,080	2,040	0	0	¢				
Total 19.540	1,614,440	137,168	162,469	79.432	33,400	\$6.606	106,193	144,119	136,534	174,460	250.312	C17.161	1:00
addy	249,400	0	0	0	0	12,470	24,916	47,386	44,892	ব	47,386	19.952	
		16,082	17,974	7.568	0	0	0	0	0	5,67	13,244	17,028	17.028
		17,640	23,814	14,994	0	0	¢	0	0	0	0	11,466	20,236
		165	33	9 9	1,155	(0	0	0		0	0	о (
(3rd rron) *		240	<u>8</u>	480	320	160	0	0	ð		0	0	0
• (and		765	128	128	1,020	510	0	0	0	1	0		
Total 6.020	5	34,892	42.976	23,830	2,495	1.330	¢	0	0	5.676	13.244	28.494	37.3.4
	l											000 000	110 011
Total Labor Requirement (man-days) 25.560	1.804.690	172.060	205,444	103.261	35,895	57.936	106,193	144,119	136.534	180.136	263.556	60/-022	1/2/240
Available Labor Force **					122.20	76 660	099 st	75,660	25,660	25,660	25.660	25,660	25,660
(persons)	25,660	25,660	000 013	000'07		0000113	513,200	513.200	513.200	513.200	513,200	513,200	513,200
(man-davs) ****	0.138,400	M7.616	010.400	011110				36	22	2	51	\$	7
Labor Balance (%) ****	29 34 40 20 /	÷.	ą	20	-		1	07					

Table 5.2.1 Labor Requirement and Labor Balance

-		Vith-Proje	<u>et</u>	W	ithout-Pro			Increment	
	Area (ha)	Yield (ton/ha)	Production (ton)	Area (ha)	Yield (ton/ha)	Production (ton)	Area (ha)	Yield (ton/ha)	Production (ton)
Jalaur Proper									
1st Paddy irrigated	8,820	5.00	44,100	6,120	3.40	20,808	2,700	1.60	23,292
2nd Paddy irrigated	8,820	5.00	44,100	4,910	3.30) 16,203	3,910	1.70	27,897
(Irrigated Total)	17,640	5.00	88,200	11,030	3.36	5 37,011	6,610	1.64	51,189
1st Paddy rainfed	0		0	2,600	2.24	5,824	-2,600		-5,824
2nd Paddy rainfed	0		0	1,940	2.24	4,346	-1,940		-4,346
3rd Paddy	1,200	2.24	2,688	1,200	2.24	2,688	0	0.00	0
(Paddy Total)	18,840	4.82	90,888	16,770	2.24	49,869	2,070	2.58	41,019
Watermelon	100	4.00	400	100	4.00	400	0	0.00	0
Mungbean rainfed	600	0.40	240	600	0.4(240	0	0.00	0
Total	19,540			17,470			2,070		
Suague									
1st Paddy irrigated	2,900	5.00	14,500	2,540	3.64	9,246	360	1.36	5,254
2nd Paddy irrigated	1,100	5.00	5,500	1,870	3.4	6,377	-770	1.59	-877
Mungbean partially irrigated	1,800	1.00	1,800	0		0	1,800	1.00	1,800
(Irrigated Total)	5,800			4,410			1,390		
1st Paddy rainfed	0		0	360	2.24	\$ 806	-360		-806
2nd Paddy rainfed	0		0	610	2.24	1,366	-610		-1,366
3rd Paddy	50	2.24	112	50	2.24	112	0	0.00	0
(Paddy Total)	4,050	4.97	20,112	5,430	3.30	17,907	-1,380	1.67	2,205
Watennelon	20	4.00) 80	20	4.00	0 80	0	0.00	0
Mungbean rainfed	150	0.40) 60	150	0.40	60	0	0.00	0
Total	6,020			5,600			420		
Total									
1st Paddy irrigated	11,720	5.00	58,600	8,660	3.43	7 30,054	3,060	1.53	28,546
2nd Paddy irrigated	9,920	5.00	49,600	6,780	3.3	3 22,580	3,140	1.67	27,020
Mungbean partially irrigated	1,800	1.00	1,800	0		0	1,800	1.00	1,800
(Irrigated Total)	23,440			15,440			8,000		
1st Paddy rainfed	0			2,960	2.24	4 6,630	-2,960	-2.24	-6,630
2nd Paddy rainfed	0			2,550	2.2	4 5,712	-2,550		
3rd Paddy	1,250	2.24	\$ 2,800	1,250	2.24	\$ 2,800	0	0.00	0
(Paddy Total)	22,890	4.8	5 111,000	22,200	3.0	5 67,776	690	1.80	43,224
Watermelon	120	4.00	9 480	120	4.0	0 480	0		
Mungbean rainfed	750	0.40	300	750	0.4) 300	0	0.00	0
Total	25,560			23,070			2,490		

Table 5.2.2 Agricultural Production under With and Without Project Conditions

		Ist Pac	Ist Paddy Impated	ated	2nd Paddy	addy 1mg	' Imgated	Paddy Imgated (masplant)	wed (tra	rsplant)	-9- 	3nd Paddy		Pade	Paddy Kanfed	, J	Na.	Watermelon		JUNK	āι	201
	Unit	ð	Price Value	Value	ð	Price Value	Value	ð	Price	Value	š		Value	ð	Price	Value	ð		Value	š	Price	Vatue
		1	peso	peso		peso	peso	Palay	peso	peso	Palay	peso	peso	Palay	peso	Peso		peso	peso			
Production Cost																				1	4	ì
Scerts	\$	011	11	1.540	140	11	1.540	8	11	1,100	140	11	1,540	140	Ħ	1.540	4	ğ	3,200	A	3	2
Fertilizer																					I	1
x	Å	16	17	1.531	50	17	1.581	б	17	1.551	8	17	1,020	8	17	1,020	8	17	850	<u>9</u>	17	510
SOCI	ke	a	អ	616	ឌ	Ħ	616	8	ន	616	14	ង	308	2	ដ	308	7	ន	<u>.</u> 08	0	ន	0
202	ъў.	13	п	143	5	11	143	13	11	14.3	2	11	7	10	::	011	14	1	ż,	•	=	¢
Chemicals																						
Herbicide			350	350	T	950	350	0.5	350	175	0.5	350	521	0.S	350	175	1	6 4	<u>8</u>		0	0
Invectivide	-	٦	<u>8</u> 05	2005	I	<u>8</u>	8	1	8	<u>8</u> 0		<u>8</u>	2005	1	8	8	-	Ş,	<u>8</u>		0	0
Fungicide	1	0.5	00 <u>7</u>	120	0.5	<u>\$0</u>	250	0.5	8	250	0	<u>8</u>	٥	0	8	0		<u>8</u> ,	<u>8</u>		0	0
Rodenteide				100			8			100			100			8						
Moluicide		` -	8	6	I	400	4 00	0.5	§	20 20	0	4 00	٥	0	ş	¢					0	0
Others				1.50			150			150			150			150			8			
Labor		69			71			8			S.			\$			8			17		
Hired	man-dav	36	8	2,800	92 2	30	2.350	8	8	4,000	23	9 8	2,240	ង	8	1240	4	80	3,200	0	8	ផ្ទ
Family	v ab-man	禹	0	0	32 5	0	0	40	0	0	ส	•	¢	ដ	Ö	0	4	٥	¢	*3	0	0
Machine/Tool/Animal																						
Handtractor/Tractor	day			00+-1			1,400			1,400			1.400			1.40			0			0
Cambao	yeb			200			300			8			200			ရွိ			0			0
Thresher	Anp			8			0 7			ş			350			05V			Ċ			150
Blower	, veb			8			8			202			180			150			à			8
Pump	•			801			80			200			ลี			10			8			0
Other				150			1,50			150			150			0% T			100			9.
Fuel/Oil				8			150			150			150			100			200			o
rsuhtoral)				10,930			11,210			11.515			8,790			8.623			9.612			2,250
Irrigation Service Fee *1	0K9Q			800			1,200			1.200			0			•			0			0
Harvestehr Sham "2				3,963			3,647			3.647			2,402			2 2 2 2 2 2 2 2			4.000			ป็

Table 5.2.3 Production Cost under Without-project Conditions

Pesos 8,000 for wet season paddy. Pesos 12,000 for dry season, free for 3rd and rainfed paddy 20,791 20,107 Peso

365

140 1.5.13

140 1,380

140 1,406 12,738

140 1,842

140 1,794

1,749 17,587 80 2.720

peso Peso Peso

Land Lease

Interest Land Tax

Tetal

50 8 4.675

9

s

00212 15.290

3

\$

2,240 12,545

8

3

2,240 14.978

8

ន

3.920 22.264

20

ş

80 2,500 166721

Ŷ,

3,

Peso Peso

Family Labor •4

Teat

18.344

13,490

Applied 1/8 (1.2.5) of gross yield for all crops Cash expenses X 0.5 x 4 months x 8% interest/month = 16 % x subtotal Family labor cost is assumed at P30/day taking consideration of employment opportunities of other jobs 977

		IST P3	Ist Paddy Impated	aled	51 K	I Fradoy Impared	C BIOD	N DUT	ind Pacity Impated	DOIE	a puir	zna raday imgilia	8	38	managers moniaum w	1 Paneo
		Alb)	21	5	ш)	(transplanting)	(a)	(din		(3)	E		្ឋ			
	t'nit	ò	Price	Value	δ	Price	Price Value	ð	84	Value	ð	Price	Value	ĝ	Price	Value
¢		Paddy	osad	peso	Paddy	peso	peso	Paddy	pc50	peso	Paddy	beso	peso		peso	peso
		2	:		ŝ	2	-	2	2		ŝ	ì	203	ł	ĉ	1
ACCOS	¥	301	2	1,000	00	10	200	3	9	1,000	2	9	200	G	2	2
Fertilizer																
X	ę,	8	17	1,700	8	17	1,700	8	17	1,70	100	17	1,700	2,	17	510
7205 7	ЯŶ Х	36	ដ	770	¥.	1	770	35	ដ	044	ž	H	ĥ	8	ដ	000
50	x S	2	[]	2.82	37	11	245	SE	1;	385	22	11	385	8	11	055
Chemicals																
Herricide		1.0	250	350	1.0	3.0	350	1.0	250	150	1.0	350	350	0.5	0 4	82
Incericide	I	5.1	500	750	1.5	500	750	1.5	500	750	1.5	500	750	0.5	005	250
Fungicide	-	1.0	<u>500</u>	005	1.0	500	500	1.0	202	<u>s</u> 00	1.0	<u>8</u> 0	20	0.5	<u>500</u>	\$\$¢
Rodentride				150			91 22			150			150			
Mollsisade		1.0	6 0	1 00	1.0	ş	<u></u>	1.0	\$	ş	1.0	ş	ą			
Others				200			200			200			20			201
Labor Total requirement	_	80			80			98			104			40		
Hired	упр-прат	4	ž	3,200	8	2	4,160	ş	80	3,200	8	×0	4,160	ži	80	1,000
Family m	man-day	ģ	0	0	23	0	0	4	0	0	С,	0	0	4	¢	o
Machine/Tool/Animal																
Handtractor/Tractor				1,600			1,600			1,600			1,600			1,600
Curahao				0			0			0			0			0
Thresher				50 <u>5</u>			500			8° 80			\$05 2005			8
Blower				250			250			250			250			30
dund																0
Other				150			150			150			150			100
Puel/Oil				100			100			100			90 100			100
Subtotal				12,605			12,765			12,605	•		12,765	:		7,150
Service Fee *1	peso			90x			808			1,200			1,200			o
Harveste'sr Share "2	peso			5,367			5,363			5,363			5,363			3,125
Land Lease	sacks															
Land Tax	peso			5			5			4			4			3
Interest *3	Peso			5 4			<u>5</u> 4			624			5 4			21
Total				19.328			19,493			8,7,91			19,403			10.653
Average of Paddy =5		(1st Paddy	Ş		19,411			(2nd Paddy)	ç		19,811					
Family Labor *4 Tetal	Peso	8	80	3.200	8	£	4,160	3 3	9 2	87.5 87.5 70.5	5	8	4160 24.053	3	80	1,920

Table 5.2.4 Production Cost under With-project Conditions

Pesos K.600 for wet season paddy. Pesos12,000 for dry season, free for 3rd and rainfed paddy Applied J/8 (12.5) of gross yield for all crops F 9 6 7 8

Cash expernes x 0.5 x 4/12 year x 20% interestyear a 3.3.% x subtotal Family labor cost is assumed at PR0/day taking consideration of employment opportunities of other jobs Assumed that transplanting method will be increase by 50% of paddy area

t Condition
: Project
Without
ı and
With
r Hectare
rofit per
Prof
Table 5.2.5

			With J	Project					Withou	Without Project		
		Outeut			Production	Net		õ	Output		Production	Net
	Output	ð	Price	Value	Cost	Profit	Output	Q.	Price	Value	Cost	Profit
		lon	peso/ton	peso	peso	peso		ton	peso/ton	peso	peso	peso
1st Paddy irrigated **	Vebed	0 \$	8.580	42,900	23.091	19.809	Paddy	3.40	8.580	29,172	20,307	8.865
vatati proper		2			19,411 *	23,489					17,587 *	11.585 *
Sugar	Paddv	5.0	8,580	42,900	23,091	19,809	Paddy	3.64	8.580	31.231	20.307	10.924
· · · · · · · · · · · · · · · · · · ·					119,411 *	23,489 *					17.587 *	13.644 *
2nd Paddy irrigated **						007.07	T T Ç	() () ()	0020	20212	102.00	7 575
Jalaur proper	Paddy	5.0	8.580	42.900	23.491 10 011 *	19,409 22 080 *	raddy		0000	+7 C O 7	+ 166.71	10.323 +
C. 10 March 10	Daddy	0 v	8580 085	42,900	23,491	19.409	Paddy	3,41	8.580	29,258	20.791	8.467
andrac	form r	2			19.811	23,089 *	•				+ 166'/1	11.267 *
let moddu roinfad	Phydy						Paddy	2.24	8.580	19,219	14,785	4,434
saturat Associates	· · · · · · · ·										12.545 *	6.674 -
2nd naddy rainfed	Paddv						Paddy	2.24	8.580	19.219	14.785	434
names from both											12.545 *	6.674 *
Mungbean partially irrigated	Dry bean	1.0	25,000	25.000	12.573 10.653 *	12,427 14,347 *						
Srd crops ***												
3rd naddv	Paddv	2.24	8.580	19.219	14,978	4,241	Paddy	2.24	8.580	19.219	14.978	4,241
	x				12.738 *	6.481 *					12.738	6,481 *
Watermelon	Fruits	4.0	8.000	32.000	18.490	13,510	Fruits	4.0	8.000	32,000	18,490	13,510
					15.290 *	16.710 *					15.290 *	16,710 =
Mungbean	Dry bean	0.4	25,000	10.000	4.675	5,325	Dry bean	4.0	25.000	10,000	4.675	5.325
ì	N				4 035 *	5.965 *					4.035 *	5.965 *
* : Production cost and net profit are excluded family labor	net profit are	excluded fo	milv labor.									

T - 23

Production cost and net profit are excluded family labor.
 Average of direct seeding and transplanting
 *** : With-project is assumed to be same as without project

						Steak .	t Project		<u>(</u> UB	it: million pes Increment	<u></u>
	Cropped	Wah I Gross	Production	Net	Cropped	Gross	Production	Net	Gross	Production	Net
	Area (ha)		Cost	Profit	Area (ba)	Income	Cost	Profit	Income	Cost	Profit
Jataur Proper											
1st Faddy irrigated	8,820	378.4	203.7	174.7	6,120	178.5	124.3	54.3	199.8	79.4	120.5
2nd Paddy irrigated	8,820	378.4	207.2	171.2	4,910	139.0	102.1	36.9	239.4	105.1	134.2
1st Paddy rainfed	0	0.0	0.0	0.0	2,600	50,0	38.4	11.5	-50.0	-38,4	11.5
2nd Paddy rainfed	0	0.6	0.0	0.0	1,940	37.3	28.7	8.6	-37.3	-28.7	-8.6
3rd Paddy	1,200	23.1	18.0	5.1	1,200	23.1	18.0	5.1	0,0	0.0	0.0
Watermeloa	100	3.2	1.8	1.4	100	3.2	1.8	1.4	0.0	0.0	0.0
Munghean rainfed	600	6.0	2.8	3.2	600	6.0	2.8	3.2	0.0	0.0	0.0
Total	19,540	789	433	356	17,470	437	316	121	351.9	117.4	234.6
Suague											
1st Paddy inigated	2,900	124.4	67.0	57.4	2,540	79.3	51.6	27.7	45.1	15.4	29.7
2nd Paddy imigated	1,100	47.2	25.8	21.3	1,870	54.7	38.9	15.8	-7.5	-13.0	5.5
Mungbean partially irrigated	1,800	45.0	22.6	22.4	0	0.0	0.0	0.0	45.0	22.6	22.4
1st Faddy rainfed	0	0.0	0.0	0.0	360	6.9	5.3	1.6	-6.9	-5.3	-1.6
2nd Paddy rainfed	0	0.0	0.0	0.0	510	11.3	9.0	2.7	-11.7	-9.0	-2.7
3rd Paddy	50	1.0	0.7	0.2	50	1.0	0.7	0.2	0.0	0.0	0.0
Watermelon	20	0.6	0.4	0.3	20	0.0	5 0.4	0.3	0.0	0.0	0.0
Mungbean rainfed	150	1.5	0.7	0.8	150	L	6.7	0.8	0.0	0.0	0.0
Total	6,020	220	117	103	5,500	150	5 107	49	63.9	10.6	53.3
Total											
1st Paddy imgated	11,720	503	271	232	8,660	258	5 176	82	244.9	94.8	150.2
2nd Paddy irrigated	9,920	426	233	193	6,780	19-	i 141	53	231.8	92.1	139.8
Mungbean partially irrigated	1,800	45	23	22	0	() 0	0	45.0	22.6	22.4
1st Paddy rainfed	C) (0	0	2,960	5	7 44	13	-56.9	-43.8	-13.1
2nd Paddy rainfed	Ċ) (• 0	0	2,450	4	9 38	11	-49.0	-37.7	-11.,
3rð Paðdy	1,250) 24	19	5	1,250	2	I 19	5	0.0	0.0	0.0
Watermelon	120) 4	i 2	2	120		1 2	2	0.0	0.0	0.4
Mungbean rainfed	750) 8	; 4	4	750		8 4	4	0.0	0.0	0.0
Total	25,560	÷ 1,009	551	458	22,970	59	3 423	170	415.5	127.9	287.

Table 5.2.6 Financial Production Value and Incremental Benefit

Table 5.3.1 Irrigation Water Requirement

	Lin.	Feb.	M¥.	Apr.	May	June	July	Aug	Sept	0.1.	01	Nov.	1w	
CROPPING PATTERN - A							landalar dalarda sel, dalah Karang Subski Suda ang	F	L				- automature	1
Jalaur pro. RIN														
		2nd Padd	y				-	lst Padd	1				2ed Paddy	ſ
	}	1	I I				8,820	ha	t		ł	8,820	ha	
					For Su	ague RIS	200	ha		For Su	ague RIS		ha	
	· ·· · ···					· · · · ·					1			
	• • • • •													
Probable Monthly Rainfall	1.6						226.6			224,4			24.4	1,750
Potential Evapo-transpiration	155.0	154.0	213.9	207.0	179.8	138.0	120.9	033	117.0	100.2	130.2	120.0	139.5	1508.6
CROPPING PATTERN - A					Į						i			
2nd Paddy	•	}										· · · · · · · · ·		
Crop Coefficient (Ke)	1.18	1.20	1.10		Í			1		1	0.87	1.01	1.07	
Crop Evapotranspiration (Ellezop)	182.9	184.8	235.3								1133	121.2	149.3	<u>5</u> 87
Percelation	62.0										62.0			
Fifective Ralofali	1				ļ				1		150.3			
Area Factor Puddring Water	0.9	0.50	0.06	'	+	···		· · · · · · · · · · · · · · · · · · ·			75.0			150
Flocing Wart			1		t		· ·· _ ·· · ·		↓ -= · · ·			1	t - ·	- · · · · · · · · · · · · · · · · · · ·
Net laigation Requirement	22		19								x	92	144	6.10
tst Paddy				••										
Crop Corfficient (Ke)			İ	.	0.90						5			
Crop Evapo transpiration (ETcrop)					161 8						Dj			866
Percelation Effective Rainfalt *					46.5						2	1		856
Area Factor					010								···	
Puddring Water					37.9								ļ	
Not Irrigation. Requirement					20	35	5	•	3	1	\$			
Irrigation Efficiency	0.5	0.50	0.50	0.50	0.50	0.50	0.5	0.5	0.50	0.5	0.50	0.50	0.50	
Conveyance Efficiency 72 % **	0.7			0.71	0.71	0.72	0.7	2 0.7	2 0.7	2 0.7	2 0.7	2 0.72	0.72	
Application Efficiency 70 % of paddy field **	0.7													
Gross Irrigation Requirement (num)									0 6					
(liusechu Irrigation Survice Area (ha)	1) <u>1.6</u> 9,02				9,020									
Seasonal Requirement (mVsec)					1 3					1.0				
			F N	1				;		s (0	v t	, ,	
	15.2	4 8.6	9 12	4 0.00			3.4	4 0.0	0 2.2				-	
									;	2.0				
		4 8.6	9	1 0.0	9 <u>1.3</u>	5 2.39	3.1	4 0.0	0 2.2	9 3.0	3 63	6 9.5	9	

.

Table 5.3.2 Irrigation Water Requirement

	1.0	6.6	Ma	Ay.	May	June	July	Aug.	Sept	0.1	Nov.	0,1.	NJV.	Dec	1
ROPFING PATTERN - A												0.1.			
Saagae \$15 Type - A.										-					
							- 900	lst Pasijy ha					900	In Pall	
Type - A	,	2nd Pach	{		· · · · · · · · · ·							· · ·			
	· · · · ·					· ·· ·· · · · · · ·	भ्प	I LE L L		Шħ					
						1600	t st paddy ha				2od Pasty ba				
		llhs	ļ	·	Mung bean 1,800			· ···		··			<u>1990</u>	1	
	1.041	 1 	Hhs.										Mung beau		
deutial Evapo-trauspication	16	5.9 1540	2139	3.0 207.0	45.5 179.5	317.6	226.6 120.9	491	190 1 117 0	224.4 130 2	188 2	224.4			
ROPPING PATTERN - A.1			•									••••	1		/
nd Paddy Ng Coefficient (Kr)	1 18	1 16	110					·					· · · · · · · · ·		
ng Even transpiration (ETcrup)	1829	178.6	235.3		· · · · · · · · · · · ·		· · · ·		0 90 105 3	0.96 127.6	1.09			1 1 1 1 54.B	
arolating Effective Rainfall * ree Factor	624	5.9	0.0		· ··· ··· ·				61.0 142.6	62.0 150.3	1112			62.6 67.7	
iddring Water	082	0.33	0.00				· · · · ·		010 37.5	0.40 75.0				1.00	
et laigation Requirement	200		0						6	45	\$0			119	
Ti Batimo Efficicos y	0.50							•	0 50	0 50		9 50	0.50		
Opersone Efficiency 72 % ** optication Efficiency 70 % of reddy field **	072	0 70	072					··	0 72 0 70	0.72	0.73	0.72	0.72	0 72	
ross in gation Requirement (mm) (hit/scotta)	326	143	0 00						12	91 035	159	0 00	0		
st Paddy										···· ¥24				Ľ	
mp Coefficient (Kc) hop Exapo transpiration (ETerop)	-				0.90 361 B	0 98	1 09		1.18	116					
medizion Emilion	1				46 5	45		148.0 46.5	138	151.0					
ice Factor		 	 		439		0 90	<u>202 1</u>	<u>1426</u> 082	150.3 033	i				[
riting Willer	1	· · · · · ·			375	1									
et Irigision Requirement					20		1	0	33	15					
migation Efficiency Conveyance Efficiency 72 9. ++	0.50	072	\$ 72		0 50 0 72	0 50		0 50 0 72	0.50	0.50 C.72	0.50	0.56			
pplication Efficiency 70 % of poldy field ** ross Erig-tion Requirement (mm)	0.70 3X	0 70	0.70		0 70 +0	0 70	0.70		0.70	0 70	0.70	0.70	0.70	0 70	1
(lickscohe) Tigating Survice Aces (he)	1.48	0.61	0.00		<u>8.15</u> 900	0 26 900	0 38		0.10 900	0.45	0.61	0.00	0.00	1 10	
casonal Requirement (mMacc)	13	0.55	6 00	· · · · · · · · · · · ·	6.14	0.24	034		900	900	990		J	900	
ROPPING PATTERN - A.2	ļ	<u>437</u>		·	<u> </u>	<u>v 24</u>	40	0.00	0.27	<u>. 0</u> .40	0.55	0.00	0.00	0,99	
st Paddy			 												
top Coefficient (Ke) Top Evarceranspiration (ETerop)	·						100 120 9)) B (07.5	<u>109</u> \$41.3	102		{		
ercolation Arctive Ralatza *		1					60 B 158 6		60.0	<u>62</u> 0	60 D				
Vea Factor Udding Water	1						0.50 150 0	1.00		8.50	0.00				
id brigation Reparement		}					- 120		55						
migstion Efficiency	0.50	0.50	0.50	0.50	0.50	0 50							<u> </u>		
ionveyance Efficiency 22 % ** optimized Efficiency 70 % of pasty field **	0.7	0 72	072	0 72	072	012	072	0 72	072	0.50	0.72	0.50	0.72	0.72	
kora brig sino Requirement (mm) (lit/sec/ha	1) 0	0	0	0	0	271	13	109	<u>070</u> 52	0	0	0	0	
rigation Survice Area (ha) easenal Requirement (mMaee)	0.00			0.00	0.00	[1,800	1,600	1,600	<u>0 20</u> 1,800	1,800		1	0	
fungbran		0.00	0.00	6.00	6.00	0.00	115	6.09	076	0.36	0.00	0.00	0.00	0.06	
top Coefficient (Ke)	6.0									•			0.00	0.00	
nop Evapotranspiration (ETerop) Affective Rulofall *	01	0.0				{					[0.0 74.0	00	
cea Factor upplemental water for generation	1.00		0.00		•	Į					ļ		1.00	1.00	· · · · · · · · · · · · · · · · · · ·
et Infgation Requirement							• · · · · · · ·	··· _ ··		· · · · · · · · · · · · · · · · · · ·			90	90	
rigation Efficiency ocveyance Efficiency 12 % **	0.5					- · · · ·	}				·		0.50		· · · -
reflication Efficiency 79 % **	0.7	070	0 70		 	ļ			<u> </u>				0.72		
iross Erigation Requirement 2 (num) (ittseoffe	.) 00	0.00	0.00		·		[0.00		· · · · · · · · ·
Intigation Survice Acea () Seasonal Requirement 2 (mVice						[· · · · ·				}		1,800 0.90	1,800	
	-														
ist and Zird puckly (Tupe A	1			A 0 0 0	 0 14		ر 4.0	A 0.00	<u>\$</u> 027	0 40			į		
ist and 2nd paddy (Tupe A										0.00	0.00	0.99	•		
		5.00	- 30	0.00	u. (A)	v 00	- 10	9.09	V./6	0.36 0.00			`		

 Minightean
 9.12
 0.00
 0.00
 0.00
 0.00
 0.00
 0.00
 0.00
 0.00
 0.00
 0.00
 0.00
 0.00
 0.00
 0.00
 0.00
 0.00
 0.00
 0.00
 0.00
 0.00
 0.00
 0.00
 0.00
 0.00
 0.00
 0.00
 0.00
 0.00
 0.00
 0.00
 0.00
 0.00
 0.00
 0.00
 0.00
 0.00
 0.00
 0.00
 0.00
 0.00
 0.00
 0.00
 0.00
 0.00
 0.00
 0.00
 0.00
 0.00
 0.00
 0.00
 0.00
 0.00
 0.00
 0.00
 0.00
 0.00
 0.00
 0.00
 0.00
 0.00
 0.00
 0.00
 0.00
 0.00
 0.00
 0.00
 0.00
 0.00
 0.00
 0.00
 0.00
 0.00
 0.00
 0.00
 0.00
 0.00
 0.00
 0.00
 0.00
 0.00
 0.00
 0.00
 0.00
 0.00
 0.00
 0.00
 0.00
 0.00
 0.00
 0.00

by Division
O&M Staff
oposed No. of NIA
Table 5.4.1 Pr

	Imgation Length Service Main Ca Arrea & Later (ha) (ha) 296 512 (9) 714 714 714 714 714 755 375 756 594 753 755 754 753 755 753 755 754 755 753 755 753 755 753 755 753 755 753 755 753 755 753 755 753 755 753 755 753 755 753 755 753 755 753 755 753 755 753 755 753 755 753 755 753 755 753 <tr< th=""><th></th><th>Present Condi Length of Chu Type 1 Contract (km) 3 3 3 4 4 4 4 4 4 4 0 0 9 9 9 9 9 9 9 9 9 9 9</th><th>rions (1907) WRF N WRF WI Crader WI 1 (km) Te 5 5 5 5 2 2 2 2 2 2 2 2 2 2 2 2 2</th><th></th><th></th><th>K K No. No. No. No. </th></tr<> <th>Ко ККа 10. У.У. 3 и и и и и и и и и и и и и и и и и и и</th> <th></th> <th>S S S S S S S S S S S S S S</th> <th>*5. Propo No. No. T CeR. T T T CeR. T</th> <th>No. No. (3) (3) (3) (3) (3) (3) (3)</th> <th>Balance No. No. No. 11 14 14 14 14 14 14 14 14 14 14 14 14 1</th> <th>No. No. No. No. No. No. No. No. No. No.</th>		Present Condi Length of Chu Type 1 Contract (km) 3 3 3 4 4 4 4 4 4 4 0 0 9 9 9 9 9 9 9 9 9 9 9	rions (1907) WRF N WRF WI Crader WI 1 (km) Te 5 5 5 5 2 2 2 2 2 2 2 2 2 2 2 2 2			K K No. No. No. No.	Ко ККа 10. У.У. 3 и и и и и и и и и и и и и и и и и и и		S S S S S S S S S S S S S S	*5. Propo No. No. T CeR. T T T CeR. T	No. No. (3) (3) (3) (3) (3) (3) (3)	Balance No. No. No. 11 14 14 14 14 14 14 14 14 14 14 14 14 1	No. No. No. No. No. No. No. No. No. No.
Review Main Gauge Indianational (American Transformer Charge of Main Main Main Charge of Main Main Main Main Main Main Main Main	Area & Later Area & Later (ha) (ha) (kan & Care (a) (b) (b) (b) (b) (c) (c) (c) (c) (c) (c) (c) (c) (c) (c		Trype 1 Trype 1 Contract (km) • • • • • • • • • • • • • • • •	wge of A WRF N I (cm) Te 10 2 5 5 2 2 5 5 5 7 6	4 0 0 - 0	3		A Radio and a state of the stat		N N N N N N N N N N N N N N N N N N N		WR 9 WR 9 (3) (3) (3) (3) (3) (3) (3)		N of the second s
New Rule Matrix Control Typel (M) NR	Area & Later Area & Later (ha) (h () () (308) 296 (14 () () () () () () () () () () () () ()					2		ARA www www. ow		× KF ender + + + + + + + + + + + + + + + + + + +		WRF 00		ARF Contraction of the work
(hal) (control transfer were were were were were were were w	Area & Late (ha) (ha) (ha) (ha) (ha) (ha) (ha) (ha)					2		var ader man www.aer		WRF erader + + + + + + + + + + + + + + + + + + +		WRF 000		
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	(14) (14) (14) (14) (14) (14) (14) (14)				E G G G	3		n n n n n n n n				2 6 6 6		
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	296 296 (808) 114 114 114 114 114 114 114 11		6. 9 (<u>5</u>) 9 (7, 4 4 (<u>5</u>) 4 0 (<u>3</u>) 0 (<u>7</u>) 0	<u>vo</u> v v vvr				"""" "				899	700 0 001, 7	0 9 9 7 7 7 7
250 Type [kill 3 313 Type [kill 4 1984 Type [kill 4 1984 Type [kill 4 1984 Type [kill 3 198 Type [kill 3 198 Type [kill 3 198	296 296 812 812 822 822 373 373 230 144) 730 730 733 733 733 733 733 733 733 733		K & (1) (1) (1) (1) (1) (1) (1) (1)	<u>v</u> ov v v <u>v</u> o								899		0 19 19 7 7 7 7
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	812 812 808) 714 714 802 802 755 755 755 755 755 755 755 75		^φ (<u>i</u>) <u>(i</u>) ^φ (x, 4, 4, ⁽³⁾) ^φ (4, 0, (i)) ^φ (r) ^φ (r)	v v v v v v				mmm m mmm • 0 m				- 6 6 6		0000 7 777
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	(808) 714 714 712 572 572 594 160 160 160 160 160 160 160 160 160 160			v v v v v v				m mm m m m m • 0 m				6		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	00 114 114 114 114 114 114 114 1		o v 4 4 [€] 4 0 € 0 L 0	<u>o</u> n n onn				nn r rrn • or	oo o oo	00 0 0	-			30
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	802 802 872 894 894 894 894 894 894 894 894		× 4 4 € 4 0 € 0 Γ 0	× × × ∞				n	o o o	0 0 0 + +		99	0 0 0 , ,	9 7 7 7 7
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	60 772 772 773 766 160 160 160 160 160 160 160 1		4 4 [€] 4 0 [⊕] 0 ℓ 0	, v, v, v, v,					• • • -	0 0		99	0 00 <u>-</u>	7 777
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	572 573 (947) 594 160 160 160 730 733 410 410 410 410 811 811 811 337 337 337 337 337 337 337 337 337 3		4 8 4 0 3 0 ℓ 0	x x x x				n mmm • 0m	0 00 -+	0 0		6 9	0 00 <u>-</u>	7 777
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	075 (947) 594 166 166 730 733 377 733 755 733 733 733 733 733 733		4 <u>%</u> 4 0 (1) 0 <i>(</i> -	v o v 2			0'	-	o o o ₊	0 0		- <u>8</u> 8	0 007 7	
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	(447) 594 594 594 594 755 730 730 733 733 733 733 733 733 733 733		(§) 4 0 €) 0 L 0	v v v v					o o o -	0 0		30		777
594 Type1 6 166 Type1 0 730 1 Type1 0 730 1 Type1 0 730 1 Type1 0 731 1 Type1 0 733 1 Type1 0 0 733 1 Type1 0 0 733 1 Type1 0 1 733 1 1 1 1 1 733 1 1 1 1 1 1 733 1 1 1 1 1 1 1 1 1	594 160 160 754 755 755 755 410 410 811 838 788 811 788 811 788 788 788 788 788 78		4 0 3 0 L 0	5 X X					° ° ,	0		0	007 7	777
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	00 160 150 150 150 150 150 150 150 15		(4) (4) 7 7 9	5 7 V					○ ○ - +	C + + + + + + + + + + + + + + + + + + +		- 0	007 -	777
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	0cr (7542) 730 733 755 755 755 755 753 753 753 788 788 788 788 788 788 788 788 788 78		()	5 7 X X					007	C		0	°°∓ -	777
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	0er (7.34) 755 755 755 755 755 410 788 788 811 788 788 788 788 788 788 788		% r 6	× 6					o <u>-</u>	+ + •			o∓ -	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	50 730 755 733 410 783 783 783 783 783 783 783 783 783 783		6	~ ~~			- 0 -		> 				7 7	7
755 9 Type 7 2 0 2 2 1 7 2 0 1 1 7 2 0 1 1 7 2 0 1 1 7 1 </td <td>0c 755 0c 838 373 410 788 788 788 788 788 788 788 788 788 78</td> <td></td> <td>6</td> <td>5</td> <td></td> <td></td> <td>- 0 -</td> <td>n .or</td> <td>+</td> <td></td> <td></td> <td> -</td> <td>-</td> <td>•</td>	0c 755 0c 838 373 410 788 788 788 788 788 788 788 788 788 78		6	5			- 0 -	n .or	+			-	-	•
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	6c 838 373 410 788 788 788 788 788 387 387	11 Type (&)1 Type 1	6			1 01	o ·	• 0 %		• •				1
00 888 111 Type 1 9 2 0 2 1 0 - - - 0 373 710 10 700 10 100 100 100 0 - - 0 - - - 0 410 738 10 7000 10 7000 0 - 1 1 0 - - - - 0 783 10 7000 10 7000 10 7000 10 7000 - - 0 -	00 373 373 410 (733) 387 387 387 387 387	11 Type 1&11 Type 1	6			1 01	o	• 0 *		, .	c			
Mar Mar <td>6c 8.38 8.38 410 (783) 788 788 788 788 788 788 788 788 788 78</td> <td>11 Type l&II Type I</td> <td>6</td> <td></td> <td></td> <td> са</td> <td>•</td> <td>0 ~</td> <td>1</td> <td></td> <td>></td> <td>•</td> <td>•</td> <td>• •</td>	6c 8.38 8.38 410 (783) 788 788 788 788 788 788 788 788 788 78	11 Type l&II Type I	6			са	•	0 ~	1		>	•	•	• •
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	838 373 410 (783) 788 788 788 11 20 811 387	11 Type l&II Type 1	6			c 1		در،	•	7	•	0		-
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	377 410 783) 788 788 788 788 11 811 387	Type 1		64			•		Ŧ	Ŧ			ŧ	-
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	210 210 213 211 211 211 211 211 211 211 211 211		"											
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	(133) (733) 138 111 811 811 337 337	f										-4		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	(783) 788 11 11 12 138 138 138 138 138 138 138 138 138 138		Þ	-	-	-	-	"	¢	ç		ପ୍	0	Ŧ
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	788 811 847 347	ļ	R)	_ ,		-	-		-	2		_	Ŧ	
811 11 Type I 9 2 0 4 4 4 387 Type I&II 3 Type I&II 3 Type I&II 3 11 23 12 <td>2) 8,820 387 387</td> <td>1</td> <td></td> <td></td> <td></td> <td>-,</td> <td></td> <td></td> <td></td> <td></td> <td>-</td> <td> -</td> <td>1</td> <td>1-</td>	2) 8,820 387 387	1				-,					-	-	1	1-
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	2) <u>8,820</u> 3,87		6	2	۰ ۵	-+ -	-	2	-		-	_		
SMEWBAT 387 Type [k!1 3 JEBADA 608 Type [k!1 3 JEBADA 608 Type [k!1 7 JEBADA 608 Type [k!1 2 Mail (955) 12 Type [k!1 2 SMEWBAT 67 Type [k!1 2 1 2 AGDABASICA 593 Type [k!1 2 1 2 1 SMEWBAT 67 Type [ki] 6 0 7 1 1 AGDABASICA 593 Type [ki] 6 0 7 1 2 1 AUDUE 560 8 Type [l 6 0 2 1 2 1 1 SUACUE3 569 8 Type [l 6 2 0<2	SMEWBAT	21	5	6	7	4	4	귀	1	Fİ	1	1	1	1
SMEWBAT 387 Type [k!! 3 JEBADA 608 Type 1 7 JEBADA 608 Type 1 7 JEBADA 608 Type 1 7 Main (995) 12 Type 1 7 Main (995) 12 Type 1 6 Main (660) 8 Type 1 6 Main (660) 8 Type 1 6 Main Type 1 6 3 1 2 1 Subasica (660) 8 Type 1 6 3 1 2 1 Subasica (660) 8 Type 1 0 1 2 1 1 Subasica (660) 8 Type 1 0 1 2 1 2 1 1 Subasica (660) 8 Type 1 0 2 1 2 1 4 Subasica (702)	SMEWBAT													
337 Type [K!] 3 608 Type [K] 7 608 Type [K] 2 (995) 12 Type [K] 2 (10) 2 1 2 1 (11) 12 Type [K] 6 0 1 2 (11) 12 Type [K] 0 1 2 1 1 1 (11) 0 2 0 2 0 2 1 2 1 1 (100) 8 Type [1 0 0 1 2 1 1 1 (100) 8 Type [1 0 2 1 2 1 1 1 (100) 8 Type [1 0 2 2 1 2 1 1 1 (1000) 8 1 10 1 1 1					1							-		
608 Type1 7 1 2 1 3 0 $+1$ 1 A 60 Type1&II 2 1 2 1 3 0 $+1$ 1 A 503 Type1&II 2 0 $+1$ 2 $+1$ 0 $+1$ 1 A 503 Type1&II 0 -1 2 $+1$ 0 -1 1 A 503 Type II 0 -1 2 $+1$ 2 $+1$ 0 -1 1 B 560 8 Type I 0 -1 2 $+1$ 0 -1 <th< td=""><td></td><td>Type likil</td><td>r. 1</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>• •</td><td></td><td></td></th<>		Type likil	r. 1									• •		
(995) 12 (10) 2 1 2 1 2 1 3 1 2 1		Type I	-			•	-	r	<	7		٠ŧ	c	C
67 Type l&II 2 A 593 Type l&II 2 (600) 8 Type l 6 0 2 1 2 1 0 1 (600) 8 Type l 8 0 2 3 1 2 1 1 1 1 (600) 8 Type l 8 0 2 3 1 2 1 <td></td> <td></td> <td>(0)</td> <td>••</td> <td>! </td> <td>2</td> <td></td> <td></td> <td></td> <td>•</td> <td>-</td> <td></td> <td></td> <td></td>			(0)	••	! 	2				•	-			
A 593 Type1 6 (660) 8 Type1 6 543 12 Type1 6 543 12 Type1 9 3 0<2		Type I&II	61											
(660) 8 (8) 0 2 1 2 1 0 1 0 1 1 0 1 1 0 1 1 0 1 1 0 1 1 0 1 1 0 1 1 0 1 1 0 1 1 0 1 1 0 1 1 0 1 1 0 1 1 0 1 1 0 1 1 0 1 1 0 1 0 1 0 1 0 1 1 0 1 1 0 1 1 0 1 1 0 1 1 0 1 1 0 1 1 0 1 </td <td>CA</td> <td>Type I</td> <td>Ŷ</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>•</td> <td>•</td> <td>-</td> <td>- {</td> <td></td> <td>-</td>	CA	Type I	Ŷ						•	•	-	- {		-
K4X 12 Type1 9 3 0*2 3 1 2 41 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 1 <th1< th=""> 1 <th1< th=""> 1 1 1</th1<></th1<>			(%)	0		5	-	 	+	-]	+	-
UE 133 TypeII 0 UE 569 TypeI 6 702) 8 TypeI 6 2 2 0 2 0 3 1 2 41 4 1 1 2 2 2 2 41 4 1 4 1 2 1 2 42 4 1 4 1 4 1 7 1 1 1 2 4 1 4 1 4 1 7 1 1 2 4 2 4 2 4 2 4 1 4 1 4 1 4 1 4 1 7 1			0	e		.	-		 	 - 			+	1
UE 569 Typel 6 (702) 8 Typel 6 (702) 8 Typel 6 2200 40 2 1 2 1 1 1 4 1200 4 2 23 1 4 4 1200 17 116 56 8 35 15 42 21 2 12 15 12 1		Type II	0											
TreeRIS (702) 8 (6) 2 0 3 1 2 4 1 meRIS 2.900 40 33 1 2 4 4 4 Tree 11 10 4 2 43 4 Tree 11 10 55 8 35 15 42 42 45	UE	Type I	Ŷ									- ;	•	ſ
markets) 2.900 40 33 2 1 2 1 4 2 1 4 4 4 4 5 1 4 4 5 1 4 5 1 4 5 1 4 4 5 1 4 4 5 1 4 4 5 1 4 5 1 1 5 1 <th1< th=""> 1 1 <</th1<>			(9)	4		٣.	-		Ŧ	•			i	Ï
11 710 172 116 26 8 32 12 12 12 12 12	rue RIS)	â	នា	Ы	-1	의	41	N	Ţ	71	3 1	ni -	ส	3
					,	20	Ľ	ç	f	4	۲.	ę	5 4	ર્ગ
	Grand-Tetal 11.720	5	वा	ส	a	র	4	Ă	1	1	1	1	ţ	{

WRF Tender : Water Resources Facilities Tender
WRF Tender : Water Resources Facilities Tenders
I. Length of catals under charge of WRF Tenders for the works equivalent to Type I contract by IA.
*2 : WRF Tender is acting for WRF Technician.
*3 : WRF Tender of Div.10 (Jalaur proper) is acting for WRF Technician of Div.10&11 (Jalaur proper).
*4 : One WRF Operator is designated as a acting WRF Technician and counted as a WRF Tender.
*5 : No. of proposed O&M staff is within the approved No. of positions by Department of Budget and Management.

Source : NIA JSRIS Office

			Location	100	Project Implementation
Description	Trance	Tranner		*2 Field and	
			Center	00000 (011)	
Phasing for the Improvement Plan of Water Munagement and O&M practice, and ISF Collection	f practice, and ISF Collection				
Detailed Design Construction of Principal Barillance					
O&M Manual					
 Preparation of Drail Oken Manual by consultant (Oken Expert : A MM) Boston and Excitoration of Oken Manual by consultant (Oken Expert) from the actual activities 	rj : A M/M) Distanoj (Aovario the actual activities				
Kehabilitation and improvement of Emganon Facilities / Installation	not Meisuring Devices				
Rehabilitation of NIA Regional Training Confer					
Establishment of Computenzed System and Communication System					
 Water Management *5 			-	4	-
 Hydrology / Meteorology 	Hydrologist (NIA)	Consultant	0	0	
Water Discharge Recording	Imgation Engineer (NIA)	(Irrigation Engineer)			· · · · · · · · · · · · · · · · · · ·
(2) Cropping Calendar / Farm Activities	Imenion Engineer (NIA)	Consultant *3	0	0	
	Operation Engineer (NIA)	(Imgation Engineer)			••••
	Agneeltunst (NIA) MAO (Municinality)				
(3) Water Balance / Imgation Water Requirement	Imgation Engineer (NIA)	Consultant *3	0	0	
	Operation Engineer (NIA)	(ITTI gation ragineer)			
(4) Water Delivery and Distribution Schedule	Impation Engineer (NIA) Operation Engineer (NIA)	Consultant *3 (Irrigation Engineer)	0	c	
				<	
(c) Computer Operation and Management	Ingerologist (NLA) Imigation Engineer (NIA) Agneultunst (NIA)	(Irrigation Engineer)	>	>	
	Operation Engineer (NIA)				
(1) Aperation work	× + + + + + + + + + + + + + + + + + + +			0	
· Uperation of Water Control Structures / Measuring Water Discharge	Uperation Engineer (NIA) WRF Technician (NIA)	(O&M Expert)	>	>	
(Intuke pare, Nutre pare, Head pare, Check and Turnout)	WRF Operator (NIA) WRF Tender (NIA)	Operation Engineer (NIA) *4			· · · · · · · · · · · · · · · · · · ·
(2) Maintenance Work	V				
- Maintenance of Water Control Structures	Maintenance Engineer (NIA) Consultant	Consultant	0	0	-
- Desilting (Canais, Divenue Daw, Settling Basin)	WRF Technician (NIA)	(O&M Expert)	00	00	
	WEST-mont (NIA)	Maintenance Envineer (NIA) *4	>)	
- Other Maintenance (Service Rowl, Other Fucilities)	IA		0	0	
3. ISF Collection 5					
(1) Collection and Billing Record	Billing Clerk (NIA)	Consultant	0	0	
(Usidose Managenen)	Constant (NIA) Cashier (NIA) IDO (NIA)				
(2) Collection Practice	Billing Clerk (NIA)	Consultant	0	0	
	Collector (NIA & IA) Cashier (NIA) HDO (NIA)	(O&M Expert)			· · · · · · · · · · · · · · · · · · ·
(.1) Computer Operation and Management	Billing Ckrk (NIA) Cashier (NIA)	Consultant (O&M Exnert)	0	o	

T - 28

Table 5.4.2 Proposed Training Plan for Water Management and O&M Practice, and ISF Collection

Note

NIA regional training contert. Pututan
 2. Four Lanum properties and Sugger RIS, Offuce : JSRIS Offuce
 3. Consultant required for received another purport
 4. Operation and Mainfortunce Engineers will be also a transer for WRF Technicum. Operation & Icoritoring by consultant.
 4. Operation and Mainfortunce Engineers will be also a transer for WRF Technicum. Operation & Icoritor in the purport
 4. Operation and Mainfortunce Engineers will be also a transer for WRF Technicum. Operation & Icoritory of Institute 1.3 days a week for the Water Mangement.
 5. days a week for the Water Mangement.
 5. days a week for the OKM practice and ISF culterium.

Table 5.5.1 Training Plan for Institutional Strengthening and Cooperative Development

		Description				
	Les clepturent Stages Pressuantractions Period Convergencia ant Sustamantiny Period	Recontinent and Japatch of consultations (pa M/M) ²¹ Recontinent and Japatch of consultations (pa M/M) ²¹ Detailed ensign Removations of M/A Reprined Training Conter Reamvains of M/A Reprined Training Conter Realisations of it and the Context Precinement of the ATTS-G contentions Antipattion of Rebusiling of the Context Construction of Rebusiling of the ATTS	M/M)= I nais cland Project			
	Investigation of the second second second second second second second second second second second second second	Trumcen (mis.)	Traincréa	Methowners	Lecaling center*2 Freid (OTD*3	93 1 1 2 3 4 5 6 7 x 9 10
	 Insuitureman Sicengilkerung Basic change on synthemity vergenizione 	I ATSA WIKGEN MOMMER	NGON	Seminar	•••	
	1.2 Organizational development and management	Connective officervingences	Convolution *IS	Winterstand		
	 Participation planning and decision making proceeding the second sector. 	IDO:		Conditioners Newslater aubilishing)	
	1.4. Плитания спосептания такутах четлях 1.5. Резегания сида/пактисят аки пелимулах.	i Alona procedu ve utilisem	NGOX Consultant *15	Scinnar, Workshop [On-the set		
	-					
	1. A RANIMU AVRICIN THATHLETING	CoMET nomber	NGOX	Nething	> 0 	
	1.7 Murageneon of evolution is mentional other and the attention programs			Oathstad	0	
	it X 200000000000000000000000000000000000					
	 Camperative Development and Manapeuken The management of Manapeuken 	1A medilice, when faither	NGO, CDA	รับหมกษร, รูดาบุท กระดิไทยรู้	0	
	and the statement of the	Currentine officer/members	NGON, MAON CDON-5	National		
Г		MAON CDON	Civitatiant *CED	Weinhah	•	
- 2	2.4. Caprill build up and capaciana	1DQx	LBP Specialists	Trude tustroutehiteen		
29	2.5 ครากแรกมาย กาะการกรรษร (สรรรษรษณฑรษฐาน) เมษณฑรษร	FINANCE COMPARES (INTSAC)	DA/PAO Specialists	On-the-yaff		
	Le Manugung Duances inskuging (Keuning and noning)		CASA UTIKON T			
	 IAM-HERRISPICAL PRACEMENT MATION IAM-HERRISPICAL STRUCTURE IAM-HERRISPICAL STRUCTURE 	Carrentine officer/members	NGON		0	
	Methodal at evaluation and haulthe	MAON CDON	Consultant +CED	Semme		
	้โกษใหญ่, ปฏาหนู แหม่ พละปไหนองกนู แก้แก่มูกที่เหม่งที่		MAON CDONTS	()n-the-yah		
	Task (grinnlant) and monotoring proceeding			Fight Tour		
	1.2 Approximation marketing	Componence of iteracinements	NGON		> 	
	PERCY and market theorem wings attaction and	MAON CDON	CONNUTION CED	Sconstar		
	Group huying und willing		MAON CDON*5	Workshop		
	Bulk huying of fami inputs			Trac langeshimm	د 	
	1.1 Operation and immugement of powerburyess facilities "4					
	e loe hangal Amintany to strik		-			
	 Furthation in group planning wretisterys, scininger, ele. 	TSA/tA BOD, Committees	NGON	ZOPP Technique		
	1 Inconvoluting daturentiality in the discrementation in IANISCA	Cimporatives	C-Insultants *15 *CED	Grup refeating		
	 Kurnlar kommuniki suway su 	IDON AND MACH, CDON	MACK CDC+5	Cauching	> -	

Kopular reconcessi advices
 Anterno.
 Kopular reconcessi advices
 Then consummers (1) frantiational Strengtheoring, 15 (48 M/M) and Creati and Enterno. Occuration, CED (20 M/M)
 2) Ni A regiment Plannary Concer, Pavissi
 2) Ni A regiment Plannary Concer, Pavissi
 2) Ni A regiment Plannary Concer, Plannary and Stagese RLS
 3) Table to Nicorgo advant mile Julane preparation (Stagese RLS)
 4) Countigrant on the tochreat and interaction (Stages) on the Statement of huy and manage RIS on Mile Countigrant on the consoling and interaction of the Cantory of the Cantory of the Cantory and manage RIS
 6) A Countigrant on the tochreat and interaction (Stages) with allow and manage RIS on the proper transmit from the consoling and NGOs.
 7) A will have the gradity reaction fraction in Rulei province
 7) IA will have the gradition of the control or program of the members in the avaitanting pressuit.

Table 5.5.2 Proposed Equipment and Facilities for Training, Communication and Transportation

Description	Number	Description	Number
Strengthening of NIA	- <u> </u>	II. Strengthening of the IAs	<u> </u>
A. Training and Communication Equipment	1	A. Office Equipment	
1. Overhead Projector	1	1. Working table (long), 2 for each 1A	40
- Screen with tripod	1	2. Working chairs (20/IA)	400
- Transparency maker	1	3. Steel cabinet	20
- TP marking kit	1	4. Wooden blackboard	20
2. Slide Projector with Screen	1	B. Communication Equipment	
3. Audio Set with Power Amplifier	1	1. Portable Hand-Held Radio Tranceiver	20
- Speaker	1	III. Upgrading of MAO Agricultural Extension Services	
- Tripod	1	A. Communication Equipment	
- Audio rack	1 1	1. Audio-visual aids	15
4. Cassette Deck	_	2. White Board with Pens	14
- Dynamic microphone	1	3. Camera Set	7
- Microphone stand (Floor)	2	B. Transport Facility	
- Microphone stand (Table)	2	1. Motorcycles	35
- Connecting cables	1 roll	C. Techno-Demo Farms	
5. Video Camera with Recorder		1. Moisture meter	15
- VTR	1	2. Soil test kit	20
- Color monitor		3. Input supply, ha	360
- TV/VTR rack	2		
- Cables	loil		
6. Camera and Accessories	2 sets		
- Camera case			
- Standard, macro, wide and zoom tens			
- Close-up lens		1	
- Filter			
- Speed and macro speed light			
- Tripod with case			
- Carrying case			
- Exposure meter			
- Battery for camera			
- Battery for exposure/speed light			
7. Electric Mimeographing Machine	1 1		
8. Stencil Scanning Machine	1		
9. Bookbinding machine	1		
10. Xerox Copier	1 L		
11. Electric Fan	4		
12. Portable Hand-Held Radio Transceiver	21		
13. Computer Set with Accessories	2		
14. Steel Cabinet	4	1	
B. Furnitures and Fixtures		7	
1. Table (Training Center/ISRIS office)	10		
2. Chair (Training Center/JSRIS office)	40		
3. Air Conditioner			
- Package type	1		
- Window/wall type	3		
C. Transport Facilities			
1. Mini Bus (Training Center)	1		
2. Pick Up (O&M Staff and IDOs)	. 3		
3. Motorcycles (O&M Staff)	41	1	

and Extension	
ural Development	
Plan for Agricult	
le 5.6.1 Training	
Tab	

Project Implementation	Period 1 (Design & Tender Administration)	Jministration)					
	Period II (Construction Period) Period III (Sustainability)						
Training for Agricultural Sector	(I) Development and built-up s (II) Self-operation stage	 Development and built-up stage for activation of extension services (II) Self-operation stage 	2				-
	Preparation of Training and Monitoring/Evaluation Manual Staff and Farmers Training	mitoring/Evaluation Manual					
Construction of the second s	Monitoring/Evaluation Assignment Period of Consultant(s) (Asricultural Expert)	nte) (Asricultural Expert)					$\left - \right $
Truining Program	Truce	rainer.	Method/Process	Location	lon		1
	(number of trainee)			Training center	Field	1 2 3 4 5 6 7 X	0:
1 Farming Technology Paddy rice Cros diversification	ATs of MAO (80) Specialists of Agriculturist of Agriculturist of NGO and NJA Consultant(s)	DA/PAO and research.	Seminar, Workshop, Research farm,	*	×		
Land neparation			Techno-demo farm	-			-
Second treatment/Second ing Fertilization Pervlokeese control Weed control	Contact Farmers (300)	Specialists of DA/PAO and research, Consultant(s)	Seminar, Workshop, Research farm, Techno-demo farm	×	×		8
weed control	T	Ī	Tashas dama farm		,		
Snail and Rat control Furm mechanization Organic farming Post-harvest Monitoring/Evaluation	Ordinary famers (6.400)	ATs of MAO, Contact farmers	Techno-demo farm Field school Field rour Group discussion		×		
2 Extension Activity Group organizing	ATs of MAO (80)	DAPAO and research,	Seminar, Workshop,	*	×		
Leadership		Consultant(s)				╇	+
Pamphlets Preparing	Contact Farmers (300)	ATS OF MAO	Seminar, Workshop,	×	~		
3 Seed Production Technical service Seed inspection	ATs of MAO (30)	Specialists of DAPAO and research, Consultant(s)	Seminar, Workshop, Research farm.	×	×		╂─-
Seed distribution	Seed Grower (80)		Seminar, Workshop, Research farm,	×	*		
Implementation of Improved Extension Services 1 Training to ATS, contact farmers and seed growers 2 Activities by MAO	wion Nervices and sood growers					Sustainability	hity stage
3 Provision of techno-domo farms		360 plots during 4.5 years (9 cropping season)	season)				•
 Activities by contact farmers Seed nroduction 							
6 Documentation and dissemination of improved farming practices	w of improved farming practices						
7 Provision of facilities and equipment Audio set	neut	15 unit				T	
Soil test kit		20 unit				Ī	
White board with pens		14 unit					
Camern set		7 unit					
Cereal moisture meter Moreonate		15 unit 35 unit					
from the first of the former of the former		360 ha in total					_

Table 5.8.1 Assessment of Probable Environmental Impacts

Probable / Potential Impacts		S	lage		Comments / recommended mitigation measures
	Constr	uction	Oper		-
	Without	With	Without	With	
 Health hazard from mishandling of agrochemical use 	•	•	2-3N d-s-r	38	 The hazard will be minimized by proper handling of chemical under proposed extension works. IPM or proper use of agrochemicals will be included in the improved farming practices (plan) and extension program.
 Deterioration of water quality in downstream Pollution of agrochemical and Eutrification of fertilizer 	•	-	2N d-s-r	3N	 Proper water management taking agro-input use into consideration will be undertaking IPM or proper use of agro-input including use of organic matter will be included in the improved farming practices (plan) and extension program.
(2) Pollution of construction materials	3N	•	-	-	 Proper disposal of construction waste shall be enforced thoroughly.
 Loss of farm land due to construction of farm pond 	2-3N d-l-ir	3N	2-3N d-l-ir	3N	 Full compensate for farm land shall be taken to the owner and tenant farmer under enough discussion with them.
4. Reduction of downstream flows that affect downstream ecology and users of water	3N	•		•	• Unlikely
 Reduction of excessive water use of ground water 	-	-	-	1-2P d-l	• The ground water table will stabilize due to reduction of excessive use of ground water in dry season.
 Conflicts over inequalities in water distribution throughout service area 	-	-	3N	-	 Crop intensity will be 200% and cropping pattern will be rotated in the area under the plan. Proper water management by IAs could utilize water efficiently and minimize such conflict.
7. Increase of construction-related employment opportunity	d-s	1P d-s	-	-	• The construction works will provide temporary job opportunity to the villagers nearby.
8. Increase of crop production (which results in the increase of farm income)	-	-	1P d-1	1P d-1	 The biggest positive effect of the project. A@This will lead to higher living standard of the population.
 Increase of agricultural-related employment opportunity 	-	-	18 d-1	1P d-1	 Employment opportunity in marketing of inputs and outputs, processing, etc. will be increased substantially.
Remarks : <1 "with" indicates future condition v Significance of impact 1 : Significant 2 : Moderate 3 : Minor	vith mitiga Character D : Direc ID : Indir S : Short L : Long	ristics of et rect t term			The feature of impacts is indicated as follow: ip meaning that the positive impact would be significant, direct, short term, and reversible.
Feature of impact P : Positive N : Negative	R : Reve IR : Intev	rsible			2N meaning that the negative impact would be significant, direct, long term, and teversible.

Work lem Jaur Proper RIS Sugge RIS Constrated FC Text Constrated FC Text Sugge RIS Constrated FC Text 1 Construction Cast UC FC Text 1 Text 257.36 503.35 101.21 66.16 27.36 503.35 51.31 259.376 56.055 50.31 57.365 56.055 56.11 26.328 57.366 66.055 57.365 66.055 57.365 56.055 57.365 56.055 57.365 56.055 57.365 56.055 57.365 56.055 57.365 56.055 57.365 56.055 57.365 56.055 57.365 56.055 57.365 57.365 56.055 57.365 57.365 56.055 57.365 57.365 56.055 57.365 57.365 56.055 57.365 57.365 56.055 57.365 57.365 57.365 57.365 57.365 57.365 57.365 57.365 57.365 57.365 57.365 57.365 57.365 57.365 57.365			Ta	Table 6.3.1 Sumn	Summary of Project Costs	sts		(U)	(Unit : 1.000 pesos)	
LC FC Total LC <thlc< th=""> <thlc< th=""> <thlc< th=""></thlc<></thlc<></thlc<>	Work Item	Jak	aur Proper RIS		Suz	igue RIS		Ğ	ant Total	
ort 325,390 374,169 699,560 111,563 118,213 229,776 436,554 42,328 4 f Diversion Dam 1,443 5,773 5,8377 6,834 1,418 5,37358 45,844 27,468 45,354 I and Related Structures 3,8375 39,616 77,920 1,035 32,333 14,185 I and Related Structures 3,8375 39,616 77,920 1,035 32,333 14,185 I and Related Structures 3,3375 9,13 1,1875 20,979 32,333 14,185 I constructures 3,350 9,377 11,017 20,979 35,303 3,500 r 913 913 1,885 9,307 11,672 20,979 3,500 3,500 r 0 3,800 31,885 9,307 11,672 20,979 3,500 3,500 r 0 3,600 0 3,500 1,572 3,500 3,500 3,500 r 0 3,5			F/C	Total	L L	F/C	Total	L/C	F/C	Total
Obsension Dam 1.443 5,773 7.216 2.6.025 4.0.21 6.1.46 27.468 4.5.844 al and Related Structures 22.3.43 2.96.12 58.870 66.884 61.341 128.195 32.9196 37.568 4.0.65 and Related Structures 23.877 11.015 5.8370 66.884 61.341 128.195 32.9196 37.568 4.0.651 and Related Structures 28.375 5.633 9.307 11.672 20.979 3.302 3.5768 4.0.651 and Related Structures 13.885 9.307 11.672 20.979 3.3179 3.500 3.5768 4.0.651 at 913 913 1.8723 9.307 11.667 2.0.979 23.196 3.5768 3.5708 3.500 3.510 3.500 3.510 3.500 3.510 3.500 3.510 3.510 3.510 3.510 3.510 3.510 3.510 3.510 3.510 3.510 3.510 3.510 3.510 3.510 3.510) Constantion Cost	325,390	374.169	699,560	111,563	118,213	229,776	436,954	492.382	929.336
In ad Related Structures $26.2.34$ 58.570 66.854 61.341 128.195 329.196 37.568 0 In ad Related Structures 18.375 39.616 77.922 1.076 1.035 21.10 91.451 4.0651 In ad Related Structures 18.375 39.616 77.992 1.076 1.035 21.10 91.451 4.0651 In ad Related Structures 13.885 18.000 31.885 9.307 11.672 20.979 35.2323 14.185 It addition 0 0 31.885 0 0 0 9133 913 9133	1 COMPUTED CON	544 1	5.773	7.216	26.025	40,121	66.146	27,468	45.894	73,362
Ind Related Structures 18,375 39,616 57,992 1,076 1,035 2,110 19,451 4,0651 Ind Related Structures 13,885 18,000 31,885 5,821 7,426 31,70 10,556 33,233 14,185 r 2,653 2,623 5,230 5,320 7,426 31,70 10,556 33,233 14,185 r 913 913 81,83 6,073 0 913 914 916 914 916 914 914 914 915 914 914 914 914 914 914 914 914 914 914 914 914	1.1 Improvement of Diversion Data	262 343		558.570	66.854	61,341	128,195	329.196	357,568	686.765
In Measure values 35.87 11.015 56.821 7.426 3.170 10.596 33.233 14.185 r 26.55 2.6525 2.6525 5.500 3.500 3.500 3.500 r 913 913 1.885 9.307 11.672 2.0979 2.1322 2.5672 r 913 913 1.825 0 3.988 3.988 3.500 3.500 r 0 5.003 5.003 0 3.988 3.988 0 6.0371 r 0 48.793 48.793 48.793 48.798 1.578 0 3.500 evelopment & Agr. Extension 0 7.260 7.260 0 2.420 2.420 6.672 6.672 stitue of Training Materials 5.004 5.004 1.0058 1.1.654 11.554 0 5.037 11.5543 evelopment k Agr. Extension 0 5.13171 19.976 4.2711 6.573 6.672 6.672 6.672	1.2 Ittigation Canal and Netative Of Ventures	18 375	39.616	57.992	1.076	1,035	2.110	19,451	40,651	60.102
Itelated Strutures 1385 1800 31.885 9.307 11.672 20.979 23.192 29.672 r 913 913 1.825 6.053 5.250 875 1.750 3.500 3.500 r 913 1.825 0 3.938 9.13 1.825 r 913 1.825 0 3.998 0 9.13 9.13 r 913 1.825 5.053 5.053 5.053 0 9.398 0 9.13 9.13 recolorment & Ayr. Extension 0 7.260 7.260 0 2.420 0 9.0371 reue of Training Materials 5.004 5.004 10.008 1.668 1.688 3.336 6.672 6.672 reue of Training Materials 5.004 5.016 4.2371 6.2347 78.975 115.543 reue of Training 2.6460 3.5755 6.2118 2.2498 4.3675 115.543 reues Costs 3.5.350 5.158 <td>1.5 Uranage Cana and Aciated Subcures</td> <td>25,807</td> <td>11.015</td> <td>36.821</td> <td>7,426</td> <td>3,170</td> <td>10,596</td> <td>33,233</td> <td>14,185</td> <td>47,418</td>	1.5 Uranage Cana and Aciated Subcures	25,807	11.015	36.821	7,426	3,170	10,596	33,233	14,185	47,418
T 2.625 5.250 875 875 1.750 3.500 3.500 T 913 1 82.5 0 0 0 0 913 913 FEquipment 0 56.053 56.053 56.053 0 1.578 1.578 0 913 913 cerelopment & Agr. Extension 0 7.400 7.260 7.260 0 2.420 2.437 0 9.6371 cerelopment & Agr. Extension 0 7.260 7.260 1.578 1.578 0 9.6371 cerelopment & Agr. Extension 0 7.260 7.260 7.260 7.375 0 9.5375 citier of Training Materials 5.004 5.004 5.004 5.004 9.0050 0 9.6371 citiers Costs 33.555 0 11.156 11.181 0 9.6357 6.672 6.672 citier of Training 35.555 62.111 19.976 4.2.71 6.7.365 49.238	1.4 Service Notad 1.6 Dural Doad and Delated Structures	13.885	18,000	31,885	9,307	11,672	20.979	23,192	29.672	52.864
r9139131182500913913913913Equipment056.05356.05356.05356.05366.0533.9983.9980913913evelopment & Agr. Extension07.2607.2607.2601.57809.56309.680true of Training Materials5.0045.0045.0041.00081.6681.6683.3366.6726.6726.672true of Training Materials5.0045.0045.00410.0081.6681.6683.33756.72366.6726.672Erraining Materials5.0045.00410.0081.115611.8212.24773.9754.55354.2371Erraining Materials26.46035.7556.111.5611.15611.8212.29764.7428.87311.155Erraining Development Fund06.1506.15002.3652.47333.5756.23435.5804.43750Cost037.174037.1747.20102.05005.7364.43750Reinford6.6088.70515.54331.1405.7584.437508.87311.182Cost37.174037.1747.20102.4052.47364.43750Reinford6.60337.37431.40731.40737.14027.3614.43750Reinford6.1331.40531.40531.40531.	1.2 Multi Now and Indiana Dawanaya	2 62 5	2.625	5.250	875	875	1.750	3.500	3.500	7.000
Equipment056.05356.05356.05356.05356.05356.05356.05356.05356.05356.05357.067.3781.578050.371evelopment & Agr. Extension07.2607.2607.26002.4202.42009.680inure of Training Materials5.0045.00410.00811.6681.6683.3366.6726.6726.672inure of Training Materials5.0045.00410.00811.6681.6683.3366.6726.672inure of Training Materials26.460357.556.22158.2002.05039.37611.5543ertining26.460357.556.15602.05039.37035.28065.305cost037.174037.1747.20107.2014.4.3750cost37.174037.1747.20107.2014.4.3750cost43.31851.71095.02814.36716.873311.4057.58568.583medy97.71437.054134.76716.873311.4057.58568.583medy97.71437.05411.86.223187.365195.74657.75868.583medy97.71437.05514.36716.873311.4057.58568.583medy97.71437.05514.36716.873311.4057.58568.583medy97.71437.05611.86.223187.3651	1.9 Tenining Canas	613	913	1.825	0	0	0	913	913	1,825
Induction 0 48,793 48,793 0 1.578 1.578 0 50,371 evelopment & Agr. Extension 0 7,260 7,260 0 2,420 2,420 0 9,680 evelopment & Agr. Extension 5,004 5,004 10,008 1,668 1,568 3,336 6,672 6,672 6,672 6,672 evices Costs 53,999 73,172 132,171 19,976 4,2371 62,347 78,975 115,543 evices Costs 33,539 37,417 69,956 11,156 11,821 22,978 43,655 49,238 et ining 26,460 35,755 6,2215 8,820 30,550 39,370 35,280 66,305 craining 26,460 37,174 0 37,174 7,201 0 7,200 0 8,200 cost 37,174 0 37,174 7,201 2,376 66,305 66,305 cost 37,114 37,114 7,201 0			56.053	56.053	0	3,998	3,998	0	60,050	60.050
evelopment & Agr. Extension07,2607.26002,4202,42009,680liture of Training Materials5,0045,00410,0081,6683.3366,6726,6726,672strices Costs8,89973,172132,17119,9764,2,3716,2,34778,97511,543strices Costs32,53937,41769,55611,15611,182122,97843,65549,238strices Costs26,46035,75562,2158,82030,55039,37035,28066,305cost06,150030,55030,55039,37035,28066,305cost05,17473,9122,2652,4784,7428,87311,182cost037,174037,1747,20107,20108,633no Cost37,174037,1747,20107,2014,4,37500no Cost37,17431,70531,70531,14057,58568,58349,149ngency9,71437,05411,86,223187,36519,74631,14076,157281,77611,86nsery574,207612,01611,86,223187,36519,746387,111761,57281,77611,86stript574,20511,86,223187,36519,746387,111761,57281,77611,86stript574,20711,86,223187,36519,746387,111761,57281,776			48.793	48.793	0	1.578	1.578	0	50.371	50.371
aining Materials 5.004 5.004 5.004 5.004 5.004 10.005 1.668 1.335 6.672 6.672 6.672 6.672 6.672 x 58,999 73.172 132.171 19.976 42.371 62.347 78.975 115.543 x 58,999 73.172 132.171 19.976 42.371 62.347 78.975 115.543 x 53,535 52,115 8,820 30.550 39.370 35.280 66.305 x 0 6,150 6,150 0 2.050 2.050 0 8.200 x 0 6,112 11.156 11.821 22.978 43.695 49.238 x 0 6,150 6,150 0 2.050 2.050 0 8.200 x 0 37.174 7.201 0 7.201 0 7.201 4.4.375 0 0 x 43,318 51.710 95.028 14.267 16.873 31.140 57.585 68.583 x 57.40 51.705<	2.1 U.S. M. WOLD. 2.2 January Development & Agr. Extension	• c	7.260	7.260	0	2,420	2,420	0	9,680	9.680
x_{1} x_{3}	2. Cart & Econolitrics of Training Materials	\$ 004	5.004	10.008	1,668	1,668	3.336	6,672	6,672	13,344
32,539 $37,417$ $69,956$ $11,156$ $11,821$ $22,978$ $43,695$ $49,238$ 26,460 $35,755$ $62,215$ $8,820$ $30,550$ $39,370$ $35,280$ $66,305$ 26,460 $5,150$ $6,150$ $6,150$ $6,150$ 0 $2,050$ 0 $35,280$ $66,305$ $6,608$ $8,705$ $15,312$ $2,265$ $2,478$ $4,742$ $8,873$ $11,182$ $37,174$ 0 $37,174$ $7,201$ 0 $7,201$ $44,375$ 0 $43,318$ $51,710$ $95,028$ $14,267$ $16,873$ $31,140$ $57,585$ $68,583$ $97,714$ $37,054$ $134,767$ $30,425$ $12,095$ $42,570$ $128,139$ $49,149$ $97,714$ $37,054$ $1.186,223$ $187,365$ $12,095$ $42,570$ $128,139$ $49,149$ $574,207$ $612,016$ $1.186,223$ $187,365$ $199,746$ $387,111$ $761,572$ $811,762$ $11,762$ $11,762$ $11,762$ $11,162,223$ $199,746$	A Regineration Convince Ports	58,000	73.172	132.171	19,976	42,371	62,347	78.975	115.543	194.519
26,460 35,755 6.2.215 8.820 30.550 39.370 35.280 66.305 velopment Fund 0 6,150 6,150 0 2.050 2.050 0 8.200 6.608 8,705 15,312 2.265 2.478 4.742 8.873 11.182 37,174 0 37,174 7.201 0 7.201 44.375 0 37,174 0 37,174 7.201 0 7.201 44.375 0 43,318 51,710 95,028 14,267 16.873 31.140 57.585 68.583 97,714 37,054 134,767 30.425 12,095 42.520 12.8139 49.149 574,207 612,016 1.186,223 187.365 199.746 387.111 761.572 811.762 1.	4 1 Civil Works	12.530	37.417	69.956	11,156	11.821	22.978	43,695	49.238	92.934
velopment Fund0 $6,150$ $6,150$ $6,150$ $6,050$ $2,050$ $2,050$ $2,050$ 0 $8,200$ $37,174$ 0 $37,174$ $7,201$ $2,265$ $2,478$ $4,742$ $8,873$ 11.182 $37,174$ 0 $37,174$ $7,201$ 0 $7,201$ $44,375$ 0 $43,318$ $51,710$ $95,028$ $14,267$ $16,873$ 31.140 $57,585$ $68,583$ $97,714$ $37,054$ $134,767$ $30,425$ $12,095$ $42,520$ $128,139$ $49,149$ $574,207$ $612,016$ $1.186,223$ $187,365$ $199,746$ $387,111$ $761,572$ $811,762$ $1.136,223$	4.1 Civil Troins	26.460	35.755	62.215	8.820	30.550	39,370	35,280	66.305	101.585
6.608 8.705 15.312 2.265 2.478 4.742 8.873 11.182 37.174 0 37.174 7.201 0 7.201 44.375 0 37.174 51.700 95.028 14.267 16.873 31.140 57.585 68.583 97.714 37.054 134.767 30.425 12.095 42.520 128.139 49.149 574.207 612.016 $1.186.223$ 187.365 199.746 387.111 761.572 811.762 $1.186.223$	4.2 FIOCUCIANU MAINUS 5 Interest According Development Rand	C	6-150	6.150	0	2.050	2.050	0	8,200	8.200
Acquisition Cost 37.174 0 37.174 1 7.201 44.375 0 Acquisition Cost 43.318 51.710 95.028 14.267 16.873 31.140 57.585 68.583 cal Contingency 97.714 37.054 134.767 30.425 12.095 42.520 128.139 49.149 Contingency 574.207 612.016 $1.186.223$ 187.365 199.746 387.111 761.572 811.762 1.1	 Littators resources recognized and Administration Cost 	ý. 6.608	8.705	15.312	2,265	2.478	4,742	8.873	11.182	20.055
cal Contingency 43,318 51,710 95,028 14,267 16,873 31,140 57,585 68,583 Contingency 97.714 $37,054$ 134.767 $30,425$ $12,095$ $42,520$ $128,139$ $49,149$ Contingency $574,207$ 612.016 $1.186,223$ 187.365 199.746 387.111 $761,572$ 811.762 $1.166,223$ 187.365 199.746 387.111 $761,572$ 811.762 $1.166,223$ 187.365 199.746 387.111 $761,572$ 811.762 $1.166,223$ 187.365 199.746 387.111 $761,572$ 811.762 $1.166,223$ 187.365 199.746 387.111 $761,572$ 811.762 $1.166,223$ 187.365 199.746 387.111 $761,572$ 811.762 $1.166,212$	7 I and Acquisition Cost	37.174	0	37,174	7.201	0	7.201	44,375	0	44.375
Contingency 97.714 37.054 134.767 30.425 12.095 42.520 128.139 49.149 574,207 612.016 1.186.223 187.365 199.746 387.111 761.572 811.762 1.	8 Physical Contineency	43.318	51,710	95,028	14,267	16.873	31,140	57,585	68.583	126,168
<u>574,207</u> 612,016 1.186,223 187,365 199,746 387.111 761.572 811.762	9 Price Continuency	97.714	37,054	134.767	30,425	12.095	42.520	128,139	49,149	177.288
	Total	574,207	612.016	1.186.223	187.365	199.746	387.111	761.572	811.762	1.573.334
	· ·									

		ur Priner RIS		ſ	uague RIS			Grant Totai	
Work Item	<u> </u>	F/C	Total	DC.	ΈλĊ	Total		F/C	Tota
Construction Cost 1 Improvement of Diversion Dam (1) Renlacement of the pates 1	1.443 1.439	5,773 5,754	7.216 7.193	26.025 439	40.121 1.755	66.146 2.193	27,468 1,877	45.894 7.509 21	73.362 9.386 26
	N00	စ္ဝဝ	400	0 15.865 9.720	2 29,511 8,854	45.376 18.574	15,865 9,720	29.511 8.854	45.376 18.574
	767 242	796,227	558.570	66.854	61,341	128,195	329,196	357,568	686.76
1.2 Imgauon Canal and Related Structures	26,793	115,124	211.918	9,852	10.864	20,716	106,645	125,988	232,63
ৰ	35,903	52,799	88.702	5.179	6,201	0336	41.001	66,988	132.55
	60.891 ee 760	62.325 61 275	112,021	4,075	4,002	44,677	82.218	79,492	161.71
(2) Lateral canal	38.333	43,442	81,775	13,460	13,514	26.974	51.793	56,956	7-801 10801
(b) Canal lining *2	17,426	17,833	35.259	12,999	4,704	2 504	57805 7867	7.487	15.3
(3) Feeder canal +2	5,905	5.945	11.850	706	1 3 2 1	2.906	12.880	12.061	24,9
	19265 19265 19265	55,535 57,535 77,652	104.799	16.015	20.883 8.464	36,898 19,495	65.279 54.307	76,418 56.122	141.697 110,429
(6) On-farm facilities -2	11111	00011							,
1.3 Drainage Canal and Related Structures	18.375	39,616 77 953	57,992 36,656	1.076 0	1.035	2.110	19,451 8,703	40.651 27.953	36,656
 Improvement of Abangay "2 Secondary drain "2 	0,705	5,962	7.830	148	474	622 622	2.017	6,436	97 00 00 F
	4,175 3,630	3.632 2.069	7.807 5.699	0 927	0 561	0 1,488	4.557	2.630	7,187
	25,807	11.015	36,821	7,426	3,170	962.01	33,233	14,185	47,418
1.6. Dural Road and Related Sinuctures	13.885	18,000	31,885	6.307	11.672	20.979	23,192	29,672	200 210 210 210 210
	8.577 5.308	15,215 2,785	23,792 8,094	5,405 3,903	9,624 2,048	5.950	9,211	4.833	14.044
1 6. 1A Office #2	2,625	2,625	5,250	875	875	1.750	3.500	3,500	7.000
	012	013	1 825	0	0	0	913	913	1.825
1.7 Training Center 1 Sub-Total	325,390	374,169	699,360	111.563	118,213	229.776	436'927	492,382	-676
2 Engincering Services Costs	32.539	37,417	69,956	11.156	11.821	22,978	43,695	49.238	92,934
3 Administration Cost	6.508	7,483	13,991	2,231	2.364	4.596	8,739	9,848	18,587
4 Land Acquisition Cost	37,174	0	37,174	7,201	0	7.201	44,375	0	44.375
s Brusical Continuency	40.161	41.907	82.068	13,215	13.240	26.455	53.376	55.147	108.523
		AKD 076	902.749	145.367	145.639	291,006	587,139	606.615	1.195.1

l Works
tts of Civil
nstruction Cos
6.3.2 Co
Table

			Table 6.3.3	Costs of Procure	Costs of Procurement and Institutional Development Works	ional Developme	nt Works	(U	(Unit: 1.000 pesos)	
		Jal	Jalaur Proper RIS		Su	Suague RIS			Total Amount	1
		L/C	F/C	Total	L/C	F/C	Total	LO L	P/C	l otal
	•	2676	2.625	5.250	875	875	1.750	3.500	3,500	7,000
	Construction of LA Utilies Demonstrian of Training Center	913	913	1.825	0	0	0	913	913	1.825
1	•	3.538	3,538	7.075	875	875	1.750	4.413	N 14 4	8.825
6	-									
તં	• •	0	48,793	48,793	0	1.578	1.578	0	50,371	50.371
2.2		c	602	897	c	297	297	0	1,190	1.190
	(1) Training & Communication		382	183	0	128	128	0	510	510
	(2) Office equipment		3.750	3.750	0	1,250	1.250	0	5.000	5.000
	(5) I ransport tachines) O	2.235	2.235	0	745	745	0	2.980	2.980
	Sub-total	0	7.260	7.260	0	2.420	2,420	0	9,680	9.680
с.,	Cost & Expenditure of Training Materials	5,004	5,004	10,008	1.668	1,668	3,336	6,672	6.672	13.344
•		76.460	35 755	62.215	8,820	30,550	39.370	35.280	66.305	101.585
4 -	~	26.460	30.150	56.610	8,820	30,150	38,970	35,280	60.300	95.580
4 4	for implementation of equipment	0	5,605	5,605	0	400	400	0	6.005	6,005
Ś	Irrigators' Association Development Fund (IADF)	0	6.150	6,150	0	2.050	2.050	0	8.200	8.200
ę	Administration Cost for Institutional Development and Procurement	100	1.221	1.321	33	£11	147	133	1,334	1,468
٢	Physical Contingency	3,156	9,803	12,960	1.052	3.633	4.685	4.209	13.436	17.645
	Total	38,258	117,524	155.782	12.449	42.886	55.335	50.707	160,410	211,117

Work Item	Jak	Jalaur Proper RIS		•1	Suague RIS		Ŭ	Grant Total	
	T/C	F/C	Total	Ž	F/C	Total	L/C	F/C	Total
Construction Cost	325.390	374.169	699.560	111.563	118.213	229,776	436.954	492.382	929.336
1 Improvement of Diversion Dam	1,443	5,773	7.216	26,025	40.121	66,146	27,468	45.894	73.362
2 Irrication Canal and Related Structures	262.343	296,227	558,570	66,854	61,341	128,195	329,196	357,568	686.765
3 Drainage Canal and Related Structures	18.375	39.616	57,992	1,076	1.035	2.110	19,451	40,651	60,102
.4 Service Road	25,807	11.015	36,821	7,426	3,170	10,596	33.233	14,185	41,418
	13,885	18,000	31,885	9.307	11.672	20,979	23.192	29.672	52.864
	2.625	2,625	5,250	875	875	1.750	3,500	3,500	7,000
	913	813	1.825	0	0	0	913	619	323.1
Procurement of Equipment	0	56,053	56,053	0	3,998	3,998	0	60.050	60.050
2.1 O& M Works	0	48.793	48,793	0	1,578	1,578	0	50.371	50.371
	0	7.260	7,260	0	2,420	2,420	0	9,680	9.680
Cost & Expenditure of Training Materials	5.004	5,004	10,00\$	1,668	1.668	3.336	6.672	6.672	13,344
Envincering Services Costs	58,999	73.172	132,171	19,976	42,371	62,347	78.975	115.543	194,519
4.1. Civil Works	32,539	37.417	69,956	11.156	11,821	22.978	43.695	49,238	92.934
	0	5.605	5,605	0	400	400	0	6.005	6.005
	26,460	30,150	56,610	8.820	30,150	38,970	35,280	60.300	95.580
Itrigators' Association Development Fund (IADF)	0	6,150	6,150	0	2.050	2,050	0	8.200	8.200
k Administration Poet	X 608	8 705 8	15312	2.265	2.478	4.742	8.873	11.182	20.055
_	6.508 6.508	7 483	190 51	2.231	2.364	4.596	8.739	848.6	18.587
	100	1.22.1	1.321	33	113	147	133	1,334	1,468
Land Acquisition Cost	37,174	0	37,174	7.201	0	7,201	44.375	0	44,375
Physical Contingency	43.318	51.710	95,028	14,267	16,873	31.140	57.585	68.583	126.168
8.1 Civil Works	40,161	41,907	82,068	13,215	13,240	26,455	53.376	55.147	108.523
	3,156	9.803	12,960	1.052	3.633	4,685	4,209	13,436	17.645
		070 - 42		11/ 11/	037 601	242.601	632 422	217 672	1 306 046

Table 6.3.4 Summary of Costs on Construction, Procurement & Institutional Development

	Ś	Without-Project			With-Project		Incremental	ental	Incremental	Cropping	Service
	Cropped	Profit	ii -	Cropped	Profit	īt	Cropped	Total	Benefit	č	Area
	Area	per ha	Total	Area	per ha	Total	Arca	Profit	Profit per ha	Without W	With % ha
	ц	peso/ha	x 1000pcso	na	pesorna	X IUUDESO	1	New York		<	õ
Jaiaur Froper 1st Paddy Imisated direct	6120	11.019	48,594	4,410	20,126	88.756	-1.710				
2nd Paddy Impared direct	4910	10.313	45,483	4,410	19.545	86,194	-500				
ter Daddy Iniantal trans	C			4.410	18.747	82,673	4.410				
and Paddy Infeated trans.	ò			4,410	18.747	82.673	4,410				
1st Paddy Rainfed	2600	5.954	15,480	0	0	0	-2,600				
2nd Paddy Rainfed	1940	5,954	11,551	0	0	0	-1.940				
3rd paddy	1200	5,821	6.985	1,200	5.821	6.985	0				
watermelon	10	13.911	1,391	100	13.911	1,391	0				
mungbean rainfed	600	4,963	2.978	88	4.963	2,978	0				
Total	17.470		132,461	19.540		351.650	2.070	219.189	24.9	198	222
Suazue											2.900
Ist Paddy Im gated, direct	2540	12,709	32.281	1,450	20,126	29.183	-1,090				
2nd Paddy Imigated, direct	1870	11.093	20.745	550	19,545	10,750	-1.320				
1st Paddy Imigated, trans.	0		0	1,450	18,747	27.183	1.450	•			
2nd Paddy Irrigated trans.	0		0	550	18,747	10.311	550				
- 1st Paddy Rainfed	360	5,954	2,143	0		0	-360				
	610	5,954	3.632	0	0	0	-610				
2 3rd paddy	50	5.821	291	50	5,821	291	0				
watermelon	20	13,911	278	20	13.911	278	0				
mungbean rainfed	150	4,963	744	150	4,963	744	0				
mungbean imgated	0	0	0	1,800	11,445	20.601	1,800				
Total	5.600		60.115	6.020		99.341	420	39,226	13.5	193	208
Total											11.720
Ist Paddy Imgated, direct	8,660		80.875	5,860		956,711	-2,800				
2nd Paddy Imgated, direct	6,780		66.227	4,960		96,944	-1,820				
1st Paddy Imgated, trans.	0		0	5,860		109.855	5.860				
2nd Paddy Imgated, trans.	0		•	4,960		92,983	4,960				
1st Paddy.Rainfed	2,960		17.624	Ó		0	-2,960				
2nd Paddy Rainfed	2,550		15,183	0		0	-2,550				
3rd paddy	1,250		7,276	1,250		7.276	0				
watemelon	120		1,669	120		1,669	0				
mungbean rainfed	750		3.722	750		3.722	0				
mungbean irrigated	o		0	1,800		20,601	1,800				
Total	23.070		192.576	25.560		450.991	2.490	258.415	22.0	161	218

Table 7.1.1 Economic Incremental Benefit

Rice	Unit	1997	2000	2005	2010
WB price, 1990 constant, FOB Bangkok	\$/t	301	279	267	262
WB price,1997 constant, FOB Bangkok	\$/t	330	306	293	287
Quality discount	%	20	20	20	20
Ocean freight & insurance	\$/t	53	53	53	53
CIF, Iloilo	\$/t	317	298	287	283
in peso, 1US\$ = 35.1 peso	P/t	11127	10451	10079	9931
Port handling & other costs	₽/t	145	145	145	145
Importer's margin, 7.5% of CIF	P/t	835	784	756	745
Ex-warehouse price(a)	P/t	12106	11380	10980	10821
Transport cost to markets(b)	P/t	58	58	58	58
70peso/3km/ton*0.83(SCF)					-
Trader's margin, 2% of (a)+(b)	P/t	243	229	221	218
Wholesale price	P/t	12407	11667	11258	11096
Transport cost to mill	P/t	388	388	388	388
467peso/20km/ton x 0.83					
Ex-mill price	P/t	12019	11279	10870	10708
Milling cost	P/t	332	332	332	332
By-product value, 100kg x 5.5P x 0.83	₽∕t	457	457	457	457
Pre-mill price	P/t	12144	11404	10995	10833
Palay equivalent price, x 0.65	P/t	7894	7413	7147	7042
Transport cost to mill, 4km	P/t	77	77	77	77
Farm gate price of palay	P/t	7816	7335	7070	6964

.

 Table 7.1.2 Economic Prices (1/2 : for Paddy)

.

.

Urea	Unit	1997	2000	2005	2010
WB price, 1990 constant, FOB Indonesia	\$/t	146	143	135	128
WB price, 1997 constant, FOB Indonesia	\$/t	160	157	148	140
Ocean freight & insurance	\$/t	53	53	53	53
CIF, Iloilo	\$/t	213	210	201	193
In peso	P/t	7482	7366	7058	6789
Marketing cost, 7% of CIF estimated by ADB	P/t	524	516	494	475
Retail price	P/t	8006	7882	7553	7264
Transport cost to farm,	P/t	388	388	388	388
Farm gate price	P/t	8394	8270	7941	7652
Farm gate price of nitrogen	P/kg	18.7	18.4	17.6	17.0
TSP	Unit	1997	2000	2005	2010
WB price,1990 constant, FOB Indonesia	\$/t	157	126	114	104
WB price, 1997 constant, FOB Indonesia	\$/t	172	138	125	114
Ocean freight & insurance	\$/t	53	53	53	53
CIF, Iloito	\$/t	225	191	178	167
In peso	P/t	7906	6693	6261	5846
Marketing cost, 7% of CIF estimated by ADB	P/t	553	468	438	409
Retail price	P/t	8459	7161	6700	6255
Transport cost to farm	P/t	388	388	388	388
Farm gate price	P/t	8847	7549	7088	6643
Farm gate price of phophoric oxide	P/kg	19.7	16.8	15.8	14.8
Potassium chloride	Unit	1997	2000	2005	2010
W8 price,1990 constant, FOB Indonesia	\$/ t	107	103	87	88
WB price,1997 constant, FOB Indonesia	\$/t	117	112	95	96
Ocean freight & insurance	\$/t	53	53	53	53
CIF, Iloilo	\$/t	170	165	148	149
In peso	P/t	5967	5807	5203	5229
Marketing cost, 8% of CIF estimated by ADB	₿ P/t	477	465	416	418
Retail price	P/t	6444	6272	5619	5648
Transport cost to farm	P/t	388	388	388	388
Farm gate price	P/t	6832	6660	6007	6036
Farm gate price of potash	P/kg	12.4	12.1	10.9	11.0

Table 7.1.2 Economic Prices (2/2 : for Fertilizers)

1.1.1

Crop Cate	gory	1st Pa	idly în	gated	200 Pa	iddy frei	gated	Mung	can Irri	gated
		Qty	Price	Value	Qty	Price	Value	Qty	Price	Value
			peso	<u>k</u> ø		peso	<u> 1680</u>		<u>teso</u>	peso
Scals	kg	100	7	707	100	7	707	25	25	623
Fertilizer										
N	kg	100	18	1,765	100	18	1,765	30	18	529
P2O5	kg	35	16	551	35	16	551	30	16	473
К2О	kg	35	п	382	35	11	382	30	11	328
Chemicals				1,370			1,951			664
Labor										
Hired	man-day	40	48	1,920	40	48	1,920	25	48	1,200
Family	man-day	40	48	1,920	40	48	1,920	24	48	1,152
Machine/Tool/Ar	inal			2,075			2,075			1,660
Fuel/Oil				83			83			83
Inigation Service	Fepeso			0			0			C
Harvesters Share	peso			4,451			4,451			2,594
laterest	Peso			0			0			(
Total	Peso			15,224			15,805			9,303

Table 7.1.3 Economic Production Cost in With-project Condition

Crop Cate	ROLA	1st Trans	Paddy	Irrigated	2nd Trans	. Paidy	Irrigate
		Qty	Price	Value	Qty	Price	Value
			peso	peso		peso	<u>peso</u>
Seed	kg	50	7	353	50	7	353
Fertilizer							
N	kg	100	18	1,765	100	18	1,765
P2O5	kg	35	16	551	35	16	551
K2O	1g	35	33	382	35	11	382
Chemicals				1,951			1,951
Labor							
Hired	man-day	52	48	2,496	52	48	2,496
Family	man-day	52	48	2,496	52	48	2,496
Machine/Tool/Ar	imat 👘			2,075			2,075
FuelOil				83			83
Irrig. Service Fee	reso			0			0
Harvester's Share	peso			4,451			4,451
Interest	Peso			0			0
Total	Peso			16,603			16,603

Crop Cat	eeory	1st Pa	addy Isri	gated	2nd P	addy In	gated	3	rd Packly	y	Pac	ldy Rair	fed
	<u>.</u>	Qty	Price		Qiy	Price	Value	Qty	Price	Value	Qty	Price	Value
	<u> </u>		peso			peso	peso		peso	peso		peso	peso
Seeds	kg	140	7	990	140	1	990	140	7	990	140	7	9 90
Fertilizer	Ŧ												
N	kg	93	18	1,641	93	18	1,641	60	18	1,059	60	18	1,059
P2O5	kg	28	16	441	28	16	441	- 14	16	221	14	16	221
K2O	kg	13	11	142	13	11	142	7	11	76	10	11	109
Chemicals	Ū			1,127			1,127			768			768
Labor													
Hired	man-day	35	48	1,680	- 36	48	1,728	28	48	1,344	28	-48	1,344
Family	man-day	34	48	1,632	35	48	1,680	28	48	1,344	28	48	1,344
Machine/Fool/A	nimał			2,034			2,117			2,100			1,975
Fuel/Oil				42			125			125			83
Irrigation Service	: Fe p eso			0			0			0			0
Harvesters Share	-			3,293			3,027			1,994			1,994
Interest	Peso			0			0			0			(
Total	Peso			13,021			13,017			10,019			9,88(

Table 7.1.4 Economic Production Cost in Without-project Condition

Crop Cate	goty	Paddy Irrig	ated (tr	ansplanted)	N	lungbea	n	Waterme	lon(Veg	getables
		Qty	Price peso		Qty	Price peso	Value peso	Qty	Price peso	Value peso
Seeds	kg	100	7	707	25	25	623	4	664	2,656
Fertilizer										
N	kg	93	18	1,641	30	18	529	50	18	882
P2O5	kg	28	16	441	0	16	0	14	16	221
K2O	kg	13	11	142	0	11	0	14	11	153
Chemicals	-			1,141						1,245
Labor										
Hired	man-day	y 50	48	2,400	9	48	432	40	48	1,920
Family	nian-day	49	48	2,352	8	48	384	40	48	1,920
Machine/Tool/An	imal			2,117			249			166
Fuel/Oil				125			83			166
Irrig. Service Fee	peso			0			0			0
Harvesters' Share	-			3,027			1,038			3,320
Interest	Peso			0			0			0
Total	Peso			14,092			3,337			12,649

		Wit	hout-proje	çt			٧	/ith-Projec	t i	
		Output	P	roduction	Profit		Output	P	roduction	Profit
_	Qty	Price	Value	Cost		Qty	Price	Value	Cost	
*****	ton	pesotion	peso	peso	peso	ton	peso/ton	peso	peso	peso
Jalaur Proper										
1st Paddy Irrigated, direct	3.40	7,070	24,040	13,021	11,019	5.00	7,070	35,350	15,224	20,126
2nd Paddy Irrigated, direct	3.30	7,070	23,330	13,017	10,313	5.00	7,070	35,350	15,805	19,545
1st Paddy Irrigated, trans.	-	-	-	-	-	5.00	7,070	35,350	16,603	18,747
2nd Paddy Inigated, trans.	-	-	-	-		5.00	7,070	35,350	16,603	18,747
1st Paddy Rainfed	2.24	7,070	15,840	9,886	5,954	2.24	7,070	15,840	9,886	5,954
2nd Paddy Rainfed	2,24	7,070	15,840	9,886	5,954	2.24	7,070	15,840	9,886	5,954
3rd paddy	2.24	7,070	15,840	10,019	5,821	2.24	7,070	15.840	10,019	5,821
watermeton	4.00	6,640	26,560	12,649	13,911	4.00	6.640	26,560	12,649	13,911
mungbean rainfed	0.40	20,750	8,300	3,337	4,963	0.40	20,750	8,300	3,337	4,963
Suague							•			•
1st Paddy Irrigated, direct	3.64	7,070	25,730	13,021	12,709	5.00	7,070	35,350	15,224	20,126
2nd Paddy Inigated, direct	3.41	7,070	24,110	13,017	11,093	5.00	7,070	35,350	15,805	19,545
1st Paddy Irrigated, trans.	-	•	-	•	•	5.00	7,070	35,350	16,603	18,747
2nd Paddy Irrigated, trans.	-		-	-		5.00	7,070	35,350	16,603	18,747
1st Paddy Rainfed	2.24	7,070	15,840	9,886	5,954	2.24	7,070	15,840	9,886	5,954
2nd Paddy Rainfed	2.24	7,070	15,840	9,886	5,954	2.24	7.070	15,840	9,886	5,954
3rd paddy	2.24	7,070	15,840	10,019	5,821	2.24	7.070	15,840	10,019	5,821
watermelon	4.00		26,560	12,649	13,911	4.00	6,640	26,560	12,649	13,911
mungbean rainfed	0.40	20,750	8,300	3,337	4,963	0.40	20,750	44,820	3,337	41,48
mungbean irrigated	-					1.00	20,750	20,750	9,305	11,449

Table 7.1.5 Economic Crop Net Income per ha in the Future

								ſ	-							
Project	Jalaur proper Init	E	Replacement	Annual	Suzgue	Initial	Replacement	Annual	Total	Initial	Replacement	Annual	, Net	Benefit	Initial cost	Combinetion
Vear	Benefit	Cost	Cost	Cost	Benefit	Cost	Cost	Cost	Benefit	Cost	Cost	Cost	Benefit	10% reduction	10% IDCICASE	COMPUTATION
-		Q¥				4		3		94		4	-108	-108	-118	011- -
- (ĥ		: =				~		3		4	48	87-	-5	-51
<u></u>				: :		3		~	c	725		4	-351	-351	-384	-384
¥7, I			•	: :	0	00 791		5.01		425		14	-388	-393	-430	-435
4	4	0/2		- °	• 1	<u>.</u>		5.00	5 5	n X		11	-126	-136	-147	-158
<u> </u>	2			00	2 2	• •		2.00				-	123	107	122	100
9				юс		t .		<u> </u>		:	:	: =	195	175	195	:75
r., '	175			c :				~ ~				: =	247	221	247	ដ
<u>.</u>	2 :			ю ч	5.6			· · ·				~	250	なたた	250	522
6	5 []		-	0 1			9 0	1 0			¢.) oc	248	222	248	122
2			-	р ч			~~~	1 6			ŧ	- > C	250	224	250	224
-	2 			0 1				1 0) oc	250	224	250	224
- • -	2 2			0 4				1.0				00	250	224	250	224
<u>:</u> :	2.4			94				10				~~~	250	224	250	224
t v		÷	, č				2	1 6			30	30	220	194	220	191
<u>c</u> z	2 C)								1		250	224	250	224
2 0				. .				1.61				8	250	224	250	401
22				o ve				2				30	250	224	250	724
	617 917											90	250	224	250	224
2 6			20		·		×				39		- 211	185	211	185
97			р.				;	l č				90	250	224	250	22
58								16				ж Э	250	224	87 87	700 700
16				2 4				1 C				90	250	224	250	727
97	23	÷		2 4								8	250	224	250	422
7.6	6 I A			<i></i>				5	_			~	250	224	250	20
3	417			2 4				<u>י</u> ו				oc	250	224	250	442
9	<u> </u>			0 4				4 6					250	224	250	224
3	<u> </u>			0				1 7				00	250	777	250	226
22				0 \				1 6				o ce	250	124	S S	22
62 6	612		Ċ	0 4			×	10			32) 0 0	218	192	218	192
2	610 617		t		. ee		,	1	258				, YUL	200 P 1	15 102	13 60.
									_					0/.0.4	0,110	

Table 7.1.6 Economic Rate of Return

	2	Without-Project			With-Project		Incremental
	Cropped	Labor rec	Labor requirement	Cropped	Labor rev	puire	
	Arca ha	per ha men-dav/ha	per ha Total men-davha 1000men-dav	Area ha	per ha men-day/ha	per ha Total men-day/ha 1000men-day	1000men-day
Lalaut Proper							
lst Paddy Imisated, direct	6120	69	305	4,410			-1,710
2nd Paddy Imicaled. direct	4910	11	313	4,410		353	-500
Let Daddy Iminated Trans	C			4,410	-	459	4.410
and management there.) C			4.410	10	459	4,410
ter Daddy Dainfad	2600 2600	56	146	0	0	0	-2,600
and Daddy Painfed	1940	99	109	0	0	0	-1.940
2nd naddw	1200	56	67	1.200	4,	67	0
watermelon	801	8	∞	100		×	0
muschean rainfed	009	17	10	009	17	10	0
Total	17,470		957	19.540		1.708	2.070
Suague							
1st Paddy Irrigated, direct	2540	69	175	1,450			060'1-
2nd Paddy Impated, direct	1870	71	133	550			-1.320
1st Paddy Irrigated, trans.	0		0	1,450	ş	151	1,450
2nd Paddy Impated trans.	0		0	550			550
1st Paddy Rainfed	360	56	ຊ	0		0	-360
2nd Paddy Rainfed	610	56		0			-610
3rd paddy	50	56		50		en L	o
watermelon	20	8		ล			0
munsbean rainfed	150	17	ŝ	150	17		0
mungbean irrigated	0	0	0	1.800	49		1.800
Total	5.600		369	6.020		463	420
Total							000 e
1st Paddy Imigated, direct	8,660		480	5,860		469	00%'7-
2nd Paddy Irngated, direct	6,780		446	4,960		397	-1.820
1st Paddy Imgated, trans.	0		0	5.860		809	5.860
2nd Paddy Irrigated trans.	0		0	4.960		516	4,960
1st Paddy Rainfed	2,960		166	0		0	-2,960
2nd Paddy Rainfed	2,550		143	0		0	-2.550
3rd paddy	1.250		2	1,250		70	0
watermelon	120		0	120		10	0
mungbean rainfed	750		13	750		13	0
mungbean irrigated	0		0	1.800		88 88	1,800
Total	23.070		1.326	25,560		2,171	2.490

Table 7.2.1 Increment of Job Opportunity