

LEGEND

- ⊙ Capital Town of District
- Sub-District Town
- District Boundary
- - - Sub-District Boundary
- Provincial Road
- District Road
- ~ River
- Irrigation Scheme
- Technical Irrigation
- ▤ Semi-Technical Irrigation
- ▨ Non-Technical Irrigation

Irrigation Scheme

Name of Scheme	Registered Area (Ha)		Subject Area (Ha)
27. Padang Sappa	12,588	T	10,889
28. Bajo	7,000	ST	6,462
29. Padang Alipan	1,200	T	795
30. Makawa	1,775	NT	1,000
31. Lamasi Kanan	5,485	T	5,170

T : Technical Irrigation
 ST : Semi-Technical Irrigation
 NT : Non-Technical Irrigation

The Study on Comprehensive Recovery Program
of Irrigation Agriculture

Japan International Cooperation Agency

**Location Map of Irrigation Schemes
in Luwu District**

I. PROJECT FUNDAMENTALS									
I.1 General									
(1) Code Number	: 73170162			(7) Number of Farmers	: 5,500				
(2) Name of Irrigation Scheme	: Padang Sappa			(8) Water Resource River	: Noling				
(3) District (Kabupaten)	: Luwu			(9) Catchment Area (km ²)	: 783				
(4) Sub-district (Kecamatan)	: Bupon			(10) Completion / Last Rehabilitation Year	: 1985				
(5) Registered Area (ha)	: 12,588								
(6) Technical Level	: Technical								
I.2 Availability of Reports/Documents & References (A : Available, B : Available but partially, C : Not available/ No plan)									
a. Design Reports of Existing System(Full set)		b. Irrigation diagram			c. As-built drawings		d. Structure lists & diagram		
A		A			B		A		
e. Rehabilitation plan & its references		f. Crops and yield data			g. Cropping Calender		h. WUAs data		
C		A			A		33		
II. SUBJECT AREA FOR REHABILITATION PLAN									
II.1 Present and Planned Land Use									
Category	Present (ha)		Plan (ha)		Increment (ha)				
a. Irrigated paddy field	4,881		9,687		4,806				
b. Rainfed paddy field	2,000		0		-2,000				
c. Upland Field	4,008		0		-4,008				
d. Uncultivated Land	0		0		0				
e. Non-irrigable	0		1,202		1,202				
Total	10,889		10,889		0				
III. AGRICULTURE									
III.1 Present/Before Project Condition									
(1) Irrigation Performance and Crop Production									
Season	Cropped Area in Irrigated Paddy Field				Annual Intensity	Irrigated Paddy Yield (GKG ton/ha)	Crop Production (ton) 1/		
	Paddy (ha)	Palawija	Others (ha)	Total (ha)			Paddy	Palawija	Others
Season I (wet)	4,711			4,711	97%	4.0	23,844	10,020	
Season II (dry I)				0					
Season III (dry II)	3,816			3,816	78%	4.5	17,172	1,000	
Total/Annual	8,527	0	0	8,527	175%	4.2	41,016	11,020	0
1/: Irrigated & rainfed paddy & palawija									
(2) Problems and Constraints									
<i>A. Irrigation & Agriculture Performances</i>									
- High irrigation performances attained in irrigated area; existing extensive rainfed field (2,000ha) & upland field (4,008ha)									
- Double cropping of paddy practiced in most of the irrigated areas; paddy yield levels low to moderate; extensive rainfed paddy & upland field									
<i>B. Primary Constraint Identified through the Inventory Survey by the JICA Study</i>									
- Irrigation & Drainage:	Water shortage at on-farm level in dry season			- Palawija Marketing:	-				
- Agronomic Issues:	Damage caused by rat			- Farmers Organizations:	No collaboration among KT's				
- Paddy Marketing	Limited bargaining power of farmers			- Extension Services:	Extension activities of PPLs are limited				
III.2 Development Plan									
(1) Development Approaches									
- Expansion of irrigated area through rehabilitation & upgrading									
- Expansion of double cropped area of paddy; productivity increase of paddy through further intensification; introduction of palawija in dry season II									
- Strengthening of extension activities tailored to area specific needs; empowerment of farmer groups (KTs) to establish agri-business oriented KT's									
(2) Planned Irrigation Performances and Crop Production									
Season	Cropped Area in Irrigated Paddy Field				Annual Intensity	Irrigated Paddy Yield (GKG ton/ha)	Crop Production (ton)		
	Paddy (ha)	Palawija	Others (ha)	Total (ha)			Paddy	Palawija	Others
Season I (wet)	9,687			9,687	100%	5.0	48,435		
Season II (dry I)				0	0%				
Season III (dry II)	4,844	969		5,813	60%	5.5	26,642	4,845	
Total/Annual	14,531	969	0	15,500	160%	5.2	75,077	4,845	0
Annual Increment	6,004	969	0	6,973	-15%	1.0	34,061	-6,175	0
IV. WUAs									
IV.1 Existing Condition									
(1) Number	a. Target;	60	b. Established;	56	c. Not yet;	4	Registered		0
Performance	a. Developed;	9	b. Under developing;	31	c. Not yet;	6	Not yet registered		56
(2) Problems and Constraints									
<input type="checkbox"/> Operation <input type="checkbox"/> Maintenance <input checked="" type="checkbox"/> Management									
(3) Causes of Problems and Constraints									
- Less attention to WUA establishment among farmers.									
IV.2 Development Plan									
(1) Proposed Countermeasures									
- Encouragement of farmers to make themselves positive in utilization of irrigation system.									
(2) Development Plan									
- WUA empowerment training.									

V. IRRIGATION FACILITY

V.1 Existing Condition

- (1) Overall Irrigation System : C (A: Functioning well, B: Partially deteriorated, C: Not functioning well, D: Serious condition for operation)
 Water Resources Facility : B Main Canal System : D Secondary Canal System : D On-farm : C
- (2) Water Resources Facility
- | | | | | | |
|----------------------------|--------------------------|-------------------------|----------------|---|-----|
| a. Type of facility | : Headworks | e. Scouring sluice gate | : 5 nos. | i. Condition | : B |
| b. Type of weir | : Fixed weir | f. Intake gate | : 3 nos. | (A: Functioning well, B: Partially deteriorated, C: Not functioning well, D: Serious condition for operation) | |
| c. Length of weir | : 106 m | g. Settling basin | : provided | (no info.: no information) | |
| d. Design intake discharge | : 15.1 m ³ /s | h. Inspection bridge | : not provided | | |

(3) Irrigation Canal and Inspection Road

Canal	Lined (m)	Unlined (m)	Total (m)	Structure (nos)	Inspection road (m)	Condition
Main	3,867	6,297	10,164	29	1,676	D
Secondary	5,156	42,804	47,960	134	4,776	D

(A: Functioning well, B: Partially deteriorated, C: Not functioning well, D: Serious condition for operation)

(4) Major Problems and Constrains

- Water Resources Facility
 - Inflow of bed loads into canal and decrease canal flow capacity
- Irrigation Canal and Related Structure
 - Sedimentation or obstruction of water flow
 - Impassable of inspection road along canal
 - Difficulty on maintenance of earth canal
- (5) Causes of Major Problems and Constraints
 - Water Resources Facility
 - Insufficient function of settling basin, no proper gate operation of intake during flood
 - Irrigation Canal and Related Structure
 - Insufficient function of settling basin(sediments), improper management of canal (sediments, water plant)
 - Improper routine O&M works due to no or narrow wide of road, slope erosion by rainfall then in flow into canal
 - Fallen down and collapse of side slope, water plants or weed at inside of canal

V.2 Development Plan

(1) Proposed Countermeasures for Major Problems

- Water Resources Facility
 - Rehabilitation of settling basin, proper gate operation of intake during flood
- Irrigation Canal and Related Structure
 - Removal of sediment soil and foreign materials from canal, grass cutting
 - Provision of inspection road both main and secondary canal with pavement
 - Provision of concrete lining

(2) Water Resources Facility

Dam/Headworks body : minor rehabilitation Intake, civil : minor rehabilitation Intake, mechanical : minor rehabilitation
 Settling basin : minor rehabilitation

(3) Irrigation Canal and Related Structure

	Works	No rehabilitation	Rehabilitation	New construction	Total
Canal (m)	Main	0	8,843	0	8,843
	Secondary	0	41,725	0	41,725
Structure (nos)	Main	0	25	3	28
	Secondary	0	117	23	140

(4) On-farm Development

(Unit: ha)

a. Potential Irrigated paddy field	4,881	d. Non-potential paddy field	2,000
b. Potential non-irrigated paddy field	0	e. Non-potential non-paddy field	4,008
c. Potential non-paddy field	0	Total	10,889

(5) Rehabilitation Cost (Direct Cost)

(Unit: Million Rp.)

W.R.F	Irrigation	Drainage	On-Farm Develop.	Project Facility	Total	Cost per ha
3,805	96,274	9,627	35,672	3,600	148,978	13.7

(W.R.F: Water Resources Facility, Develop.: Development)

VI. PROJECT EVALUATION




VI.1 EIRR

VI.2 Prioritization Scoring

Evaluation Index		Full Score	Score	Evaluation Index		Full Score	Score	Total Score
Irrigation System	Utilization of Irrigation Potential	10.0	8.0	Agricultural Productivity	20.0	18.0	78.7	
	Urgency	25.0	20.4	Social Problem	15.0	13.5		
	Sustainability	15.0	8.3	Economic Impact	15.0	10.5		

VI.3 Priority Group

VI.4 Priority Ranking in the Province

Scheme	Padang Sappa	District	Luwu		
Technical Level	Technical	Registered Area	12,588 ha	Year of Construction	1985
		<p><u>Category</u> Irrigation (Headworks)</p>			
		<p><u>Structure</u> Fixed Weir, Intake</p>			
		<p><u>Condition</u> <input type="checkbox"/> A <input checked="" type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D</p>			
		<p><u>Category</u> Irrigation Canal</p>			
		<p><u>Structure</u> Masonry Lined Canal</p>			
		<p><u>Condition</u> <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D</p>			
		<p><u>Category</u> Irrigation (Main Canal)</p>			
		<p><u>Structure</u> Earth Canal</p>			
		<p><u>Condition</u> <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D</p>			
		<p><u>Problems</u> Insufficient diversion water due to sedimentation in front of intake; leakage from gate leaf; insufficient strength against design load due to rust, decay of steel material; problem on management due to lack of periodically maintenance</p>			
		<p><u>Problems</u> Sedimentation; leakage from lined canal; crack on lined canal; deflection of lining toward inside of canal; less maintenance; and no inspection road.</p>			
		<p><u>Problems</u> Sedimentation; collapse of canal; leakage from canal; difficulty on maintenance of earth canal; no inspection road.</p>			

Condition: A: Functioning well, B: Partially deteriorated, C: Not functioning well, D: Serious condition for operation

Scheme	Padang Sappa	District	Luwu		
Technical Level	Technical	Registered Area	12,588 ha	Year of Construction	1985
		<p><u>Category</u> Irrigation (Secondary Canal)</p>			
		<p><u>Structure</u> Check Structure</p>			
		<p><u>Condition</u> <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D</p>			
		<p><u>Category</u> Agriculture, On-Farm</p>			
		<p><u>Activity</u> Paddy Cultivation</p>			
		<p><u>Condition</u> <input type="checkbox"/> A <input type="checkbox"/> B <input checked="" type="checkbox"/> C <input type="checkbox"/> D</p>			
		<p><u>Category</u> Agriculture, On-Farm</p>			
		<p><u>Activity</u> Harvesting and Treshering</p>			
		<p><u>Condition</u> <input type="checkbox"/> A <input type="checkbox"/> B <input checked="" type="checkbox"/> C <input type="checkbox"/> D</p>			
		<p><u>Problems</u> Damage on structure; lower function of check structure due to deflection of structure; physical operation problem on structure; deterioration of gate; sedimentation at inside of canal.</p>			
		<p><u>Problems</u> Low density of on-farm canals and farm roads.</p>			
		<p><u>Problems</u> Low density of on-farm canals and farm roads.</p>			

Condition: A: Functioning well, B: Partially deteriorated, C: Not functioning well, D: Serious condition for operation

I. PROJECT FUNDAMENTALS										
I.1 General										
(1) Code Number	: 73170162	(7)	Number of Farmers	5,035						
(2) Name of Irrigation Scheme	: Bajo	(8)	Water Resource River	: Sungai Bajo						
(3) District (Kabupaten)	: Luwu	(9)	Catchment Area (km ²)	: 316						
(4) Sub-district (Kecamatan)	: Bajo, Belopa	(10)	Completion / Last Rehabilitation Year	: 1970						
(5) Registered Area (ha)	: 7,000									
(6) Technical Level	: Semi Technical									
I.2 Availability of Reports/Documents & References (A : Available, B : Available but partially, C : Not available/ No plan)										
a. Design Reports of Existing System(Full set)	A		b. Irrigation diagram	A		c. As-built drawings	B		d. Structure lists & diagram	A
e. Rehabilitation plan & its references	C		f. Crops and yield data	A		g. Cropping Calender	A		h. WUAs data	16
II. SUBJECT AREA FOR REHABILITATION PLAN										
II.1 Present and Planned Land Use										
Category	Present (ha)	Plan (ha)	Increment (ha)							
a. Irrigated paddy field	5,466	6,462	996							
b. Rainfed paddy field	996	0	-996							
c. Upland Field	0	0	0							
d. Uncultivated Land	0	0	0							
e. Non-irrigable	0	0	0							
Total	6,462	6,462	0							
III. AGRICULTURE										
III.1 Present/Before Project Condition										
(1) Irrigation Performance and Crop Production										
Season	Cropped Area in Irrigated Paddy Field				Annual Intensity	Irrigated Paddy Yield (GKG ton/ha)	Crop Production (ton) 1/			
	Paddy (ha)	Palawija	Others (ha)	Total (ha)			Paddy	Palawija	Others	
Season I (wet)	5,466			5,466	100%	4.0	24,354			
Season II (dry I)				0						
Season III (dry II)	4,202			4,202	77%	4.5	18,909	498		
Total/Annual	9,668	0	0	9,668	177%	4.2	43,263	498	0	
1/: Irrigated & rainfed paddy & palawija										
(2) Problems and Constraints										
<i>A. Irrigation & Agriculture Performances</i>										
- High irrigation performances attained in irrigated area; existing of extensive rainfed field (996ha)										
- Double cropping of paddy practiced in most of the irrigated areas; paddy yield levels low to moderate; extensive rainfed paddy field										
<i>B. Primary Constraint Identified through the Inventory Survey by the JICA Study</i>										
- Irrigation & Drainage: Flooding			- Palawija Marketing: Poor quality of products							
- Agronomic Issues: Infestation of pest & diseases			- Farmers Organizations: Managerial capacity of KT's are limited							
- Paddy Marketing: Low marketing prices			- Extension Services: Implementation of extension programs is limited							
III.2 Development Plan										
(1) Development Approaches										
- Expansion of irrigated area through rehabilitation & upgrading										
- Expansion of double cropped area of paddy; productivity increase of paddy through further intensification; introduction of palawija in dry season II										
- Strengthening of extension activities tailored to area specific needs; empowerment of farmer groups (KTs) to establish agri-business oriented KT's										
(2) Planned Irrigation Performances and Crop Production										
Season	Cropped Area in Irrigated Paddy Field				Annual Intensity	Irrigated Paddy Yield (GKG ton/ha)	Crop Production (ton)			
	Paddy (ha)	Palawija	Others (ha)	Total (ha)			Paddy	Palawija	Others	
Season I (wet)	6,462			6,462	100%	5.0	32,310			
Season II (dry I)				0	0%					
Season III (dry II)	5,816	646		6,462	100%	5.5	31,988	3,230		
Total/Annual	12,278	646	0	12,924	200%	5.2	64,298	3,230	0	
Annual Increment	2,610	646	0	3,256	23%	1.0	21,035	2,732	0	
IV. WUAs										
IV.1 Existing Condition										
(1) Number	a. Target;	69	b. Established;	23	c. Not yet;	46	Registered		0	
Performance	a. Developed;	0	b. Under developing;	19	c. Not yet;	4	Not yet registered		25	
(2) Problems and Constraints										
<input type="checkbox"/> Operation <input type="checkbox"/> Maintenance <input checked="" type="checkbox"/> Management										
(3) Causes of Problems and Constraints										
- No management system in WUA.										
- Less attention to O&M works among WUA members.										
IV.2 Development Plan										
(1) Proposed Countermeasures										
- Encouragement of farmers to organize WUA and Federation.										
(2) Development Plan										
- WUA empowerment training.										

V. IRRIGATION FACILITY

V.1 Existing Condition

- (1) Overall Irrigation System : D (A: Functioning well, B: Partially deteriorated, C: Not functioning well, D: Serious condition for operation)
Water Resources Facility : C Main Canal System : D Secondary Canal System : D On-farm : D
- (2) Water Resources Facility
- | | | | | | |
|----------------------------|-------------------------|-------------------------|----------------|---|-----|
| a. Type of facility | : Headworks | e. Scouring sluice gate | : 1 nos. | i. Condition | : C |
| b. Type of weir | : Fixed weir | f. Intake gate | : 2 nos. | (A: Functioning well, B: Partially deteriorated, C: Not functioning well, D: Serious condition for operation) | |
| c. Length of weir | : 62 m | g. Settling basin | : provided | (no info.: no information) | |
| d. Design intake discharge | : 8.4 m ³ /s | h. Inspection bridge | : not provided | | |

(3) Irrigation Canal and Inspection Road

Canal	Lined (m)	Unlined (m)	Total (m)	Structure (nos)	Inspection road (m)	Condition
Main	500	1,600	2,100	5	0	D
Secondary	0	47,275	47,275	8	0	D

(A: Functioning well, B: Partially deteriorated, C: Not functioning well, D: Serious condition for operation)

(4) Major Problems and Constrains

- Water Resources Facility
 - Crack or damage on weir crest
 - Physical operational problem on flood/scouring sluice gate(s) of headworks
 - Physical operational problem on intake gate(s)
- Irrigation Canal and Related Structure
 - Sedimentation or obstruction of water flow
 - Impassable of inspection road along canal
 - General O&M problems
 - Lower function of regulating structure on canal
 - Difficulty on O&M
- (5) Causes of Major Problems and Constraints
 - Water Resources Facility
 - Collision of foreign materials against weir crest, low quality of concrete/masonry
 - Improper design, installation and/or maintenance of flood/scouring sluice gate(s); breakdown of hoist, stem, guide frame or leaf
 - Improper design, installation and/or maintenance of intake gate(s); breakdown of hoist, stem, guide frame or leaf
 - Irrigation Canal and Related Structure
 - Insufficient function of settling basin(sediments), improper management of canal (sediments, water plant)
 - Improper routine O&M works due to no or narrow wide of road, slope erosion by rainfall then in flow into canal
 - No kilo and hectometer post, no structure plate or mark on structures and no identification for repair/maintenance
 - Deterioration of regulating structure on canal, especially gate and metal works
 - No provision or damage of inspection road, difficulty on passing of inspection road due to damage, broken

V.2 Development Plan

(1) Proposed Countermeasures for Major Problems

- Water Resources Facility
 - Repair of weir crest by cement/chemical grouting or filling concrete
 - Replacement of control system or damaged equipment of flood/scouring sluice gate(s)
 - Replacement of intake gate(s)
- Irrigation Canal and Related Structure
 - Removal of sediment soil and foreign materials from canal, grass cutting
 - Provision of inspection road both main and secondary canal with pavement
 - Provision of kilo, hect-m posts, marking to each structure with structure name
 - Replacement and reconstruction of regulating structure on canal
 - Provision or repair of inspection road with all weather type/pavement

(2) Water Resources Facility

Dam/Headworks body : large rehabilitation Intake, civil : large rehabilitation Intake, mechanical : minor rehabilitation
Settling basin : replacement or new

(3) Irrigation Canal and Related Structure

	Works	No rehabilitation	Rehabilitation	New construction	Total
Canal (m)	Main	0	2,100	210	2,310
	Secondary	0	47,275	9,455	56,730
Structure (nos)	Main	0	5	1	6
	Secondary	0	8	77	85

(4) On-farm Development

(Unit: ha)

a. Potential Irrigated paddy field	5,466	d. Non-potential paddy field	0
b. Potential non-irrigated paddy field	996	e. Non-potential non-paddy field	0
c. Potential non-paddy field	0	Total	6,462

(5) Rehabilitation Cost (Direct Cost)

(Unit: Million Rp.)

W.R.F	Irrigation	Drainage	On-Farm Develop.	Project Facility	Total	Cost per ha
4,506	89,079	8,908	13,758	2,590	118,841	18.4

(W.R.F: Water Resources Facility, Develop.: Development)

VI. PROJECT EVALUATION

VI.1 EIRR

VI.2 Prioritization Scoring



Evaluation Index	Full Score	Score	Evaluation Index	Full Score	Score	Total Score
Irrigation System	Utilization of Irrigation Potential	10.0	- Agricultural Productivity	20.0	-	-
	Urgency	25.0	- Social Problem	15.0	-	-
	Sustainability	15.0	- Economic Impact	15.0	-	-

VI.3 Priority Group

VI.4 Priority Ranking in the Province

Scheme	Bajo	District	Luwu	
Technical Level	Semi-technical	Registered Area	7,000 ha	Year of Construction 1970
		<i>Category</i> Irrigation (Headworks)		
		<i>Structure</i> Fixed Weir		
		<i>Condition</i> <input type="checkbox"/> A <input type="checkbox"/> B <input checked="" type="checkbox"/> C <input type="checkbox"/> D		
		<i>Problems</i> Crack or damage on weir crest; settlement of weir body; deflection of pier of weir.		
		<i>Category</i> Irrigation (Headworks)		
		<i>Structure</i> Scouring Sluice Gate		
		<i>Condition</i> <input type="checkbox"/> A <input type="checkbox"/> B <input checked="" type="checkbox"/> C <input type="checkbox"/> D		
		<i>Problems</i> Insufficient diversion water due to sedimentation in front of intake; leakage from gate leaf; insufficient strength against design load due to rust, decay of steel material; problem on management due to lack of periodically maintenance		
		<i>Category</i> Irrigation (Main Canal)		
		<i>Structure</i> Division Structure		
		<i>Condition</i> <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D		
		<i>Problems</i> Lower function of division structure due to sedimentation in front gate; physical operation problem on structure; deterioration of gates.		

Condition: A: Functioning well, B: Partially deteriorated, C: Not functioning well, D: Serious condition for operation

Scheme	Bajo	District	Luwu		
Technical Level	Semi-technical	Registered Area	7,000 ha	Year of Construction	1970
		<p><u>Category</u> Irrigation (Secondary Canal)</p>			
		<p><u>Structure</u> Earth Canal</p>			
		<p><u>Condition</u> <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D</p>			
		<p><u>Problems</u> Sedimentation; collapse of canal; leakage from canal; difficulty on maintenance of earth canal; no inspection road.</p>			
		<p><u>Category</u> Agriculture, On-Farm</p>			
		<p><u>Activity</u> Land Preparation by Hand Tractor</p>			
		<p><u>Condition</u> <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D</p>			
		<p><u>Problems</u> Low density of on-farm canals and farm roads.</p>			
		<p><u>Category</u> Agriculture, On-Farm</p>			
		<p><u>Activity</u> Paddy Cultivation</p>			
		<p><u>Condition</u> <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D</p>			
		<p><u>Problems</u> Low density of on-farm canals and farm roads.</p>			

Condition: A: Functioning well, B: Partially deteriorated, C: Not functioning well, D: Serious condition for operation

I. PROJECT FUNDAMENTALS									
I.1 General									
(1) Code Number	: 73170167			(7) Number of Farmers	: 800				
(2) Name of Irrigation Scheme	: Pagang Alipan			(8) Water Resource River	: Sungai Battang				
(3) District (Kabupaten)	: Luwu Selatan			(9) Catchment Area (km ²)	: 115				
(4) Sub-district (Kecamatan)	: Walenrang			(10) Completion / Last Rehabilitation Year	: 1975/1977				
(5) Registered Area (ha)	: 1,200								
(6) Technical Level	: Semi Technical								
I.2 Availability of Reports/Documents & References (A : Available, B : Available but partially, C : Not available/ No plan)									
a. Design Reports of Existing System(Full set)		b. Irrigation diagram			c. As-built drawings		d. Structure lists & diagram		
A		B			A		B		
e. Rehabilitation plan & its references		f. Crops and yield data			g. Cropping Calender		h. WUAs data		
C		A			A		6		
II. SUBJECT AREA FOR REHABILITATION PLAN									
II.1 Present and Planned Land Use									
Category	Present (ha)			Plan (ha)			Increment (ha)		
a. Irrigated paddy field	795			795			0		
b. Rainfed paddy field	0			0			0		
c. Upland Field	0			0			0		
d. Uncultivated Land	0			0			0		
e. Non-irrigable	0			0			0		
Total	795			795			0		
III. AGRICULTURE									
III.1 Present/Before Project Condition									
(1) Irrigation Performance and Crop Production									
Season	Cropped Area in Irrigated Paddy Field				Annual Intensity	Irrigated Paddy Yield (GKG ton/ha)	Crop Production (ton)		
	Paddy (ha)	Palawija	Others (ha)	Total (ha)			Paddy	Palawija	Others
Season I (wet)	795			795	100%	4.0	3,180		
Season II (dry I)	647			647	81%	4.0	2,588		
Season III (dry II)				0					
Total/Annual	1,442	0	0	1,442	181%	4.0	5,768	0	0
(2) Problems and Constraints									
<i>A. Irrigation & Agriculture Performances</i>									
- High irrigation performances attained; however water shortage in dry season reported									
- Double cropping of paddy practiced in most of the entire irrigated area; paddy yield levels moderate to high; palawija not introduced yet									
<i>B. Primary Constraint Identified through the Inventory Survey by the JICA Study</i>									
- Irrigation & Drainage:	Water shortage at on-farm level in dry season			- Palawija Marketing:	-				
- Agronomic Issues:	Farmers not following recommended practices			- Farmers Organizations:	Economic activities are limited				
- Paddy Marketing	Low marketing prices			- Extension Services:	Extension activities of PPLs are limited				
III.2 Development Plan									
(1) Development Approaches									
- Ensuring year round irrigation water supply at on-farm level through rehabilitation									
- Double cropping of paddy in the entire scheme; productivity increase of paddy through further intensification; introduction of palawija in dry season II									
- Strengthening of extension activities tailored to area specific needs; empowerment of farmer groups (KTs) to establish agri-business oriented KT's									
(2) Planned Irrigation Performances and Crop Production									
Season	Cropped Area in Irrigated Paddy Field				Annual Intensity	Irrigated Paddy Yield (GKG ton/ha)	Crop Production (ton)		
	Paddy (ha)	Palawija	Others (ha)	Total (ha)			Paddy	Palawija	Others
Season I (wet)	795			795	100%	5.0	3,975		
Season II (dry I)	795			795	100%	5.0	3,975		
Season III (dry II)		239		239	30%			1,195	
Total/Annual	1,590	239	0	1,829	230%	5.0	7,950	1,195	0
Annual Increment	148	239	0	387	49%	1.0	2,182	1,195	0
IV. WUAs									
IV.1 Existing Condition									
(1) Number	a. Target;	11	b. Established;	6	c. Not yet;	5	Registered		0
Performance	a. Developed;	0	b. Under developing;	6	c. Not yet;	6	Not yet registered		6
(2) Problems and Constraints									
<input type="checkbox"/> Operation <input type="checkbox"/> Maintenance <input checked="" type="checkbox"/> Management									
(3) Causes of Problems and Constraints									
- No management system in WUA and no coordination with District WRS.									
IV.2 Development Plan									
(1) Proposed Countermeasures									
- Calling attention of farmers and public servants to irrigation system utilization.									
(2) Development Plan									
- WUA empowerment training.									
- Capacity training of District WRS staff.									

V. IRRIGATION FACILITY

V.1 Existing Condition

- (1) Overall Irrigation System : C (A: Functioning well, B: Partially deteriorated, C: Not functioning well, D: Serious condition for operation)
 Water Resources Facility : B Main Canal System : D Secondary Canal System : D On-farm : D
- (2) Water Resources Facility
- | | | |
|--|-------------------------------------|---|
| a. Type of facility : Headworks | e. Scouring sluice gate : 1 nos. | i. Condition : B |
| b. Type of weir : Fixed weir | f. Intake gate : 1 nos. | (A: Functioning well, B: Partially deteriorated, C: Not functioning well, D: Serious condition for operation) |
| c. Length of weir : 36 m | g. Settling basin : provided | (no info.: no information) |
| d. Design intake discharge : 2.4 m ³ /s | h. Inspection bridge : not provided | |

(3) Irrigation Canal and Inspection Road

Canal	Lined (m)	Unlined (m)	Total (m)	Structure (nos)	Inspection road (m)	Condition
Main	375	1,281	1,656	13	1,656	D
Secondary	3,785	2,224	6,009	33	0	D

(A: Functioning well, B: Partially deteriorated, C: Not functioning well, D: Serious condition for operation)

(4) Major Problems and Constrains

- Water Resources Facility
 - Fallen down, inclined, or washed away of retaining wall of weir
 - Physical operational problem on flood/scouring sluice gate(s) of headworks
 - Physical operational problem on intake gate(s)
- Irrigation Canal and Related Structure
 - Sedimentation or obstruction of water flow
 - General O&M problems
 - Lower function of regulating structure on canal
 - Difficulty on O&M

(5) Causes of Major Problems and Constraints

- Water Resources Facility
 - Insufficient quality of concrete or masonry material, over acting earth pressure more than design
 - Improper design, installation and/or maintenance of flood/scouring sluice gate(s); breakdown of hoist, stem, guide frame or leaf
 - Improper design, installation and/or maintenance of intake gate(s); breakdown of hoist, stem, guide frame or leaf
- Irrigation Canal and Related Structure
 - Insufficient function of settling basin(sediments), improper management of canal (sediments, water plant)
 - No kilo and hectometer post, no structure plate or mark on structures and no identification for repair/maintenance
 - Deterioration of regulating structure on canal, especially gate and metal works
 - No provision or damage of inspection road, difficulty on passing of inspection road due to damage, broken

V.2 Development Plan

(1) Proposed Countermeasures for Major Problems

- Water Resources Facility
 - Reconstruction of retaining wall of weir
 - Replacement of control system or damaged equipment of flood/scouring sluice gate(s)
 - Replacement of intake gate(s)
- Irrigation Canal and Related Structure
 - Removal of sediment soil and foreign materials from canal, grass cutting
 - Provision of kilo, hect-m posts, marking to each structure with structure name
 - Replacement and reconstruction of regulating structure on canal
 - Provision or repair of inspection road with all weather type/pavement

(2) Water Resources Facility

Dam/Headworks body : minor rehabilitation Intake, civil : minor rehabilitation Intake, mechanical : minor rehabilitation
 Settling basin : minor rehabilitation

(3) Irrigation Canal and Related Structure

	Works	No rehabilitation	Rehabilitation	New construction	Total
Canal (m)	Main	0	1,093	109	1,202
	Secondary	0	3,966	793	4,759
Structure (nos)	Main	0	9	2	10
	Secondary	0	22	8	29

(4) On-farm Development

(Unit: ha)

a. Potential Irrigated paddy field	795	d. Non-potential paddy field	0
b. Potential non-irrigated paddy field	0	e. Non-potential non-paddy field	0
c. Potential non-paddy field	0	Total	795

(5) Rehabilitation Cost (Direct Cost)

(Unit: Million Rp.)

W.R.F	Irrigation	Drainage	On-Farm Develop.	Project Facility	Total	Cost per ha
1,476	7,128	713	1,630	1,260	12,207	15.4

(W.R.F: Water Resources Facility, Develop.: Development)

VI. PROJECT EVALUATION

VI.1 EIRR 17.5%

VI.2 Prioritization Scoring

Evaluation Index		Full Score	Score	Evaluation Index	Full Score	Score	Total Score
Irrigation System	Utilization of Irrigation Potential	10.0	-	Agricultural Productivity	20.0	-	-
	Urgency	25.0	-	Social Problem	15.0	-	-
	Sustainability	15.0	-	Economic Impact	15.0	-	-

VI.3 Priority Group



Group VI: Development by other category
(Subject area is less than 1,000 ha)

VI.4 Priority Ranking in the Province

-

Scheme	Pagang Alipan	District	Luwu		
Technical Level	Semi-technical	Registered Area	1,200 ha	Year of Construction	1977
		<p><u>Category</u> Irrigation (Headworks)</p>			
		<p><u>Structure</u> Fixed Weir</p>			
		<p><u>Condition</u> <input type="checkbox"/> A <input checked="" type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D</p>			
		<p><u>Problems</u> Crack or damage on weir crest; settlement of weir body; deflection of pier of weir.</p>			
		<p><u>Category</u> Irrigation Canal</p>			
		<p><u>Structure</u> Earth Canal</p>			
		<p><u>Condition</u> <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D</p>			
		<p><u>Problems</u> Sedimentation; collapse of canal; leakage from canal; difficulty on maintenance of earth canal; no inspection road.</p>			
		<p><u>Category</u> Irrigation (Main Canal)</p>			
		<p><u>Structure</u> Division Structure</p>			
		<p><u>Condition</u> <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D</p>			
		<p><u>Problems</u> Totally damaged</p>			

Condition: A: Functioning well, B: Partially deteriorated, C: Not functioning well, D: Serious condition for operation

Scheme	Pagang Alipan	District	Luwu		
Technical Level	Semi-technical	Registered Area	1,200 ha	Year of Construction	1977
		<p><u>Category</u> Irrigation (Secondary Canal)</p>			
		<p><u>Structure</u> Earth Canal</p>			
		<p><u>Condition</u> <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D</p>			
		<p><u>Problems</u> Sedimentation; collapse of canal; leakage from canal; difficulty on maintenance of earth canal; no inspection road.</p>			
		<p><u>Category</u> Agriculture, On-Farm</p>			
		<p><u>Activity</u> Paddy Cultivation</p>			
		<p><u>Condition</u> <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D</p>			
		<p><u>Problems</u> Low density of on-farm canals and farm roads.</p>			
		<p><u>Category</u> Agriculture, On-Farm</p>			
		<p><u>Structure</u> Farm Road and Drainage Canal</p>			
		<p><u>Condition</u> <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D</p>			
		<p><u>Problems</u></p>			

Condition: A: Functioning well, B: Partially deteriorated, C: Not functioning well, D: Serious condition for operation

I. PROJECT FUNDAMENTALS									
I.1 General									
(1) Code Number	: 73170175			(7) Number of Farmers	: 765				
(2) Name of Irrigation Scheme	: Makawa			(8) Water Resource River	: Sungai Makawa				
(3) District (Kabupaten)	: Luwu Selatan			(9) Catchment Area (km ²)	: 108				
(4) Sub-district (Kecamatan)	: Walenrang			(10) Completion / Last Rehabilitation Year	: 1969/1971				
(5) Registered Area (ha)	: 1,775								
(6) Technical Level	: Non Technical								
I.2 Availability of Reports/Documents & References (A : Available, B : Available but partially, C : Not available/ No plan)									
a. Design Reports of Existing System(Full set)		b. Irrigation diagram			c. As-built drawings		d. Structure lists & diagram		
A		A			B		A		
e. Rehabilitation plan & its references		f. Crops and yield data			g. Cropping Calender		h. WUAs data		
C		A			A		5		
II. SUBJECT AREA FOR REHABILITATION PLAN									
II.1 Present and Planned Land Use									
Category	Present (ha)		Plan (ha)		Increment (ha)				
a. Irrigated paddy field	880		1,000		120				
b. Rainfed paddy field	120		0		-120				
c. Upland Field	0		0		0				
d. Uncultivated Land	0		0		0				
e. Non-irrigable	0		0		0				
Total	1,000		1,000		0				
III. AGRICULTURE									
III.1 Present/Before Project Condition									
(1) Irrigation Performance and Crop Production									
Season	Cropped Area in Irrigated Paddy Field				Annual Intensity	Irrigated Paddy Yield (GKG ton/ha)	Crop Production (ton) 1/		
	Paddy (ha)	Palawija	Others (ha)	Total (ha)			Paddy	Palawija	Others
Season I (wet)	810			810	92%	4.0	3,540		
Season II (dry I)	600			600	68%	4.0	2,400		
Season III (dry II)				0				60	
Total/Annual	1,410	0	0	1,410	160%	4.0	5,940	60	0
1/: Irrigated & rainfed paddy & palawija									
(2) Problems and Constraints									
<i>A. Irrigation & Agriculture Performances</i>									
- Substantial irrigation performances attained irrigated area; existing of rainfed field (120ha)									
- Double cropping of paddy introduced; paddy yield levels still low ; palawija not introduced yet									
<i>B. Primary Constraint Identified through the Inventory Survey by the JICA Study</i>									
- Irrigation & Drainage: Flooding									
- Palawija Marketing: -									
- Agronomic Issues: Farmers not following recommended practices									
- Farmers Organizations: Managerial capacity of KTs are limited									
- Paddy Marketing: Unstable marketing prices									
- Extension Services: Extension activities of PPLs are limited									
III.2 Development Plan									
(1) Development Approaches									
- Expansion of irrigated area & ensuring year round irrigation water supply at on-farm level through rehabilitation & upgrading									
- Expansion of double cropped area of paddy; productivity increase of paddy through intensification; introduction of palawija in dry season I									
- Strengthening of extension activities tailored to area specific needs; empowerment of farmer groups (KTs) to establish agri-business oriented KT's									
(2) Planned Irrigation Performances and Crop Production									
Season	Cropped Area in Irrigated Paddy Field				Annual Intensity	Irrigated Paddy Yield (GKG ton/ha)	Crop Production (ton)		
	Paddy (ha)	Palawija	Others (ha)	Total (ha)			Paddy	Palawija	Others
Season I (wet)	1,000			1,000	100%	5.0	5,000		
Season II (dry I)	800	200		1,000	100%	5.0	4,000	1,000	
Season III (dry II)				0	0%				
Total/Annual	1,800	200	0	2,000	200%	5.0	9,000	1,000	0
Annual Increment	390	200	0	590	40%	1.0	3,060	940	0
IV. WUAs									
IV.1 Existing Condition									
(1) Number	a. Target;	11	b. Established;	1	c. Not yet;	10	Registered		0
Performance	a. Developed;	0	b. Under developing;	1	c. Not yet;	0	Not yet registered		1
(2) Problems and Constraints									
<input type="checkbox"/> Operation <input type="checkbox"/> Maintenance <input checked="" type="checkbox"/> Management									
(3) Causes of Problems and Constraints									
- No management system in WUA and no coordination with District WRS.									
IV.2 Development Plan									
(1) Proposed Countermeasures									
- Calling attention of farmers and public servants to WUA establishment.									
(2) Development Plan									
- WUA empowermwnt training.									
- Capacity building of District WRS staff.									

V. IRRIGATION FACILITY**V.1 Existing Condition**

- (1) Overall Irrigation System : D (A: Functioning well, B: Partially deteriorated, C: Not functioning well, D: Serious condition for operation)
 Water Resources Facility : C Main Canal System : D Secondary Canal System : D On-farm : D
- (2) Water Resources Facility
- | | | | | | |
|----------------------------|-------------------------|-------------------------|----------------|---|-----|
| a. Type of facility | : Headworks | e. Scouring sluice gate | : 1 nos. | i. Condition | : C |
| b. Type of weir | : Fixed weir | f. Intake gate | : 1 nos. | (A: Functioning well, B: Partially deteriorated, C: Not functioning well, D: Serious condition for operation) | |
| c. Length of weir | : 60 m | g. Settling basin | : not provided | (no info.: no information) | |
| d. Design intake discharge | : 3.1 m ³ /s | h. Inspection bridge | : not provided | | |

(3) Irrigation Canal and Inspection Road

Canal	Lined (m)	Unlined (m)	Total (m)	Structure (nos)	Inspection road (m)	Condition
Main	1,761	1,539	3,300	14	0	D
Secondary	1,231	2,229	3,460	25	0	D

(A: Functioning well, B: Partially deteriorated, C: Not functioning well, D: Serious condition for operation)

(4) Major Problems and Constrains

- Water Resources Facility

- Incline, settlement, or deflection of pier of weir
- Physical operational problem on flood/scouring sluice gate(s) of headworks
- Physical operational problem on intake gate(s)

- Irrigation Canal and Related Structure

- Sedimentation or obstruction of water flow
- General O&M problems
- Lower function of regulating structure on canal
- Difficulty on O&M

(5) Causes of Major Problems and Constraints

- Water Resources Facility

- Insufficient strength of weir foundation or not enough foundation treatment
- Improper design, installation and/or maintenance of flood/scouring sluice gate(s); breakdown of hoist, stem, guide frame or leaf
- Improper design, installation and/or maintenance of intake gate(s); breakdown of hoist, stem, guide frame or leaf

- Irrigation Canal and Related Structure

- No provision of settling basin (sediments), improper management of canal (sediments, water plant)
- No kilo and hectometer post, no structure plate or mark on structures and no identification for repair/maintenance
- Deterioration of regulating structure on canal, especially gate and metal works
- No provision or damage of inspection road, difficulty on passing of inspection road due to damage, broken

V.2 Development Plan

(1) Proposed Countermeasures for Major Problems

- Water Resources Facility

- Reconstruction of pier of weir
- Replacement of control system or damaged equipment of flood/scouring sluice gate(s)
- Replacement of intake gate(s)

- Irrigation Canal and Related Structure

- Removal of sediment soil and foreign materials from canal, grass cutting
- Provision of kilo, hect-m posts, marking to each structure with structure name
- Replacement and reconstruction of regulating structure on canal
- Provision or repair of inspection road with all weather type/pavement

(2) Water Resources Facility

- Dam/Headworks body : minor rehabilitation Intake, civil : minor rehabilitation Intake, mechanical : replacement or new
 Settling basin : replacement or new

(3) Irrigation Canal and Related Structure

	Works	No rehabilitation	Rehabilitation	New construction	Total
Canal (m)	Main	0	1,848	370	2,218
	Secondary	0	1,938	969	2,906
Structure (nos)	Main	0	8	2	10
	Secondary	0	14	7	21

(4) On-farm Development

(Unit: ha)

a. Potential Irrigated paddy field	880	d. Non-potential paddy field	0
b. Potential non-irrigated paddy field	120	e. Non-potential non-paddy field	0
c. Potential non-paddy field	0	Total	1,000

(5) Rehabilitation Cost (Direct Cost)

(Unit: Million Rp.)

W.R.F	Irrigation	Drainage	On-Farm Develop.	Project Facility	Total	Cost per ha
2,593	8,839	884	2,112	1,260	15,687	15.7




(W.R.F: Water Resources Facility, Develop.: Development)

VI. PROJECT EVALUATIONVI.1 EIRR **VI.2 Prioritization Scoring**

Evaluation Index		Full Score	Score	Evaluation Index	Full Score	Score	Total Score
Irrigation System	Utilization of Irrigation Potential	10.0	-	Agricultural Productivity	20.0	-	-
	Urgency	25.0	-	Social Problem	15.0	-	-
	Sustainability	15.0	-	Economic Impact	15.0	-	-

VI.3 Priority Group

VI.4 Priority Ranking in the Province

Scheme	Makawa	District	Luwu		
Technical Level	Non-technical	Registered Area	1,775 ha	Year of Construction	1971/81
		<p><u>Category</u> Irrigation (Main Canal)</p>			
		<p><u>Structure</u> Division Structure</p>			
		<p><u>Condition</u> <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D</p>			
		<p><u>Problems</u> Lower function of division structure due to sedimentation in front gate; physical operation problem on structure.</p>			
		<p><u>Category</u> Irrigation (Secondary Canal)</p>			
		<p><u>Structure</u> Masonry Lined Canal</p>			
		<p><u>Condition</u> <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D</p>			
		<p><u>Problems</u> Sedimentation; leakage from lined canal; crack on lined canal; deflection of lining toward inside of canal; less maintenance; and no inspection road.</p>			
		<p><u>Category</u> Irrigation (Secondary Canal)</p>			
		<p><u>Structure</u> Earth Canal</p>			
		<p><u>Condition</u> <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D</p>			
		<p><u>Problems</u> Sedimentation; collapse of canal; leakage from canal; difficulty on maintenance of earth canal; no inspection road.</p>			

Condition: A: Functioning well, B: Partially deteriorated, C: Not functioning well, D: Serious condition for operation

Scheme	Makawa	District	Luwu		
Technical Level	Non-technical	Registered Area	1,775 ha	Year of Construction	1971/81
		<p><u>Category</u> Irrigation (Secondary Canal)</p>			
		<p><u>Structure</u> Division Structure</p>			
		<p><u>Condition</u> <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D</p>			
		<p><u>Problems</u> Lower function of division structure due to sedimentation in front gate; physical operation problem on structure.</p>			
		<p><u>Category</u> Agriculture, On-Farm</p>			
		<p><u>Activity</u> Land Preparation</p>			
		<p><u>Condition</u> <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D</p>			
		<p><u>Problems</u> Low density of on-farm canals and farm roads.</p>			
		<p><u>Category</u> Agriculture, On-Farm</p>			
		<p><u>Activity</u> Rainfed Paddy Cultivation</p>			
		<p><u>Condition</u> <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D</p>			
		<p><u>Problems</u> Low density of on-farm canals and farm roads.</p>			

Condition: A: Functioning well, B: Partially deteriorated, C: Not functioning well, D: Serious condition for operation

I. PROJECT FUNDAMENTALS									
I.1 General									
(1) Code Number	: 73170176	(7) Number of Farmers	: 5,039						
(2) Name of Irrigation Scheme	: Lamasi Kanan	(8) Water Resource River	: Lamasi						
(3) District (Kabupaten)	: Luwu	(9) Catchment Area (km ²)	: 305						
(4) Sub-district (Kecamatan)	: Walenrang	(10) Completion / Last Rehabilitation Year	: 1979/1983						
(5) Registered Area (ha)	: 5,485								
(6) Technical Level	: Technical								
I.2 Availability of Reports/Documents & References (A : Available, B : Available but partially, C : Not available/ No plan)									
a. Design Reports of Existing System(Full set)		b. Irrigation diagram		c. As-built drawings		d. Structure lists & diagram			
A		A		A		A			
e. Rehabilitation plan & its references		f. Crops and yield data		g. Cropping Calender		h. WUAs data			
C		A		A		2			
II. SUBJECT AREA FOR REHABILITATION PLAN									
II.1 Present and Planned Land Use									
Category	Present (ha)	Plan (ha)	Increment (ha)						
a. Irrigated paddy field	4,290	5,147	857						
b. Rainfed paddy field	802	0	-802						
c. Upland Field	0	0	0						
d. Uncultivated Land	78	0	-78						
e. Non-irrigable	0	23	23						
Total	5,170	5,170	0						
III. AGRICULTURE									
III.1 Present/Before Project Condition									
(1) Irrigation Performance and Crop Production									
Season	Cropped Area in Irrigated Paddy Field				Annual Intensity	Irrigated Paddy Yield (GKG ton/ha)	Crop Production (ton) 1/		
	Paddy (ha)	Palawija	Others (ha)	Total (ha)			Paddy	Palawija	Others
Season I (wet)	4,290			4,290	100%	4.0	19,165		
Season II (dry I)	3,647			3,647	85%	4.0	14,588		
Season III (dry II)				0	0%			400	
Total/Annual	7,937	0	0	7,937	185%	4.0	33,753	400	0
1/: Irrigated & rainfed paddy & palawija									
(2) Problems and Constraints									
<i>A. Irrigation & Agriculture Performances</i>									
- High irrigation performances attained; however water shortage in dry season reported									
- Double cropping of paddy practiced in most of the entire irrigated area; paddy yield levels still low; palawija not introduced yet									
<i>B. Primary Constraint Identified through the Inventory Survey by the JICA Study</i>									
- Irrigation & Drainage:		Water shortage at on-farm level in dry season			- Palawija Marketing:		-		
- Agronomic Issues:		Farmers not following recommended practices			- Farmers Organizations:		Unstable marketing prices		
- Paddy Marketing		Low marketing prices			- Extension Services:		Shortage of operation funds of PPLs		
III.2 Development Plan									
(1) Development Approaches									
- Ensuring year round irrigation water supply at on-farm level through rehabilitation									
- Expansion of double cropped area of paddy; productivity increase of paddy through intensification; introduction of palawija in dry season I									
- Strengthening of extension activities tailored to area specific needs; empowerment of farmer groups (KTs) to establish agri-business oriented KT's									
(2) Planned Irrigation Performances and Crop Production									
Season	Cropped Area in Irrigated Paddy Field				Annual Intensity	Irrigated Paddy Yield (GKG ton/ha)	Crop Production (ton)		
	Paddy (ha)	Palawija	Others (ha)	Total (ha)			Paddy	Palawija	Others
Season I (wet)	5,147			5,147	100%	5.0	25,735		
Season II (dry I)	4,375	772		5,147	100%	5.0	21,875	3,860	
Season III (dry II)				0	0%				
Total/Annual	9,522	772	0	10,294	200%	5.0	47,610	3,860	0
Annual Increment	1,585	772	0	2,357	15%	1.0	13,857	3,460	0
IV. WUAs									
IV.1 Existing Condition									
(1) Number	a. Target;	11	b. Established;	11	c. Not yet;	0	Registered		0
	Performance	a. Developed;	0	b. Under developing;	11	c. Not yet;	0	Not yet registered	11
(2) Problems and Constraints									
<input type="checkbox"/> Operation <input type="checkbox"/> Maintenance <input checked="" type="checkbox"/> Management									
(3) Causes of Problems and Constraints									
- No attention to O&M among WUA members.									
- No coordination with District WRS office.									
IV.2 Development Plan									
(1) Proposed Countermeasures									
- Calling attention of farmers and public servants to irrigation system utilization.									
(2) Development Plan									
- WUA empowerment training.									
- Capacity building of District WRS staff.									

V. IRRIGATION FACILITY

V.1 Existing Condition

- (1) Overall Irrigation System : D (A: Functioning well, B: Partially deteriorated, C: Not functioning well, D: Serious condition for operation)
Water Resources Facility : C Main Canal System : D Secondary Canal System : D On-farm : C
- (2) Water Resources Facility
- | | | | | | |
|----------------------------|-------------------------|-------------------------|----------------|---|-----|
| a. Type of facility | : Headworks | e. Scouring sluice gate | : 2 nos. | i. Condition | : C |
| b. Type of weir | : Fixed weir | f. Intake gate | : 2 nos. | (A: Functioning well, B: Partially deteriorated, C: Not functioning well, D: Serious condition for operation) | |
| c. Length of weir | : 80 m | g. Settling basin | : provided | (no info.: no information) | |
| d. Design intake discharge | : 7.5 m ³ /s | h. Inspection bridge | : not provided | | |

(3) Irrigation Canal and Inspection Road

Canal	Lined (m)	Unlined (m)	Total (m)	Structure (nos)	Inspection road (m)	Condition
Main	11,009	1,870	12,879	62	11,279	D
Secondary	0	32,928	32,928	73	5,700	D

(A: Functioning well, B: Partially deteriorated, C: Not functioning well, D: Serious condition for operation)

(4) Major Problems and Constrains

- Water Resources Facility
 - Settlement or breakdown of stilling basin of weir
 - Physical operational problem on flood/scouring sluice gate(s) of headworks
 - Physical operational problem on intake gate(s)
- Irrigation Canal and Related Structure
 - Sedimentation or obstruction of water flow
 - Impassable of inspection road along canal
 - Overage, lower strength of canal
 - Difficulty on maintenance of earth canal
 - Difficulty on O&M
- (5) Causes of Major Problems and Constraints
 - Water Resources Facility
 - Insufficient strength of weir foundation, not enough foundation treatment, or insufficient length of stilling basin
 - Improper design, installation and/or maintenance of flood/scouring sluice gate(s); breakdown of hoist, stem, guide frame or leaf
 - Improper design, installation and/or maintenance of intake gate(s); breakdown of hoist, stem, guide frame or leaf
 - Irrigation Canal and Related Structure
 - Insufficient function of settling basin(sediments), improper management of canal (sediments, water plant)
 - Improper routine O&M works due to no or narrow wide of road, slope erosion by rainfall then in flow into canal
 - Deterioration of canal, no or insufficient rehabilitation due to budget problem
 - Fallen down and collapse of side slope, water plants or weed at inside of canal
 - No provision or damage of inspection road, difficulty on passing of inspection road due to damage, broken

V.2 Development Plan

(1) Proposed Countermeasures for Major Problems

- Water Resources Facility
 - Reconstruction of stilling basin of weir
 - Replacement of control system or damaged equipment of flood/scouring sluice gate(s)
 - Replacement of intake gate(s)
- Irrigation Canal and Related Structure
 - Removal of sediment soil and foreign materials from canal, grass cutting
 - Provision of inspection road both main and secondary canal with pavement
 - Replace and reconstruction of canal
 - Provision of concrete lining
 - Provision or repair of inspection road with all weather type/pavement

(2) Water Resources Facility

Dam/Headworks body : minor rehabilitation Intake, civil : large rehabilitation Intake, mechanical : large rehabilitation
Settling basin : large rehabilitation

(3) Irrigation Canal and Related Structure

	Works	No rehabilitation	Rehabilitation	New construction	Total
Canal (m)	Main	0	12,879	0	12,879
	Secondary	0	32,928	0	32,928
Structure (nos)	Main	0	62	6	68
	Secondary	0	73	15	88

(4) On-farm Development

(Unit: ha)

a. Potential Irrigated paddy field	4,290	d. Non-potential paddy field	398
b. Potential non-irrigated paddy field	404	e. Non-potential non-paddy field	0
c. Potential non-paddy field	78	Total	5,170

(5) Rehabilitation Cost (Direct Cost)

(Unit: Million Rp.)

W.R.F	Irrigation	Drainage	On-Farm Develop.	Project Facility	Total	Cost per ha
2,801	74,889	7,489	11,249	2,590	99,018	19.2

(W.R.F: Water Resources Facility, Develop.: Development)

VI. PROJECT EVALUATION




VI.1 EIRR

VI.2 Prioritization Scoring

Evaluation Index		Full Score	Score	Evaluation Index		Full Score	Score	Total Score
Irrigation System	Utilization of Irrigation Potential	10.0	5.0	Agricultural Productivity	20.0	14.0	69.2	
	Urgency	25.0	22.4	Social Problem	15.0	10.5		
	Sustainability	15.0	8.3	Economic Impact	15.0	9.0		

VI.3 Priority Group

VI.4 Priority Ranking in the Province

Scheme	Lamasi Kanan	District	Luwu		
Technical Level	Technical	Registered Area	5,485 ha	Year of Construction	1979/83
		<p><u>Category</u> Irrigation (Headworks)</p>			
		<p><u>Structure</u> Fixed Weir</p>			
		<p><u>Condition</u> <input type="checkbox"/> A <input type="checkbox"/> B <input checked="" type="checkbox"/> C <input type="checkbox"/> D</p>			
		<p><u>Problems</u> Crack or damage on weir crest; settlement of weir body; deflection of pier of weir; rock sedimentation at weir.</p>			
		<p><u>Category</u> Irrigation (Headworks)</p>			
		<p><u>Structure</u> Intake</p>			
		<p><u>Condition</u> <input type="checkbox"/> A <input type="checkbox"/> B <input checked="" type="checkbox"/> C <input type="checkbox"/> D</p>			
		<p><u>Problems</u> Insufficient diversion water due to sedimentation in front of intake; leakage from gate leaf; insufficient strength against design load due to rust, decay of steel material; problem on management due to lack of periodically maintenance</p>			
		<p><u>Category</u> Irrigation (Main Canal)</p>			
		<p><u>Structure</u> Earth Canal</p>			
		<p><u>Condition</u> <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D</p>			
		<p><u>Problems</u> Sedimentation; collapse of canal; leakage from canal; difficulty on maintenance of earth canal; no inspection road.</p>			

Condition: A: Functioning well, B: Partially deteriorated, C: Not functioning well, D: Serious condition for operation

Scheme	Lamasi Kanan	District	Luwu		
Technical Level	Technical	Registered Area	5,485 ha	Year of Construction	1979/83
		<p><u>Category</u> Irrigation (Main Canal)</p>			
		<p><u>Structure</u> Drop</p>			
		<p><u>Condition</u> <input type="checkbox"/> A <input type="checkbox"/> B <input checked="" type="checkbox"/> C <input type="checkbox"/> D</p>			
		<p><u>Problems</u> Sedimentation at inside of canal; clogging of drop structure.</p>			
		<p><u>Category</u> Agriculture, On-Farm</p>			
		<p><u>Activity</u> Paddy Cultivation</p>			
		<p><u>Condition</u> <input type="checkbox"/> A <input type="checkbox"/> B <input checked="" type="checkbox"/> C <input type="checkbox"/> D</p>			
		<p><u>Problems</u> Low density of on-farm canals and farm roads.</p>			
		<p><u>Category</u> Post-harvest Facility</p>			
		<p><u>Activity</u> Storage & Drying Yard</p>			
		<p><u>Condition</u> <input type="checkbox"/> A <input type="checkbox"/> B <input checked="" type="checkbox"/> C <input type="checkbox"/> D</p>			
		<p><u>Problems</u></p>			

Condition: A: Functioning well, B: Partially deteriorated, C: Not functioning well, D: Serious condition for operation