

LEGEND

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

Irrigation Scheme

Name of Scheme	Registered Area (Ha)	Subject Area (Ha)
19. Salobunne	1,386 T	1,296
20. Leworeng	2,258 T	2,187
21. Tinco Kiri	2,620 T	2,620

T : Technical Irrigation

The Study on Comprehensive Recovery Program
of Irrigation Agriculture

Japan International Cooperation Agency

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

I. PROJECT FUNDAMENTALS										
I.1 General										
(1) Code Number	: 73120084	(7)	Number of Farmers	: 1,560						
(2) Name of Irrigation Scheme	: Salobunne	(8)	Water Resource River	: Salobunne						
(3) District (Kabupaten)	: Soppeng	(9)	Catchment Area (km ²)	: 43.75						
(4) Sub-district (Kecamatan)	: Marioriwawa	(10)	Completion / Last Rehabilitation Year	: 1929						
(5) Registered Area (ha)	: 1,386									
(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		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	13
II. SUBJECT AREA FOR REHABILITATION PLAN										
II.1 Present and Planned Land Use										
Category	Present (ha)	Plan (ha)	Increment (ha)							
a. Irrigated paddy field	1,296	1,296	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	1,296	1,296	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)	1,058			1,058	82%	4.0	4,232			
Season II (dry I)		252		252	19%			252		
Season III (dry II)	1,165			1,165	90%	4.5	5,243			
Total/Annual	2,223	252	0	2,475	191%	4.3	9,475	252	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 almost in the entire irrigated area; paddy yield levels low to moderate; palawija introduced to some extent										
<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:	Low marketing prices					
- Agronomic Issues:	Farmers not following recommended practices			- Farmers Organizations:	Most members are not active					
- Paddy Marketing	Low marketing prices			- Extension Services:	Capability & experiences 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; expansion 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)	1,296			1,296	100%	5.0	6,480			
Season II (dry I)		518		518	40%			673		
Season III (dry II)	1,296			1,296	100%	5.5	7,128			
Total/Annual	2,592	518	0	3,110	240%	5.3	13,608	673	0	
Annual Increment	369	266	0	635	49%	1.0	4,134	421	0	
IV. WUAs										
IV.1 Existing Condition										
(1) Number	a. Target;	13	b. Established;	13	c. Not yet;	0	Registered		0	
	a. Developed;	2	b. Under developing;	1	c. Not yet;	10	Not yet registered		13	
(2) Problems and Constraints										
<input type="checkbox"/> Operation <input type="checkbox"/> Maintenance <input checked="" type="checkbox"/> Management										
(3) Causes of Problems and Constraints										
- Low management level.										
IV.2 Development Plan										
(1) Proposed Countermeasures										
- Improvement of WUA management capability.										
(2) Development Plan										
- WUA management 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 : C
- (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 | : 25 m | g. Settling basin | : not provided | (no info.: no information) | |
| d. Design intake discharge | : 2.5 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	3,436	0	3,436	16	0	D
Secondary	8,503	2,032	10,535	30	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
 - Physical O&M problem due to overage facility
 - Fallen down, inclined, or washed away of retaining wall of weir
 - Physical operational problem on intake gate(s)
 - Irrigation Canal and Related Structure
 - Impassable of inspection road along canal
 - General O&M problems
 - Difficulty on O&M
- (5) Causes of Major Problems and Constraints
- Water Resources Facility
 - Deterioration of weir, no or insufficient rehabilitation due to budget problem
 - Insufficient quality of concrete or masonry material, over acting earth pressure more than design
 - Improper design, installation and/or maintenance of intake gate(s); breakdown of hoist, stem, guide frame or leaf
 - Irrigation Canal and Related Structure
 - 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
 - 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
 - Replace and reconstruction of weir
 - Reconstruction of retaining wall of weir
 - Replacement of intake gate(s)
- Irrigation Canal and Related Structure
 - Provision of inspection road both main and secondary canal with pavement
 - Provision of kilo, hect-m posts, marking to each structure with structure name
 - Provision or repair of inspection road with all weather type/pavement

(2) Water Resources Facility

Dam/Headworks body : replacement or new Intake, civil : replacement or new 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)	Structure (nos)	Canal (m)	Structure (nos)	Canal (m)	Structure (nos)	Canal (m)	Structure (nos)
Main	0	0	3,436	16	0	2	3,436	18
Secondary	0	0	10,535	30	0	6	10,535	36

(4) On-farm Development

(Unit: ha)

a. Potential Irrigated paddy field	1,296	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	1,296

(5) Rehabilitation Cost (Direct Cost)

(Unit: Million Rp.)

W.R.F	Irrigation	Drainage	On-Farm Develop.	Project Facility	Total	Cost per ha
5,186	19,153	1,915	2,657	1,260	30,171	23.3

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

VI. PROJECT EVALUATION

VI.1 EIRR 11.0%

VI.2 Prioritization Scoring

Evaluation Index	Full Score	Score	Evaluation Index	Full Score	Score	Total Score		
							Irrigation System	Utilization of Irrigation Potential
			Urgency	25.0	22.4	Social Problem	15.0	10.5
			Sustainability	15.0	11.3	Economic Impact	15.0	10.5

VI.3 Priority Group

Group II: Second priority group

VI.4 Priority Ranking in the Province

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Scheme	Salobunne	District	Soppeng	
Technical Level	Technical	Registered Area	1,386 ha	Year of Construction 1929
SS.24.71		<p><u>Category</u> Irrigation (Headworks)</p> <hr/> <p><u>Structure</u> Retaining Wall</p> <hr/> <p><u>Condition</u> <input type="checkbox"/> A <input type="checkbox"/> B <input checked="" type="checkbox"/> C <input type="checkbox"/> D</p> <hr/> <p><u>Problems</u> Fallen down, incline or washed away of retaining wall of weir.</p>		
SS.24.72		<p><u>Category</u> Irrigation (Headworks)</p> <hr/> <p><u>Structure</u> Scouring Sluice and Stilling Basin</p> <hr/> <p><u>Condition</u> <input type="checkbox"/> A <input type="checkbox"/> B <input checked="" type="checkbox"/> C <input type="checkbox"/> D</p> <hr/> <p><u>Problems</u> Settlement or washed away of stilling basin floor</p>		
SS.24.83		<p><u>Category</u> Irrigation (Main Canal)</p> <hr/> <p><u>Structure</u> Division Structure</p> <hr/> <p><u>Condition</u> <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D</p> <hr/> <p><u>Problems</u> Lower function of division structure due to sedimentation in front gate; physical operation problem on structure.</p>		

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

Scheme	Salobunne	District	Soppeng	
Technical Level	Technical	Registered Area	1,386 ha	Year of Construction 1929
		<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>Category</u> Agriculture, On-Farm</p>		
		<p><u>Activity</u> Transplanting</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> Post-harvest Facility</p>		
		<p><u>Activity</u> 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> Sedimentation; leakage from canal; collapse of canal; difficulty on maintenance of earth canal; no inspection road.</p>		
		<p><u>Problems</u> Low density of on-farm canals and farm roads.</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	: 73120087	(7)	Number of Farmers	: 1,129						
(2) Name of Irrigation Scheme	: Leworeng	(8)	Water Resource River	: Leworeng						
(3) District (Kabupaten)	: Soppeng	(9)	Catchment Area (km ²)	: 111.90						
(4) Sub-district (Kecamatan)	: Donri-Donri	(10)	Completion / Last Rehabilitation Year	: 1977/1994						
(5) Registered Area (ha)	: 2,258									
(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		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	17
II. SUBJECT AREA FOR REHABILITATION PLAN										
II.1 Present and Planned Land Use										
Category	Present (ha)	Plan (ha)	Increment (ha)							
a. Irrigated paddy field	2,187	2,187	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	2,187	2,187	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)	1,880			1,880	86%	4.5	8,460			
Season II (dry I)		154		154	7%			125		
Season III (dry II)	2,165			2,165	99%	4.5	9,743			
Total/Annual	4,045	154	0	4,199	192%		18,203	125	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 almost in the entire irrigated area; paddy yield levels moderate; palawija introduced to some extent										
<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: Low marketing prices							
- Agronomic Issues: Farmers not following recommended practices			- Farmers Organizations: Managerial capacity of KTs are limited							
- Paddy Marketing: Unstable marketing prices			- Extension Services: Implementation of extension programs is 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; expansion 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 KTs										
(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)	2,187			2,187	100%	5.5	12,029			
Season II (dry I)		437		437	20%			524		
Season III (dry II)	2,187			2,187	100%	5.5	12,029			
Total/Annual	4,374	437	0	4,811	220%	5.5	24,057	524	0	
Annual Increment	329	283	0	612	28%	5.5	5,855	399	0	
IV. WUAs										
IV.1 Existing Condition										
(1) Number	a. Target;	17	b. Established;	17	c. Not yet;	0	Registered		0	
	a. Developed;	0	b. Under developing;	10	c. Not yet;	7	Not yet registered		17	
(2) Problems and Constraints										
<input checked="" type="checkbox"/> Operation <input checked="" type="checkbox"/> Maintenance <input type="checkbox"/> Management										
(3) Causes of Problems and Constraints										
- Low level O&M skills of WUA members.										
IV.2 Development Plan										
(1) Proposed Countermeasures										
- Improvement of WUA members O&M skills.										
(2) Development Plan										
- O&M 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 : C Main Canal System : B Secondary Canal System : C 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 | : 32 m | g. Settling basin | : not provided | (no info.: no information) | |
| d. Design intake discharge | : 1.8 m ³ /s | h. Inspection bridge | : not provided | | |

(3) Irrigation Canal and Inspection Road

Canal	Lined (m)	Unlined	Total (m)	Structure (nos)	Inspection road (m)	Condition
Main	835	0	835	2	736	B
Secondary	22,149	0	22,149	54	5,336	C

(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
 - Washed away of ripraps or blocks after stilling basin
 - Insufficient diversion water due to sedimentation in front of intake
- Irrigation Canal and Related Structure
 - Impassable of inspection road along canal
 - General O&M problems
 - 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
 - Insufficient weight of ripraps or blocks for stilling basin, insufficient length of protection work after stilling basin
 - Sedimentation in front of intake
- Irrigation Canal and Related Structure
 - 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
 - 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
 - Provision of additional ripraps or blocks after stilling basin of weir as required
 - Dredging or flushing of sediment, proper gate operation of headworks and intake
- Irrigation Canal and Related Structure
 - Provision of inspection road both main and secondary canal with pavement
 - Provision of kilo, hect-m posts, marking to each structure with structure name
 - 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 : replacement or new

(3) Irrigation Canal and Related Structure

Works	No rehabilitation	Rehabilitation	New construction	Total
Canal (m)				
Main	0	835	0	835
Secondary	0	22,149	0	22,149
Structure (nos)				
Main	0	2	0	2
Secondary	0	54	11	65

(4) On-farm Development

(Unit: ha)

a. Potential Irrigated paddy field	2,187	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	2,187

(5) Rehabilitation Cost (Direct Cost)

(Unit: Million Rp.)

W.R.F	Irrigation	Drainage	On-Farm Develop.	Project Facility	Total	Cost per ha
5,092	10,358	1,036	4,483	1,570	22,539	10.3

(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	11.0	64.5
	Urgency	25.0	19.2	Social Problem	15.0	10.5	
	Sustainability	15.0	6.8	Economic Impact	15.0	12.0	

VI.3 Priority Group

VI.4 Priority Ranking in the Province

Scheme	Leworeng	District	Soppeng	
Technical Level	Technical	Registered Area	2,258 ha	Year of Construction 1977/94
 <p>SS.25.65</p>		<p><u>Category</u> Irrigation (Headworks)</p> <hr/> <p><u>Structure</u> Fixed Weir</p> <hr/> <p><u>Condition</u> <input type="checkbox"/> A <input type="checkbox"/> B <input checked="" type="checkbox"/> C <input type="checkbox"/> D</p> <hr/> <p><u>Problems</u> Settlement or breakage of apron; crack or damage on weir crest; settlement of weir body.</p>		
 <p>SS.25.63</p>		<p><u>Category</u> Irrigation (Headworks)</p> <hr/> <p><u>Structure</u> Fixed Weir</p> <hr/> <p><u>Condition</u> <input type="checkbox"/> A <input type="checkbox"/> B <input checked="" type="checkbox"/> C <input type="checkbox"/> D</p> <hr/> <p><u>Problems</u> Settlement of weir body; deflection of pier of weir</p>		
 <p>SS.25.67</p>		<p><u>Category</u> Irrigation (Main Canal)</p> <hr/> <p><u>Structure</u> Earth Canal</p> <hr/> <p><u>Condition</u> <input type="checkbox"/> A <input type="checkbox"/> B <input checked="" type="checkbox"/> C <input type="checkbox"/> D</p> <hr/> <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	Leworeng	District	Soppeng	
Technical Level	Technical	Registered Area	2,258 ha	Year of Construction 1977/94
		<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 checked="" type="checkbox"/> C <input 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> 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> Post-harvest Facility</p>		
		<p><u>Activity</u> Drying Yard</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	: 73120090	(7) Number of Farmers	: 4,242						
(2) Name of Irrigation Scheme	: Tinco Kiri	(8) Water Resource River	: S. Lawo						
(3) District (Kabupaten)	: Soppeng	(9) Catchment Area (km ²)	: 63.00						
(4) Sub-district (Kecamatan)	: Lalabata	(10) Completion / Last Rehabilitation Year	: 1994						
(5) Registered Area (ha)	: 2,620								
(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	b. Irrigation diagram	A	c. As-built drawings	B	d. Structure lists & diagram	B		
e. Rehabilitation plan & its references	C	f. Crops and yield data	A	g. Cropping Calender	A	h. WUAs data	19		
II. SUBJECT AREA FOR REHABILITATION PLAN									
II.1 Present and Planned Land Use									
Category	Present (ha)	Plan (ha)	Increment (ha)						
a. Irrigated paddy field	2,620	2,620	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	2,620	2,620	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)	2,605			2,605	99%	4.5	11,723		
Season II (dry I)		375		375	14%			263	
Season III (dry II)	2,006	54		2,060	79%	5.0	10,030	38	
Total/Annual	4,611	429	0	5,040	192%	4.7	21,753	301	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 almost in the entire irrigated area; paddy yield levels moderate to high; palawija introduced to some extent									
<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:		Low marketing prices		
- Agronomic Issues:		Infestation of pest & diseases			- Farmers Organizations:		Most members are not active		
- Paddy Marketing		Low marketing prices			- Extension Services:		Implementation of extension programs is 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; expansion of palawija in dry season II									
- Extension activities toward improvement of post-harvest & marketing; 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)	2,620			2,620	100%	5.5	14,410		
Season II (dry I)		786		786	30%			943	
Season III (dry II)	2,620			2,620	100%	5.5	14,410		
Total/Annual	5,240	786	0	6,026	230%	5.5	28,820	943	0
Annual Increment	629	357	0	986	38%	0.8	7,068	642	0
IV. WUAs									
IV.1 Existing Condition									
(1) Number	a. Target;	19	b. Established;	19	c. Not yet;	0	Registered		0
Performance	a. Developed;	0	b. Under developing;	5	c. Not yet;	14	Not yet registered		19
(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 duties among WUA farmers.									
IV.2 Development Plan									
(1) Proposed Countermeasures									
- Calling attention to WUA activities among WUA members.									
(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 : D
- (2) Water Resources Facility
- | | | | | | |
|----------------------------|-------------------------|-------------------------|----------------|---|-----|
| a. Type of facility | : Headworks | e. Scouring sluice gate | : 2 nos. | i. Condition | : B |
| b. Type of weir | : Fixed weir | f. Intake gate | : 4 nos. | (A: Functioning well, B: Partially deteriorated, C: Not functioning well, D: Serious condition for operation) | |
| c. Length of weir | : 61 m | g. Settling basin | : provided | (no info.: no information) | |
| d. Design intake discharge | : 3.6 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	2,075	1,461	3,536	9	0	D
Secondary	0	25,073	25,073	20	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
 - Settlement or breakdown of stilling basin of weir
 - Fallen down, inclined, or washed away of retaining wall of weir
 - Washed away of ripraps or blocks after stilling basin
 - Irrigation Canal and Related Structure
 - Impassable of inspection road along canal
 - General O&M problems
 - Difficulty on maintenance of earth canal
 - 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, not enough foundation treatment, or insufficient length of stilling basin
 - Insufficient quality of concrete or masonry material, over acting earth pressure more than design
 - Insufficient weight of ripraps or blocks for stilling basin, insufficient length of protection work after stilling basin
 - Irrigation Canal and Related Structure
 - 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
 - Fallen down and collapse of side slope, water plants or weed at inside of canal
 - 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 stilling basin of weir
 - Reconstruction of retaining wall of weir
 - Provision of additional ripraps or blocks after stilling basin of weir as required
- Irrigation Canal and Related Structure
 - Provision of inspection road both main and secondary canal with pavement
 - Provision of kilo, hect-m posts, marking to each structure with structure name
 - Provision of concrete lining
 - 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)	Structure (nos)	Inspection road (m)	Structure (nos)	Inspection road (m)	Structure (nos)	Inspection road (m)	Structure (nos)	Inspection road (m)
Main	0	0	0	9	0	0	0	9	0
Secondary	0	0	0	20	0	0	0	20	0

(4) On-farm Development

(Unit: ha)

a. Potential Irrigated paddy field	2,620	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	2,620

(5) Rehabilitation Cost (Direct Cost)

(Unit: Million Rp.)

W.R.F	Irrigation	Drainage	On-Farm Develop.	Project Facility	Total	Cost per ha
2,001	30,995	3,100	5,371	1,570	43,037	16.4

(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	5.0	Agricultural Productivity	20.0	11.0	63.3
	Urgency	25.0	21.0	Social Problem	15.0	10.5	
	Sustainability	15.0	6.8	Economic Impact	15.0	9.0	

VI.3 Priority Group

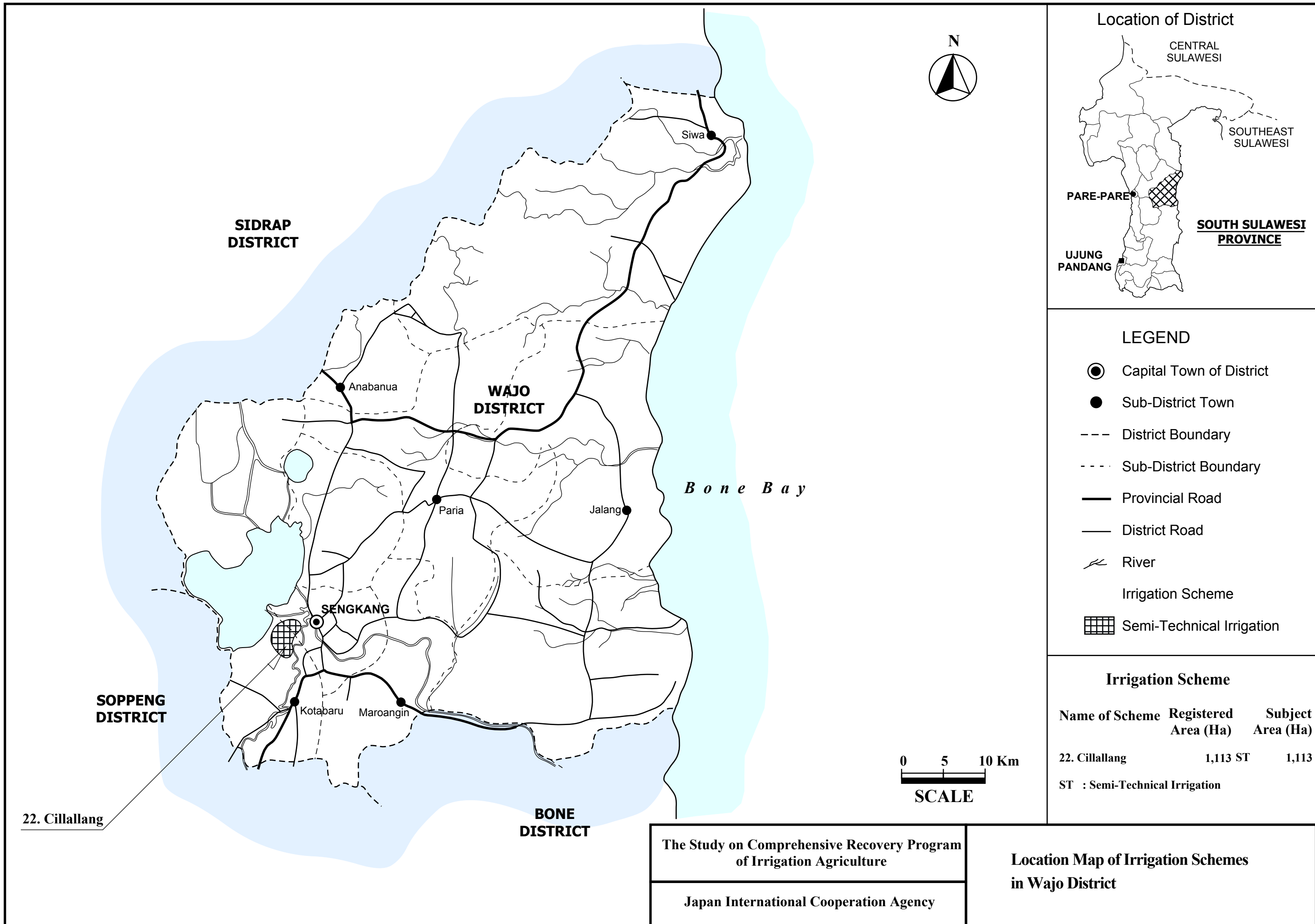
VI.4 Priority Ranking in the Province

Scheme	Tinco Kiri	District	Soppeng	
Technical Level	Technical	Registered Area	2,620 ha	Year of Construction 1994
		<p><u>Category</u> Irrigation (Headworks)</p> <p><u>Structure</u> Retaining Wall</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> Fallen down, incline or washed away of retaining wall of weir.</p>		
		<p><u>Category</u> Irrigation (Main 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; crack or damage on lined canal; leakage from lined canal; deflection of lining toward inside of canal; no inspection road.</p>		
		<p><u>Category</u> Irrigation (Main 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> Left side was completely damaged.</p>		

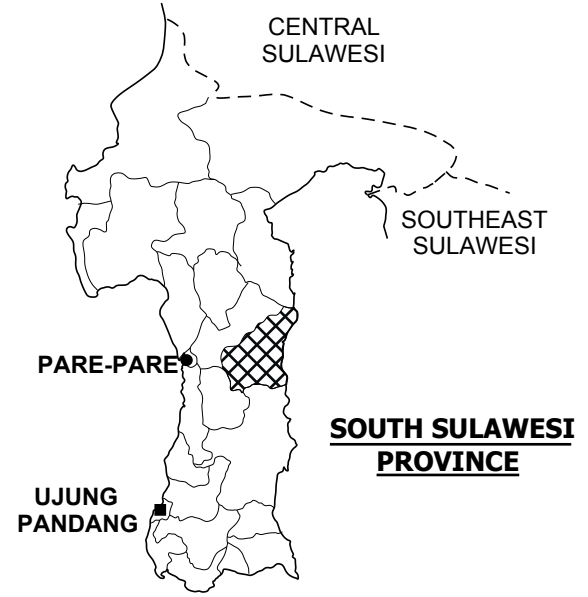
Condition: A: Functioning well, B: Partially deteriorated, C: Not functioning well, D: Serious condition for operation

Scheme	Tinco Kiri	District	Soppeng		
Technical Level	Technical	Registered Area	2,620 ha	Year of Construction	1994
		<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> Agriculture, On-Farm</p>			
		<p><u>Activity</u> Transplanting by Women</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> Horse Transportation</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> Horse transportation due to no provision of farm roads.</p>			

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



Location of District



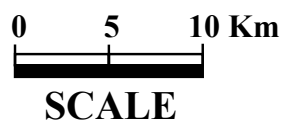
LEGEND

- ⊙ Capital Town of District
- Sub-District Town
- - - District Boundary
- · - · - Sub-District Boundary
- Provincial Road
- District Road
- ~ River
- ▭ Irrigation Scheme
- ▧ Semi-Technical Irrigation

Irrigation Scheme

Name of Scheme	Registered Area (Ha)	Subject Area (Ha)
22. Cillallang	1,113 ST	1,113

ST : Semi-Technical Irrigation



The Study on Comprehensive Recovery Program
of Irrigation Agriculture

Japan International Cooperation Agency

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

22. Cillallang

I. PROJECT FUNDAMENTALS									
I.1 General									
(1) Code Number	: 73130205			(7) Number of Farmers	: 118				
(2) Name of Irrigation Scheme	: Cilallang			(8) Water Resource River	: Woronge				
(3) District (Kabupaten)	: Wajo			(9) Catchment Area (km ²)	: 57.50				
(4) Sub-district (Kecamatan)	: Sabbangparu			(10) Completion / Last Rehabilitation Year	: 1968				
(5) Registered Area (ha)	: 1,113								
(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		
B		B			B		B		
e. Rehabilitation plan & its references		f. Crops and yield data			g. Cropping Calender		h. WUAs data		
C		A			A		3		
II. SUBJECT AREA FOR REHABILITATION PLAN									
II.1 Present and Planned Land Use									
Category	Present (ha)		Plan (ha)		Increment (ha)				
a. Irrigated paddy field	201		1,113		912				
b. Rainfed paddy field	912		0		-912				
c. Upland Field	0		0		0				
d. Uncultivated Land	0		0		0				
e. Non-irrigable	0		0		0				
Total	1,113		1,113		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)	125			125	62%	4.0	2,780		
Season II (dry I)				0					
Season III (dry II)	118			118	59%	4.0	472	455	
Total/Annual	243	0	0	243	121%	4.0	3,252	455	0
1/: Irrigated & rainfed paddy & palawija									
(2) Problems and Constraints									
<i>A. Irrigation & Agriculture Performances</i>									
- Irrigated area is limited to 201ha; existence of rainfed field (912ha); poor drainage problem reported									
- Double cropping of paddy still limited; extensive rainfed paddy; paddy yield levels still low; palawija not yet introduced									
<i>B. Primary Constraint Identified through the Inventory Survey by the JICA Study</i>									
- Irrigation & Drainage:		Poor drainage			- Palawija Marketing:		No palawija marketed		
- Agronomic Issues:		Farmers not following recommended practices			- Farmers Organizations:		Most members are not active		
- Paddy Marketing		Low marketing prices			- 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 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)	1,113			1,113	100%	5.0	5,565		
Season II (dry I)				0					
Season III (dry II)	890	223		1,113	100%	5.0	4,450	1,115	
Total/Annual	2,003	223	0	2,226	200%	5.0	10,015	1,115	0
Annual Increment	1,760	223	0	1,983	79%	1.0	6,763	660	0
IV. WUAs									
IV.1 Existing Condition									
(1) Number	a. Target;	3	b. Established;	3	c. Not yet;	0	Registered		0
Performance	a. Developed;	0	b. Under developing;	0	c. Not yet;	3	Not yet registered		3
(2) Problems and Constraints									
<input checked="" type="checkbox"/> Operation <input type="checkbox"/> Maintenance <input checked="" type="checkbox"/> Management									
(3) Causes of Problems and Constraints									
- Lack of positive action among WUA members.									
- Damaged irrigation facilities.									
IV.2 Development Plan									
(1) Proposed Countermeasures									
- Activation of WUA works.									
(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 | : - | i. Condition | : C |
| b. Type of weir | : Movable 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 | : 8 m | g. Settling basin | : not provided | (no info.: no information) | |
| d. Design intake discharge | : 1.1 m ³ /s | h. Inspection bridge | : provided | | |

(3) Irrigation Canal and Inspection Road

Canal	Lined (m)	Unlined (m)	Total (m)	Structure (nos)	Inspection road (m)	Condition
Main	2,533	3,849	6,382	10	0	D
Secondary	0	0	0	0	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
 - Physical O&M problem due to overage facility
 - Physical operational problem on flood/scouring sluice gate(s) of headworks
 - Difficulty on O&M
 - Irrigation Canal and Related Structure
 - Impassable of inspection road along canal
 - General O&M problems
 - Difficulty on maintenance of earth canal
 - Lower function of regulating structure on canal
 - Difficulty on O&M
- (5) Causes of Major Problems and Constraints
- Water Resources Facility
 - Deterioration of weir, no or insufficient rehabilitation due to budget problem
 - Improper design, installation and/or maintenance of flood/scouring sluice gate(s); breakdown of hoist, stem, guide frame or leaf
 - No provision of inspection/access road, no provision of inspection bridge/deck
 - Irrigation Canal and Related Structure
 - 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
 - Fallen down and collapse of side slope, water plants or weed at inside of canal
 - 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
 - Replace and reconstruction of weir
 - Replacement of control system or damaged equipment of flood/scouring sluice gate(s)
 - Provision of inspection/access road, inspection bridge/deck
- Irrigation Canal and Related Structure
 - Provision of inspection road both main and secondary canal with pavement
 - Provision of kilo, hect-m posts, marking to each structure with structure name
 - Provision of concrete lining
 - 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 : large rehabilitation
Settling basin : replacement or new

(3) Irrigation Canal and Related Structure

	Works	No rehabilitation	Rehabilitation	New construction	Total
Canal (m)	Main	0	6,382	638	7,020
	Secondary	0	0	0	0
Structure (nos)	Main	0	10	2	12
	Secondary	0	0	0	0

(4) On-farm Development

(Unit: ha)

a. Potential Irrigated paddy field	201	d. Non-potential paddy field	912
b. Potential non-irrigated paddy field	0	e. Non-potential non-paddy field	0
c. Potential non-paddy field	0	Total	1,113

(5) Rehabilitation Cost (Direct Cost)

(Unit: Million Rp.)

W.R.F	Irrigation	Drainage	On-Farm Develop.	Project Facility	Total	Cost per ha
4,049	11,511	1,151	2,749	1,260	20,720	18.6

(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	10.0	Agricultural Productivity	20.0	16.0	91.0	
	Urgency	25.0	23.0	Social Problem	15.0	15.0		
	Sustainability	15.0	12.0	Economic Impact	15.0	15.0		

VI.3 Priority Group

VI.4 Priority Ranking in the Province

Scheme	Cillallang	District	Wajo	
Technical Level	Semi-technical	Registered Area	1,113 ha	Year of Construction 1968
		<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> Steel gates are out of services; sedimentation at inside of canal.</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; crack or damage on lined canal; leakage from lined canal; deflection of lining toward inside of canal; no inspection road.</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; collapse or incline 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	Cillallang	District	Wajo		
Technical Level	Semi-technical	Registered Area	1,113 ha	Year of Construction	1968
		<p><u>Category</u> Irrigation (Secondary Canal)</p>			
		<p><u>Structure</u> Off -take 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>			
		<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>Activity</u> Tresher by Portable Engine</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