

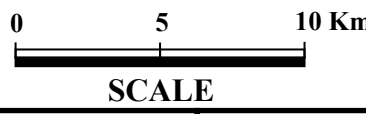
LEGEND

- ⊙ Capital Town of District
- Municipal City
- Sub-District Town
- Provincial Boundary
- - - District Boundary
- - - Sub-District Boundary
- ▬ Railway
- Provincial Road
- District Road
- ~ River
- ▬ Irrigation Scheme
- ▬ Technical Irrigation

Irrigation Scheme

Name of Scheme	Registered Area (Ha)		Subject Area (Ha)
8. Kedung Putri	4,341	T	4,451
9. Sudagaran	3,665	T	3,665
10. Rebug	1,202	T	1,202
11. Kalimeneng	1,262	T	1,262
12. Kedung GW	1,129	T	1,129

T : Technical Irrigation



The Study on Comprehensive Recovery Program
of Irrigation Agriculture

Japan International Cooperation Agency

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

I. PROJECT FUNDAMENTALS									
I.1 General									
(1) Code Number	: 33024012-18	(7) Number of Farmers	: 14,836						
(2) Name of Irrigation Scheme	: Kedung Putri	(8) Water Resource River	: S. Bogowonto						
(3) District (Kabupaten)	: Purworejo	(9) Catchment Area (km ²)	: 364						
(4) Sub-district (Kecamatan)	: Banyu Urip	(10) Completion / Last Rehabilitation Year	: 1937/1988						
(5) Registered Area (ha)	: 4,341								
(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		61			
II. SUBJECT AREA FOR REHABILITATION PLAN									
II.1 Present and Planned Land Use									
Category	Present (ha)	Plan (ha)	Increment (ha)						
a. Irrigated paddy field	4,341	4,451	110						
b. Rainfed paddy field	110	0	-110						
c. Upland field	0	0	0						
d. Uncultivated land	0	0	0						
e. Non-irrigable land	0	0	0						
Total	4,451	4,451	0						
III. AGRICULTURE									
III.1 Present/Before Project Condition									
(1) Irrigation Performance and Crop Production									
Season	Cropped Area in Irrigated Paddy Field (ha)				Annual Intensity	Irrigated Paddy Yield (GKG ton/ha)	Crop Production (ton) 1/		
	Paddy	Palawija	Sugarcane	Total			Paddy	Palawija	Others
Season I (wet)	4,334			4,334	100%	5.0	21,670	330	
Season II (dry I)	3,328	162		3,490	80%	5.0	16,640	486	
Season III (dry II)				0	0%				
Total/Annual	7,662	162	0	7,824	180%	5.0	38,310	816	0
1/: Include palawija in rainfed field									
(2) Problems and Constraints									
<i>A. Irrigation & Agriculture Performances</i>									
- High irrigation performances achieved; however, water shortage in dry season reported; rainfed field (110ha)									
- Double cropping of paddy practiced almost in the entire irrigated area; paddy yield levels high; palawija production still limited									
<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: Damage caused by rat - Farmers Organizations: Most members are not active									
- Paddy Marketing: Unstable marketing prices - Extension Services: Shortage of operation funds of PPLs									
III.2 Development Plan									
(1) Development Approaches									
- Expansion of irrigated area & ensuring year round irrigation water supply at on-farm level through rehabilitation & upgrading									
- 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									
(2) Planned Irrigation Performances and Crop Production									
Season	Cropped Area in Irrigated Paddy Field (ha)				Annual Intensity	Irrigated Paddy Yield (GKG ton/ha)	Crop Production (ton)		
	Paddy	Palawija	Sugarcane	Total			Paddy	Palawija	Others
Season I (wet)	4,451			4,451	100%	5.5	24,481		
Season II (dry I)	4,451			4,451	100%	5.5	24,481		
Season III (dry II)		1,335		1,335	30%			1,869	
Total/Annual	8,902	1,335	0	10,237	230%	5.5	48,961	1,869	0
Annual Increment	1,240	1,173	0	2,413	50%	0.5	10,651	1,053	0
IV. WUAs									
IV.1 Existing Condition									
(1) Number	a. Target;	61	b. Established;	61	c. Not yet;	0	Registered		0
	Performance	a. Developed;	0	b. Under developing;	41	c. Not yet;	20	Not yet registered	61
(2) Problems and Constraints									
<input type="checkbox"/> Operation <input type="checkbox"/> Maintenance <input checked="" type="checkbox"/> Management									
(3) Causes of Problems and Constraints									
- Management system not functioned well, especially membership fee collection.									
IV.2 Development Plan									
(1) Proposed Countermeasures									
- Improvement of WUA management system.									
(2) Development Plan									
- WUA management 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 : C Secondary Canal System : C 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 | : 3 nos. | (A: Functioning well, B: Partially deteriorated, C: Not functioning well, D: Serious condition for operation) | |
| c. Length of weir | : 53 m | g. Settling basin | : provided | (no info.: no information) | |
| d. Design intake discharge | : 5.5 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	6,644	2,656	9,300	66	9,300	C
Secondary	3,527	1,328	4,855	292	2,500	C

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

(4) Major Problems and Constrains

- Water Resources Facility
 - Problem on management for flood/scouring sluice gate(s) operation
 - Insufficient diversion water due to sedimentation in front of intake
 - Difficulty on water distribution/discharge measurement
- Irrigation Canal and Related Structure
 - Leakage from canal
 - Collapse of canal
 - Lower function of regulating structure on canal
 - Difficulty on O&M

(5) Causes of Major Problems and Constraints

- Water Resources Facility
 - Improper maintenance of flood or scouring sluice gate(s) of headworks (no greasing and anti-rust painting)
 - Sedimentation in front of intake
 - No provision of water level gauge/measuring facility
- Irrigation Canal and Related Structure
 - Improper regular maintenance of canal, settlement of canal then insufficient freeboard and overtopping
 - Improper maintenance; insufficient nos. of cross drain, berm width, or catch drain; and/or steep slope 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
 - Replacement of control system or damaged equipment of flood/scouring sluice gate(s) of headworks
 - Dredging or flushing of sediment, proper gate operation of headworks and intake
 - Provision of water level gauge/measuring facility and equipment
- Irrigation Canal and Related Structure
 - Repair of leakage from canal, widen canal wide, recompaction of embankment
 - Redesign of canal section; provision of cross drain, proper width of berm, catch drain, and/or proper slope
 - 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 : minor 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)	Structure (nos)							
Canal (m)	Main		0	9,300		0		9,300	
	Secondary		0	4,855		22,949		27,804	
Structure (nos)	Main		1	65		7		73	
	Secondary		59	233		58		350	

(4) On-farm Development

(Unit: ha)

a. Potential Irrigated paddy field	4,341	d. Non-potential paddy field	0
b. Potential non-irrigated paddy field	110	e. Non-potential non-paddy field	0
c. Potential non-paddy field	0	Total	4,451

(5) Rehabilitation Cost (Direct Cost)

(Unit: Million Rp.)

W.R.F	Irrigation	Drainage	On-Farm Develop.	Project Facility	Total	Cost per ha
3,926	67,551	6,755	9,181	1,570	88,983	20.0

(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	57.8	
	Urgency	25.0	20.0	Social Problem	15.0	6.0		
	Sustainability	15.0	8.3	Economic Impact	15.0	7.5		

VI.3 Priority Group

VI.4 Priority Ranking in the Province

Scheme	Kedung Putri	District	Purworejo	
Technical Level	Technical	Registered Area	4,341 ha	Year of Construction 1937/1988
		<i>Category</i> Irrigation (Headworks)		
		<i>Structure</i> Fixed Weir, Upstream		
		<i>Condition</i> <input type="checkbox"/> A <input type="checkbox"/> B <input checked="" type="checkbox"/> C <input type="checkbox"/> D		
		<i>Category</i> Irrigation (Headworks)		
		<i>Structure</i> Fixed Weir, Downstream		
		<i>Condition</i> <input type="checkbox"/> A <input type="checkbox"/> B <input checked="" type="checkbox"/> C <input type="checkbox"/> D		
		<i>Category</i> Irrigation (Main Canal)		
		<i>Structure</i> Lined Canal		
		<i>Condition</i> <input type="checkbox"/> A <input checked="" type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D		
		<i>Problems</i> Require repair of weir body and gate works		
		<i>Problems</i> Require repair of inspection bridge		
		<i>Problems</i> Require removal of sediments and debris		

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

Scheme		District	
Kedung Putri		Purworejo	
Technical Level	Technical	Registered Area	4,341 ha
		Year of Construction	1937/1988
		<p><u>Category</u> Irrigation (Secondary Canal)</p>	
		<p><u>Structure</u> Lined Canal and Division Structure</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> Require provision of inspection road</p>	
		<p><u>Category</u> Irrigation (Secondary Canal)</p>	
		<p><u>Structure</u> 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> Require widening of inspection road</p>	
		<p><u>Category</u> Irrigation (Paddy Field)</p>	
		<p><u>Structure</u> Division Box</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> Require widening of farm road</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	: 33024106-09	(7) Number of Farmers	: 14,660						
(2) Name of Irrigation Scheme	: Sudagaran	(8) Water Resource River	: Jali						
(3) District (Kabupaten)	: Purworejo	(9) Catchment Area (km ²)	: -						
(4) Sub-district (Kecamatan)	: Grabag	(10) Completion / Last Rehabilitation Year	: -						
(5) Registered Area (ha)	: 3,665								
(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		53			
II. SUBJECT AREA FOR REHABILITATION PLAN									
II.1 Present and Planned Land Use									
Category	Present (ha)	Plan (ha)	Increment (ha)						
a. Irrigated paddy field	3,665	3,665	0						
b. Rainfed paddy field	0	0	0						
c. Upland field	0	0	0						
d. Uncultivated land	0	0	0						
e. Non-irrigable land	0	0	0						
Total	3,665	3,665	0						
III. AGRICULTURE									
III.1 Present/Before Project Condition									
(1) Irrigation Performance and Crop Production									
Season	Cropped Area in Irrigated Paddy Field (ha)				Annual Intensity	Irrigated Paddy Yield (GKG ton/ha)	Crop Production (ton)		
	Paddy	Palawija	Sugarcane	Total			Paddy	Palawija	Others
Season I (wet)	3,372			3,372	92%	5.0	16,860		
Season II (dry I)	2,615			2,615	71%	4.5	11,768		
Season III (dry II)				0	0%				
Total/Annual	5,987	0	0	5,987	163%	4.8	28,628	0	0
(2) Problems and Constraints									
<i>A. Irrigation & Agriculture Performances</i>									
- Substantially high irrigation performances achieved; however, irrigation water supply at on-farm level limited in dry season									
- Double cropping of paddy practiced in most of the 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:		Low marketing prices			
- Agronomic Issues:		Damage caused by rat		- Farmers Organizations:		Most members are not active			
- 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									
- Expansion of double cropped area of paddy; productivity increase of paddy through further intensification; introduction of palawija in dry season I & 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 (ha)				Annual Intensity	Irrigated Paddy Yield (GKG ton/ha)	Crop Production (ton)		
	Paddy	Palawija	Sugarcane	Total			Paddy	Palawija	Others
Season I (wet)	3,665			3,665	100%	5.5	20,158		
Season II (dry I)	2,749	916		3,665	100%	5.0	13,745	4,580	
Season III (dry II)		733		733	20%			1,026	
Total/Annual	6,414	1,649	0	8,063	220%	5.3	33,903	5,606	0
Annual Increment	427	1,649	0	2,076	57%	0.5	5,275	5,606	0
IV. WUAs									
IV.1 Existing Condition									
(1)	Number	a. Target;	50	b. Established;	38	c. Not yet;	12	Registered	1
	Performance	a. Developed;	0	b. Under developing;	35	c. Not yet;	3	Not yet registered	37
(2) Problems and Constraints									
<input checked="" type="checkbox"/> Operation <input type="checkbox"/> Maintenance <input type="checkbox"/> Management									
(3) Causes of Problems and Constraints									
- Insufficient water distribution.									
IV.2 Development Plan									
(1) Proposed Countermeasures									
Strengthening of O&M capability by WUA									
(2) Development Plan									
- WUA 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 : C Secondary Canal System : C On-farm : C
- (2) Water Resources Facility
- | | | | | | |
|----------------------------|-------------------------|-------------------------|----------------|---|-----|
| a. Type of facility | : Headworks | e. Scouring sluice gate | : no info. | i. Condition | : C |
| b. Type of weir | : Fixed weir | f. Intake gate | : no info. | (A: Functioning well, B: Partially deteriorated, C: Not functioning well, D: Serious condition for operation) | |
| c. Length of weir | : 43 m | g. Settling basin | : not provided | (no info.: no information) | |
| d. Design intake discharge | : 7.0 m ³ /s | h. Inspection bridge | : no info. | | |

(3) Irrigation Canal and Inspection Road

Canal	Lined (m)	Unlined (m)	Total (m)	Structure (nos)	Inspection road (m)	Condition
Main	1,000	3,100	4,100	3	2,000	C
Secondary	16,000	25,700	41,700	87	15,000	C

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

(4) Major Problems and Constrains

- Water Resources Facility
 - Problem on management for flood/scouring sluice gate(s) operation
 - Inflow of bed loads into canal and decrease canal flow capacity
 - Difficulty on water distribution/discharge measurement
 - Irrigation Canal and Related Structure
 - Sedimentation or obstruction of water flow
 - Leakage from canal
 - Collapse of canal
 - Difficulty on O&M
- (5) Causes of Major Problems and Constraints
- Water Resources Facility
 - Improper maintenance of flood or scouring sluice gate(s) of headworks (no greasing and anti-rust painting)
 - No provision of settling basin, no proper gate operation of intake during flood
 - No provision of water level gauge/measuring facility
 - Irrigation Canal and Related Structure
 - No provision of settling basin (sediments), improper management of canal (sediments, water plant)
 - Improper regular maintenance of canal, settlement of canal then insufficient freeboard and overtopping
 - Improper maintenance; insufficient nos. of cross drain, berm width, or catch drain; and/or steep slope 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
 - Replacement of control system or damaged equipment of flood/scouring sluice gate(s) of headworks
 - Provision of settling basin, proper gate operation of intake during flood
 - Provision of water level gauge/measuring facility and equipment
- Irrigation Canal and Related Structure
 - Removal of sediment soil and foreign materials from canal, grass cutting
 - Repair of leakage from canal, widen canal wide, recompaction of embankment
 - Redesign of canal section; provision of cross drain, proper width of berm, catch drain, and/or proper slope
 - Provision or repair of inspection road with all weather type/pavement

(2) Water Resources Facility

Dam/Headworks body : large rehabilitation Intake, civil : minor 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)	Structure (nos)	Canal (m)	Structure (nos)	Canal (m)	Structure (nos)	Canal (m)	Structure (nos)
Main		0	4,100	3	0	0	4,100	3
Secondary		0	41,700	87	0	17	41,700	104

(4) On-farm Development

(Unit: ha)

a. Potential Irrigated paddy field	3,665	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	3,665

(5) Rehabilitation Cost (Direct Cost)

(Unit: Million Rp.)

W.R.F	Irrigation	Drainage	On-Farm Develop.	Project Facility	Total	Cost per ha
3,553	52,448	5,245	7,513	1,570	70,329	19.2

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

VI. PROJECT EVALUATION




VI.1 EIRR 9.4%

VI.2 Prioritization Scoring

Evaluation Index	Full Score	Score	Evaluation Index	Full Score	Score	Total Score	
							Irrigation System
	Urgency	25.0	20.0	Social Problem	15.0	10.5	
	Sustainability	15.0	6.8	Economic Impact	15.0	7.5	

VI.3 Priority Group Group I: First priority group

VI.4 Priority Ranking in the Province 12

Scheme	Sudagaran	District	Purworejo	
Technical Level	Technical	Registered Area	3,665 ha	Year of Construction
		<i>Category</i> Irrigation (Headworks)		
		<i>Structure</i> Fixed Weir, Upstream		
		<i>Condition</i> <input type="checkbox"/> A <input type="checkbox"/> B <input checked="" type="checkbox"/> C <input type="checkbox"/> D		
		<i>Problems</i> Require repair of weir body and gate works		
		<i>Category</i> Irrigation (Headworks)		
		<i>Structure</i> Fixed Weir, Downstream		
		<i>Condition</i> <input type="checkbox"/> A <input type="checkbox"/> B <input checked="" type="checkbox"/> C <input type="checkbox"/> D		
		<i>Problems</i> Require repair of retaining wall		
		<i>Category</i> Irrigation (Main Canal)		
		<i>Structure</i> Lined Canal		
		<i>Condition</i> <input type="checkbox"/> A <input checked="" type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D		
		<i>Problems</i> Require minor repair		

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

Scheme	Sudagaran	District	Purworejo	
Technical Level	Technical	Registered Area	3,665 ha	Year of Construction
		<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> Require canal lining</p>		
		<p><u>Category</u> Irrigation (Secondary Canal)</p>		
		<p><u>Structure</u> Canal and Inspection Road</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> Require major repair and provision of inspection road</p>		
		<p><u>Category</u> Irrigation (Paddy Field)</p>		
		<p><u>Structure</u> Tertiary Canal and Paddy Field</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> Require reshaping of canal</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	: -			(7) Number of Farmers	: 6,868				
(2) Name of Irrigation Scheme	: Rebug			(8) Water Resource River	: Bedono				
(3) District (Kabupaten)	: Purworejo			(9) Catchment Area (km ²)	: -				
(4) Sub-district (Kecamatan)	: Kutoarjo			(10) Completion / Last Rehabilitation Year	: 1977/1988				
(5) Registered Area (ha)	: 1,202								
(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		27		
II. SUBJECT AREA FOR REHABILITATION PLAN									
II.1 Present and Planned Land Use									
Category		Present (ha)		Plan (ha)		Increment (ha)			
a. Irrigated paddy field		1,202		1,202		0			
b. Rainfed paddy field		0		0		0			
c. Upland field		0		0		0			
d. Uncultivated land		0		0		0			
e. Non-irrigable land		0		0		0			
Total		1,202		1,202		0			
III. AGRICULTURE									
III.1 Present/Before Project Condition									
(1) Irrigation Performance and Crop Production									
Season	Cropped Area in Irrigated Paddy Field (ha)				Annual Intensity	Irrigated Paddy Yield (GKG ton/ha)	Crop Production (ton)		
	Paddy	Palawija	Sugarcane	Total			Paddy	Palawija	Others
Season I (wet)	1,200			1,200	100%	5.0	6,000		
Season II (dry I)	806			806	67%	4.5	3,627		
Season III (dry II)				0	0%				
Total/Annual	2,006	0	0	2,006	167%	4.8	9,627	0	0
(2) Problems and Constraints									
<i>A. Irrigation & Agriculture Performances</i>									
- Substantially high irrigation performances achieved; however, irrigation water supply at on-farm level limited in dry season									
- Double cropping of paddy practiced in most of the 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:		Unstable marketing prices		
- Agronomic Issues:		Farmers not following recommended practices			- Farmers Organizations:		Most members are not active		
- 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									
- Expansion of double cropped area of paddy; productivity increase of paddy through further intensification; introduction of palawija in dry season I & 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 (ha)				Annual Intensity	Irrigated Paddy Yield (GKG ton/ha)	Crop Production (ton)		
	Paddy	Palawija	Sugarcane	Total			Paddy	Palawija	Others
Season I (wet)	1,202			1,202	100%	5.5	6,611		
Season II (dry I)	841	362		1,203	100%	5.0	4,205	1,810	
Season III (dry II)		240		240	20%			336	
Total/Annual	2,043	602	0	2,645	220%	5.3	10,816	2,146	0
Annual Increment	37	602	0	639	53%	0.5	1,189	2,146	0
IV. WUAs									
IV.1 Existing Condition									
(1)	Number	a. Target;	18	b. Established;	9	c. Not yet;	9	Registered	0
	Performance	a. Developed;	0	b. Under developing;	9	c. Not yet;	0	Not yet registered	9
(2) Problems and Constraints									
<input type="checkbox"/> Operation <input type="checkbox"/> Maintenance <input checked="" type="checkbox"/> Management									
(3) Causes of Problems and Constraints									
- Low level of farmers understanding about the necessity of O&M works.									
IV.2 Development Plan									
(1) Proposed Countermeasures									
- Acceleration of WUA establishment									
(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 | : no info. | (A: Functioning well, B: Partially deteriorated, C: Not functioning well, D: Serious condition for operation) | |
| c. Length of weir | : 45 m | g. Settling basin | : provided | (no info.: no information) | |
| d. Design intake discharge | | h. Inspection bridge | : provided | | |

(3) Irrigation Canal and Inspection Road

Canal	Lined (m)	Unlined (m)	Total (m)	Structure (nos)	Inspection road (m)	Condition
Main	0	0	0	0	0	D
Secondary	6,000	13,000	19,000	40	8,000	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
 - Insufficient diversion water due to sedimentation in front of intake
 - Difficulty on water distribution/discharge measurement
- Irrigation Canal and Related Structure
 - Leakage from canal
 - Lower function of regulating structure on canal
 - Difficulty on O&M
 - Difficulty on water distribution
- (5) Causes of Major Problems and Constraints
 - Water Resources Facility
 - Insufficient quality of concrete or masonry material, over acting earth pressure more than design
 - Sedimentation in front of intake
 - No provision of water level gauge/measuring facility
 - Irrigation Canal and Related Structure
 - Improper regular maintenance of canal, settlement of canal then insufficient freeboard and overtopping
 - 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
 - No provision of water level gauge/facility

V.2 Development Plan

(1) Proposed Countermeasures for Major Problems

- Water Resources Facility
 - Reconstruction of retaining wall of weir
 - Dredging or flushing of sediment, proper gate operation of headworks and intake
 - Provision of water level gauge/measuring facility and equipment
- Irrigation Canal and Related Structure
 - Repair of leakage from canal, widen canal wide, recompaction of embankment
 - Replacement and reconstruction of regulating structure on canal
 - Provision or repair of inspection road with all weather type/pavement
 - Provision of water level gauge/facility

(2) Water Resources Facility

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

(3) Irrigation Canal and Related Structure

Works	No rehabilitaion		Rehabilitation		New construction		Total	
	Canal (m)	Structure (nos)	Canal (m)	Structure (nos)	Canal (m)	Structure (nos)	Canal (m)	Structure (nos)
Main	0	0	0	0	0	0	0	0
Secondary	0	0	19,000	40	0	0	19,000	48

(4) On-farm Development

(Unit: ha)

a. Potential Irrigated paddy field	1,202	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	1,202

(5) Rehabilitation Cost (Direct Cost)

(Unit: Million Rp.)

W.R.F	Irrigation	Drainage	On-Farm Develop.	Project Facility	Total	Cost per ha
1,990	21,756	2,176	2,464	1,260	29,645	24.7

(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
	Urgency	25.0	23.0	Social Problem	15.0	9.0	
	Sustainability	15.0	8.3	Economic Impact	15.0	7.5	

VI.3 Priority Group

VI.4 Priority Ranking in the Province

Scheme	Rebug	District	Purworejo	
Technical Level	Technical	Registered Area	1,202 ha	Year of Construction 1977/1988
		<i>Category</i> Irrigation (Headworks)		
		<i>Structure</i> Fixed Weir, Upstream		
		<i>Condition</i> <input type="checkbox"/> A <input type="checkbox"/> B <input checked="" type="checkbox"/> C <input type="checkbox"/> D		
		<i>Problems</i> Require repair for civil and gate works and removal of sediment		
		<i>Category</i> Irrigation (Headworks)		
		<i>Structure</i> Fixed Weir, Downstream		
		<i>Condition</i> <input type="checkbox"/> A <input type="checkbox"/> B <input checked="" type="checkbox"/> C <input type="checkbox"/> D		
		<i>Problems</i> Require repair for civil and gate works and removal of sediment		
		<i>Category</i> Irrigation (Headworks)		
		<i>Structure</i> Intake		
		<i>Condition</i> <input type="checkbox"/> A <input type="checkbox"/> B <input checked="" type="checkbox"/> C <input type="checkbox"/> D		
		<i>Problems</i> Require repair for civil and gate works and removal of sediment		

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

Scheme	Rebug	District	Purworejo	
Technical Level	Technical	Registered Area	1,202 ha	Year of Construction 1977/1988
		<p><u>Category</u> Irrigation (Main Canal)</p>		
		<p><u>Structure</u> Lined Canal and 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>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>Category</u> Irrigation (Paddy Field)</p>		
		<p><u>Structure</u> Tertiary Canal and Paddy Field</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> Require provision of division structure with gate</p>		
		<p><u>Problems</u> Require provision of canal lining and inspection road</p>		
		<p><u>Problems</u> Require farm road</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	:	-	(7) Number of Farmers	:	5,048					
(2) Name of Irrigation Scheme	:	Kalimeneng	(8) Water Resource River	:	Bedono					
(3) District (Kabupaten)	:	Purworejo	(9) Catchment Area (km ²)	:	11.620					
(4) Sub-district (Kecamatan)	:	Mirit	(10) Completion / Last Rehabilitation Year	:	1940/1984					
(5) Registered Area (ha)	:	1,262								
(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		29				
II. SUBJECT AREA FOR REHABILITATION PLAN										
II.1 Present and Planned Land Use										
Category		Present (ha)		Plan (ha)		Increment (ha)				
a. Irrigated paddy field		1,262		1,262		0				
b. Rainfed paddy field		0		0		0				
c. Upland field		0		0		0				
d. Uncultivated land		0		0		0				
e. Non-irrigable land		0		0		0				
Total		1,262		1,262		0				
III. AGRICULTURE										
III.1 Present/Before Project Condition										
(1) Irrigation Performance and Crop Production										
Season		Cropped Area in Irrigated Paddy Field (ha)				Annual Intensity	Irrigated Paddy Yield (GKG ton/ha)	Crop Production (ton)		
		Paddy	Palawija	Sugarcane	Total			Paddy	Palawija	Others
Season I (wet)		1,244			1,244	99%	5.0	6,220		
Season II (dry I)		795			795	63%	4.5	3,578		
Season III (dry II)		644			644	51%	4.0	2,576		
Total/Annual		2,683	0	0	2,683	213%	4.6	12,374	0	0
(2) Problems and Constraints										
<i>A. Irrigation & Agriculture Performances</i>										
- High irrigation performances achieved; 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 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:		Low marketing prices				
- Agronomic Issues:		Damage caused by rat		- Farmers Organizations:		Most members are not active				
- 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										
- Introduction of palawija production in dry season I & II; productivity increase of paddy & palawija through further intensification										
- Strengthening of extension activities tailored to area specific needs; empowerment of farmer groups (KTs) to establish agri-business oriented KTAs										
(2) Planned Irrigation Performances and Crop Production										
Season		Cropped Area in Irrigated Paddy Field (ha)				Annual Intensity	Irrigated Paddy Yield (GKG ton/ha)	Crop Production (ton)		
		Paddy	Palawija	Sugarcane	Total			Paddy	Palawija	Others
Season I (wet)		1,262			1,262	100%	5.5	6,941		
Season II (dry I)		883	252		1,135	90%	5.0	4,415	1,260	
Season III (dry II)		631	126		757	60%	4.5	2,840	176	
Total/Annual		2,776	378	0	3,154	250%	5.1	14,196	1,436	0
Annual Increment		93	378	0	471	37%	0.5	1,822	1,436	0
IV. WUAs										
IV.1 Existing Condition										
(1)	Number	a. Target;	14	b. Established;	14	c. Not yet;	0	Registered	0	
	Performance	a. Developed;	13	b. Under developing;	1	c. Not yet;	0	Not yet registered	14	
(2) Problems and Constraints										
<input type="checkbox"/> Operation <input type="checkbox"/> Maintenance <input checked="" type="checkbox"/> Management										
(3) Causes of Problems and Constraints										
- Selfish performance without coordination among 14 WUA										
IV.2 Development Plan										
(1) Proposed Countermeasures										
- Encouragement of cooperation among WUA										
(2) Development Plan										
- WUA management 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 : C Secondary Canal System : C 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 | : 36 m | g. Settling basin | : provided | (no info.: no information) | |
| d. Design intake discharge | : 2.0 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	906	180	1,086	10	1,086	C
Secondary	9,941	5,200	15,141	139	8,100	C

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

(4) Major Problems and Constrains

- Water Resources Facility
 - Leakage from flood or scouring sluice gate(s) of headworks
 - Insufficient diversion water due to sedimentation in front of intake
 - Problem on management for intake gate(s) operation
 - Irrigation Canal and Related Structure
 - Leakage from canal
 - Collapse of canal
 - Lower function of regulating structure on canal
 - Difficulty on O&M
 - Difficulty on water distribution
- (5) Causes of Major Problems and Constraints
- Water Resources Facility
 - Improper construction of flood/scouring sluice gate of headworks, opening of space more than design due to outer load more than design
 - Sedimentation in front of intake
 - Improper management or deterioration of intake gate(s)
 - Irrigation Canal and Related Structure
 - Improper regular maintenance of canal, settlement of canal then insufficient freeboard and overtopping
 - Improper maintenance; insufficient nos. of cross drain, berm width, or catch drain; and/or steep slope 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
 - No provision of water level gauge/facility

V.2 Development Plan

(1) Proposed Countermeasures for Major Problems

- Water Resources Facility
 - Repair or replacement of guide frames, sill beams, provision of filling materials to spaces/gaps
 - Dredging or flushing of sediment, proper gate operation of headworks and intake
 - Replacement of control system or damaged equipment of intake
- Irrigation Canal and Related Structure
 - Repair of leakage from canal, widen canal wide, recompaction of embankment
 - Redesign of canal section; provision of cross drain, proper width of berm, catch drain, and/or proper slope
 - Replacement and reconstruction of regulating structure on canal
 - Provision or repair of inspection road with all weather type/pavement
 - Provision of water level gauge/facility

(2) Water Resources Facility

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

(3) Irrigation Canal and Related Structure

Works	No rehabilitaion			Rehabilitation		New construction		Total	
	Canal (m)	Structure (nos)							
Main	0	10	1,086	0	1	0	0	1,086	11
	0	139	15,141	0	28	0	0	15,141	167

(4) On-farm Development

(Unit: ha)

a. Potential Irrigated paddy field	1,262	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	1,262

(5) Rehabilitation Cost (Direct Cost)

(Unit: Million Rp.)

W.R.F	Irrigation	Drainage	On-Farm Develop.	Project Facility	Total	Cost per ha
2,562	19,634	1,963	2,587	1,260	28,007	22.2

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

VI. PROJECT EVALUATION




VI.1 EIRR 6.8%

VI.2 Prioritization Scoring

Evaluation Index	Full Score	Score	Evaluation Index	Full Score	Score	Total Score
Irrigation System	10.0	5.0	Agricultural Productivity	20.0	9.0	58.8
	25.0	20.0	Social Problem	15.0	9.0	
	15.0	8.3	Economic Impact	15.0	7.5	

VI.3 Priority Group Group II: Second priority group

VI.4 Priority Ranking in the Province 21

Scheme	Kalimeneng	District	Purworejo	
Technical Level	Technical	Registered Area	1,262 ha	Year of Construction 1940/1984
		<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> Require removal of sediment in front of weir and intake		
		<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> Require removal of sediment in front of weir and intake		
		<i>Category</i> Irrigation (Headworks)		
		<i>Structure</i> Fixed Weir, Downstream		
		<i>Condition</i> <input type="checkbox"/> A <input type="checkbox"/> B <input checked="" type="checkbox"/> C <input type="checkbox"/> D		
		<i>Problems</i> Require major repair of civil and gate works		

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

Scheme	Kalimeneng	District	Purworejo	
Technical Level	Technical	Registered Area	1,262 ha	Year of Construction 1940/1984
		<i>Category</i> Irrigation (Secondary Canal)		
		<i>Structure</i> Lined Canal		
		<i>Condition</i> <input type="checkbox"/> A <input type="checkbox"/> B <input checked="" type="checkbox"/> C <input type="checkbox"/> D		
		<i>Problems</i> Require major repair and provision of inspection road		
		<i>Category</i> Irrigation (Secondary Canal)		
		<i>Structure</i> Lined Canal		
		<i>Condition</i> <input type="checkbox"/> A <input type="checkbox"/> B <input checked="" type="checkbox"/> C <input checked="" type="checkbox"/> D		
		<i>Problems</i> Require major repair and provision of inspection road		
		<i>Category</i> Irrigation (Paddy Field)		
		<i>Structure</i> Tertiary Canal and Paddy Field		
		<i>Condition</i> <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D		
		<i>Problems</i> Require division box and farm road		

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	:	-	(7) Number of Farmers	:	5,645				
(2) Name of Irrigation Scheme	:	Kedung GW	(8) Water Resource River	:	-				
(3) District (Kabupaten)	:	Purworejo	(9) Catchment Area (km ²)	:	11,290				
(4) Sub-district (Kecamatan)	:	Kemiri	(10) Completion / Last Rehabilitation Year	:	1939				
(5) Registered Area (ha)	:	1,129							
(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		22			
II. SUBJECT AREA FOR REHABILITATION PLAN									
II.1 Present and Planned Land Use									
Category	Present (ha)	Plan (ha)	Increment (ha)						
a. Irrigated paddy field	1,129	1,129	0						
b. Rainfed paddy field	0	0	0						
c. Upland field	0	0	0						
d. Uncultivated land	0	0	0						
e. Non-irrigable land	0	0	0						
Total	1,129	1,129	0						
III. AGRICULTURE									
III.1 Present/Before Project Condition									
(1) Irrigation Performance and Crop Production									
Season	Cropped Area in Irrigated Paddy Field (ha)				Annual Intensity	Irrigated Paddy Yield (GKG ton/ha)	Crop Production (ton)		
	Paddy	Palawija	Sugarcane	Total			Paddy	Palawija	Others
Season I (wet)	1,129			1,129	100%	5.0	5,645		
Season II (dry I)	1,129			1,129	100%	4.5	5,081		
Season III (dry II)				0					
Total/Annual	2,258	0	0	2,258	200%	4.8	10,726	0	0
(2) Problems and Constraints									
<i>A. Irrigation & Agriculture Performances</i>									
- High irrigation performances achieved; however, water shortage in dry season reported									
- Double cropping of paddy practiced in 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:		Low marketing prices			
- Agronomic Issues:		Damage caused by rat		- Farmers Organizations:		Most members are not active			
- 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									
- Introduction of palawija production in dry season II; productivity increase of paddy & palawija through further intensification									
- 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 (ha)				Annual Intensity	Irrigated Paddy Yield (GKG ton/ha)	Crop Production (ton)		
	Paddy	Palawija	Sugarcane	Total			Paddy	Palawija	Others
Season I (wet)	1,129			1,129	100%	5.5	6,210		
Season II (dry I)	1,129			1,129	100%	5.0	5,645		
Season III (dry II)		339		339	30%			475	
Total/Annual	2,258	339	0	2,597	230%	5.3	11,855	475	0
Annual Increment	0	339	0	339	30%	0.5	1,129	475	0
IV. WUAs									
IV.1 Existing Condition									
(1)	Number	a. Target;	20	b. Established;	20	c. Not yet;	0	Registered	0
	Performance	a. Developed;	10	b. Under developing;	1	c. Not yet;	0	Not yet registered	20
(2) Problems and Constraints									
<input type="checkbox"/> Operation <input type="checkbox"/> Maintenance <input type="checkbox"/> Management									
(3) Causes of Problems and Constraints									
- Less awareness of WUA members to obligation in implementing O&M activities.									
IV.2 Development Plan									
(1) Proposed Countermeasures									
- Calling attention to duty of WUA									
(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 : D Main Canal System : C Secondary Canal System : C On-farm : C
- (2) Water Resources Facility
- | | | | | | |
|----------------------------|-------------------------|-------------------------|----------------|---|-----|
| a. Type of facility | : Headworks | e. Scouring sluice gate | : 2 nos. | i. Condition | : D |
| 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 | : 68 m | g. Settling basin | : not provided | (no info.: no information) | |
| d. Design intake discharge | : 2.0 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	748	435	1,183	13	200	C
Secondary	13,000	2,929	15,929	124	10,000	C

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

(4) Major Problems and Constrains

- Water Resources Facility
 - Problem on management for flood/scouring sluice gate(s) operation
 - Inflow of bed loads into canal and decrease canal flow capacity
 - Lower strength against design load due to rust, decay of steel materials of 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
 - Lower function of regulating structure on canal
 - Difficulty on O&M
- (5) Causes of Major Problems and Constraints
 - Water Resources Facility
 - Improper maintenance of flood or scouring sluice gate(s) of headworks (no greasing and anti-rust painting)
 - No provision of settling basin, no proper gate operation of intake during flood
 - No over coating on intake gate(s) to prevent rust and decay
 - Irrigation Canal and Related Structure
 - No provision 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
 - 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
 - Replacement of control system or damaged equipment of flood/scouring sluice gate(s) of headworks
 - Provision of settling basin, proper gate operation of intake during flood
 - Provision of overcoat or replacement of intake gate(s) of headworks
- 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
 - 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 : 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 rehabilitaion			Rehabilitation	New construction	Total
	Main	Secondary				
Canal (m)	Main		0	1,183	0	1,183
	Secondary		0	15,929	0	15,929
Structure (nos)	Main		0	13	1	14
	Secondary		0	124	25	149

(4) On-farm Development

(Unit: ha)

a. Potential Irrigated paddy field	1,129	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	1,129

(5) Rehabilitation Cost (Direct Cost)

(Unit: Million Rp.)

W.R.F	Irrigation	Drainage	On-Farm Develop.	Project Facility	Total	Cost per ha
11,226	29,938	2,994	2,314	1,260	47,732	42.3

(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	- Agricultural Productivity	20.0	-	0.0
	Urgency	25.0	- Social Problem	15.0	-	
	Sustainability	15.0	- Economic Impact	15.0	-	

VI.3 Priority Group

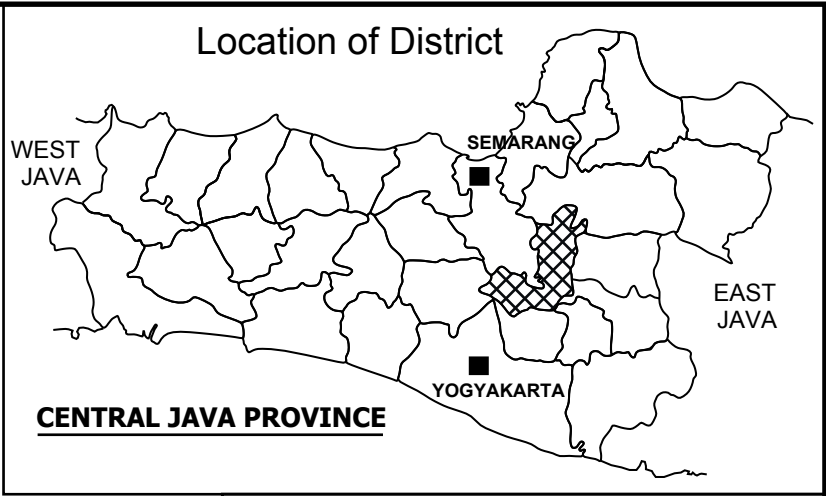
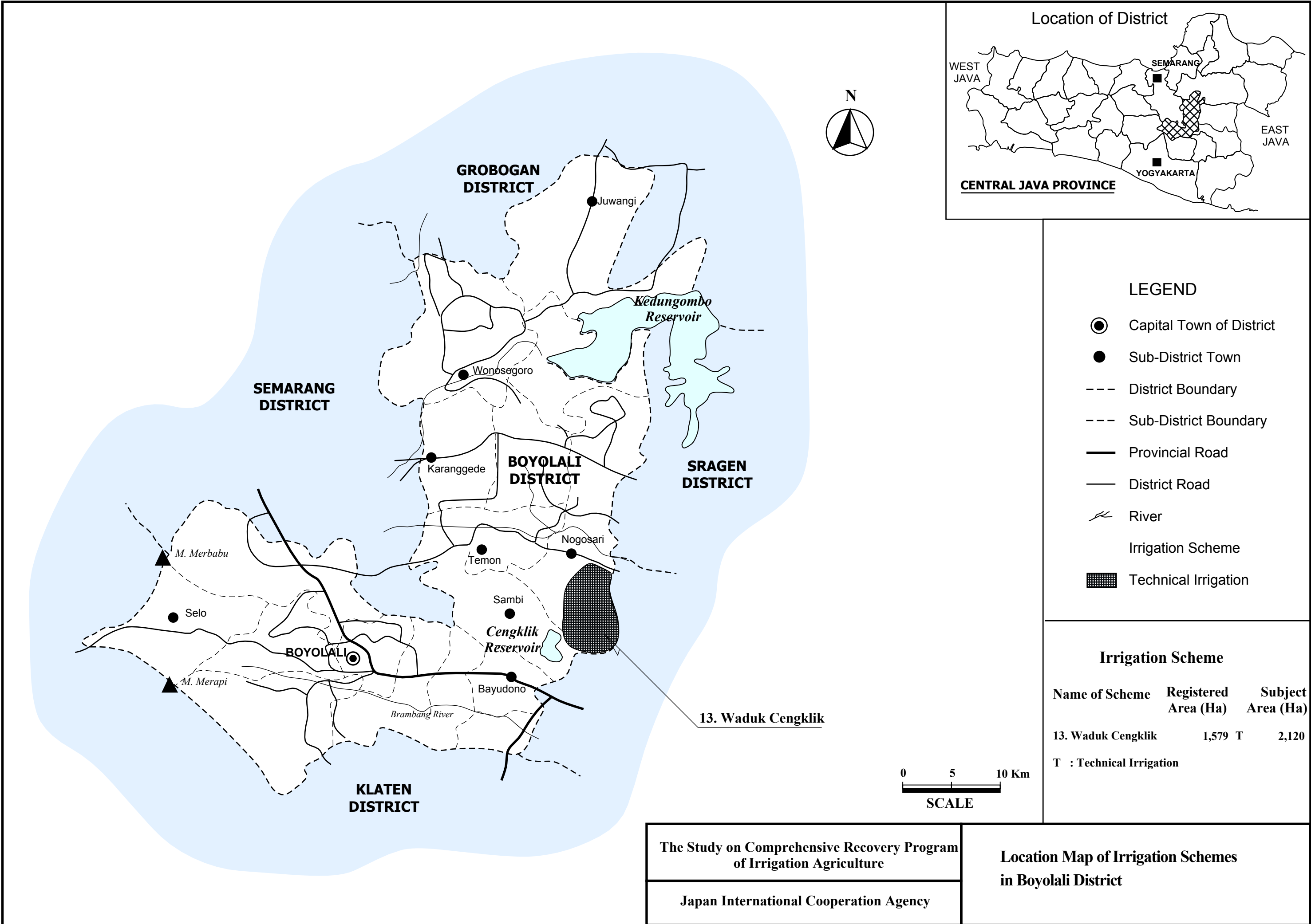
VI.4 Priority Ranking in the Province

Scheme		District	
Kedung GW		Purworejo	
Technical Level	Technical	Registered Area	1,129 ha
		Year of Construction	1939
		<i>Category</i> Irrigation (Headworks)	
		<i>Structure</i> Gabion Weir (no function)	
		<i>Condition</i> <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D	
		<i>Category</i> Irrigation (Headworks)	
		<i>Structure</i> Gabion Weir (no function)	
		<i>Condition</i> <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D	
		<i>Category</i> Irrigation (Headworks)	
		<i>Structure</i> Intake	
		<i>Condition</i> <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D	
		<i>Problems</i> Totally damaged, require new construction	
		<i>Problems</i> Totally damaged, require new construction	
		<i>Problems</i> No function, require new construction	

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

Scheme	Kedung GW	District	Purworejo	
Technical Level	Technical	Registered Area	1,129 ha	Year of Construction 1939
		<i>Category</i> Irrigation (Main Canal)		
		<i>Structure</i> Earth Canal		
		<i>Condition</i> <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D		
		<i>Problems</i> Require rehabilitation totally		
		<i>Category</i> Irrigation (Main canal)		
		<i>Structure</i> Lined Canal		
		<i>Condition</i> <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D		
		<i>Problems</i> Require rehabilitation totally		
		<i>Category</i> Irrigation (Secondary Canal)		
		<i>Structure</i> Lined Canal		
		<i>Condition</i> <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D		
		<i>Problems</i> Require rehabilitation totally		

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



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)
13. Waduk Cengklik	1,579 T	2,120

T : Technical Irrigation



The Study on Comprehensive Recovery Program
of Irrigation Agriculture

Japan International Cooperation Agency

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

I. PROJECT FUNDAMENTALS									
I.1 General									
(1) Code Number	: 33020034-35	(7) Number of Farmers	: 24,600						
(2) Name of Irrigation Scheme	: Waduk Cengklik	(8) Water Resource River	: Kali Pepe, K. Butak. Apur Senting						
(3) District (Kabupaten)	: Boyolali	(9) Catchment Area (km ²)	: -						
(4) Sub-district (Kecamatan)	: Ngemplak	(10) Completion / Last Rehabilitation Year	: 1999/2000						
(5) Registered Area (ha)	: 1,579								
(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		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	2,120	2,120	0						
b. Rainfed paddy field	0	0	0						
c. Upland field	0	0	0						
d. Uncultivated land	0	0	0						
e. Non-irrigable land	0	0	0						
Total	2,120	2,120	0						
III. AGRICULTURE									
III.1 Present/Before Project Condition									
(1) Irrigation Performance and Crop Production									
Season	Cropped Area in Irrigated Paddy Field (ha)				Annual Intensity	Irrigated Paddy Yield (GKG ton/ha)	Crop Production (ton)		
	Paddy	Palawija	Sugarcane	Total			Paddy	Palawija	Others
Season I (wet)	957	42	42	1,041	49%	4.5	4,307	126	2,730
Season II (dry I)	1,030	41		1,071	51%	4.5	4,635	123	
Season III (dry II)	716	39		755	36%	4.0	2,864	47	
Total/Annual	2,703	122	42	2,867	135%	4.4	11,806	296	2,730
(2) Problems and Constraints									
<i>A. Irrigation & Agriculture Performances</i>									
- Irrigation performances poor; water shortage in dry season reported									
- Single cropping of paddy prevailing; paddy yield levels moderate; palawija introduced limitedly									
<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:	Implementation of extension programs is limited						
III.2 Development Plan									
(1) Development Approaches									
- Expansion of irrigated area & ensuring year round irrigation water supply at on-farm level through rehabilitation									
- Introduction of double cropping of paddy; productivity increase of paddy through further intensification; introduction of palawija in dry season I & 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 (ha)				Annual Intensity	Irrigated Paddy Yield (GKG ton/ha)	Crop Production (ton)		
	Paddy	Palawija	Sugarcane	Total			Paddy	Palawija	Others
Season I (wet)	2,078		42	2,120	100%	5.0	10,390		2,730
Season II (dry I)	1,060	212		1,272	60%	5.0	5,300	1,060	
Season III (dry II)	636	212		848	40%	5.0	3,180	207	
Total/Annual	3,774	424	42	4,240	200%	5.0	18,870	1,267	2,730
Annual Increment	1,071	302	0	1,373	65%	0.6	7,065	971	0
IV. WUAs									
IV.1 Existing Condition									
(1)	Number	a. Target;	14	b. Established;	12	c. Not yet;	2	Registered	0
	Performance	a. Developed;	2	b. Under developing;	9	c. Not yet;	1	Not yet registered	12
(2) Problems and Constraints									
<input type="checkbox"/> Operation <input type="checkbox"/> Maintenance <input type="checkbox"/> Management									
(3) Causes of Problems and Constraints									
- Insufficient irrigation water distribution									
IV.2 Development Plan									
(1) Proposed Countermeasures									
- Encouragement of WUA members to conduct O&M works more positively.									
(2) Development Plan									
- WUA 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 : C Secondary Canal System : C On-farm : C
- (2) Water Resources Facility
- | | | | | | |
|----------------------------|-------------------------|-------------------------|----------------|---|-----|
| a. Type of facility | : Headworks | e. Scouring sluice gate | : 3 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 | : 40 m | g. Settling basin | : provided | (no info.: no information) | |
| d. Design intake discharge | : 4.7 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	1,891	2,765	4,656	42	4,656	C
Secondary	11,003	17,246	28,249	191	28,249	C

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

(4) Major Problems and Constrains

- Water Resources Facility
 - Problem on management for flood/scouring sluice gate(s) operation
 - Insufficient diversion water due to sedimentation in front of intake
 - Problem on management for intake gate(s) operation
- Irrigation Canal and Related Structure
 - Leakage from canal
 - Lower function of regulating structure on canal
 - Difficulty on O&M
 - Difficulty on water distribution
- (5) Causes of Major Problems and Constraints
 - Water Resources Facility
 - Improper maintenance of flood or scouring sluice gate(s) of headworks (no greasing and anti-rust painting)
 - Sedimentation in front of intake
 - Improper management or deterioration of intake gate(s)
 - Irrigation Canal and Related Structure
 - Improper regular maintenance of canal, settlement of canal then insufficient freeboard and overtopping
 - 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
 - No provision of water level gauge/facility

V.2 Development Plan

(1) Proposed Countermeasures for Major Problems

- Water Resources Facility
 - Replacement of control system or damaged equipment of flood/scouring sluice gate(s) of headworks
 - Dredging or flushing of sediment, proper gate operation of headworks and intake
 - Replacement of control system or damaged equipment of intake
- Irrigation Canal and Related Structure
 - Repair of leakage from canal, widen canal wide, recompaction of embankment
 - Replacement and reconstruction of regulating structure on canal
 - Provision or repair of inspection road with all weather type/pavement
 - Provision of water level gauge/facility

(2) Water Resources Facility

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

(3) Irrigation Canal and Related Structure

Works	No rehabilitation			Rehabilitation		New construction		Total	
	Canal (m)	Structure (nos)							
Canal (m)	Main		378		4,278		0		4,656
	Secondary		2,200		26,049		0		28,249
Structure (nos)	Main		6		36		4		46
	Secondary		0		191		38		229

(4) On-farm Development

(Unit: ha)

a. Potential Irrigated paddy field	2,120	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	2,120

(5) Rehabilitation Cost (Direct Cost)

(Unit: Million Rp.)

W.R.F	Irrigation	Drainage	On-Farm Develop.	Project Facility	Total	Cost per ha
4,097	35,332	3,533	4,346	1,570	48,878	23.1

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

VI. PROJECT EVALUATION




VI.1 EIRR 8.9%

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	13.0
	Urgency	25.0	20.0	Social Problem	15.0	6.0
	Sustainability	15.0	6.8	Economic Impact	15.0	7.5

VI.3 Priority Group Group II: Second priority group

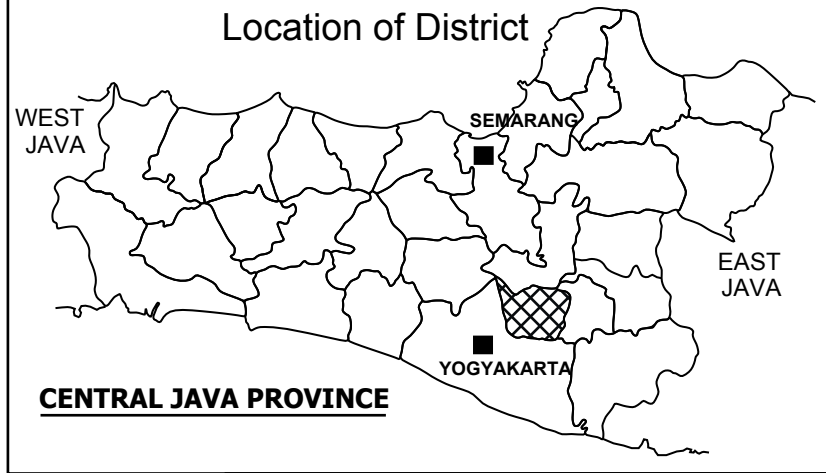
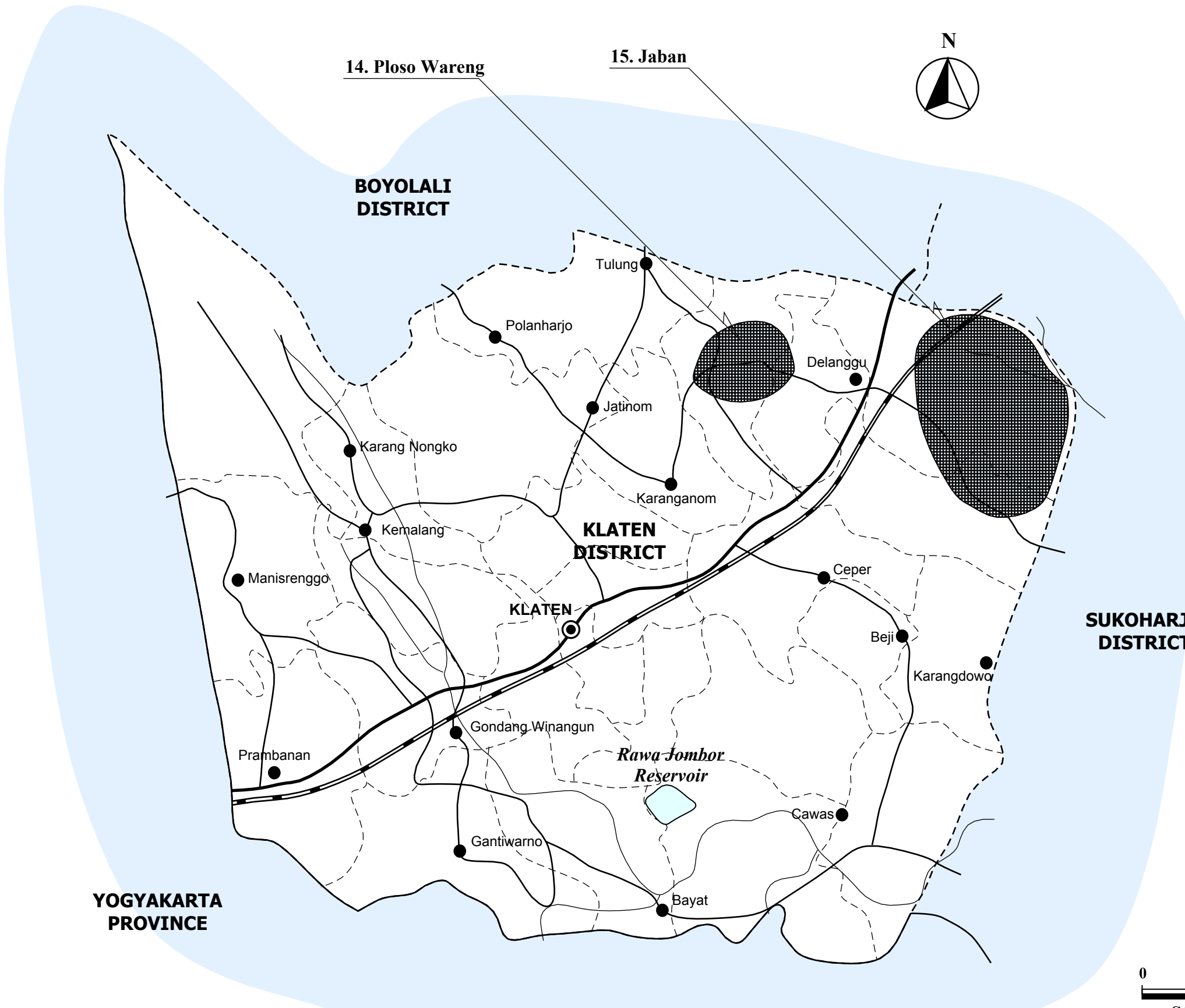
VI.4 Priority Ranking in the Province 24

Scheme	Waduk Cengklik	District	Boyolali
Technical Level	Technical	Registered Area	1,579 ha
		Year of Construction	1999/2000
		<p><u>Category</u> Irrigation (Dam)</p> <hr/> <p><u>Structure</u> Dam and Reservoir</p> <hr/> <p><u>Condition</u> <input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D</p> <hr/> <p><u>Problems</u> In good condition</p>	
		<p><u>Category</u> Irrigation (Dam)</p> <hr/> <p><u>Structure</u> Intake Tower</p> <hr/> <p><u>Condition</u> <input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D</p> <hr/> <p><u>Problems</u> In good condition</p>	
		<p><u>Category</u> Irrigation (Dam)</p> <hr/> <p><u>Structure</u> Outlet of Intake</p> <hr/> <p><u>Condition</u> <input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D</p> <hr/> <p><u>Problems</u> In good condition</p>	

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

Scheme		District	
Waduk Cengklik		Boyolali	
Technical Level	Technical	Registered Area	1,579 ha
		Year of Construction	1999/2000
		<u>Category</u> Irrigation (Dam)	
		<u>Structure</u> Outlet of Intake, Measuring Device	
		<u>Condition</u> <input checked="" type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D	
		<u>Problems</u> In good condition	
		<u>Category</u> Irrigation (Main Canal)	
		<u>Structure</u> Lined Canal	
		<u>Condition</u> <input type="checkbox"/> A <input type="checkbox"/> B <input checked="" type="checkbox"/> C <input type="checkbox"/> D	
		<u>Problems</u> Require major repair work	
		<u>Category</u> Irrigation (Secondary Canal)	
		<u>Structure</u> Lined Canal	
		<u>Condition</u> <input type="checkbox"/> A <input type="checkbox"/> B <input checked="" type="checkbox"/> C <input type="checkbox"/> D	
		<u>Problems</u> Require major repair work for canal and structure	

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



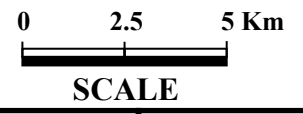
LEGEND

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

Irrigation Scheme

Name of Scheme	Registered Area (Ha)	Subject Area (Ha)
14. Ploso Wareng	1,100	T 1,100
15. Jaban	1,191	T 1,191

T : Technical Irrigation



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

I. PROJECT FUNDAMENTALS									
I.1 General									
(1) Code Number	: 33021275	(7) Number of Farmers	: 4,700						
(2) Name of Irrigation Scheme	: Ploso Wareng	(8) Water Resource River	: Sungai Pusur						
(3) District (Kabupaten)	: Klaten	(9) Catchment Area (km ²)	: -						
(4) Sub-district (Kecamatan)	: Polanharjo	(10) Completion / Last Rehabilitation Year	: 1992						
(5) Registered Area (ha)	: 1,100								
(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	1,100	1,100	0						
b. Rainfed paddy field	0	0	0						
c. Upland field	0	0	0						
d. Uncultivated land	0	0	0						
e. Non-irrigable land	0	0	0						
Total	1,100	1,100	0						
III. AGRICULTURE									
III.1 Present/Before Project Condition									
(1) Irrigation Performance and Crop Production									
Season	Cropped Area in Irrigated Paddy Field (ha)				Annual Intensity	Irrigated Paddy Yield (GKG ton/ha)	Crop Production (ton)		
	Paddy	Palawija	Sugarcane	Total			Paddy	Palawija	Others
Season I (wet)	1,100			1,100	100%	5.0	5,500		
Season II (dry I)	1,100			1,100	100%	5.0	5,500		
Season III (dry II)	451	649		1,100	100%	5.0	2,255	779	
Total/Annual	2,651	649	0	3,300	300%	5.0	13,255	779	0
(2) Problems and Constraints									
<i>A. Irrigation & Agriculture Performances</i>									
- Maximum irrigation performances achieved; however, water shortage in dry season reported									
- Double cropping of paddy (partly triple cropping) practiced in the entire irrigated area; paddy yield levels high; palawija introduced extensively									
<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: -									
III.2 Development Plan									
(1) Development Approaches									
- Ensuring year round irrigation water supply at on-farm level through rehabilitation									
- Expansion of cropped area of paddy in dry season II; productivity increase of paddy & palawija through further intensification									
- 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 (ha)				Annual Intensity	Irrigated Paddy Yield (GKG ton/ha)	Crop Production (ton)		
	Paddy	Palawija	Sugarcane	Total			Paddy	Palawija	Others
Season I (wet)	1,100			1,100	100%	5.5	6,050		
Season II (dry I)	1,100			1,100	100%	5.5	6,050		
Season III (dry II)	550	550		1,100	100%	5.5	3,025	770	
Total/Annual	2,750	550	0	3,300	300%	5.5	15,125	770	0
Annual Increment	99	-99	0	0	0%	0.5	1,870	-9	0
IV. WUAs									
IV.1 Existing Condition									
(1)	Number	a. Target;	16	b. Established;	16	c. Not yet;	0	Registered	0
	Performance	a. Developed;	1	b. Under developing;	11	c. Not yet;	4	Not yet registered	16
(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 payment of WUA membership fee.									
IV.2 Development Plan									
(1) Proposed Countermeasures									
- Encouragement of WUA members to fulfill their duties.									
(2) Development Plan									
- WUA management 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 : C Secondary Canal System : C 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 | : 2 nos. | (A: Functioning well, B: Partially deteriorated, C: Not functioning well, D: Serious condition for operation) | |
| c. Length of weir | : 20 m | g. Settling basin | : provided | (no info.: no information) | |
| d. Design intake discharge | : 1.6 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	250	0	250	3	250	C
Secondary	6,205	4,075	10,280	96	10,280	C

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

(4) Major Problems and Constrains

- Water Resources Facility
 - Problem on management for flood/scouring sluice gate(s) operation
 - Lower strength against design load due to rust, decay of steel materials of intake gate(s)
 - Difficulty on water distribution/discharge measurement
- Irrigation Canal and Related Structure
 - Leakage from canal
 - Collapse of canal
 - Lower function of regulating structure on canal
 - Difficulty on O&M

(5) Causes of Major Problems and Constraints

- Water Resources Facility
 - Improper maintenance of flood or scouring sluice gate(s) of headworks (no greasing and anti-rust painting)
 - No over coating on intake gate(s) to prevent rust and decay
 - No provision of water level gauge/measuring facility
- Irrigation Canal and Related Structure
 - Improper regular maintenance of canal, settlement of canal then insufficient freeboard and overtopping
 - Improper maintenance; insufficient nos. of cross drain, berm width, or catch drain; and/or steep slope 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
 - Replacement of control system or damaged equipment of flood/scouring sluice gate(s) of headworks
 - Provision of overcoat or replacement of intake gate(s) of headworks
 - Provision of water level gauge/measuring facility and equipment
- Irrigation Canal and Related Structure
 - Repair of leakage from canal, widen canal wide, recompaction of embankment
 - Redesign of canal section; provision of cross drain, proper width of berm, catch drain, and/or proper slope
 - 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 : large rehabilitation

(3) Irrigation Canal and Related Structure

Works	No rehabilitaion		Rehabilitation		New construction		Total	
	Canal (m)	Structure (nos)	Canal (m)	Structure (nos)	Canal (m)	Structure (nos)	Canal (m)	Structure (nos)
Main	0	0	250	3	0	0	250	3
Secondary	0	13	10,280	83	0	19	10,280	115

(4) On-farm Development

(Unit: ha)

a. Potential Irrigated paddy field	1,100	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	1,100

(5) Rehabilitation Cost (Direct Cost)

(Unit: Million Rp.)

W.R.F	Irrigation	Drainage	On-Farm Develop.	Project Facility	Total	Cost per ha
1,621	10,109	1,011	2,255	1,260	16,257	14.8

(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	9.0	54.3	
	Urgency	25.0	20.0	Social Problem	15.0	6.0		
	Sustainability	15.0	6.8	Economic Impact	15.0	7.5		

VI.3 Priority Group

VI.4 Priority Ranking in the Province

Scheme	Ploso Wareng	District	Klaten	
Technical Level	Technical	Registered Area	1,100 ha	Year of Construction 1992
		<i>Category</i> Irrigation (Headworks)		
		<i>Structure</i> Fixed Weir, Upstream		
		<i>Condition</i> <input type="checkbox"/> A <input checked="" type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D		
		<i>Problems</i> Require minor repair for civil and gate works		
		<i>Category</i> Irrigation (Headworks)		
		<i>Structure</i> Fixed Weir, Downstream		
		<i>Condition</i> <input type="checkbox"/> A <input checked="" type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D		
		<i>Problems</i> Require minor repair for civil and gate works		
		<i>Category</i> Irrigation (Headworks)		
		<i>Structure</i> Intake		
		<i>Condition</i> <input type="checkbox"/> A <input checked="" type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D		
		<i>Problems</i> Require minor repair for civil and gate works		

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

Scheme		District	
Ploso Wareng		Klaten	
Technical Level	Technical	Registered Area	1,100 ha
		Year of Construction	1992
		<u>Category</u> Irrigation (Main Canal)	
		<u>Structure</u> Inspection Road	
		<u>Condition</u> <input type="checkbox"/> A <input type="checkbox"/> B <input checked="" type="checkbox"/> C <input type="checkbox"/> D	
		<u>Problems</u> Require provision of inspection road	
		<u>Category</u> Irrigation (Paddy Field)	
		<u>Structure</u> Paddy Field	
		<u>Condition</u> <input type="checkbox"/> A <input type="checkbox"/> B <input checked="" type="checkbox"/> C <input type="checkbox"/> D	
		<u>Problems</u> Require farm road	
		<u>Category</u> Irrigation (Paddy Field)	
		<u>Structure</u> Paddy Field	
		<u>Condition</u> <input type="checkbox"/> A <input type="checkbox"/> B <input checked="" type="checkbox"/> C <input type="checkbox"/> D	
		<u>Problems</u> Require farm road	

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	: 33021112	(7) Number of Farmers	: 6000							
(2) Name of Irrigation Scheme	: Jaban	(8) Water Resource River	: Sungai Jebol							
(3) District (Kabupaten)	: Klaten	(9) Catchment Area (km ²)	: -							
(4) Sub-district (Kecamatan)	: Wonosari	(10) Completion / Last Rehabilitation Year	: 1991/1992							
(5) Registered Area (ha)	: 1,191									
(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		1,191		1,191		0				
b. Rainfed paddy field		0		0		0				
c. Upland field		0		0		0				
d. Uncultivated land		0		0		0				
e. Non-irrigable land		0		0		0				
Total		1,191		1,191		0				
III. AGRICULTURE										
III.1 Present/Before Project Condition										
(1) Irrigation Performance and Crop Production										
Season		Cropped Area in Irrigated Paddy Field (ha)				Annual Intensity	Irrigated Paddy Yield (GKG ton/ha)	Crop Production (ton)		
		Paddy	Palawija	Sugarcane	Total			Paddy	Palawija	Others
Season I (wet)		1,191			1,191	100%	5.0	5,955		
Season II (dry I)		1,191			1,191	100%	5.0	5,955		
Season III (dry II)		562	629		1,191	100%	4.0	2,248	755	
Total/Annual		2,944	629	0	3,573	300%	4.8	14,158	755	0
(2) Problems and Constraints										
<i>A. Irrigation & Agriculture Performances</i>										
- Maximum irrigation performances achieved; however, water shortage in dry season reported										
- Double cropping of paddy (partly triple cropping) practiced in the entire irrigated area; paddy yield levels high; palawija introduced extensively										
<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:		Most members are not active				
- 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										
- Productivity increase of paddy & palawija through further intensification										
- 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 (ha)				Annual Intensity	Irrigated Paddy Yield (GKG ton/ha)	Crop Production (ton)		
		Paddy	Palawija	Sugarcane	Total			Paddy	Palawija	Others
Season I (wet)		1,191			1,191	100%	5.5	6,551		
Season II (dry I)		1,191			1,191	100%	5.5	6,551		
Season III (dry II)		596	595		1,191	100%	4.5	2,682	833	
Total/Annual		2,978	595	0	3,573	300%	5.3	15,783	833	0
Annual Increment		34	(34)	0	0	0%	0.5	1,625	78	0
IV. WUAs										
IV.1 Existing Condition										
(1)	Number	a. Target;	10	b. Established;	10	c. Not yet;	0	Registered	0	
	Performance	a. Developed;	1	b. Under developing;	9	c. Not yet;	0	Not yet registered	10	
(2) Problems and Constraints										
<input type="checkbox"/> Operation <input type="checkbox"/> Maintenance <input checked="" type="checkbox"/> Management										
(3) Causes of Problems and Constraints										
- Low awareness of WUA members to O&M works										
IV.2 Development Plan										
(1) Proposed Countermeasures										
- Encouragement of member farmers to take positive activities.										
(2) Development Plan										
- WUA 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 : C Secondary Canal System : C 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 | : 13 m | g. Settling basin | : not provided | (no info.: no information) | |
| d. Design intake discharge | : 2.7 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	3,627	400	4,027	2	4,027	C
Secondary	9,275	3,970	13,245	142	13,245	C

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

(4) Major Problems and Constrains

- Water Resources Facility
 - Problem on management for flood/scouring sluice gate(s) operation
 - Inflow of bed loads into canal and decrease canal flow capacity
 - Difficulty on water distribution/discharge measurement
 - Irrigation Canal and Related Structure
 - Sedimentation or obstruction of water flow
 - Leakage from canal
 - Lower function of regulating structure on canal
 - Difficulty on O&M
- (5) Causes of Major Problems and Constraints
- Water Resources Facility
 - Improper maintenance of flood or scouring sluice gate(s) of headworks (no greasing and anti-rust painting)
 - No provision of settling basin, no proper gate operation of intake during flood
 - No provision of water level gauge/measuring facility
 - Irrigation Canal and Related Structure
 - No provision of settling basin(sediments), improper management of canal (sediments, water plant)
 - Improper regular maintenance of canal, settlement of canal then insufficient freeboard and overtopping
 - 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
 - Replacement of control system or damaged equipment of flood/scouring sluice gate(s) of headworks
 - Provision of settling basin, proper gate operation of intake during flood
 - Provision of water level gauge/measuring facility and equipment
- Irrigation Canal and Related Structure
 - Removal of sediment soil and foreign materials from canal, grass cutting
 - Repair of leakage from canal, widen canal wide, recompaction of embankment
 - 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 rehabilitaion		Rehabilitation		New construction		Total	
	Canal (m)	Structure (nos)	Canal (m)	Structure (nos)	Canal (m)	Structure (nos)	Canal (m)	Structure (nos)
Main	0	0	4,027	2	0	0	4,027	2
Secondary	0	0	13,245	142	0	28	13,245	170

(4) On-farm Development

(Unit: ha)

a. Potential Irrigated paddy field	1,191	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	1,191

(5) Rehabilitation Cost (Direct Cost)

(Unit: Million Rp.)

W.R.F	Irrigation	Drainage	On-Farm Develop.	Project Facility	Total	Cost per ha
2,249	26,533	2,653	2,442	1,260	35,137	29.5

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

VI. PROJECT EVALUATION

VI.1 EIRR 0.6%

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	-	0.0
	Urgency	25.0	- Social Problem	15.0	-	
	Sustainability	15.0	- Economic Impact	15.0	-	

VI.3 Priority Group

Group VI: Development by other category
(High rehabilitation cost)

VI.4 Priority Ranking in the Province

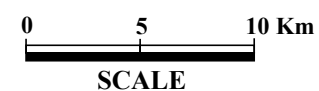
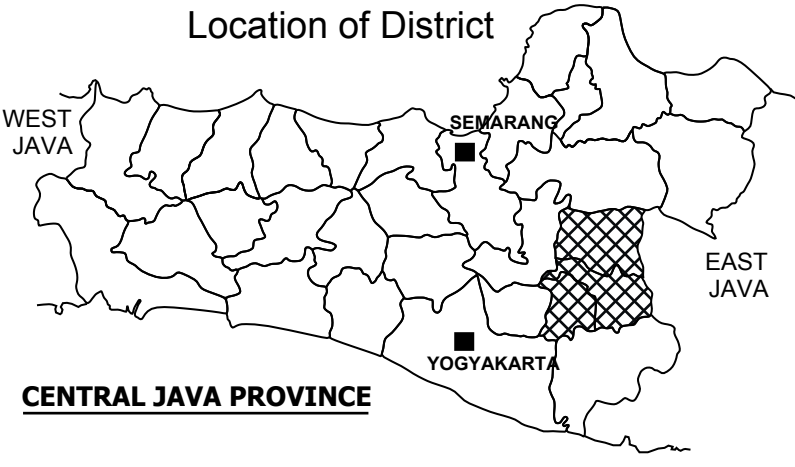
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Scheme	Jaban	District	Klaten		
Technical Level	Technical	Registered Area	1,191 ha	Year of Construction	1991/1992
		<i>Category</i> Irrigation (Headworks)			
		<i>Structure</i> Fixed Weir			
		<i>Condition</i> <input type="checkbox"/> A <input type="checkbox"/> B <input checked="" type="checkbox"/> C <input type="checkbox"/> D			
		<i>Problems</i> Require repair of civil and gate works			
		<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> Require repair of civil and gate works			
		<i>Category</i> Irrigation (Headworks)			
		<i>Structure</i> Intake			
		<i>Condition</i> <input type="checkbox"/> A <input type="checkbox"/> B <input checked="" type="checkbox"/> C <input type="checkbox"/> D			
		<i>Problems</i> Require repair of civil and gate works			

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

Scheme	Jaban	District	Klaten		
Technical Level	Technical	Registered Area	1,191 ha	Year of Construction	1991/1992
		<p><u>Category</u> Irrigation (Main Canal)</p>			
		<p><u>Structure</u> Lined Canal</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> Require minor repair</p>			
		<p><u>Category</u> Irrigation (Main Canal)</p>			
		<p><u>Structure</u> Division Structure and 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> Require repair of civil works and provision of steel gate</p>			
		<p><u>Category</u> Irrigation (Tertiary canal)</p>			
		<p><u>Structure</u> Tertiary Canal and Paddy Field</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> Require division box and farm road</p>			

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



LEGEND

- Capital Town of District
- Municipal City
- Sub-District Town
- Provincial Boundary
- - - District Boundary
- - - Sub-District Boundary
- +— Railway
- Provincial Road
- District Road
- ~ River
- ▨ Irrigation Scheme
- ▨ Technical Irrigation

Irrigation Scheme

Name of Scheme	Registered Area (Ha)	Subject Area (Ha)
16. Colo Kanan	18,108 T	22,982
17. Bonggo	1,811 T	1,406

T : Technical Irrigation

The Study on Comprehensive Recovery Program
of Irrigation Agriculture
Japan International Cooperation Agency

Location Map of Irrigation Schemes
in Sragen, Karanganyar and Sukoharjo District

I. PROJECT FUNDAMENTALS									
I.1 General									
(1) Code Number	:	33016030-31 ~ 18007-	(7)	Number of Farmers	:	29,807			
(2) Name of Irrigation Scheme	:	Colo Kanan / Timur	(8)	Water Resource River	:	Bengawan Solo			
(3) District (Kabupaten)	:	Sukoharjo	(9)	Catchment Area (km ²)	:	274.333			
(4) Sub-district (Kecamatan)	:	Nguter	(10)	Completion / Last Rehabilitation Year	:	1985			
(5) Registered Area (ha)	:	18,108							
(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		46			
II. SUBJECT AREA FOR REHABILITATION PLAN									
II.1 Present and Planned Land Use									
Category	Present (ha)	Plan (ha)	Increment (ha)						
a. Irrigated paddy field	22,982	22,982	0						
b. Rainfed paddy field	0	0	0						
c. Upland field	0	0	0						
d. Uncultivated land	0	0	0						
e. Non-irrigable land	0	0	0						
Total	22,982	22,982	0						
III. AGRICULTURE									
III.1 Present/Before Project Condition									
(1) Irrigation Performance and Crop Production									
Season	Cropped Area in Irrigated Paddy Field (ha)				Annual Intensity	Irrigated Paddy Yield (GKG ton/ha)	Crop Production (ton)		
	Paddy	Palawija	Sugarcane	Total			Paddy	Palawija	Others
Season I (wet)	22,982			22,982	100%	5.0	114,910		
Season II (dry I)	22,524	160	298	22,982	100%	5.0	112,620	480	19,370
Season III (dry II)	21,250	1,434		22,684	99%	4.5	95,625	1,721	
Total/Annual	66,756	1,594	298	68,648	299%	4.8	323,155	2,201	19,370
(2) Problems and Constraints									
<i>A. Irrigation & Agriculture Performances</i>									
- Maximum irrigation performances achieved; however, water shortage in dry season reported									
- Triple cropping of paddy practiced almost in the entire irrigated area; paddy yield levels high; palawija introduced limited									
<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:		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									
- Expansion of triple cropped area of paddy; productivity increase of paddy through further intensification									
- 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 (ha)				Annual Intensity	Irrigated Paddy Yield (GKG ton/ha)	Crop Production (ton)		
	Paddy	Palawija	Sugarcane	Total			Paddy	Palawija	Others
Season I (wet)	22,982			22,982	100%	5.5	126,401		
Season II (dry I)	22,684		298	22,982	100%	5.5	124,762		19,370
Season III (dry II)	22,684			22,684	99%	5.0	113,420		
Total/Annual	68,350	0	298	68,648	299%	5.3	364,583	0	19,370
Annual Increment	1,594	-1,594	0	0	0%	0.5	41,428	-2,201	0
IV. WUAs									
IV.1 Existing Condition									
(1) Number	a. Target;	33	b. Established;	33	c. Not yet;	0	Registered		0
	Performance	a. Developed;	25	b. Under developing;	8	c. Not yet;	0	Not yet registered	33
(2) Problems and Constraints									
<input type="checkbox"/> Operation <input type="checkbox"/> Maintenance <input type="checkbox"/> Management									
(3) Causes of Problems and Constraints (Good condition)									
IV.2 Development Plan									
(1) Proposed Countermeasures									
(2) Development Plan									

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 : D Secondary Canal System : C 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 | : 5 nos. | (A: Functioning well, B: Partially deteriorated, C: Not functioning well, D: Serious condition for operation) | |
| c. Length of weir | : 112 m | g. Settling basin | : provided | (no info.: no information) | |
| d. Design intake discharge | : 31.6 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	17,816	46,684	64,500	428	64,500	D
Secondary	110,378	9,800	120,178	199	120,178	C

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

(4) Major Problems and Constrains

- Water Resources Facility
 - Washed away of ripraps or blocks after stilling basin
 - Problem on management for flood/scouring sluice gate(s) operation
 - Difficulty on O&M
- Irrigation Canal and Related Structure
 - Sedimentation or obstruction of water flow
 - Leakage from canal
 - Lower function of regulating structure on canal
 - Difficulty on O&M

(5) Causes of Major Problems and Constraints

- Water Resources Facility
 - Insufficient weight of ripraps or blocks for stilling basin, insufficient length of protection work after stilling basin
 - Improper maintenance of flood or scouring sluice gate(s) of headworks (no greasing and anti-rust painting)
 - No provision of inspection/access road, no provision of inspection bridge/deck
- Irrigation Canal and Related Structure
 - No provision of settling basin(sediments), improper management of canal (sediments, water plant)
 - Improper regular maintenance of canal, settlement of canal then insufficient freeboard and overtopping
 - 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
 - Provision of additional ripraps or blocks after stilling basin of weir as required
 - Replacement of control system or damaged equipment of flood/scouring sluice gate(s) of headworks
 - Provision of inspection/access road, inspection bridge/deck
- Irrigation Canal and Related Structure
 - Removal of sediment soil and foreign materials from canal, grass cutting
 - Repair of leakage from canal, widen canal wide, recompaction of embankment
 - 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 : large rehabilitation
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	64,500	428	0	43	64,500	471
Secondary	0	0	120,178	199	0	40	120,178	239

(4) On-farm Development

(Unit: ha)

a. Potential Irrigated paddy field	22,982	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	22,982

(5) Rehabilitation Cost (Direct Cost)

(Unit: Million Rp.)

W.R.F	Irrigation	Drainage	On-Farm Develop.	Project Facility	Total	Cost per ha
14,995	439,122	43,912	47,113	3,600	548,742	23.9

(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
			Urgency	25.0	21.4	Social Problem	15.0	6.0
			Sustainability	15.0	8.3	Economic Impact	15.0	7.5

VI.3 Priority Group

VI.4 Priority Ranking in the Province

Scheme	Colo Kanan / Timur	District	Sukoharjo	
Technical Level	Technical	Registered Area	18,108 ha	Year of Construction 1985
		<i>Category</i> Irrigation (Headworks)		
		<i>Structure</i> Fixed Weir, Upstream		
		<i>Condition</i> <input type="checkbox"/> A <input type="checkbox"/> B <input checked="" type="checkbox"/> C <input type="checkbox"/> D		
		<i>Problems</i> Require remove of sediment in front of intake and weir		
		<i>Category</i> Irrigation (Headworks)		
		<i>Structure</i> Fixed Weir, Downstream		
		<i>Condition</i> <input type="checkbox"/> A <input checked="" type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D		
		<i>Problems</i> Require minor repair of structure		
		<i>Category</i> Irrigation (Headworks)		
		<i>Structure</i> Intake		
		<i>Condition</i> <input type="checkbox"/> A <input type="checkbox"/> B <input checked="" type="checkbox"/> C <input type="checkbox"/> D		
		<i>Problems</i> Require remove of sediment in front of intake and weir		

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

Scheme	Colo Kanan / Timur	District	Sukoharjo		
Technical Level	Technical	Registered Area	18,108 ha	Year of Construction	1985
		<i>Category</i> Irrigation (Main Canal)			
		<i>Structure</i> Lined Canal			
		<i>Condition</i> <input type="checkbox"/> A <input type="checkbox"/> B <input checked="" type="checkbox"/> C <input type="checkbox"/> D			
		<i>Problems</i> Require repair of embankment slope			
		<i>Category</i> Irrigation (Main Canal)			
		<i>Structure</i> Lined Canal			
		<i>Condition</i> <input type="checkbox"/> A <input type="checkbox"/> B <input checked="" type="checkbox"/> C <input type="checkbox"/> D			
		<i>Problems</i> Require lining, removal of sediment and debris from inside of canal			
		<i>Category</i> Irrigation (Secondary Canal)			
		<i>Structure</i> Canal and Paddy Field			
		<i>Condition</i> <input type="checkbox"/> A <input type="checkbox"/> B <input checked="" type="checkbox"/> C <input type="checkbox"/> D			
		<i>Problems</i> Require removal of sediment and repair of canal lining			

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	: 33016041	(7) Number of Farmers	: 3,315						
(2) Name of Irrigation Scheme	: Bonggo	(8) Water Resource River	: Kenatan						
(3) District (Kabupaten)	: Sragen	(9) Catchment Area (km ²)	: 66.04						
(4) Sub-district (Kecamatan)	: Karangmalang	(10) Completion / Last Rehabilitation Year	: 1836/1985						
(5) Registered Area (ha)	: 1,811								
(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		1,406		1,406		0			
b. Rainfed paddy field		0		0		0			
c. Upland field		0		0		0			
d. Uncultivated land		0		0		0			
e. Non-irrigable land		0		0		0			
Total		1,406		1,406		0			
III. AGRICULTURE									
III.1 Present/Before Project Condition									
(1) Irrigation Performance and Crop Production									
Season	Cropped Area in Irrigated Paddy Field (ha)				Annual Intensity	Irrigated Paddy Yield (GKG ton/ha)	Crop Production (ton)		
	Paddy	Palawija	Sugarcane	Total			Paddy	Palawija	Others
Season I (wet)	1,350			1,350	96%	5.0	6,750		
Season II (dry I)	1,336			1,336	95%	5.0	6,680		
Season III (dry II)	232			232	17%	4.5	1,044		
Total/Annual	2,918	0	0	2,918	208%	5.0	14,474	0	0
(2) Problems and Constraints									
<i>A. Irrigation & Agriculture Performances</i>									
- High irrigation performances achieved; however, water shortage in dry season reported									
- Double cropping of paddy (partly triple cropping) practiced almost in the entire irrigated area; paddy yield levels 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:		Low marketing prices			
- Agronomic Issues:		Farmers not following recommended practices		- 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; introduction 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									
(2) Planned Irrigation Performances and Crop Production									
Season	Cropped Area in Irrigated Paddy Field (ha)				Annual Intensity	Irrigated Paddy Yield (GKG ton/ha)	Crop Production (ton)		
	Paddy	Palawija	Sugarcane	Total			Paddy	Palawija	Others
Season I (wet)	1,406			1,406	100%	5.5	7,733		
Season II (dry I)	1,406			1,406	100%	5.5	7,733		
Season III (dry II)	281	281		562	40%	5.0	1,405	393	
Total/Annual	3,093	281	0	3,374	240%	5.5	16,871	393	0
Annual Increment	175	281	0	456	32%	0.5	2,397	393	0
IV. WUAs									
IV.1 Existing Condition									
(1)	Number	a. Target;	8	b. Established;	8	c. Not yet;	0	Registered	0
	Performance	a. Developed;	6	b. Under developing;	2	c. Not yet;	0	Not yet registered	8
(2) Problems and Constraints									
<input type="checkbox"/> Operation <input type="checkbox"/> Maintenance <input type="checkbox"/> Management									
(3) Causes of Problems and Constraints									
(Good condition)									
IV.2 Development Plan									
(1) Proposed Countermeasures									
(2) Development Plan									

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 : D Main Canal System : C Secondary Canal System : C On-farm : C
- (2) Water Resources Facility
- | | | | | | |
|----------------------------|-------------------------|-------------------------|----------------|---|-----|
| a. Type of facility | : Headworks | e. Scouring sluice gate | : 1 nos. | i. Condition | : D |
| 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 | : 50 m | g. Settling basin | : provided | (no info.: no information) | |
| d. Design intake discharge | : 1.5 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	600	1,200	1,800	5	1,800	C
Secondary	6,508	9,570	16,078	160	16,078	C

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

(4) Major Problems and Constrains

- Water Resources Facility
 - Washed away of ripraps or blocks after stilling basin
 - Insufficient diversion water due to sedimentation in front of intake
 - Difficulty on O&M
- Irrigation Canal and Related Structure
 - Leakage from canal
 - Collapse of canal
 - Lower function of regulating structure on canal
 - Difficulty on O&M

(5) Causes of Major Problems and Constraints

- Water Resources Facility
 - Insufficient weight of ripraps or blocks for stilling basin, insufficient length of protection work after stilling basin
 - Sedimentation in front of intake
 - No provision of inspection/access road, no provision of inspection bridge/deck
- Irrigation Canal and Related Structure
 - Improper regular maintenance of canal, settlement of canal then insufficient freeboard and overtopping
 - Improper maintenance; insufficient nos. of cross drain, berm width, or catch drain; and/or steep slope 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
 - 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
 - Provision of inspection/access road, inspection bridge/deck
- Irrigation Canal and Related Structure
 - Repair of leakage from canal, widen canal wide, recompaction of embankment
 - Redesign of canal section; provision of cross drain, proper width of berm, catch drain, and/or proper slope
 - 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 : 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 rehabilitaion		Rehabilitation		New construction		Total	
	Canal (m)	Structure (nos)	Canal (m)	Structure (nos)	Canal (m)	Structure (nos)	Canal (m)	Structure (nos)
Main	0	0	1,800	5	0	1	1,800	6
Secondary	0	0	16,078	160	0	32	16,078	192

(4) On-farm Development

(Unit: ha)

a. Potential Irrigated paddy field	1,406	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	1,406

(5) Rehabilitation Cost (Direct Cost)

(Unit: Million Rp.)

W.R.F	Irrigation	Drainage	On-Farm Develop.	Project Facility	Total	Cost per ha
9,356	22,970	2,297	2,882	1,260	38,766	27.6

(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	10.0	5.0	Agricultural Productivity	20.0	9.0	57.8
	25.0	22.0	Social Problem	15.0	6.0	
	15.0	8.3	Economic Impact	15.0	7.5	

VI.3 Priority Group

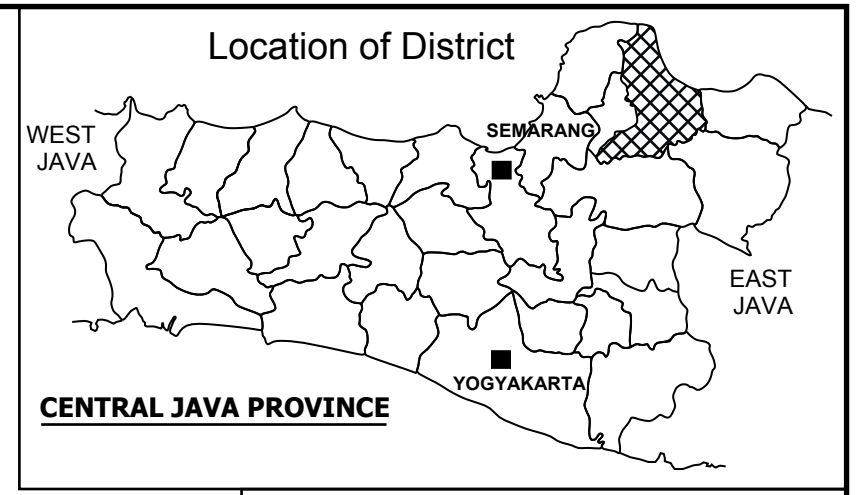
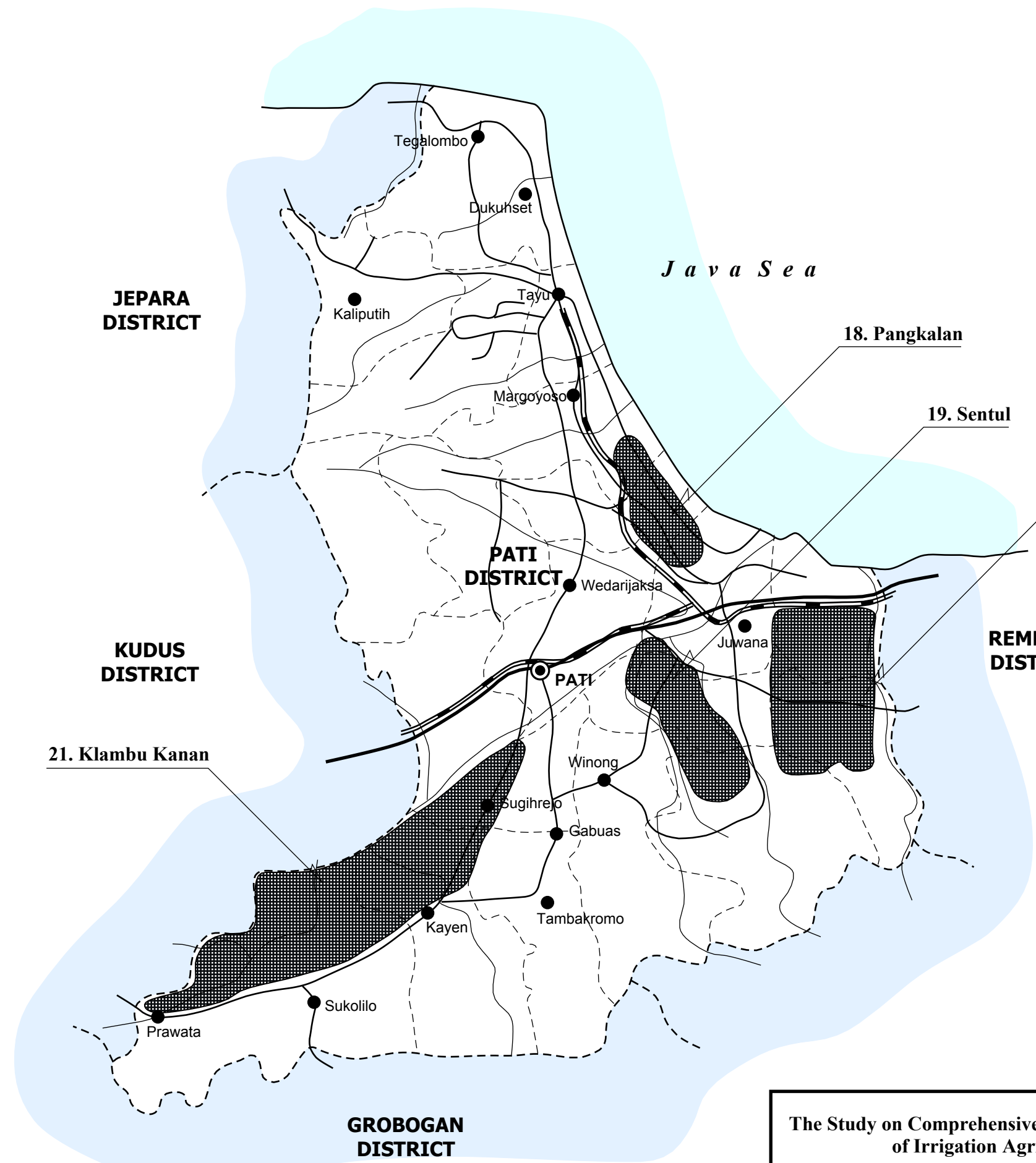
VI.4 Priority Ranking in the Province

Scheme		District	
Bonggo		Sragen	
Technical Level	Technical	Registered Area	1,811 ha
		Year of Construction	1836/1985
		<u>Category</u> Irrigation (Headworks)	
		<u>Structure</u> Fixed Weir	
		<u>Condition</u> <input type="checkbox"/> A <input type="checkbox"/> B <input checked="" type="checkbox"/> C <input type="checkbox"/> D	
		<u>Problems</u> Require repair for weir and intake	
		<u>Category</u> Irrigation (Headworks)	
		<u>Structure</u> Scouring Sluice Gate	
		<u>Condition</u> <input checked="" type="checkbox"/> A <input type="checkbox"/> B <input checked="" type="checkbox"/> C <input type="checkbox"/> D	
		<u>Problems</u> Require repair for weir and intake	
		<u>Category</u> Irrigation (Headworks)	
		<u>Structure</u> Fixed Weir (Downstream)	
		<u>Condition</u> <input type="checkbox"/> A <input type="checkbox"/> B <input checked="" type="checkbox"/> C <input type="checkbox"/> D	
		<u>Problems</u> Require provision of stilling basin and retaining wall	

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

Scheme	Bonggo	District	Sragen		
Technical Level	Technical	Registered Area	1,811 ha	Year of Construction	1836/1985
		<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 checked="" type="checkbox"/> C <input type="checkbox"/> D</p>			
		<p><u>Problems</u> Require provision of inspection road</p>			
		<p><u>Category</u> Irrigation (Secondary 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> Require major repair for lining</p>			
		<p><u>Category</u> Irrigation (Tertiary Canal)</p>			
		<p><u>Structure</u> Canal and Paddy Field</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> Require farm road</p>			

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



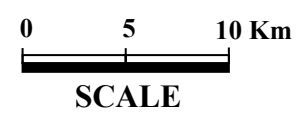
LEGEND

- ⊙ Capital Town of District
- Sub-District Town
- - - District Boundary
- - - Sub-District Boundary
- ▬ Railway
- ▬ Provincial Road
- ▬ District Road
- ~ River
- ▬ Irrigation Scheme
- ▬ Technical Irrigation

Irrigation Scheme

Name of Scheme	Registered Area (Ha)	Subject Area (Ha)
18. Pangkalan	1,765 T	654
19. Sentul	1,759 T	1,739
20. Widodaren	3,652 T	2,616
21. Klambu Kanan	10,391 T	6,216

T : Technical Irrigation



The Study on Comprehensive Recovery Program
of Irrigation Agriculture

Japan International Cooperation Agency

Location Map of Irrigation Schemes
in Pati District

I. PROJECT FUNDAMENTALS										
I.1 General										
(1) Code Number	: -			(7) Number of Farmers	: 1,292					
(2) Name of Irrigation Scheme	: BD. Pangkalan			(8) Water Resource River	: K. Margolilo & K. Winong					
(3) District (Kabupaten)	: Pati			(9) Catchment Area (km ²)	: 23.00					
(4) Sub-district (Kecamatan)	: Margoyoso, Wedarijak			(10) Completion / Last Rehabilitation Year	: 1993					
(5) Registered Area (ha)	: 1,765									
(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		1			
II. SUBJECT AREA FOR REHABILITATION PLAN										
II.1 Present and Planned Land Use										
Category		Present (ha)		Plan (ha)		Increment (ha)				
a. Irrigated paddy field		654		654		0				
b. Rainfed paddy field		0		0		0				
c. Upland field		0		0		0				
d. Uncultivated land		0		0		0				
e. Non-irrigable land		0		0		0				
Total		654		654		0				
III. AGRICULTURE										
III.1 Present/Before Project Condition										
(1) Irrigation Performance and Crop Production										
Season		Cropped Area in Irrigated Paddy Field (ha)				Annual Intensity	Irrigated Paddy Yield (GKG ton/ha)	Crop Production (ton)		
		Paddy	Palawija	Sugarcane	Total			Paddy	Palawija	Others
Season I (wet)		654			654	100%	4.5	2,943		
Season II (dry I)		336	318		654	100%	4.5	1,512	954	
Season III (dry II)					0					
Total/Annual		990	318	0	1,308	200%	4.5	4,455	954	0
(2) Problems and Constraints										
<i>A. Irrigation & Agriculture Performances</i>										
- High irrigation performances achieved; however, water shortage in dry season reported										
- Double cropping of paddy introduced; paddy yield levels moderate; palawija introduced extensively										
<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:		Most members are not active			
- 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										
- Productivity increase of paddy through 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 (ha)				Annual Intensity	Irrigated Paddy Yield (GKG ton/ha)	Crop Production (ton)		
		Paddy	Palawija	Sugarcane	Total			Paddy	Palawija	Others
Season I (wet)		654			654	100%	5.0	3,270		
Season II (dry I)		392	262		654	100%	5.0	1,960	1,310	
Season III (dry II)			131		131	20%			183	
Total/Annual		1,046	393	0	1,439	220%	5.0	5,230	1,493	0
Annual Increment		56	75	0	131	20%	0.5	775	539	0
IV. WUAs										
IV.1 Existing Condition										
(1)	Number	a. Target;	20	b. Established;	4	c. Not yet;	16	Registered	0	
	Performance	a. Developed;	0	b. Under developing;	4	c. Not yet;	0	Not yet registered	4	
(2) Problems and Constraints										
<input type="checkbox"/> Operation <input type="checkbox"/> Maintenance <input checked="" type="checkbox"/> Management										
(3) Causes of Problems and Constraints										
- No awareness of farmers to WUA activities because of prevailing irrigation practice by moval pump.										
IV.2 Development Plan										
(1) Proposed Countermeasures										
- Calling attention of farmers to merit of gravity irrigation system.										
(2) Development Plan										
- WUA 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 : C Secondary Canal System : C 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 | : 2 nos. | (A: Functioning well, B: Partially deteriorated, C: Not functioning well, D: Serious condition for operation) | |
| c. Length of weir | : 31 m | g. Settling basin | : not provided | (no info.: no information) | |
| d. Design intake discharge | : 2.5 m ³ /s | h. Inspection bridge | : no info. | | |

(3) Irrigation Canal and Inspection Road

Canal	Lined (m)	Unlined	Total (m)	Structure (nos)	Inspection road (m)	Condition
Main	700	0	700	4	700	C
Secondary	5,650	1,152	6,802	58	3,000	C

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

(4) Major Problems and Constrains

- Water Resources Facility
 - Problem on management for flood/scouring sluice gate(s) operation
 - Insufficient diversion water due to sedimentation in front of intake
 - Difficulty on O&M
- Irrigation Canal and Related Structure
 - Sedimentation or obstruction of water flow
 - Impassable of inspection road along canal
 - Lower function of regulating structure on canal
 - Difficulty on O&M

(5) Causes of Major Problems and Constraints

- Water Resources Facility
 - Improper maintenance of flood or scouring sluice gate(s) of headworks (no greasing and anti-rust painting)
 - Sedimentation in front of intake
 - No provision of inspection/access road, no provision of inspection bridge/deck
- Irrigation Canal and Related Structure
 - No provision 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 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
 - Replacement of control system or damaged equipment of flood/scouring sluice gate(s) of headworks
 - Dredging or flushing of sediment, proper gate operation of headworks and intake
 - Provision of inspection/access road, inspection bridge/deck
- 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
 - 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 : replacement or new

(3) Irrigation Canal and Related Structure

	Works	No rehabilitaion	Rehabilitation	New construction	Total
Canal (m)	Main	0	700	0	700
	Secondary	0	6,802	0	6,802
Structure (nos)	Main	0	4	0	4
	Secondary	0	58	12	70

(4) On-farm Development

(Unit: ha)

a. Potential Irrigated paddy field	654	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	654

(5) Rehabilitation Cost (Direct Cost)

(Unit: Million Rp.)

W.R.F	Irrigation	Drainage	On-Farm Develop.	Project Facility	Total	Cost per ha
2,523	9,984	998	1,341	1,260	16,106	24.6

(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	-	Agricultural Productivity	20.0	-	-	0.0
	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		BD. Pangkalan		District		Pati	
Technical Level	Technical	Registered Area	1,765 ha	Year of Construction	1993		
				<u>Category</u> Irrigation (Headworks)			
				<u>Structure</u> Fixed Weir, Upstream			
				<u>Condition</u> <input type="checkbox"/> A <input type="checkbox"/> B <input checked="" type="checkbox"/> C <input type="checkbox"/> D			
				<u>Problems</u> Require repair of weir body and gate works, removal of debris and sediment			
				<u>Category</u> Irrigation (Headworks)			
				<u>Structure</u> Fixed Weir, Downstream			
				<u>Condition</u> <input type="checkbox"/> A <input type="checkbox"/> B <input checked="" type="checkbox"/> C <input type="checkbox"/> D			
				<u>Problems</u> Require repair of weir body and gate works, provision of retaining wall			
				<u>Category</u> Irrigation (Secondary Canal)			
				<u>Structure</u> Canal			
				<u>Condition</u> <input type="checkbox"/> A <input type="checkbox"/> B <input checked="" type="checkbox"/> C <input type="checkbox"/> D			
				<u>Problems</u> Require removal of sediment and debris, repair of inspection road			

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

Scheme	BD. Pangkalan	District	Pati		
Technical Level	Technical	Registered Area	1,765 ha	Year of Construction	1993
		<i>Category</i> Irrigation (Secondary Canal)			
		<i>Structure</i> Lined Canal			
		<i>Condition</i> <input type="checkbox"/> A <input type="checkbox"/> B <input checked="" type="checkbox"/> C <input type="checkbox"/> D			
		<i>Problems</i> Require removal of sediment and debris, repair of inspection road			
		<i>Category</i> Irrigation (Secondary Canal)			
		<i>Structure</i> Canal and Division Structure			
		<i>Condition</i> <input type="checkbox"/> A <input type="checkbox"/> B <input checked="" type="checkbox"/> C <input type="checkbox"/> D			
		<i>Problems</i> Require removal of sediments and debris, repair of gate			
		<i>Category</i> Irrigation (Paddy Field)			
		<i>Structure</i> Paddy Field			
		<i>Condition</i> <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D			
		<i>Problems</i> Require farm road and field ditch			

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	:	-	(7) Number of Farmers	:	2,240				
(2) Name of Irrigation Scheme	:	Sentul	(8) Water Resource River	:	Sentul				
(3) District (Kabupaten)	:	Pati	(9) Catchment Area (km ²)	:	30				
(4) Sub-district (Kecamatan)	:	Jakenan, Juwana	(10) Completion / Last Rehabilitation Year	:	1992				
(5) Registered Area (ha)	:	1,759							
(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		1			
II. SUBJECT AREA FOR REHABILITATION PLAN									
II.1 Present and Planned Land Use									
Category		Present (ha)		Plan (ha)		Increment (ha)			
a. Irrigated paddy field		1,739		1,739		0			
b. Rainfed paddy field		0		0		0			
c. Upland field		0		0		0			
d. Uncultivated land		0		0		0			
e. Non-irrigable land		0		0		0			
Total		1,739		1,739		0			
III. AGRICULTURE									
III.1 Present/Before Project Condition									
(1) Irrigation Performance and Crop Production									
Season	Cropped Area in Irrigated Paddy Field (ha)				Annual Intensity	Irrigated Paddy Yield (GKG ton/ha)	Crop Production (ton)		
	Paddy	Palawija	Sugarcane	Total			Paddy	Palawija	Others
Season I (wet)	1,551	188		1,739	100%	4.5	6,980	564	
Season II (dry I)	1,412	327		1,739	100%	4.5	6,354	981	
Season III (dry II)				0					
Total/Annual	2,963	515	0	3,478	200%	4.5	13,334	1,545	0
(2) Problems and Constraints									
<i>A. Irrigation & Agriculture Performances</i>									
- High irrigation performances achieved; however, water shortage in dry season reported									
- Double cropping of paddy practiced most of the irrigated area; paddy yield levels moderate; palawija introduced substantially									
<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:		No collaboration among KTs			
- Paddy Marketing		Low marketing prices		- Extension Services:		Implementation of extension programs is limited			
III.2 Development Plan									
(1) Development Approaches									
- Expansion of irrigated area & ensuring year round irrigation water supply at on-farm level through rehabilitation									
- Expansion of double cropped area of paddy; productivity increase of paddy through further intensification; introduction of palawija in dry season I & II									
- 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 (ha)				Annual Intensity	Irrigated Paddy Yield (GKG ton/ha)	Crop Production (ton)		
	Paddy	Palawija	Sugarcane	Total			Paddy	Palawija	Others
Season I (wet)	1,739			1,739	100%	5.0	8,695		
Season II (dry I)	1,391	348		1,739	100%	5.0	6,955	1,740	
Season III (dry II)		348		348	20%			487	
Total/Annual	3,130	696	0	3,826	220%	5.0	15,650	2,227	0
Annual Increment	167	181	0	348	20%	0.5	2,317	682	0
IV. WUAs									
IV.1 Existing Condition									
(1)	Number	a. Target;	14	b. Established;	8	c. Not yet;	6	Registered	0
	Performance	a. Developed;	0	b. Under developing;	8	c. Not yet;	0	Not yet registered	8
(2) Problems and Constraints									
<input checked="" type="checkbox"/> Operation <input type="checkbox"/> Maintenance <input type="checkbox"/> Management									
(3) Causes of Problems and Constraints									
- Limited WUA supplied with irrigation water due to insufficient water resource.									
IV.2 Development Plan									
(1) Proposed Countermeasures									
- Promotion of rotation irrigation system introduction.									
(2) Development Plan									
- WUA 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 : C Secondary Canal System : C 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 | : 2 nos. | (A: Functioning well, B: Partially deteriorated, C: Not functioning well, D: Serious condition for operation) | |
| c. Length of weir | : 30 m | g. Settling basin | : provided | (no info.: no information) | |
| d. Design intake discharge | : 2.0 m ³ /s | h. Inspection bridge | : no info. | | |

(3) Irrigation Canal and Inspection Road

Canal	Lined (m)	Unlined (m)	Total (m)	Structure (nos)	Inspection road (m)	Condition
Main	1,357	1,408	2,765	26	1,889	C
Secondary	5,456	8,348	13,804	59	3,257	C

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

(4) Major Problems and Constrains

- Water Resources Facility
 - Problem on management for flood/scouring sluice gate(s) operation
 - Insufficient diversion water due to sedimentation in front of intake
 - Difficulty on O&M
 - Irrigation Canal and Related Structure
 - Leakage from canal
 - Collapse of canal
 - Impassable of inspection road along canal
 - General O&M problems
 - Difficulty on O&M
- (5) Causes of Major Problems and Constraints
- Water Resources Facility
 - Improper maintenance of flood or scouring sluice gate(s) of headworks (no greasing and anti-rust painting)
 - Sedimentation in front of intake
 - No provision of inspection/access road, no provision of inspection bridge/deck
 - Irrigation Canal and Related Structure
 - Improper regular maintenance of canal, settlement of canal then insufficient freeboard and overtopping
 - Improper maintenance; insufficient nos. of cross drain, berm width, or catch drain; and/or steep slope of canal
 - 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
 - Replacement of control system or damaged equipment of flood/scouring sluice gate(s) of headworks
 - Dredging or flushing of sediment, proper gate operation of headworks and intake
 - Provision of inspection/access road, inspection bridge/deck
- Irrigation Canal and Related Structure
 - Repair of leakage from canal, widen canal wide, recompaction of embankment
 - Redesign of canal section; provision of cross drain, proper width of berm, catch drain, and/or proper slope
 - 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 : minor rehabilitation Intake, mechanical : large rehabilitation
Settling basin : large rehabilitation

(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	2,765	22	0	3	2,765	29
Secondary		0	13,804	49	0	12	13,804	71

(4) On-farm Development

(Unit: ha)

a. Potential Irrigated paddy field	1,739	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	1,739

(5) Rehabilitation Cost (Direct Cost)

(Unit: Million Rp.)

W.R.F	Irrigation	Drainage	On-Farm Develop.	Project Facility	Total	Cost per ha
2,225	19,029	1,903	3,565	1,260	27,982	16.1

(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
			Urgency	25.0	20.0	Social Problem	15.0	10.5
			Sustainability	15.0	6.8	Economic Impact	15.0	7.5

VI.3 Priority Group

VI.4 Priority Ranking in the Province

Scheme	Sentul	District	Pati	
Technical Level	Technical	Registered Area	1,759 ha	Year of Construction 1992
		<i>Category</i> Irrigation (Headworks)		
		<i>Structure</i> Fixed Weir, Upstream		
		<i>Condition</i> <input type="checkbox"/> A <input type="checkbox"/> B <input checked="" type="checkbox"/> C <input type="checkbox"/> D		
		<i>Category</i> Irrigation (Headworks)		
		<i>Structure</i> Fixed Weir, Downstream		
		<i>Condition</i> <input type="checkbox"/> A <input type="checkbox"/> B <input checked="" type="checkbox"/> C <input type="checkbox"/> D		
		<i>Category</i> Irrigation (Headworks)		
		<i>Structure</i> Intake		
		<i>Condition</i> <input type="checkbox"/> A <input type="checkbox"/> B <input checked="" type="checkbox"/> C <input type="checkbox"/> D		
		<i>Problems</i> Require repair of body and gate works, removal of sediment in front of intake		
		<i>Problems</i> Require repair of retaining wall		
		<i>Problems</i> Require removal of sediment in front of intake		

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

Scheme	Sentul	District	Pati
Technical Level	Technical	Registered Area	1,759 ha Year of Construction 1992
		<p><u>Category</u> Irrigation (Main Canal)</p>	
		<p><u>Structure</u> 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>Category</u> Irrigation (Secondary Canal)</p>	
		<p><u>Structure</u> 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>Category</u> Irrigation (Tertiary Canal)</p>	
		<p><u>Structure</u> Division Box and Paddy Field</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> Require removal of sediment and provision of inspection road</p>		<p><u>Problems</u> Require major repair of canal and total removal of sediment at inside of canal</p>	
		<p><u>Problems</u> Require total repair</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	:	-	(7) Number of Farmers	:	5,730					
(2) Name of Irrigation Scheme	:	Widodaren	(8) Water Resource River	:	Widodaren					
(3) District (Kabupaten)	:	Pati	(9) Catchment Area (km ²)	:	25					
(4) Sub-district (Kecamatan)	:	Jakenan & Batangan	(10) Completion / Last Rehabilitation Year	:	1990					
(5) Registered Area (ha)	:	3,652								
(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		1				
II. SUBJECT AREA FOR REHABILITATION PLAN										
II.1 Present and Planned Land Use										
Category		Present (ha)		Plan (ha)		Increment (ha)				
a. Irrigated paddy field		2,616		2,616		0				
b. Rainfed paddy field		0		0		0				
c. Upland field		0		0		0				
d. Uncultivated land		0		0		0				
e. Non-irrigable land		0		0		0				
Total		2,616		2,616		0				
III. AGRICULTURE										
III.1 Present/Before Project Condition										
(1) Irrigation Performance and Crop Production										
Season		Cropped Area in Irrigated Paddy Field (ha)				Annual Intensity	Irrigated Paddy Yield (GKG ton/ha)	Crop Production (ton)		
		Paddy	Palawija	Sugarcane	Total			Paddy	Palawija	Others
Season I (wet)		1,911	705		2,616	100%	4.5	8,600	2,115	
Season II (dry I)		572	2,044		2,616	100%	4.5	2,574	6,132	
Season III (dry II)					0					
Total/Annual		2,483	2,749	0	5,232	200%	4.5	11,174	8,247	0
(2) Problems and Constraints										
A. Irrigation & Agriculture Performances										
- High irrigation performances achieved; however, intensity of paddy is limited & water shortage in dry season reported										
- Single cropping of paddy prevailing; paddy yield levels moderate; palawija cropped area larger than that of paddy										
B. Primary Constraint Identified through the Inventory Survey by the JICA Study										
- Irrigation & Drainage:		Water shortage at on-farm level in dry season			- Palawija Marketing:		Unstable marketing prices			
- Agronomic Issues:		Farmers not following recommended practices			- Farmers Organizations:		Most members are not active			
- Paddy Marketing		Unstable marketing prices			- Extension Services:		Shortage of operation funds of PPLs			
III.2 Development Plan										
(1) Development Approaches										
- Expansion of irrigated area & ensuring year round Irrigation water supply at on-farm level through rehabilitation										
- Introduction of double cropping 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 KTAs										
(2) Planned Irrigation Performances and Crop Production										
Season		Cropped Area in Irrigated Paddy Field (ha)				Annual Intensity	Irrigated Paddy Yield (GKG ton/ha)	Crop Production (ton)		
		Paddy	Palawija	Sugarcane	Total			Paddy	Palawija	Others
Season I (wet)		2,616			2,616	100%	5.0	13,080		
Season II (dry I)		1,308	1,308		2,616	100%	5.0	6,540	6,540	
Season III (dry II)			785		785	30%			1,099	
Total/Annual		3,924	2,093	0	6,017	230%	5.0	19,620	7,639	0
Annual Increment		1,441	-656	0	785	30%	0.5	8,447	-608	0
IV. WUAs										
IV.1 Existing Condition										
(1)	Number	a. Target;	13	b. Established;	6	c. Not yet;	13	Registered	0	
	Performance	a. Developed;	0	b. Under developing;	1	c. Not yet;	5	Not yet registered	6	
(2) Problems and Constraints										
<input checked="" type="checkbox"/> Operation <input type="checkbox"/> Maintenance <input type="checkbox"/> Management										
(3) Causes of Problems and Constraints										
- Limited WUA supplied with irrigation water due to insufficient water resource.										
IV.2 Development Plan										
(1) Proposed Countermeasures										
- Promotion of rotation irrigation system introduction.										
(2) Development Plan										
- WUA 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 : 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 | : no info. | i. Condition | : B |
| 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 | : 22 m | g. Settling basin | : provided | (no info.: no information) | |
| d. Design intake discharge | : 2.0 m ³ /s | h. Inspection bridge | : no info. | | |

(3) Irrigation Canal and Inspection Road

Canal	Lined (m)	Unlined (m)	Total (m)	Structure (nos)	Inspection road (m)	Condition
Main	0	5,778	5,778	38	5,778	D
Secondary	5,500	15,640	21,140	72	7,000	D

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

(4) Major Problems and Constrains

- Water Resources Facility
 - Problem on management for flood/scouring sluice gate(s) operation
 - Insufficient diversion water due to sedimentation in front of intake
 - Problem on management for intake gate(s) operation
 - Irrigation Canal and Related Structure
 - Leakage from canal
 - Collapse of canal
 - Difficulty on maintenance of earth canal
 - Difficulty on O&M
- (5) Causes of Major Problems and Constraints
- Water Resources Facility
 - Improper maintenance of flood or scouring sluice gate(s) of headworks (no greasing and anti-rust painting)
 - Sedimentation in front of intake
 - Improper management or deterioration of intake gate(s)
 - Irrigation Canal and Related Structure
 - Improper regular maintenance of canal, settlement of canal then insufficient freeboard and overtopping
 - Improper maintenance; insufficient nos. of cross drain, berm width, or catch drain; and/or steep slope of canal
 - 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
 - Replacement of control system or damaged equipment of flood/scouring sluice gate(s) of headworks
 - Dredging or flushing of sediment, proper gate operation of headworks and intake
 - Replacement of control system or damaged equipment of intake
- Irrigation Canal and Related Structure
 - Repair of leakage from canal, widen canal wide, recompaction of embankment
 - Redesign of canal section; provision of cross drain, proper width of berm, catch drain, and/or proper slope
 - 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 : minor rehabilitation Intake, mechanical : large rehabilitation
Settling basin : minor rehabilitation

(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	5,778	38	0	4	5,778	42
Secondary	0	0	21,140	72	0	14	21,140	86

(4) On-farm Development

(Unit: ha)

a. Potential Irrigated paddy field	2,616	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	2,616

(5) Rehabilitation Cost (Direct Cost)

(Unit: Million Rp.)

W.R.F	Irrigation	Drainage	On-Farm Develop.	Project Facility	Total	Cost per ha
2,529	30,974	3,097	5,363	1,570	43,533	16.6

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

VI. PROJECT EVALUATION




VI.1 EIRR 13.9%

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 V: Acceleration of WUAs establishment

VI.4 Priority Ranking in the Province -

Scheme	Widodaren	District	Pati		
Technical Level	Technical	Registered Area	3,652 ha	Year of Construction	1990
		<i>Category</i> Irrigation (Headworks)			
		<i>Structure</i> Fixed Weir, Upstream			
		<i>Condition</i> <input type="checkbox"/> A <input type="checkbox"/> B <input checked="" type="checkbox"/> C <input type="checkbox"/> D			
		<i>Problems</i> Require repair for civil and gate works and removal of sediment			
		<i>Category</i> Irrigation (Headworks)			
		<i>Structure</i> Fixed Weir, Downstream			
		<i>Condition</i> <input type="checkbox"/> A <input type="checkbox"/> B <input checked="" type="checkbox"/> C <input type="checkbox"/> D			
		<i>Problems</i> Require repair for civil and gate works and removal of sediment			
		<i>Category</i> Irrigation (Main Canal)			
		<i>Structure</i> Canal and Division Structure			
		<i>Condition</i> <input type="checkbox"/> A <input type="checkbox"/> B <input checked="" type="checkbox"/> C <input type="checkbox"/> D			
		<i>Problems</i> Require major repair and provision of lining			

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

Scheme	Widodaren	District	Pati		
Technical Level	Technical	Registered Area	3,652 ha	Year of Construction	1990
		<i>Category</i> Irrigation (Main Canal)			
		<i>Structure</i> Division Structure			
		<i>Condition</i> <input type="checkbox"/> A <input type="checkbox"/> B <input checked="" type="checkbox"/> C <input type="checkbox"/> D			
		<i>Problems</i> Require major repair for civil and gate works			
		<i>Category</i> Irrigation (Secondary 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> Require total reconstruction			
		<i>Category</i> Irrigation (Paddy Field)			
		<i>Structure</i> Tertiary Canal and Paddy Field			
		<i>Condition</i> <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input checked="" type="checkbox"/> D			
		<i>Problems</i> Require farm ditch and road			

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	:	-	(7)	Number of Farmers	:	30,208				
(2) Name of Irrigation Scheme	:	Klambu Kanan/Wilalung	(8)	Water Resource River	:	Serang				
(3) District (Kabupaten)	:	Pati	(9)	Catchment Area (km ²)	:	868 km + 1.986 km				
(4) Sub-district (Kecamatan)	:	Klambu, Undaan	(10)	Completion / Last Rehabilitation Year	:	1990				
(5) Registered Area (ha)	:	10,391								
(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		1			
II. SUBJECT AREA FOR REHABILITATION PLAN										
II.1 Present and Planned Land Use										
Category		Present (ha)		Plan (ha)		Increment (ha)				
a. Irrigated paddy field		6,216		6,216		0				
b. Rainfed paddy field		0		0		0				
c. Upland field		0		0		0				
d. Uncultivated land		0		0		0				
e. Non-irrigable land		0		0		0				
Total		6,216		6,216		0				
III. AGRICULTURE										
III.1 Present/Before Project Condition										
(1) Irrigation Performance and Crop Production										
Season		Cropped Area in Irrigated Paddy Field (ha)				Annual Intensity	Irrigated Paddy Yield (GKG ton/ha)	Crop Production (ton)		
		Paddy	Palawija	Sugarcane	Total			Paddy	Palawija	Others
Season I (wet)		5,946		270	6,216	100%	4.5	26,757		17,550
Season II (dry I)		5,946			5,946	96%	4.5	26,757		
Season III (dry II)		1,533	1,669		3,202	52%	4.0	6,132	2,003	
Total/Annual		13,425	1,669	270	15,364	247%	4.4	59,646	2,003	17,550
(2) Problems and Constraints										
A. Irrigation & Agriculture Performances										
- High irrigation performances achieved										
- Double cropping of paddy (partly triple cropping) practiced in the entire irrigated area; paddy yield levels moderate; palawija introduced extensively										
B. Primary Constraint Identified through the Inventory Survey by the JICA Study										
- Irrigation & Drainage:		Poor O&M at main & 2ry canals		- Palawija Marketing:		Unstable marketing prices				
- Agronomic Issues:		Farmers not following recommended practices		- Farmers Organizations:		Most members are not active				
- Paddy Marketing		Unstable 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 palawija production in dry season II; productivity increase of paddy & palawija through further intensification										
- Strengthening of extension activities tailored to area specific needs; empowerment of farmer groups (KTs) to establish agri-business oriented KTAs										
(2) Planned Irrigation Performances and Crop Production										
Season		Cropped Area in Irrigated Paddy Field (ha)				Annual Intensity	Irrigated Paddy Yield (GKG ton/ha)	Crop Production (ton)		
		Paddy	Palawija	Sugarcane	Total			Paddy	Palawija	Others
Season I (wet)		5,946		270	6,216	100%	5.0	29,730		17,550
Season II (dry I)		5,946			5,946	96%	5.0	29,730		
Season III (dry II)		1,554	2,486		4,040	65%	4.5	6,993	3,480	
Total/Annual		13,446	2,486	270	16,202	261%	4.9	66,453	3,480	17,550
Annual Increment		21	817	0	838	13%	0.5	6,807	1,477	0
IV. WUAs										
IV.1 Existing Condition										
(1)	Number	a. Target;	112	b. Established;	112	c. Not yet;	0	Registered		1
	Performance	a. Developed;	9	b. Under developing;	89	c. Not yet;	14	Not yet registered		111
(2) Problems and Constraints										
<input type="checkbox"/> Operation <input type="checkbox"/> Maintenance <input checked="" type="checkbox"/> Management										
(3) Causes of Problems and Constraints										
- Low level of management capacity.										
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 : C (A: Functioning well, B: Partially deteriorated, C: Not functioning well, D: Serious condition for operation)
Water Resources Facility : C Main Canal System : C Secondary Canal System : C On-farm : C
- (2) Water Resources Facility
- | | | | | | |
|----------------------------|-------------------------|-------------------------|------------|---|-----|
| a. Type of facility | : Headworks | e. Scouring sluice gate | : no info. | i. Condition | : C |
| b. Type of weir | : Fixed weir | f. Intake gate | : no info. | (A: Functioning well, B: Partially deteriorated, C: Not functioning well, D: Serious condition for operation) | |
| c. Length of weir | : 33 m | g. Settling basin | : provided | (no info.: no information) | |
| d. Design intake discharge | : 9.0 m ³ /s | h. Inspection bridge | : no info. | | |

(3) Irrigation Canal and Inspection Road

Canal	Lined (m)	Unlined	Total (m)	Structure (nos)	Inspection road (m)	Condition
Main	37,270	0	37,270	37	37,270	C
Secondary	50,200	5,900	56,100	170	31,570	C

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

(4) Major Problems and Constrains

- Water Resources Facility
 - Washed away of ripraps or blocks after stilling basin
 - Inflow of bed loads into canal and decrease canal flow capacity
 - Difficulty on water distribution/discharge measurement
- Irrigation Canal and Related Structure
 - Sedimentation or obstruction of water flow
 - Overage, lower strength of canal
 - Leakage from lined canal
 - Difficulty on O&M
- (5) Causes of Major Problems and Constraints
 - Water Resources Facility
 - Insufficient weight of ripraps or blocks for stilling basin, insufficient length of protection work after stilling basin
 - Insufficient function of settling basin, no proper gate operation of intake during flood
 - No provision of water level gauge/measuring facility
 - Irrigation Canal and Related Structure
 - Insufficient function of settling basin(sediments), improper management of canal (sediments, water plant)
 - Deterioration of canal, no or insufficient rehabilitation due to budget problem
 - Improper regular maintenance or long leave of repair, narrow wide of canal embankment
 - 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
 - Provision of additional ripraps or blocks after stilling basin of weir as required
 - Rehabilitation of settling basin, proper gate operation of intake during flood
 - Provision of water level gauge/measuring facility and equipment
- Irrigation Canal and Related Structure
 - Removal of sediment soil and foreign materials from canal, grass cutting
 - Replace and reconstruction of canal
 - Replace canal embankment material with impermeable soil and re-lining
 - 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 : large rehabilitation

(3) Irrigation Canal and Related Structure

	Works	No rehabilitaion	Rehabilitation	New construction	Total
Canal (m)	Main	0	37,270	0	37,270
	Secondary	0	56,100	0	56,100
Structure (nos)	Main	0	37	4	41
	Secondary	0	170	34	204

(4) On-farm Development

		(Unit: ha)	
a. Potential Irrigated paddy field	6,216	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	6,216

(5) Rehabilitation Cost (Direct Cost)

							(Unit: Million Rp.)
W.R.F	Irrigation	Drainage	On-Farm Develop.	Project Facility	Total	Cost per ha	
2,958	132,998	13,300	12,743	2,590	164,589	26.5	(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	9.0	55.8	
	Urgency	25.0	20.0	Social Problem	15.0	7.5		
	Sustainability	15.0	6.8	Economic Impact	15.0	7.5		

VI.3 Priority Group

VI.4 Priority Ranking in the Province

Scheme	Klambu Kanan / Wilalung	District	Pati	
Technical Level	Technical	Registered Area	10,391 ha	Year of Construction 1990
		<i>Category</i> Irrigation (Headworks)		
		<i>Structure</i> Movable Weir		
		<i>Condition</i> <input type="checkbox"/> A <input type="checkbox"/> B <input checked="" type="checkbox"/> C <input type="checkbox"/> D		
		<i>Category</i> Irrigation (Headworks)		
		<i>Structure</i> Movable Weir and Intake		
		<i>Condition</i> <input type="checkbox"/> A <input checked="" type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D		
		<i>Category</i> Irrigation (Headworks)		
		<i>Structure</i> Roller Gate (Electric Driven)		
		<i>Condition</i> <input type="checkbox"/> A <input checked="" type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D		
		<i>Problems</i> Require removal of sediment in front of weir and intake		
		<i>Problems</i> Require removal of sediment in front of weir and intake		
		<i>Problems</i> Require minor repair and painting, greasing		

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

Scheme	Klambu Kanan / Wilung	District	Pati		
Technical Level	Technical	Registered Area	10,391 ha	Year of Construction	1990
		<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>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>Category</u></p>			
		<p><u>Structure</u></p>			
		<p><u>Condition</u> <input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D</p>			
<p><u>Problems</u> Require removal of sediment in front of weir and intake</p>		<p><u>Problems</u> Require removal of sediment in front of weir and intake</p>			

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