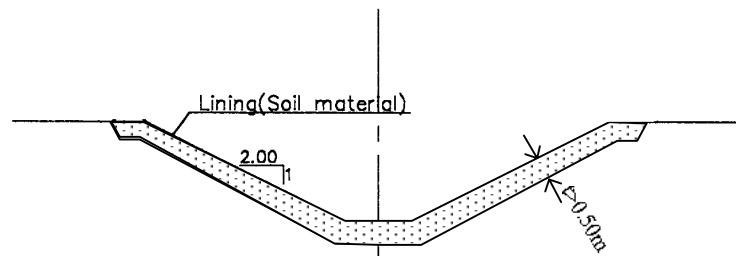
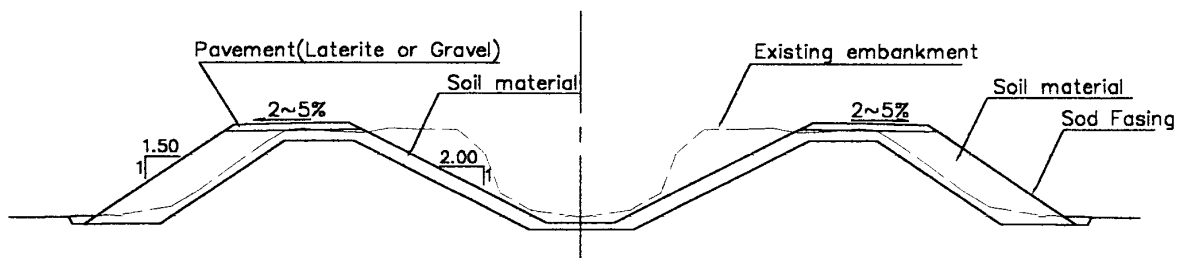


Figure 13.2
Rehabilitation of Existing Dike

The Study on The Rehabilitation and reconstruction of
Agricultural Production System in the Slakou River
Basin
The Kingdom of Cambodia
Japan International Cooperation Agency



Canal Section (Cut Portion)



Canal Section (Embankment Portion)

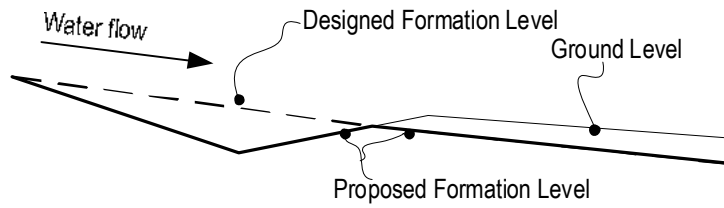
The Study on The Rehabilitation and reconstruction of
Agricultural Production System in the Slakou River
Basin
The Kingdom of Cambodia

Japan International Cooperation Agency

Figure 13.3

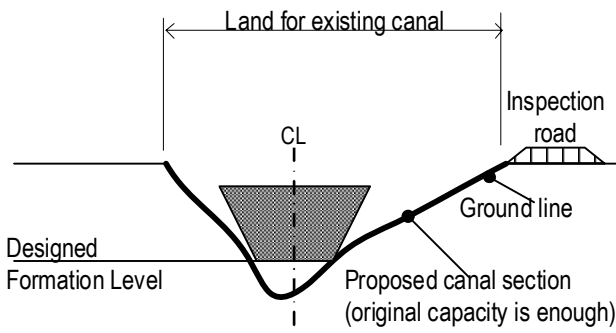
Typical Canal Section

PROFILE

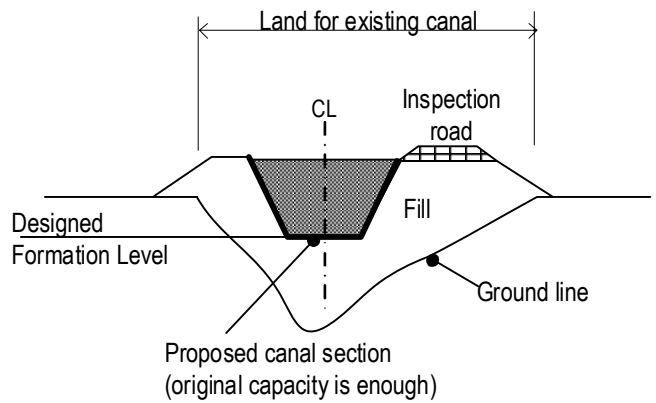


SECTION

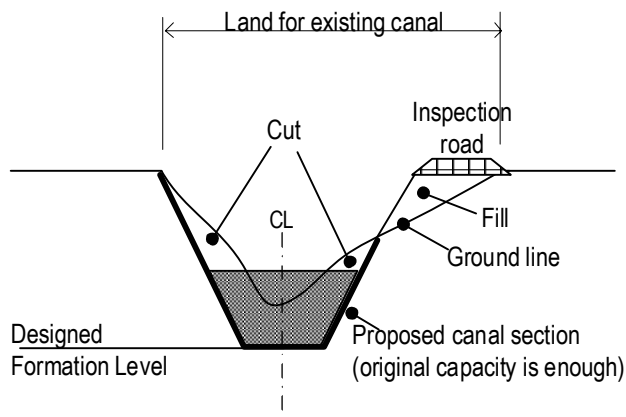
roughness number = 0.035 (earth canal)



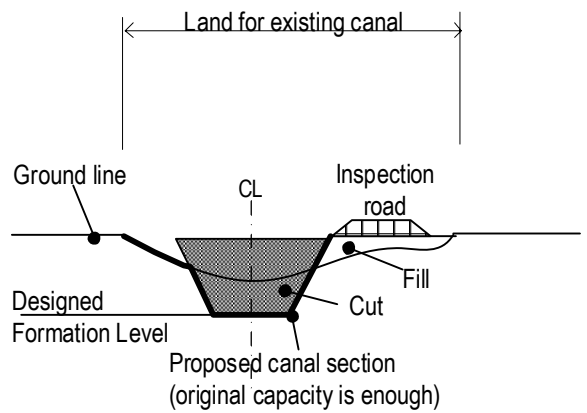
roughness number = 0.025 (earth lining)



roughness number = 0.025



roughness number = 0.030

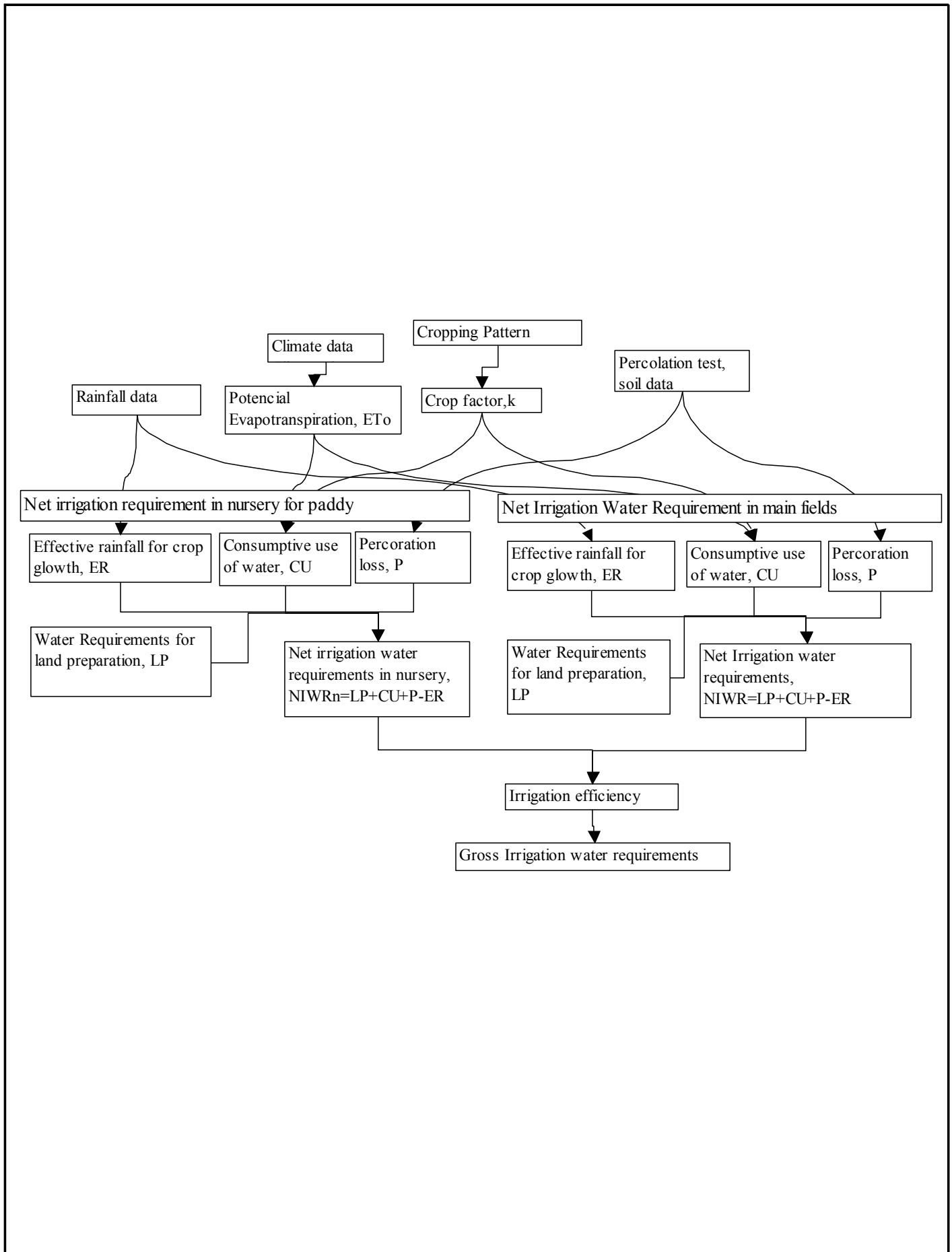


The Study on The Rehabilitation and reconstruction of
Agricultural Production System in the Slakou River
Basin
The Kingdom of Cambodia

Japan International Cooperation Agency

Figure 13.4

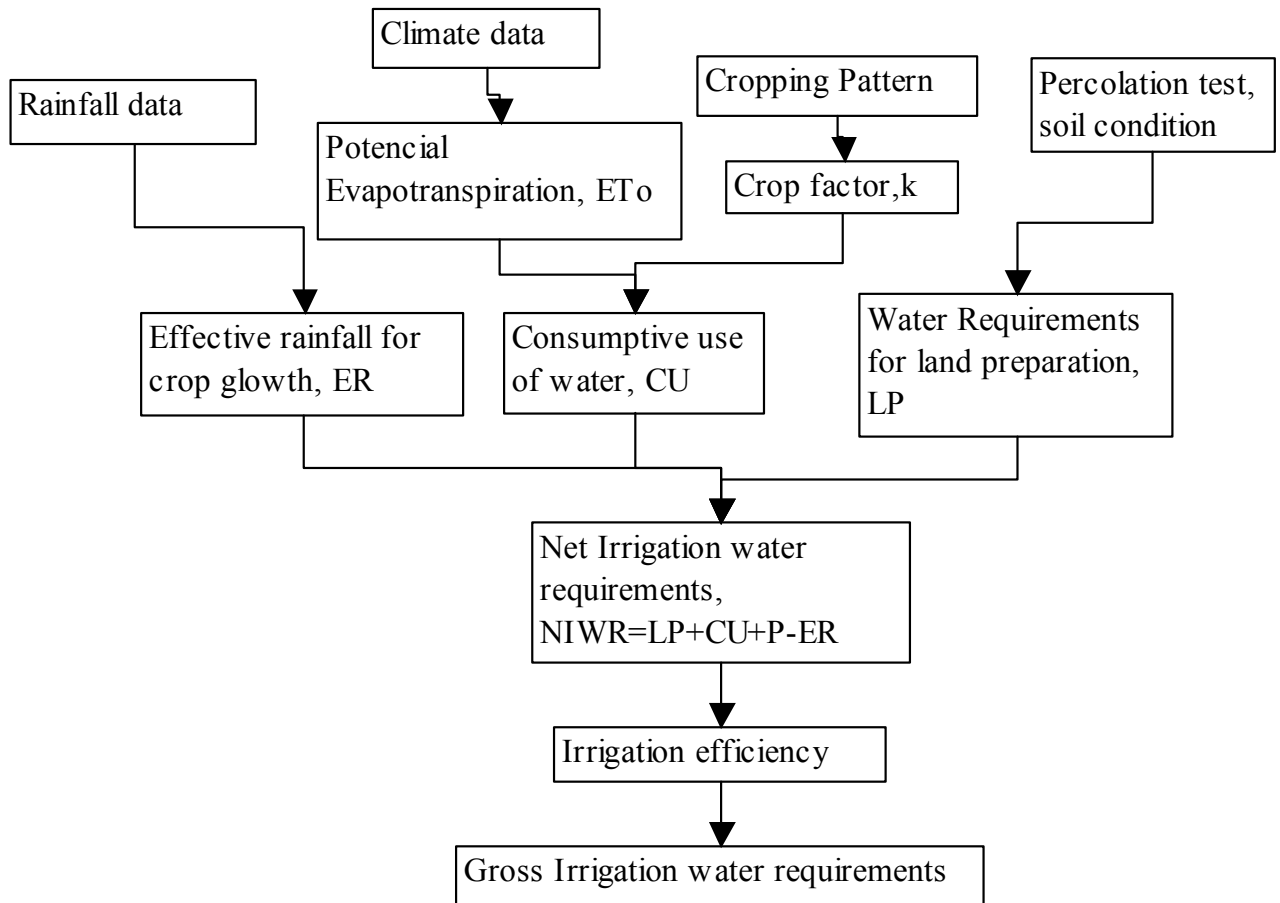
Utilization of Existing Canal Capacity



The Study on The Rehabilitation and reconstruction of Agricultural Production System In the Slakou River Basin, The Kingdom of Cambodia

Japan International Cooperation Agency

Figure 13.5
Calculation Process of Irrigation Water Requirements for Paddy Rice

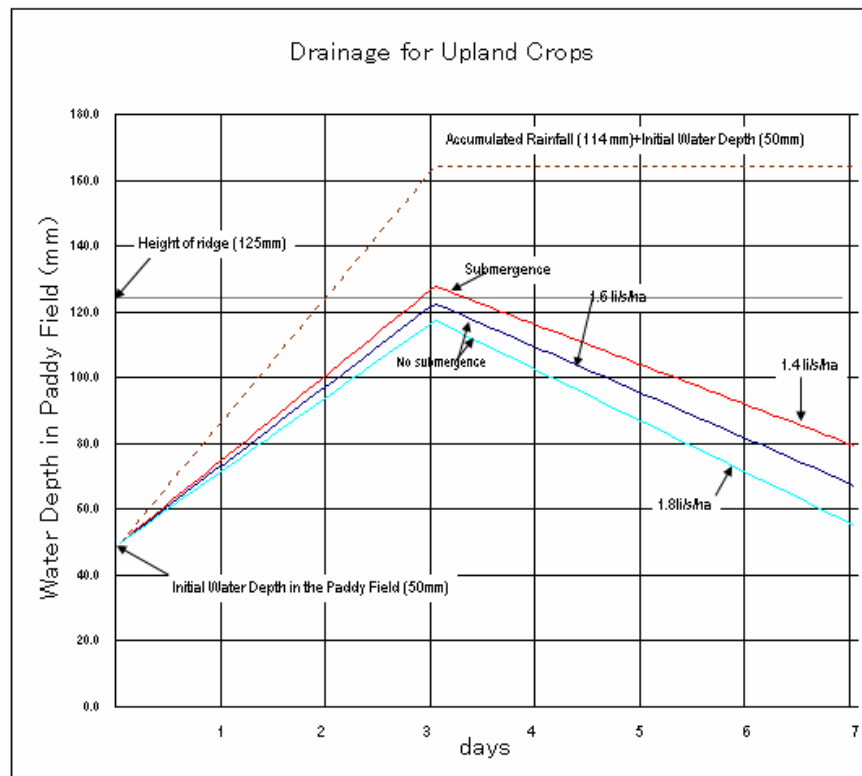
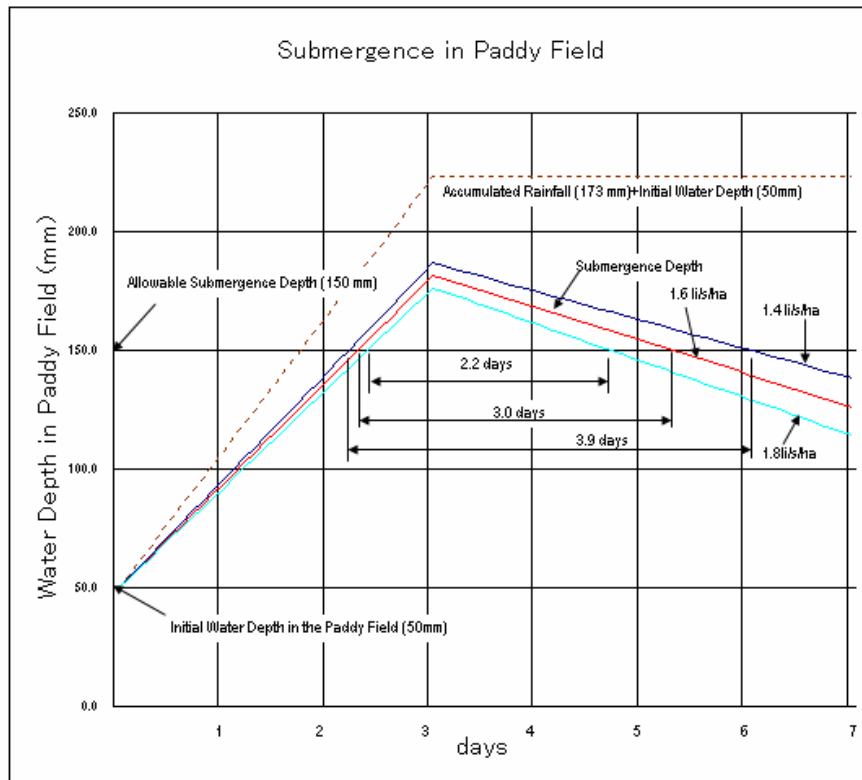


The Study on The Rehabilitation and reconstruction of
Agricultural Production System in the Slakou River
Basin
The Kingdom of Cambodia

Japan International Cooperation Agency

Figure 13.6

Calculation Process of Irrigation Water
Requirements for Upland Crops

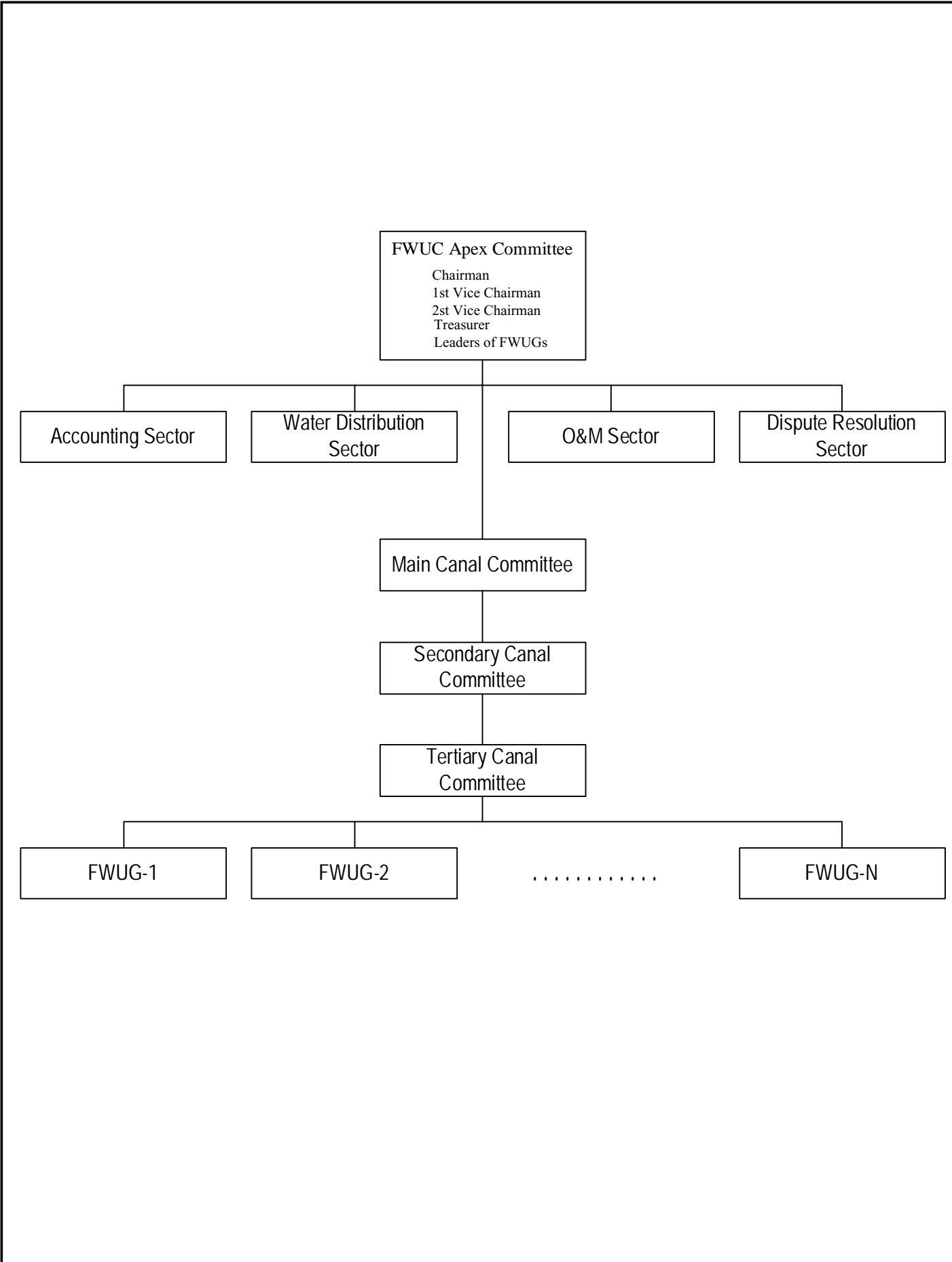


The Study on the Rehabilitation and Reconstruction of Agricultural Production System in the Slakou River Basin, The Kingdom of Cambodia

Japan International Cooperation Agency

Figure 13.7

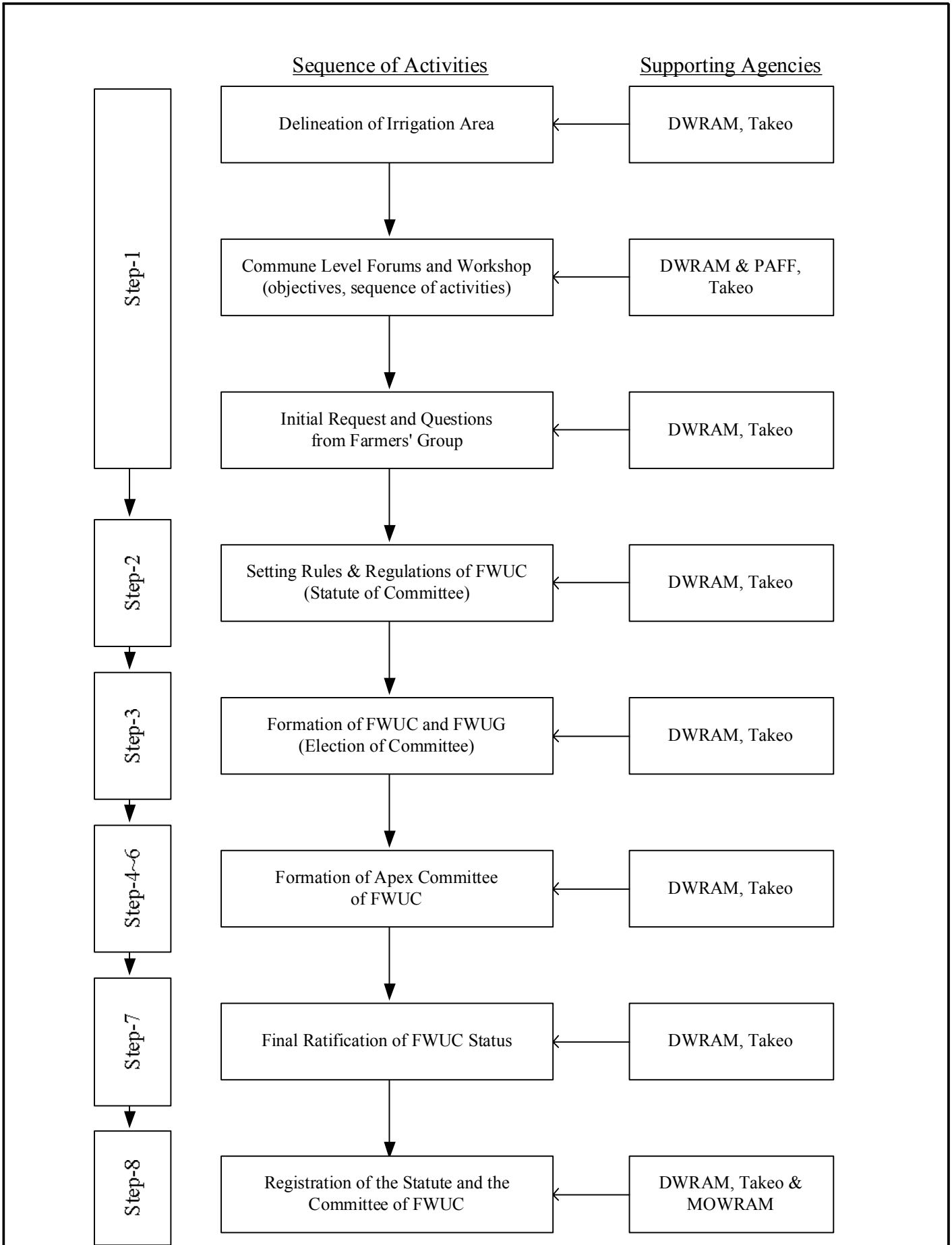
Determination of Unit Drainage Requirement



The Study on The Rehabilitation and reconstruction of
 Agricultural Production System in the Slakou River
 Basin
 The Kingdom of Cambodia

Japan International Cooperation Agency

Figure 15.1
 Standard Structure of FWUCs

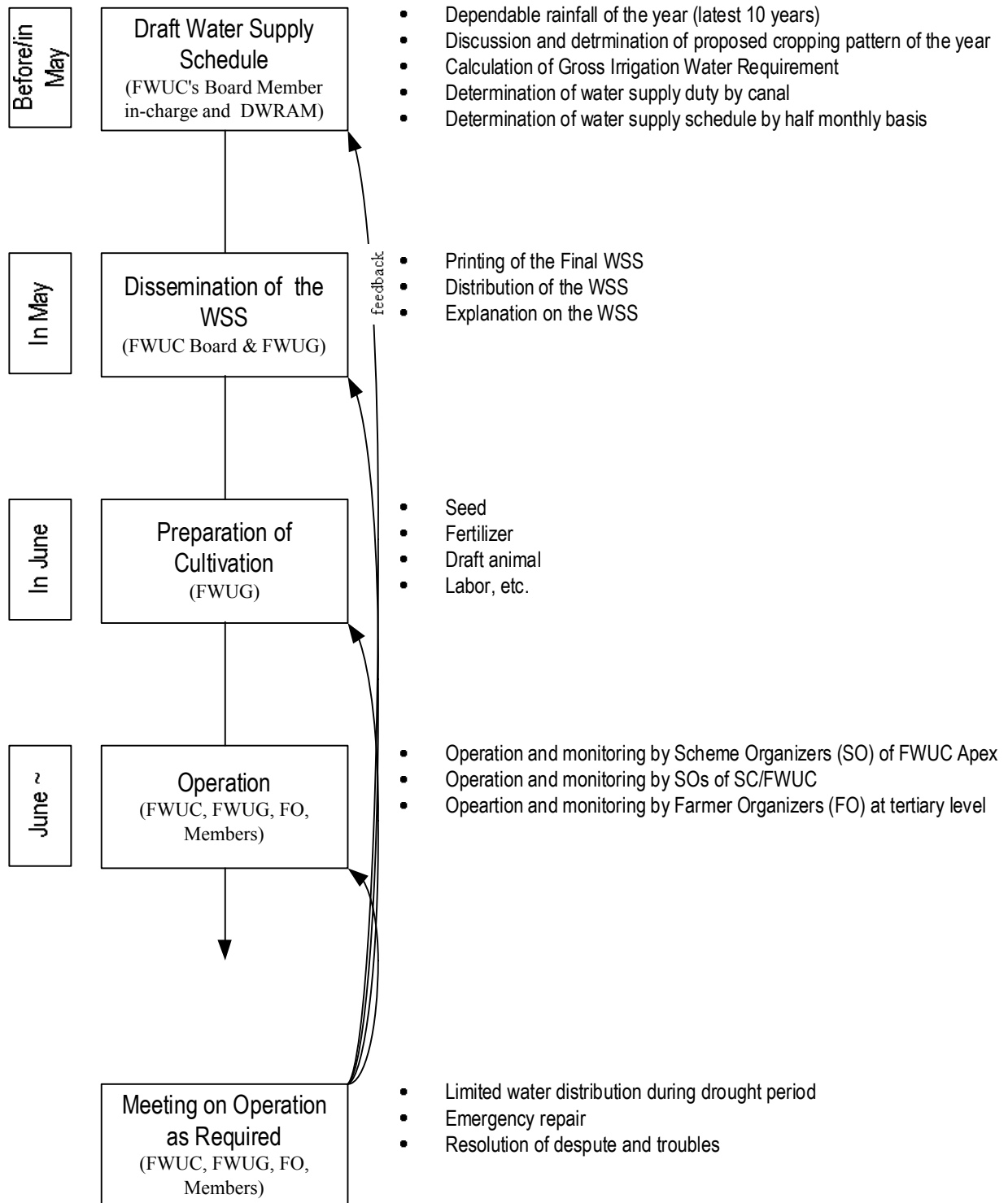


The Study on The Rehabilitation and reconstruction of Agricultural Production System in the Slakou River Basin
The Kingdom of Cambodia

Japan International Cooperation Agency

Figure 15.2

Sequence of Formation of FWUC



Note:
 FWUC= Farmer Water User Community
 FO= Farmer Organizer is in charge of operation, monitoring, arrangement of maintenance works for one or a few tertiary blocks.

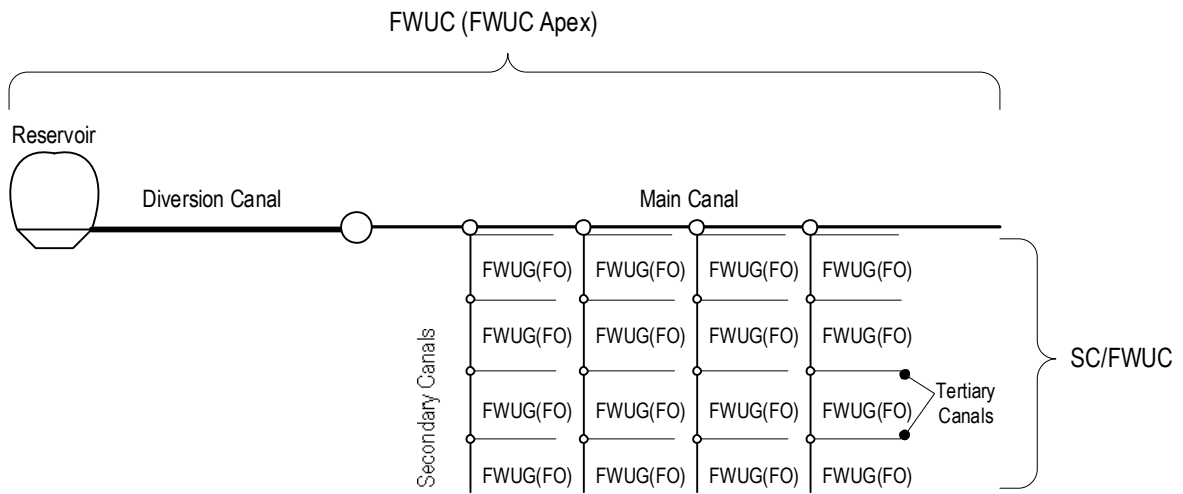
The Study on The Rehabilitation and reconstruction of Agricultural Production System in the Slakou River Basin
 The Kingdom of Cambodia

Japan International Cooperation Agency

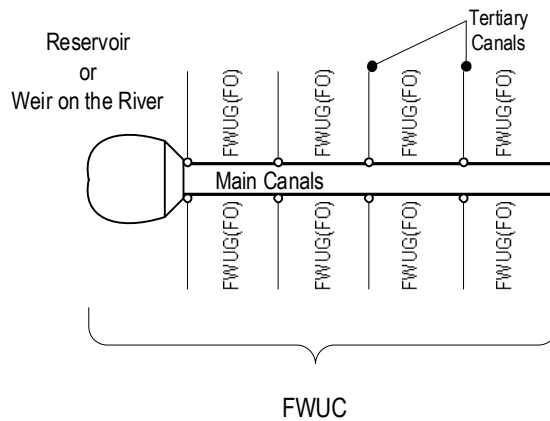
Figure 16.1

Setting-up of Water Supply Schedule and Operation

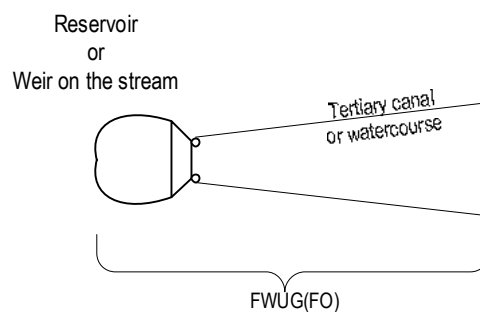
I. Large/Medium Scale Irrigation Scheme (Irrigation Area > 500ha)



II. Small Scale Irrigation Scheme (Irrigation Area <500 ha)



III. Micro Scale Irrigation Scheme (Irrigation Area <50 ha)



The Study on The Rehabilitation and reconstruction of
Agricultural Production System in the Slakou River
Basin
The Kingdom of Cambodia

Japan International Cooperation Agency

Figure 16.2

Responsibility of FWUC/FWUG by Scheme

Attachment

FORMS

List of Forms

	<u>Page</u>
Form-1	Inventory of Existing Irrigation Scheme A1-1
Form-2	Prioritization at Provincial Level A1-2
Form-3	Form for Commune Profile Survey A1-3
Form-4	Questionnaire for Farm Household Survey A1-5
Form-5	Questionnaire on Agriculture A1-10
Form-6	Form for Discharge Measurement and Calculation A1-17
Form-7	Perception of Farmers on Water Management A1-18
Form-8	Form for Inventory Survey of Canals A1-19
Form-9	Form for Inventory Survey of Road/Dike A1-21
Form-10	Form for Inventory Survey of Structures..... A1-23
Form-11	List of Related Personnel for the Project A1-27
Form-12	Identification of Pond Project A1-28
Form-13	Survey of Proposed Pond A1-29
Form-14	Design and Cost Estimate of Proposed Pond A1-32
Form-15	Project Description and Screening A1-34
Form-16	Summarized Site Description A1-35
Form-17a	Initial Evaluation (Social Issue) A1-36
Form-17b	Initial Evaluation (Natural Issue) A1-37

Inventory of Existing Irrigation Scheme

No.	Province	District	Commune	Name of Scheme	Irrigation area (ha)	Water Source			Irrigation System				FWUC	Crops		Access Road		Year	Fund	Status	
						River	Catchment Area (km)	Rainfall Station	Reservoir No.	Reservoir Volume (m ³)	Canal	Pump		Others	Main	Other	Distance to Commune Center (km)				Condition

I-IV

HOW TO FILL UP THE FORM

- | | | | |
|--------------------------|--|---------------------------------------|---|
| No. | Please put serial number. Ex. 1, 2, 3, ... | FWUC | Existence of FWUC for the scheme. (yes or no) |
| Province | Name of Province. Ex. Takeo, Kampot,.... | Crops | |
| District | Name of District. Ex. Tram Kak, Don Kaev,.... | main | main crops. Ex. Paddy rice |
| Commune | Name of Commune. If more than one commune, specify main commune where intake facilities exist. Ex. Trapeang Kranhung, O Saray, and 3 other communes. | others | other crops. Ex. Vegetables, sugarcane, |
| Name of Scheme | Name of irrigation scheme. Ex. Upper Slakou River, Kim Sei, ... | Access road | |
| Irrigation area | Proposed irrigation area in ha, or maximum irrigable area in rainy season. Ex. 3,500 ha | distance to district condition | Distance from the beginning point of main canal to the District center. Ex. 15 km |
| River | Name of water source river. If more than one, specify the main river. Ex. Slakou R., and 2 others. | Year | Road condition. Please choose from; "good", "fair", "poor"
Completion year. Ex. 1975 |
| Catchment area | Total catchment area at intake points. If there are three intakes, add three areas. Measure with planimeter on 1 in 100,000 topographic map. Ex. 534 km ² | Fund | Fund for construction. Ex. "government", "ADB", "JICA", |
| Rainfall station | Name of rainfall stations near-by. Ex. Takeo,.... | Status | Current status of the scheme. Please choose from; "G"(being operated in good condition), "P"(being operated in poor condition), "N" (temporarily not operated. 3years or less), "A" (abandoned. over 3 years) |
| Irrigation system | | | |
| reservoir number | Number of existing reservoirs | | |
| pump | number of mobile pump ("M") or parmanent pump station("P"), if any. Ex. M x7, P x1 ... | | |
| others | other facilities, if any. Ex. Tubewell with engine pump,... | | |

FORM-1

Prioritization at Provincial Level

No.	District	Commune	Name of Scheme	Irrigation area (ha)	Project Type		Approximate Cost or Work Volume	Priority	Reasons
					Rehabilitation	Reconstruction			

A1-2

FORM-2

Note: "Number" should coincide with those of FORM-1
 "Priority" could be given either by sequential number (1,2,3,...n) or classification (A, B, C...)
 "Approximate cost or work volume" should be specified either by estimated cost (Riel ????) or work volume (large, medium, small)

Form for Commune Profile Survey

Commune name		District	
--------------	--	----------	--

1. General Information

Name of commune chief:
Number of staff and position of commune:
Budget of commune (financial source and expenditure):
Established year of Commune Rural Development Committee (CRDC):
Nos. of member of CRDC, and Nos. of female members:
Name of CRDC's Chairman:
Activities of CRDC (meeting, completed/on-going/planned projects):
SEILA program:
Conditions of Commune Office (electricity, capacity of meeting room, office facilities):
Nos. of Villages in the Commune:
Pagoda in the Commune:

2. Population, Households and Labor Force

Total population:	Male:	Female:
Total households:	Agricultural households:	(families or %)
Female-headed households:	Migrants by insecurity :	(families or %)
Repatriation households:	(families or %)	
Population who are working apart from the commune for earning money	More than 10 months a year:	6 – 10 months:
Peak/busy months of on-farm work	3 – 6 months:	1 – 3 months:
	1 2 3 4 5 6 7 8 9 10 11 12	
Existence of exchange work or group working system for farming in the commune		

3. Conditions of Village in the Commune

	Name of Village	Population	Nos. of households	Total area (ha)	Paddy field (ha)	Secondary crop field (ha)	Existence of VDC
1							
2							
3							
4							
5							
6							
7							
8							

4. Land Use in the Commune

Total area	ha		
Paddy field:	ha	Fish ponds:	ha
Irrigated	ha	Grassland/pasture:	ha
secondary crop field:	ha	Forest/wood land:	ha
Tree crop land	ha	Residential area:	ha
Agricultural land total:	ha	Others:	ha

5. Household Income and Poverty in the Commune

Ratio of poverty family (family or %)	
Poverty line (Riel/year/person)	
Food deficit households (family or %)	

6. Living Conditions

Item	Conditions
Transportation	
Distance from national road (km)	
Transportation facility	
Road condition (impassable period)	
Communication facilities	
Telephone, Wireless ratio	
Electricity line	
Household electrified	

Drinking water	Ratio of population supplied safe water: %		
Main water source	Wet season (%)		Dry season (%)
Stored rain water			
Well			
Canal/river			
Pond			
Others			
Main cooking fuel			
Health care			
Hospital (Nos. of beds)			
Health center (Nos. and location)			
Nos. of medical staff			
Education/School			
Primary school (Nos. and location)			
Enrollment ratio			
Drop-out ratio			
Lower secondary school (Nos. and location)			
Enrollment ratio			
Drop-out ratio			
Literacy ratio of adults	Average: %	Male: %	Female: %
Ratio of students who go on higher school			
Market center in and around the commune			

7. Farmers Organization in the Commune

Name of organizations	Name of organizations	Nos. of members	Activities
Farmer Water User Community			
Farmers groups			
Farming technique study group			
Production group			
Marketing group			
Seed production group			
Credit group			
Institutional credit group			
Micro credit group			
Mutual loan association			
Rice Bank			
Pig Bank			
Drinking water user group			
Women group			
Religion group			
Community group			
Youth group			
Others (specify:			

8. NGOs Activities in the Commune

Name of NGO	Activity in the commune

Questionnaire for Farm Household Survey (for all interviewees)

Date (M/D/Y): / /

Enumerator: Team Leader:

Province: Q-2 District: Q-3

Commune: Q-4 Village: Q-5

SECTION I GENERAL INFORMATION

I-1 Name of interviewee

I-2 Total number of household members Q-6

I-3 Main activity of this household Q-7

I-4 Household member in the same house

	Sex		Age		Education		Farming		Main occupation		Present/Absent		Literacy	
1	M/W	Q-8	<input type="text"/>	Q-9	<input type="text"/>	Q-10	Y/N	Q-11	<input type="text"/>	Q-12	P/A	Q-13	Y/N	Q-14
2	M/W	Q-15	<input type="text"/>	Q-16	<input type="text"/>	Q-17	Y/N	Q-18	<input type="text"/>	Q-19	P/A	Q-20	Y/N	Q-21
3	M/W	Q-22	<input type="text"/>	Q-23	<input type="text"/>	Q-24	Y/N	Q-25	<input type="text"/>	Q-26	P/A	Q-27	Y/N	Q-28
4	M/W	Q-29	<input type="text"/>	Q-30	<input type="text"/>	Q-31	Y/N	Q-32	<input type="text"/>	Q-33	P/A	Q-34	Y/N	Q-35
5	M/W	Q-36	<input type="text"/>	Q-37	<input type="text"/>	Q-38	Y/N	Q-39	<input type="text"/>	Q-40	P/A	Q-41	Y/N	Q-42
6	M/W	Q-43	<input type="text"/>	Q-44	<input type="text"/>	Q-45	Y/N	Q-46	<input type="text"/>	Q-47	P/A	Q-48	Y/N	Q-49
7	M/W	Q-50	<input type="text"/>	Q-51	<input type="text"/>	Q-52	Y/N	Q-53	<input type="text"/>	Q-54	P/A	Q-55	Y/N	Q-56
8	M/W	Q-57	<input type="text"/>	Q-58	<input type="text"/>	Q-59	Y/N	Q-60	<input type="text"/>	Q-61	P/A	Q-62	Y/N	Q-63
9	M/W	Q-64	<input type="text"/>	Q-65	<input type="text"/>	Q-66	Y/N	Q-67	<input type="text"/>	Q-68	P/A	Q-69	Y/N	Q-70
10	M/W	Q-71	<input type="text"/>	Q-72	<input type="text"/>	Q-73	Y/N	Q-74	<input type="text"/>	Q-75	P/A	Q-76	Y/N	Q-77

I-5 Member of village organization (Head of the family)

1 Q-78 2 Q-79 3 Q-80 4 Q-81 5 Q-82

I-6 Member of village organization (Housewife)

1 Q-83 2 Q-84 3 Q-85 4 Q-86 5 Q-87

SECTION II LIVING CONDITION

II-1 Drinking water

	Main source		Distance		Sufficiency
Dry season	<input type="text"/>	Q-88	<input type="text"/> m	Q-89	<input type="text"/> Q-90
Wet season	<input type="text"/>	Q-91	<input type="text"/> m	Q-92	<input type="text"/> Q-93

II-2 Fuel source for cooking

	Importance		Availability
1 Most important	<input type="text"/>	Q-94	<input type="text"/> Q-95
2 Secondary importance	<input type="text"/>	Q-96	<input type="text"/> Q-97

II-3 Facilities in your house

Nos.			Nos.				
1	Radio	set	Q-98	5	Car	set	Q-102
2	TV	set	Q-99	6	Audio	set	Q-103
3	Bicycle	set	Q-100	7	Toilet	set	Q-104
4	Motorcycle	set	Q-101				Q-105

SECTION III INCOME AND EXPENDITURE

III-1 Cash income sources in last year

1	Selling paddy/rice	riel/Yr	Q-106	9	Wage from temporary job out of farm	riel/Yr	Q-114
2	Selling vegetables (including beans)	riel/Yr	Q-107	10	Private business (transportation, trading, shop, etc.)	riel/Yr	Q-115
3	Selling fruits	riel/Yr	Q-108	11	Remittance from family members	riel/Yr	Q-116
4	Selling other agricultural products	riel/Yr	Q-109	12	Selling firewood	riel/Yr	Q-117
5	Selling livestock/ poultry products	riel/Yr	Q-110	13	Selling handicraft/ cottage industry products	riel/Yr	Q-118
6	Selling fishes	riel/Yr	Q-111	14	Selling forest vegetable/ crop	riel/Yr	Q-119
7	Salary from permanent job	riel/Yr	Q-112	15	Others (Specify: Q-120)	riel/Yr	Q-121
8	Wage from temporary job on farm	riel/Yr	Q-113	16	Total	riel/Yr	Q-122

III-2 Expenditure for consumption

1	Rice	riel/month	Q-123			riel/Yr	Q-124
2	Other foods	riel/month	Q-125			riel/Yr	Q-126
3	Health/ medicine	riel/month	Q-127			riel/Yr	Q-128
4	Education	riel/month	Q-129			riel/Yr	Q-130
5	Clothes	riel/month	Q-131			riel/Yr	Q-132
6	Firewood/Kerosene/Electricity	riel/month	Q-133			riel/Yr	Q-134
7	Transportation	riel/month	Q-135			riel/Yr	Q-136
8	Tax	riel/month	Q-137			riel/Yr	Q-138
9	Others	riel/month	Q-139			riel/Yr	Q-140
10	Total	riel/month	Q-141			riel/Yr	Q-142

III-3 Investment of productive and fixed assets in the last two year

1	Livestock	riel	Q-143			Q-144
2	Housing (building & maintenance)	riel	Q-145			Q-146
3	Private business	riel	Q-147			Q-148
4	Land	riel	Q-149			Q-150
5	Transportation means	riel	Q-151			Q-152
6	Others	riel	Q-153			Q-154

Explanatory Notes for Questionnaire Survey for Farm Household Survey

BASIC INFORMATION

Sample No. (Q-1):

All questionnaires shall be attached sequential numbers, i.e. 001, 002, ---, 200.

Date (M/D/Y):

Data format shall be written as "12/8/01" (Month: December/Date: 8th/Year: 2001). This item is not necessarily given in the data summary.

Enumerator:

Name of enumerator shall be written in block letters. This item is not necessarily given in the data summary.

Team Leader:

Enter name of team leader after proofreading. This item is not necessarily given in the data summary.

Province (Q-2):

Write name of Province.

District (Q-3):

District code shall be specified by District as below.

District	Code
	1
	2
	3
	4
	5

Commune (Q-4):

Commune code shall be specified by Commune as below.

Commune	Code	Commune	Code
			15
	1		
	2		16
	3		
	4		17
	5		
	6		18
	7		19
	8		20
	9		
	10		21
	11		22
	12		23
	13		24
	14		

Village (Q-5):

Write village name.

SECTION I GENERAL INFORMATION

I-1 Write interviewee's name (full name in block letters). This item is not necessarily given in the data summary.

I-2 (Q-6) Enter total number of family member (ex. 1, 5, 6).

I-3 (Q-7) Choose main activity of this household from codes below.

Main activity	Code	Remarks
Farmer	1	This household has own/rented land, and agricultural income is more than other income.
On-farm labor	2	Wage for labor work on farm is more than other income.
Non-farm labor	3	Wage for labor work except on farm is more than other income.
Salary worker	4	Salary is more than other work.
Private business	5	Income from private business is more than other work.
Others	6	

I-4

Sex Choose sex of this member. “M” means male and “W” means female. Head of the family shall be written on the top.

Age Enter age of the members at present.

Education Education level shall be chosen from codes below.

for adult (>18 yr)	Code	for children (<18 yr)	Code
No formal education	1	Presently going to school	9
Drop-out at primary school	2	Not going to school	10
Graduate from primary school	3	Before school age	11
Drop-out at junior high school	4		
Graduate from junior high school	5		
Drop-out at high school	6		
Graduate from high school	7		
More than high school	8		

Farming Question whether if he/she engaged in farming (including livestock raising and fishery).

Main occupation

Main occupation shall be chosen from codes below.

Main occupation	Code	Main occupation	Code
Farmer	1	House activities (cooking, child care, etc.)	6
On-farm labor	2	No job	7
Non-farm labor	3	Student	8
Salary worker	4	Child (below school age)	9
Private business	5	Others	10

Present/Absent

“P” means he/she lives in this house throughout year.

“A” means he/she lives in other place more than four (4) months in a year.

Literacy If he/she can read and write Cambodian character, choose “Y”.

I-5 Choose village organization codes below which head of the family belong to. If there are other organizations, write in **Q-81** and **Q-82**.

Village organization	Code	Village organization	Code
Farmer’s water users’ community	1	Marketing group	7
Credit group by government	2	Youth group	8
Micro-credit group by NGO	3	Veteran group	9
Production group	4	Women’s group	10
Religion group	5	Others	11
Drinking water users’ group	6		

I-6 Choose village organizations codes below which housewife belong to. If there are other organizations, write in **Q-86** and **Q-87**.

Village organization	Code	Village organization	Code
Farmer’s water users’ community	1	Marketing group	7
Credit group by government	2	Youth group	8
Micro-credit group by NGO	3	Veteran group	9
Production group	4	Women’s group	10
Religion group	5	Others	11
Drinking water users’ group	6		

SECTION II LIVING CONDITION

II-1 Choose main source for drinking by season, and write distance to the source and its sufficiency.

Main source	Code	Main source	Code	Main source	Code
Piped	1	Reservoir/ Pond	4	Rain	7
Tube pipe well	2	Spring/River	5	Others	8
Dug well	3	Bought	6		

Sufficiency	Code	Sufficiency	Code
Sufficient	1	Short	3
Just enough	2	Very short	4

II-2 Choose fuel source primary and secondary (supplemental), and its availability.

Fuel source	Code	Fuel source	Code	Fuel source	Code
Firewood	1	Charcoal	3	Electricity	5
Kerosene	2	Gas cylinder (LPG)	4	Others	6

Availability	Code	Availability	Code
Easy to obtain	1	Very difficult to obtain	3
Difficult to obtain	2		

II-3 Write number of facilities in your house.

SECTION III INCOME AND EXPENDITURE

III-1 Write cash income of this household last year (total of one year). If the interviewee answer in US\$, convert to riel (1 US\$ = 3,900 riel).

III-2 Write expenditure for consumption of this household last year. Total of expenditure should be less than total of income. If the interviewee answer in US\$, convert to riel (1 US\$ = 3,900 riel).

III-3 Write amount of investment of productive and fixed assets in the **last two year**, and choose their sources from codes below. If the interviewee answer in US\$, convert to riel (1 US\$ = 3,900 riel).

Source for investment	Code
Own money	1
Borrowed (from formal source, e.g. bank)	2
Borrowed (from informal source, e.g. friend, money lender, etc.)	3
Others	4

**Questionnaire on Agriculture (For Public Hearing and
Commune/Village Chief)**

1. General				
Commune name (or village)		Number of villages (or sub-villages):		
Households (family)	Total:	Agricultural households		
Population		Average family size (person/family):		
2. Labor Force				
Labor force (person)	Total:	Agricultural labor force:		
Average labor force (person/family)				
Busiest month of on-farm work				
Period of labor shortage (month)				
3. Food Security				
Present condition of food balance		Sufficient	Balanced	Deficit
If shortage, how many families (percent) in short?, and how many tons of paddy rice deficit?		(family)	(%)	Amount of deficit (ton):
4. Agricultural land (ha)				
	Total area:			
Paddy irrigated	Total:	Irrigated:	Rain-fed:	
Dry-crop field	Total:	Irrigated:	Rain-fed:	
Tree crop land				
5. Land Holding and Land Tenure				
Average or typical farm size (ha/family)				
Range of farm size (ha/family)	Largest:	Smallest:		
Tenant farmer (family)				
Land fee system	(a) Constant land fee system	If (a), how much the land fee per year?	(Riel/ha)	
	(b) Crop sharing system	If (b), what ratio of sharing? (Tenant : Land-owner)	% : %	
		If (b), who pays production cost? and who decides crop selection?		
Landless farmer who has no his own land and are hired as farm labor (family)				
6. Planted Area and Production				
Crop	Cropping season (month - month)	Cropped area (ha)	Average yield (kg/ha)	Production (ton)
Early maturing paddy (HYV)				
Medium maturing paddy				
Late maturing paddy				
Maize				
Bean (specify:				
(
Sesame				
Sugarcane				
Vegetable (specify:				
(
(
Fruits, Tree crops (specify:				
(
(

7. Farming Practice				
	Actual practice by farmers	Recommended practices by extension	Labor requirement (man-day/ha)	
Varieties			-	
Renewal of seed			-	
Land preparation				
Seeding & Seeding rate (kg/ha)				
Transplanting				
Fertilizer application				
Kinds and dosage of chemical-fertilizer				
Weed control				
Plant protection / Pest control				
Dosage of agro-chemicals				
Irrigation / water management				
Harvesting / Threshing				
Drying				
Storage			-	
8. Agricultural Machinery and Draft Animal				
Machinery / draft animal	Available number	Rental or contract fee		
Wheel tractor				
Power tiller				
Draft cattle / buffalo (pair)				
Portable irrigation pump				
Knapsack-sprayer				
Pedal thresher				
Engine thresher				
Ox-cart				
Truck / lorry for transportation of agro-products				
Hired labor fee (Riel/day)	-			
9. Livestock (number of livestock animals)				
Cattle		Water-buffalo		
Pig		Goat/sheep		
Chicken		Duck		
10. Prices of Agricultural Outputs and Inputs				
Outputs	Farm-gate price (Riel/kg)	Market price (Riel/kg)	Inputs	Farm-gate price (Riel/kg)
Paddy (HYV)			Urea	
Paddy local			DAP	
Milled rice			Ammonium Sulfate	
Beans			KCl	
Sesame			Pesticide (
Vegetable (specify			(
(Paddy seed	
(Other seed (
((

11. Other conditions	
Paddy drying lot for public use	Location & capacity:
Mechanical dryer	Location & capacity:
Paddy/rice storage for group use	Location, capacity & purpose:
Rice mill	Location, number, capacity, operation rate & milling charge:
Processing / industrial facilities for agro-products	Material, products processed, location, capacity & operation rate:
Market for purchase agricultural inputs	Location & availability of inputs:
Market for sale agricultural products	Location and facilities:
Activities of VDC (Agriculture, livestock, fishery, credit)	Sub-VDC, number of members and activities
Availability of "Rice Bank" and "Pig Bank"	
Extension services	Kinds of activity (farmers school, demonstration plot, input supply, credit service, etc), frequency of visits of extension worker
Seed paddy production and availability of certified paddy seeds	
Availability of diversified-crop seed	
Credit for agricultural inputs	
Activities of NGOs concerned agriculture	
Related project/ program	Component / executing agency / donor
12. Farmers needs and intention	
Varieties of paddy to be irrigated	Early, medium or late maturing paddy Proportion of paddy varieties
Other crops to be irrigated	
Needs for extension service of technical guidance of crop cultivation	Kind of target crop, manner of service, and participatory mind in the activities
Farmers intention to group activities	Extension, group purchase of inputs, group marketing of products, credit group, etc.

Questionnaire for Individual Farmers

Date interviewed		Serial No.	
Enumerator		Checked by	
Village		District	

1. Family and Labor Force

Name of household head			1. Male	2. Female
Nos. of family members	Total:	Labor force of family	Total:	
Farm labor force	Total:	Full time:	Part time:	
Family member who works apart from the village	1. Yes 2. No	If Yes, the period?	1. < 3 month/year, 2. 3 - 6 month/year, 3. > 6 month/year	

2. Land Holding and Tenure

	Land owned (1)	Land rented from others (2)	Land leased to others (3)	Land operated (1 + 2 - 3)
Irrigated paddy field	ha	ha	ha	ha
Rain-fed paddy field	ha	ha	ha	ha
Dry crop field	ha	ha	ha	ha
Tree crop field	ha	ha	ha	ha
Total	ha	ha	ha	ha

3. Land fee system, if respondent have land rented out or leased from others at Question 2.

	Constant land fee	Crop sharing for tenant	Who dose pay the production cost?	Who is decision maker for crop?
Irrigated paddy field	Riel/year	%	1. Owner 2. Tenant	1. Owner 2. Tenant
Rain-fed paddy field	Riel/year	%	1. Owner 2. Tenant	1. Owner 2. Tenant
Dry crop field	Riel/year	%	1. Owner 2. Tenant	1. Owner 2. Tenant
Tree crop field	Riel/year	%	1. Owner 2. Tenant	1. Owner 2. Tenant

4. Planted Area in Operated Land

		Early rainy season	Rainy season	Dry season
Irrigated paddy field	Paddy	ha	ha	ha
	Vegetables	ha	ha	ha
	Secondary crops	ha	ha	ha
Rain-fed paddy field	Paddy	ha	ha	ha
	Vegetables	ha	ha	ha
	Secondary crops	ha	ha	ha
Dry crop field	Vegetables	ha	ha	ha
	Secondary crops	ha	ha	ha
Total		ha	ha	ha

5. Tree crop of respondent

Name of tree	Nos. of trees	Name of tree	Nos. of trees
Coconut		Mango	
Banana			
Lemon			

6. Livestock Animals of Respondent

Livestock	Number	Livestock	Number
Cattle	head	Goat/sheep	head
Water buffalo	head	Pig	head
Draft animal	pair	Chicken	head
		Duck	head

7. Agricultural Machinery and Tool

Machinery/ tool	Number	Machinery/ tool	Number
Wheel tractor		Engine thresher	
Power tiller		Pedal thresher	
Portable irrigation pump		Ox-cart	
Knapsack sprayer		Hoe	
Pick-up car		Sickle	
Engine winnower		Shovel	
Manual winnower		Drying lot	m ²
Storage for paddy		Kinds of paddy storage:	
Maximum storage volume of rice	kg	1. Bag	3. Wooden box
		2. Bamboo basket	4. Others (specify)

8. Crop Production and Income from Agricultural Production during Last Year

	Planted area (ha)	Production (kg)	Self-consumed (kg)	Sold (kg)	Price (Riel/kg)	Income (Riel)
Paddy rice						
HYV						
local						
Subtotal						
Secondary crop						
Maize						
Beans						
(
Subtotal						
Vegetables						
(
(
Subtotal						
Fruits	-					
(-					
(-					
Subtotal						
Livestock	-					
Cattle	-					
Pig	-					
Chicken	-					
Duck	-					
Egg	-					
Subtotal						
Fish	-					
Total						

9. Other Cash Income during Last One Year

Source of cash income	Per month	Year
Salary from permanent job	Riel	Riel
Wage from temporary job on farm	Riel	Riel
Wage from temporary job out of farm	Riel	Riel
Private business (transportation, trading, shop, rice mill, etc.)	Riel	Riel
Remittance from family members who live apart from family	Riel	Riel
Selling handicraft / cottage industry products	Riel	Riel
Selling firewood	Riel	Riel
Selling forestry products / crops	Riel	Riel
Others (specify)	Riel	Riel
Total	-	Riel
Total of Q8+G9	-	Riel

10. Agricultural Production Cost

Crop	Paddy	Vegetables	Corn	Beans	Total
Seed	Riel	Riel	Riel	Riel	Riel
Chemical fertilizer	Riel	Riel	Riel	Riel	Riel
Agro-chemicals	Riel	Riel	Riel	Riel	Riel
Hired labor	Riel	Riel	Riel	Riel	Riel
Land preparation	Riel	Riel	Riel	Riel	Riel
Others	Riel	Riel	Riel	Riel	Riel
Subtotal	Riel	Riel	Riel	Riel	Riel
Livestock	Cattle	Pig	Chicken	Duck	Total
Feed	Riel	Riel	Riel	Riel	Riel
Vaccination/ medicine	Riel	Riel	Riel	Riel	Riel
Others	Riel	Riel	Riel	Riel	Riel
Subtotal	Riel	Riel	Riel	Riel	Riel
Total	Riel	Riel	Riel	Riel	Riel

11. Cash Expenditure during Last One Year

Food	Per month	Year
Rice/Paddy	-	-
Other food and edible oil etc.	Riel	Riel
Subtotal	-	
Other living expenditure	-	-
Health /medicine	Riel	Riel
Education	Riel	Riel
Clothes	Riel	Riel
Firewood/ kerosene/ electricity	Riel	Riel
Transportation (fee and fuel)	Riel	Riel
Tax	-	Riel
Others	-	Riel
Subtotal	-	Riel
Investment and purchase of fixed asset	-	-
Purchase of land	-	Riel
Housing (building / maintenance)	-	Riel
Investment to private business	-	Riel
Purchase of transportation means	-	Riel
Others (specify	-	Riel
Subtotal	-	Riel
Total	-	Riel
Total of Q10 and Q11	-	Riel

Remark: Totals of "cash income (Q8 and Q9)" and cash expenditure (Q10 and Q11)" should be roughly balanced. If the difference is extremely large, ask to respondent the reason.

12. Savings of Any Types at Present

Source			
Amount	Riel	Riel	Riel
Purpose			
Source of savings	Purpose for saving		
1. Money in bank	4. Jewelry	1. For safety	4. For private business
2. Land	5. Cash	2. For future expenditure	5. For invest/purchase of (specify
3. Livestock	6. Others (specify	3. For emergency needs	6. Others (specify

13. Debts and Credit

Source			
Amount			
Interest rate			
Purpose			
Collateral			
Source 1. Money lender 2. Trader 3. Friend/Neighbor 4. NGO 5. Bank 6. Others (specify)	Purpose 1. Agricultural input 2. Farm machinery 3. Family assets 4. Housing 5. Purchase land 6. Education	7. Ceremonial occasions 8. Business 9. Living expenses 10. Disease / medicine 11. Land reclamation 12. Others (specify)	Collateral 1. Nothing 2. Crop products 3. Land 4. Jewry 5. Labor force 6. Others (specify)

14. Inputs for Crop production During Last One Year

	Paddy	Vegetable	Corn	Beans
Seed	kg	kg	kg	kg
Farm manure	kg	kg	kg	kg
Urea	kg	kg	kg	kg
DAP	kg	kg	kg	kg
AP	kg	kg	kg	kg
KCL	kg	kg	kg	kg
Herbicide	liter	liter	liter	liter
Insecticide	liter	liter	liter	liter
Fungicide	liter	liter	liter	liter
Others (specify)				

15. Farming Practices

	Paddy	Vegetables	Corn	Beans
Land preparation by Tractor (1), Animal (2), or Hand (3)	1 2 3	1 2 3	1 2 3	1 2 3
Date of first plowing				
Transplanting (1) or Direct seeding (2)	1 2	1 2	1 2	1 2
Date of transplanting or direct seeding				
Date of Fertilizer application				
Date of pesticide application				
Date of harvesting				
Harvesting by engine thresher (1), pedal thresher (2), or manual (3)	1 2 3	1 2 3	1 2 3	1 2 3

16. Training and Intention of Crop

Have you participated in FFS? *1	1. Yes, 2. No	If yes, the purpose (
Have you received any extension services?	1. Yes, 2. No	If yes, the purpose (
Which diversified crop do you want to plant?	1. Vegetables (specify 3. Beans (specify 5. Others (specify	2. Maize 4. Sesame
Which variety do you want to plant, HYV or local variety? *2	1. HYV(specify	2. Local (specify
How many percent of HYV do you want to plant in your land?	% of paddy field	

*1: FFS: Farmers Field School, *2: HYV: High Yielding Variety

Form for Discharge Measurement and Calculation

Measurement point:

Date:

Water level at staff gauge:

Horizontal Measurement Point	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Distance (m)																	
Interval (m)																	
Water depth (m)																	
Vertical point from water surface																	
Measurement 1																	
Dial number																	
Number of Buzzer																	
Time (sec)																	
velocity (m/sec)																	
Measurement 2																	
Dial number																	
Number of Buzzer																	
Time (sec)																	
Velocity (m/sec)																	
Average velocity (m/sec)																	
Vertical point from water surface																	
Measurement 1																	
Dial Number																	
Number of Buzzer																	
Time (sec)																	
Velocity (m/sec)																	
Measurement 2																	
Dial number																	
Number of Buzzer																	
Time (sec)																	
velocity (m/sec)																	
Average velocity (m/sec)																	
Average Velocity (m/sec)																	

Current meter: Sanei-3, No. 6086
 velocity = 0.087 N + 0.011
 N = (dial number) x (number of buzzer) / (time)
 (Applicable range: 0.120 m/sec - 1.971 m/sec)

Name of person in charge:

Signature:

A1-17

FORM-6

Perception of Farmers on Water Management

Name of FWUC or FWUG :	
Member of FWUC :	
Command Area :	

1. Understanding on Policy for FWUC prepared by MOWRAM	Yes or No
a) Irrigation development shall be implemented on the basis of Demand of farmers.	
b) Full participation of FWUC shall be taken place from the very beginning.	
c) Formation of FWUC shall be the primary task.	

2. Formation of FWUC	Yes or No
a) Rules and Regulation of FWUC (Statute of Community)	
b) Election of Committee by secret ballot of members	

2. Responsibility of O&M :	Agree or No
First year after implemetation Gov. share 80% at Farmer members 20%	
2nd year Gov. share 60% at Farmer members 40%	
3rd year Gov. share 40% at Farmer members 60%	
4th year Gov. share 20% at Farmer members 80%	
5th year Gov. share 0% anc Farmer members 100%	

3. ISF(Irrigation Service Fee):	Agree or No
a) O&M Costs(maintenance, repair, expenditures on administration, contingency, etc.)	
b) 20 % of Increased Production for emergency repair (after 5 years not less than 5%)	

4. Duties of FWUC :	Agree or No
a) Implementing work program of the Community	
b) Organizing O&M of irrigation system	
c) Collecting ISF from the members	
d) Dispute resolution among the community members	

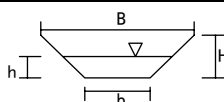
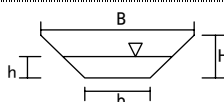
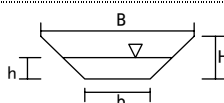
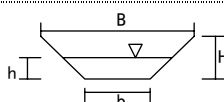
5. Farmers Opinion :	

Serial Number : A-_____

I. General

A₋₁	Location	Coordinate (UTM)	
		Name of Canal	(from _____ to _____)
		Total Length (m)	
		Purpose	Irrigation / Drain / Others
Date of visit (member)			
Access			

II. Dimension and Conditions

Up / Down stream - _____ Canal dimensions and conditions		B: H: h: b:	
Up / Down stream - _____ Canal dimensions and conditions		B: H: h: b:	
Up / Down stream - _____ Canal dimensions and conditions		B: H: h: b:	
Up / Down stream - _____ Canal dimensions and conditions		B: H: h: b:	

III. Present Condition near the Canal

	Left bank	Right bank
1. Landuse		

IV. Problems on the Canal

1. Sediments	none some serious	
2. Leakage	none some serious	
3. Inspection road	none some serious	
4. Others	none some serious	

IV. Evaluation

A	Fully functioning
B	Partly deteriorated, but functioning in a satisfactory range
C	Not functioning well and/or affecting the downstream flow
D	Completely not functioning

Serial Number : A-

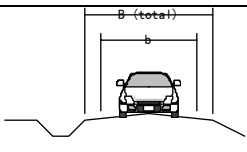
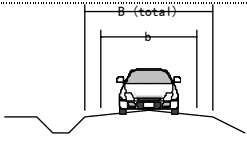
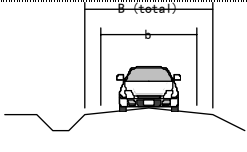
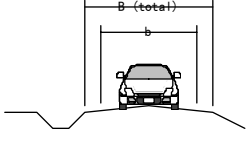
A ₋₂	Name of Canal	
	Number of Photo	
	Coordinate	
photograph		
Sketch with direction of the photograph taken and water flow		

Serial Number : B- _____

I. General

B -1	Location	Coordinate	
		Name of Road/Dike	(from _____ to _____)
		Total Length (m)	
Date of visit (member)			
Access			

II. Dimension and Conditions

Dike/Road-1 Canal dimensions and conditions		B: b: H:	Side drain (right / left / no) * Surface (paved / gravel / earth) Structure (cut / embankment) Access (car / cycle / foot)
Dike/Road-2 Canal dimensions and conditions		B: b: H:	Side drain (right / left / no) * Surface (paved / gravel / earth) Structure (cut / embankment) Access (car / cycle / foot)
Dike/Road-3 Canal dimensions and conditions		B: b: H:	Side drain (right / left / no) * Surface (paved / gravel / earth) Structure (cut / embankment) Access (car / cycle / foot)
Dike/Road-4 Canal dimensions and conditions		B: b: H:	Side drain (right / left / no) * Surface (paved / gravel / earth) Structure (cut / embankment) Access (car / cycle / foot)

III. Present Condition near the Road /Dike

1. Landuse	Left _____	Right _____
------------	------------	-------------

IV. Problems on the Road /Dike

1. Road surface	none some serious	
2. Sub-surface	none some serious	
3. Side slope	none some serious	
4. Drain	none some serious	
5. Others	none some serious	

IV. Evaluation

A	Fully functioning
B	Partly deteriorated, but functioning in a satisfactory range
C	Not functioning well and/or affecting the access to the adjacent areas
D	Completely not functioning

*: Left = Left when you stand toward south or west, Right = Right when you stand toward south or west

Serial Number : B-

B ₋₂	Dikes / Roads	
	Number of Photo	
	Map Coordinate	
photograph		
Sketch with direction of the photograph		