

Table D.4.1.1 Summary Results of Socio-economic Survey on Farming Constraints, Improvement Measures & Expectations - 1/3

1. Design of Sample Survey

Target Area/Zone	Irrigation Status of Paddy Field	Sample No.	Survey Method
Category Area-1	Double cropping of paddy	50	Interview survey by enumerator
Category Area-2	Supplemental irrigation in rainy season/Canal system	50	
Category Area-3	Supplemental irrigation in rainy season/Ponds	50	
Category Area-4	Rainfed paddy field	50	
Total		200	

2. Farming Constraints and Improvement

2-1. Farming Constraints (agronomic & farm management)

Question What are serious agronomic & farm management constraints for farming ? (select plural answer)

Target Area: Overall	Degree of Constraints												Total Score	Rating	
	Most Serious Score: 4			2nd Serious Score: 3			3rd Serious Score: 2			4th Serious Score: 1					
	No.	%	Score	No.	%	Score	No.	%	Score	No.	%	Score			
Farming constraint (agronomic/farm management)															
Low yield of crops (paddy)	51	26	204	15	8	45	12	6	24	23	12	23	296	2	
Crop losses due to pest & disease	44	22	176	43	22	129	35	18	70	29	15	29	404	1	
Weed problem	2	1	8	12	6	36	18	9	36	15	8	15	95		
Crop losses due to wild animal	2	1	8	6	3	18	3	2	6	9	5	9	41		
Difficulty for hiring draft animal/machinery	14	7	56	18	9	54	13	7	26	8	4	8	144		
Labor shortage	7	4	28	13	7	39	16	8	32	14	7	14	113		
Insufficient extension services	3	2	12	8	4	24	17	9	34	21	11	21	91		
Shortage of farming capital	19	10	76	23	12	69	30	15	60	18	9	18	223	3	
Difficulty for obtaining quality seeds	4	2	16	10	5	30	13	7	26	12	6	12	84		
Difficulty for purchasing fertilizers	16	8	64	23	12	69	12	6	24	6	3	6	163	5	
Expensive farm inputs	23	12	92	15	8	45	13	7	26	9	5	9	172	4	
Poor soil conditions	10	5	40	10	5	30	11	6	22	17	9	17	109		
Marketing problems of products	1	1	4	0	0	0	2	1	4	5	3	5	13		
Lack of farm credit	3	2	12	4	2	12	5	3	10	14	7	14	48		
Others	1	1	4	0	0	0	0	0	0	0	0	0	4		
Total	200	100	800	200	100	600	200	100	400	200	100	200	2,000		

2-2. Farming Constraints (physical)

Question What are serious physical constraints for farming ? (select plural answer)

Target Area: Overall	Degree of Constraints												Total Score	Rating
	Most Serious Score: 3			2nd Serious Score: 2			3rd Serious Score: 1							
	No.	%	Score	No.	%	Score	No.	%	Score					
Faming Constraints/Physical (Answer)														
Irrigation water shortage in rainy season	146	73	438	19	9.5	38	9	4.5	9	485	1			
Irrigation water shortage in dry season	26	13	78	65	32.5	130	30	15	30	238	3			
Inundation/flooding	2	1	6	9	4.5	18	5	2.5	5	29				
Drainage problem		0	0		0	0	1	0.5	1	1				
Lack of farm road	2	1	6	3	1.5	6	20	10	20	32				
Lack of transportation means	4	2	12	17	8.5	34	23	11.5	23	69				
Leveling problem of paddy field	4	2	12	25	12.5	50	36	18	36	98				
Insufficient irrigation system	16	8	48	62	31	124	76	38	76	248	2			
Others		0	0		0	0		0	0	0				
Total	200	100	600	200	100	400	200	100	200	1,200				

2-3. Marketing constraints

Target Area: Overall	Degree of Constraints												Total Score	Rating
	Most Serious Score: 3			2nd Serious Score: 2			3rd Serious Score: 1							
	No.	%	Score	No.	%	Score	No.	%	Score					
Marketing Constraints (Answer)														
Unstable market prices of paddy/rice	88	176	264	15	30	30	14	28	14	308	2			
Low market prices of paddy/rice	75	150	225	48	96	96	19	38	19	340	1			
Limitation of market of paddy/rice	12	24	36	20	40	40	22	44	22	98				
Unstable market prices of other crops	6	12	18	23	46	46	15	30	15	79				
Low market prices of other crops	15	30	45	45	90	90	13	26	13	148	3			
Limitation of market of other crops	2	4	6	7	14	14	17	34	17	37				
Unstable market prices of livestock	1	2	3	14	28	28	36	72	36	67				
Low market prices of livestock	0	0	0	17	34	34	33	66	33	67				
Limitation of market of livestock	1	2	3	8	16	16	17	34	17	36				
Lack of or poor farm to market road	0	0	0	3	6	6	14	28	14	20				
Total	200	400	600	200	400	400	200	400	200	1,200				

Table D.4.1.1 Summary Results of Socio-economic Survey on Farming Constraints, Improvement Measures & Expectations - 2/3

2-4. Reasons for limited productivity of crops in the rice field of interviewee (not specific to last year)

Target Area: Overall	Degree of Constraints									Total Score	Rating
	Most Serious Score: 3			2nd Serious Score: 2			3rd Serious Score: 1				
	No.	%	Score	No.	%	Score	No.	%	Score		
Reasons for Limited Productivity (Answer)											
Drought in rainy season	151	302	453	21	42	42	8	16	8	503	1
Water shortage in dry season	16	32	48	57	114	114	9	18	9	171	2
Shortage of farming capital	4	8	12	20	40	40	21	42	21	73	
Poor seed quality	1	2	3	10	20	20	10	20	10	33	
Poor soil	5	10	15	16	32	32	17	34	17	64	
Limited application of fertilizer	8	16	24	31	62	62	36	72	36	122	3
Damages caused by wild animal (rat)	2	4	6	5	10	10	18	36	18	34	
Poor drainage	0	0	0	0	0	0	0	0	0	0	
Flooding/inundation	1	2	3	2	4	4	2	4	2	9	
Inadequate farming technologies	3	6	9	3	6	6	17	34	17	32	
Damages caused by pest & disease	6	12	18	19	38	38	24	48	24	80	
Others	3	6	9	16	32	32	38	76	38	79	
Total	200	400	600	200	400	400	200	400	200	1,200	

2-5. Activities/practices to improve rice productivity implemented by the interviewee in the past 3 years (plural answer)

Activities Implemented	No. & Proportion of Respondents Implemented Activities/Practices										Remarks
	Category 1		Category 2		Category 3		Category 4		Overall		
	No.	%	No.	%	No.	%	No.	%	No.	%	
Increased fertilization doses	39	78	44	88	42	84	45	90	170	85	No. of respondents per category : 50 Total respondent: 200
Applied of compost/manure	39	78	29	58	32	64	37	74	137	69	
Used quality seed (local variety)	9	18	16	32	8	16	14	28	47	24	4 activities selected/respondent
Used quality seed (high yielding variety)	27	54	33	66	34	68	34	68	128	64	
Constructed of farm pond	6	12	3	6	12	24	18	36	39	20	Total answers per category: 200
Started to use water pump for irrigation	37	74	38	76	39	78	27	54	141	71	
Improved farming practices	26	52	27	54	17	34	14	28	84	42	
Improved post-harvest practices	12	24	7	14	5	10	6	12	30	15	
Changed marketing methods	3	6		0	8	16	3	6	14	7	
Others	2	4	3	6	3	6	2	4	10	5	
Total	200	-	200	-	200	-	200	-	800	-	

2-6. Necessary activities to improve rice productivity in the field of the interviewee (farming & farm management, plural answer)

Target Area: Overall	Degree of Necessity of Activity												Total Score	Rating
	Most Required Score: 4			2nd Most Required Score: 3			3rd Most Required Score: 2			4th Most Required Score: 1				
	No.	%	Score	No.	%	Score	No.	%	Score	No.	%	Score		
Necessary Activities														
Improvement of farming practices	67	34	268	7	4	21	15	8	30	22	11	22	341	2
Use of quality seed (local variety)	6	3	24	16	8	48	5	3	10	10	5	10	92	
Use of quality seed (high yielding variety)	24	12	96	41	21	123	24	12	48	23	12	23	290	4
Use of adequate doses of fertilizer	48	24	192	57	29	171	43	22	86	23	12	23	472	1
Improved leveling of paddy field	31	16	124	27	14	81	32	16	64	35	18	35	304	3
Planting at proper time	10	5	40	16	8	48	31	16	62	22	11	22	172	
Intensive weeding	6	3	24	34	17	102	40	20	80	53	27	53	259	
Formation/strengthening of farmers organization	6	3	24	2	1	6	9	5	18	11	6	11	59	
Others	2	1	8	0	0	0	1	1	2	1	1	1	11	
Total	200	100	800	200	100	600	200	100	400	200	100	200	2,000	

2-7. Necessary physical works to improve rice productivity in the field of the interviewee (plural answer)

Target Area: Overall	Degree of Necessity of Activity									Total Score	Rating
	Most Required Score: 3			2nd Most Required Score: 2			3rd Most Required Score: 1				
	No.	%	Score	No.	%	Score	No.	%	Score		
Necessary Physical Works											
Irrigation water supply for rainy season	157	314	471	30	60	60	8	16	8	539	1
Irrigation water supply for dry season	24	48	72	125	250	250	29	58	29	351	2
Mitigation of inundation/flooding	2	4	6	8	16	16	31	62	31	53	
Drainage improvement	0	0	0	0	0	0	0	0	0	0	
Improvement of irrigation system	17	34	51	34	68	68	121	242	121	240	3
Others	0	0	0	3	6	6	11	22	11	17	
Total	200	400	600	200	400	400	200	400	200	1,200	

Table D.4.1.1 Summary Results of Socio-economic Survey on Farming Constraints, Improvement Measures & Expectations - 3/3

3. Livestock Constraints

Target Area: Overall	Degree of Constraints									Total Score	Rating
	Most Serious Score: 3			2nd Serious Score: 2			3rd Serious Score: 1				
	No.	%	Score	No.	%	Score	No.	%	Score		
Livestock Constraints											
Low productivity	13	7	39	21	11	42	29	15	29	110	
Shortage of feed	6	3	18	33	17	66	36	18	36	120	3
Low or unstable market prices	7	4	21	9	5	18	15	8	15	54	
Market availability	3	2	9	1	1	2	5	3	5	16	
Losses due to diseases	149	75	447	28	14	56	8	4	8	511	1
Insufficient veterinary services	10	5	30	73	37	146	57	29	57	233	2
Insufficient extension services	4	2	12	19	10	38	26	13	26	76	
Difficulty in obtaining good breed	2	1	6	10	5	20	21	11	21	47	
Others	6	3	18	6	3	12	3	2	3	33	
Total	200	100	600	200	100	400	200	100	200	1,200	

4. Expectations for Improvement

4-1. Farming (agronomic & farm management)

Target Area: Overall	Degree of Expectation									Total Score	Rating
	Most Expected Score: 3			2nd Most Expected Score: 2			3rd Most Expected Score: 1				
	No.	%	Score	No.	%	Score	No.	%	Score		
Expectations for Improvement											
Productivity improvement of rainy season rice	149	75	447	25	13	50	11	6	11	508	1
Productivity improvement of dry season rice	35	18	105	84	42	168	10	5	10	283	2
Productivity improvement of field crops	1	1	3	24	12	48	23	12	23	74	
Productivity improvement of vegetables	4	2	12	15	8	30	23	12	23	65	
Productivity improvement of livestock/poultry	6	3	18	20	10	40	52	26	52	110	3
Increasing livestock holding size & production	1	1	3	20	10	40	55	28	55	98	
Increasing poultry holding size & production	1	1	3	6	3	12	10	5	10	25	
Strengthening/formation of farmers organization	0	0	0	4	2	8	10	5	10	18	
Improvement of post-harvest operation	2	1	6	2	1	4	6	3	6	16	
Others	1	1	3	0	0	0	0	0	0	3	
Total	200	100	600	200	100	400	200	100	200	1,200	

4-2. Farming (farming system)

Target Area: Overall	Degree of Expectation									Total Score	Rating
	Primarily Intended Score: 3			Secondary Intended Score: 2			Thirdly Intended Score: 1				
	No.	%	Score	No.	%	Score	No.	%	Score		
Farming System											
Double cropping of rice	166	83	498	15	8	30	8	4	8	536	1
Stable single cropping of rice	19	10	57	33	17	66	18	9	18	141	
Multiple farming (crop + livestock etc.)	14	7	42	134	67	268	45	23	45	355	2
Crop diversification	1	1	3	18	9	36	129	65	129	168	3
Total	200	100	600	200	100	400	200	100	200	1,200	

4-3. Farming (physical)

Target Area: Overall	Degree of Expectation									Total Score	Rating
	Primarily Expected Score: 3			Secondary Expected Score: 2			Thirdly Expected Score: 1				
	No.	%	Score	No.	%	Score	No.	%	Score		
Farming (physical)											
Adequate irrigation water supply in rainy season	156	78	468	22	11	44	13	6.5	13	525	1
Adequate irrigation water supply in dry season	22	11	66	90	45	180	30	15	30	276	2
Mitigation of inundation & flooding	1	0.5	3	4	2	8	10	5	10	21	
Construction/rehabilitation of farm road	0	0	0	8	4	16	23	11.5	23	39	
Construction/rehabilitation of farm to market road	0	0	0	1	0.5	2	9	4.5	9	11	
Drainage improvement	20	10	60	55	27.5	110	84	42	84	254	3
Leveling of paddy field	1	0.5	3	20	10	40	31	15.5	31	74	
Total	200	100	600	200	100	400	200	100	200	1,200	

4-4. Agricultural support services

Target Area: Overall	Degree of Necessity of Support									Total Score	Rating
	Most Required Score: 3			2nd Most Required Score: 2			3rd Most Required Score: 1				
	No.	%	Score	No.	%	Score	No.	%	Score		
Agricultural Support Required											
Field Extension services (demonstration / field guidance)	99	50	297	35	18	70	24	12	24	391	1
Provision of quality seed	31	16	93	52	26	104	45	23	45	242	3
Farmer training (technical & host-harvest operation)	49	25	147	59	30	118	18	9	18	283	2
Farmer training (organization, marketing, farm management)	7	4	21	13	7	26	14	7	14	61	
Support to organize farmers	0	0	0	4	2	8	5	3	5	13	
Provision of market information	3	2	9	8	4	16	30	15	30	55	
Provision of farm credit	2	1	6	15	8	30	27	14	27	63	
Provision of fertilizer	9	5	27	14	7	28	37	19	37	92	
Others (specify)	0	0	0	0	0	0	0	0	0	0	
Total	200	100	600	200	100	400	200	100	200	1,200	

Table D.5.3.1 Present/Without-Project Condition Assumed and With-Project Conditions 1/

1. Land Use

Zone	Present/ Without-Project		With-Project					
	Paddy Field		Paddy Field		Right of Ways		Total	
	Area (ha)	%	Area (ha)	%	Area (ha)	%	Area (ha)	%
Zone-1	5,710	14	5,660	14	50	23	5,710	14
Zone-2	11,210	27	11,040	27	170	77	11,210	27
Zone-3	1,200	3	1,200	3			1,200	3
Zone-4	23,380	56	23,380	57			23,380	56
Total	41,500	100	41,280	100	220	100	41,500	100

Zone-1: Irrigated by Prek Thnot River by 80% dependability

Zone-3: Irrigated by Water Harvesting

Zone-2: Irrigated by Prek Thnot River by 50% dependability

Zone-4: Rainfed Paddy Field

2. Irrigation Status

Zone	I. Present/Without-Project							
	Irrigated Paddy Field 2/		Supplementary Irrigated 3/		Rainfed Paddy Field		Total	
	Area (ha)	%	Area (ha)	%	Area (ha)	%	Area (ha)	%
Zone-1	500	9	3,490	61	1,720	30	5,710	100
Zone-2			1,710	15	9,500	85	11,210	100
Zone-3			600	50	600	50	1,200	100
Zone-4					23,380	100	23,380	100
Total	500	1	5,800	14	35,200	85	41,500	100
Zone	2. With-Project Condition							
	Irrigated Paddy Field 2/		Supplementary Irrigated 3/		Rainfed Paddy Field		Total	
	Area (ha)	%	Area (ha)	%	Area (ha)	%	Area (ha)	%
Zone-1	500	9	5,160	91			5,660	100
Zone-2 4/	(3,200)		11,040	100			11,040	100
Zone-3			1,200	100			1,200	100
Zone-4					23,380	100	23,380	100
Total	500	1	17,400	42	23,380	57	41,280	100
Zone	Increment (2 - 1)							
	Irrigated Paddy Field 2/		Supplementary Irrigated 3/		Rainfed Paddy Field		Total	
	Area (ha)	%	Area (ha)	%	Area (ha)	%	Area (ha)	%
Zone-1		0		1,670		-1,720		-50
Zone-2				9,330		-9,500		-170
Zone-3				600		-600		0
Zone-4				0		0		0
Total		0		11,600		-11,820		-220

1/: Without-project conditions prior to the functional failure of the Roleang Chery Regulator

2/: Irrigated paddy field; irrigation water available for double cropping of rice

3/: Supplementary irrigated field in rainy season; irrigation water supply only for single cropping of rice in rainy season
Zone - 1 by 80% dependability & Zone - 2 & 3 by 50% dependability

4/: In Zone-2, irrigation for early rainy season rice in 3,200 ha & for rainy season rice in 11,040 ha possible
by 50% dependability

Table D.5.3.2 Agricultural Development Status under Present & Without-Project Conditions by Zone

Zone-1: Subject Area 5,710ha

Crops/Cropping Season	Present/Without-Project 1/				Without-Project 2/	
	Cropped Area (ha)	Crop. Intensity (%)	Crop Yield (ton/ha)	Production (ton)	Crop Yield (ton/ha)	Production (ton)
Early Rainy Season Rice						
- Early Variety (HYV)	500	9	2.40	1,200	2.40	1,200
Rainy Season Rice						
- Early Variety (HYV)						
- Medium Variety (irrigated)	3,990	70	2.10	8,379	2.10	8,379
- Medium Variety (rainfed) 2/	1,720	30	1.20	2,064	1.50	2,580
Sub-total	5,710	100		10,443		10,959
Annual Paddy	6,210	109		11,643		12,159
Upland Crop	54	0.9	0.45	24	0.45	24
Vegetable	6	0.1	9.25	56	9.25	56
Upland Crops/Vegetables Total	60	1		80		80
Total	6,270	110	-	-	-	-

Zone-2: Subject Area 11,210ha

Crops/Cropping Season	Present/Without-Project 1/				Without-Project 2/	
	Cropped Area (ha)	Crop. Intensity (%)	Crop Yield (ton/ha)	Production (ton)	Crop Yield (ton/ha)	Production (ton)
Rainy Season Rice						
- Medium Variety (irrigated)	1,710	15	2.10	3,591	2.10	3,591
- Medium Variety (rainfed) 2/	9,500	85	1.20	11,400	1.50	14,250
Sub-total	11,210	100		14,991		17,841
Annual Paddy	11,210	100		14,991		17,841
Upland Crop	100	0.9	0.45	45	0.45	45
Vegetable	10	0.1	9.25	93	9.25	93
Upland Crops/Vegetables Total	110	1		138		138
Total	11,320	101	-	-	-	-

Zone-3: Subject Area 1,200ha

Crops/Cropping Season	Present/Without-Project 1/				Without-Project 2/	
	Cropped Area (ha)	Crop. Intensity (%)	Crop Yield (ton/ha)	Production (ton)	Crop Yield (ton/ha)	Production (ton)
Rainy Season Rice						
- Medium Variety (irrigated)	600	50	2.10	1,260	2.10	1,260
- Medium Variety (rainfed) 2/	600	50	1.20	720	1.50	900
Annual Paddy	1,200	100		1,980		2,160
Upland Crop	10	2	0.45	5	0.45	5
Vegetable						
Upland Crops/Vegetables Total	10	2		5		5
Total	1,210	102	-	-	-	-

Zone-4: Subject Area 23,380ha

Crops/Cropping Season	Present/Without-Project 1/				Without-Project 2/	
	Cropped Area (ha)	Crop. Intensity (%)	Crop Yield (ton/ha)	Production (ton)	Crop Yield (ton/ha)	Production (ton)
Rainy Season Rice						
- Medium Variety (rainfed) 2/	23,380	100	1.20	28,056	1.50	35,070
Annual Paddy	23,380	100		28,056		35,070
Upland Crops/Vegetables Total	0	0				
Total	23,380	100	-	-	-	-

Overall: Overall Subject Area 41,500ha

Crops/Cropping Season	Present/Without-Project 1/				Without-Project 2/	
	Cropped Area (ha)	Crop. Intensity (%)	Crop Yield (ton/ha)	Production (ton)	Crop Yield (ton/ha)	Production (ton)
Early Rainy Season Rice						
- Early Variety (HYV)	500	1.2	2.4	1,200	2.4	1,200
Rainy Season Rice						
- Early Variety (HYV)	0			0		0
- Medium Variety (irrigated)	6,300	14	2.1	13,230	2.1	13,230
- Medium Variety (rainfed) 2/	35,200	86	1.2	42,240	1.5	52,800
Sub-total	41,500	100	1.3	55,470	1.6	66,030
Annual Paddy	42,000	101	1.3	56,670	1.6	67,230
Upland Crop	164	0.4	0.5	74	0.5	74
Vegetable	16	0.0	9.3	148	9.3	148
Upland Crops/Vegetables Total	180	0.4		222		222
Total	42,180	102	-	-	-	-

1/: Without-project conditions before the functional failure of the Roleang Chery Regulator

2/: Without-project conditions in the medium term; yield increase in rainfed field from the present 1.2t/ha to 1.5t/ha is assumed

3/: Overall paddy production under the present is estimated at 56,670 ton/year

Table D.5.3.3 Yield Estimation for With & Without-Project Conditions

1. Statistic Data: Paddy Yields in Project Communes

Province	Average Paddy Yield (ton/ha)				Remarks
	To Cropped Area		To Harvested Area		
	Rainy Season	Dry Season	Rainy Season	Dry Season	
Kampong Speu	1.4	2.4	1.7	2.6	1/
Kandal	1.8	2.8	1.9	2.8	2/
All Communes	1.6	2.4	1.7	2.4	3/

1/: Average of 2003/04 - 2004/05 2/: Average of 2000/01 - 2003/04 3/: 2003/04

Source: Kampong Speu: 2003-04: Commune Survey on Crops & Livestock, 2003, Statistic Office, MAFF; 2004-05: PDA Kandal: PDA Kandal

2. SEILA Data Base: Paddy Yields in Project Communes

Province	2002	2003	2004	Remarks
	Rainy Season	Rainy Season	Rainy Season	
Kampong Speu	1.02	1.59	0.53	Severe draught occur in the Target Area in 2004/05 cropping season
Kandal	1.80	1.54	0.99	
All Communes	1.24	1.57	0.67	

3. Results of Socio-economic Survey: Average yield 1/

Zone	Paddy Yield (ton/ha)		Irrigation Status	Remarks
	Rainy Season	Dry Season		
	Local Variety 2/	Improved Variety		
Zone-1	3/ } 2.13	2.40	Irrigated field	No. of respondents: 46
Zone-2			- Supplemental irrigation in	No. of respondents: 141
Zone-3			- rainy season	
Zone-4			- Rainfed field	No. of respondents: 124
Overall Average 4/	1.69	-	-	No. of respondents: 182

1/: Results of Socio-economic Survey conducted by the JICA Study Team

2/: No differentiation into irrigated & rainfed paddy is made

3/: Assumed yield level is similar among the categories, since irrigation conditions in rainy season similar in Category 1 to 3 are similar

4/: Note that overall average yield is nearly equal to the average yield in all communes in the statistics above

4. Results of Socio-economic Survey: Yield Distribution 1/

Irrigation Category	Paddy Yield (ton/ha)		Irrigation Status	Remarks
	Rainy Season	Dry Season		
	Local Variety	Improved Variety		
Category 1	0.7 ~ 6.0	0 ~ 6.0	Fully irrigated field	No. of respondents: 46
Category 2	1.1 ~ 6.0		- Supplemental irrigation in	No. of respondents: 141
Category 3	0 ~ 5.4		- rainy season	
Category 4	0.03 ~ 4.0		- Rainfed field	No. of respondents: 124
Overall Average	0 ~ 6.0			No. of respondents: 182

1/: Results of Socio-economic Survey conducted by the JICA Study Team

5. Yield Estimated by PDAs

Province	Management Condition	Irrigated Paddy		Rainfed Paddy
		Rainy Season	Dry Season	Rainy Season
Kampong Speu	Well managed paddy field	5.0	6.0	2.5
	Poorly managed paddy field	2.0	3.0	1.5
	Average of the two	2.0 ~ 5.0	4.5	1.5 ~ 2.5
Kandal	Well managed paddy field	4.0	5.5	4.0
	Poorly managed paddy field	1.8	2.0	1.8
	Average of the two	2.5	3.0	2.5

6. Modified SRI Results in Kampong Speu in 2005/06 Cropping Season

No. of District	No. of Village	No. of Farmers	Total Area	Yield
5	179	2,800	1,340	Estimated at > 2.5 1/

1/: Estimated by PDAs

7. Demonstration Results of CARDI Conducted in Rainfed Fields in 2005/06 Rainy Season: 5 plots in each province

Location	Yield Range	Full Practices 1/	Location	Yield Range	Full Practices 1/
Kampong Speu	1.77 ~ 3.00 t/ha	3.00 t/ha	Kampong Speu	1.68 ~ 3.16 t/ha	3.16 t/ha

1/: Yield in plot with full recommended practices of seed quality, fertilizer, pest management, land leveling

8. Estimated Yield Levels of Paddy in the Target Area under With and Without-Project

On the basis of the statistic data & results of the Socio-economic Survey, the With & Without-Project paddy yield level in the Target Area estimated as follows;

Estimated Current Yield Levels in the Target Area

	Zone-1				Zone-2				Zone-3	Zone-4
	Early Rainy Season		Rainy Season		Early Rainy Season		Rainy Season		rainy Season	rainy Season
	HYV	Medium	HYV	Medium	HYV	Medium	HYV	Medium	Medium	Medium
Present	2.40			2.10				2.10	2.10	1.20
Without Project	2.40			2.10				2.10	2.10	1.50
With Project	3.30		3.30	3.00	3.30			2.80	2.80	2.00

1/: Yield improvement assumed through the expansion of modified SRI in rainfed Area

Table D.5.4.1 Agricultural Development Plan by Zone

Zone-1: Total Irrigation Area 5,660ha

Crops/Cropping Season	I. Without Project 1/				II. With Project				Increment (II - I)			
	Cropped Area (ha)	Cropping Intensity (%)	Paddy Yield (ton)	Production (ton)	Cropped Area (ha)	Cropping Intensity (%)	Paddy Yield (ton)	Production (ton)	Cropped Area (ha)	Cropping Intensity (%)	Paddy Yield (ton)	Production (ton)
Early Rainy Season Rice												
- Early Variety (HYV)	500	9	2.40	1,200	500	9	3.30	1,650	0	0	0.9	450
Rainy Season Rice												
- Early Variety (HYV)					500	9	3.30	1,650	500	9		1,650
- Medium Variety (irrigated)	3,990	70	2.10	8,379	5,160	91	3.00	15,480	1,170	21	0.9	7,101
- Medium Variety (rainfed)	1,720	30	1.50	2,580					-1,720	-30		-2,580
Sub-total	5,710	100	1.92	10,959	5,660	100	3.03	17,130	-50	0	1.1	6,171
Annual Paddy	6,210	109	1.96	12,159	6,160	109	3.05	18,780	-50	0	1.1	6,621
Upland Crop	54	0.9	0.45	24	250	4.4	0.70	175	196	3	0.3	151
Vegetable	6	0.1	9.25	56	30	0.5	9.25	278	24	0	0	222
Upland Crops/Vegetables Total	60	1		80	280	5		453	220	4		373
Total	6,270	110			6,440	114			170	4		

Zone-2: Total Irrigation Area 11,040ha

Crops/Cropping Season	I. Without Project 1/				II. With Project				Increment (II - I)			
	Cropped Area (ha)	Cropping Intensity (%)	Paddy Yield (ton)	Production (ton)	Cropped Area (ha) /1	Cropping Intensity (%)	Paddy Yield (ton)	Production (ton)	Cropped Area (ha)	Cropping Intensity (%)	Paddy Yield (ton)	Production (ton)
Early Rainy Season Rice												
- Early Variety (HYV)					1,600	14	3.30	5,280	1,600	14		5,280
Rainy Season Rice												
- Early Variety (HYV)												
- Medium Variety (irrigated)	1,710	15	2.10	3,591	11,040	100	2.80	30,912	9,330	85	0.7	27,321
- Medium Variety (rainfed)	9,500	85	1.50	14,250					-9,500	-85		-14,250
Sub-total	11,210	100	1.59	17,841	11,040	100	2.80	30,912	-170	0	1.2	13,071
Annual Paddy	11,210	100	1.59	17,841	12,640	114	2.86	36,192	1,430	14	1.3	18,351
Upland Crop	100	0.9	0.45	45	495	4	0.70	347	395	4	0.3	302
Vegetable	10	0.1	9.25	93	55	0	9.25	509	45	0	0	416
Upland Crops/Vegetables Total	110	1		138	550	5		855	440	4		718
Total	11,320	101			13,190	119			1,870	18		

1/: Early Rainy Season: 3,200 ha can be irrigated by 50% dependability; average annual irrigated area estimated at 1,600ha for benefit evaluation purpose

Zone-3: Total Irrigation Area 1,200ha

Crops/Cropping Season	I. Without Project 1/				II. With Project				Increment (II - I)			
	Cropped Area (ha)	Cropping Intensity (%)	Paddy Yield (ton)	Production (ton)	Cropped Area (ha)	Cropping Intensity (%)	Paddy Yield (ton)	Production (ton)	Cropped Area (ha)	Cropping Intensity (%)	Paddy Yield (ton)	Production (ton)
Rainy Season Rice												
- Medium Variety (irrigated)	600	50	2.10	1,260	1,200	100	2.80	3,360	600	50	0.7	2,100
- Medium Variety (rainfed)	600	50	1.50	900					-600	-50		-900
Annual Paddy	1,200	100	1.80	2,160	1,200	100	2.80	3,360	0	0	1.0	1,200
Upland Crop	10	2	0.45	5	54	5	0.70	38	44	3	0.3	33
Vegetable					6	1	9.25	56	6	1		56
Upland Crops/Vegetables Total	10	2		5	60	5		93	50	3		89
Total	1,210	102			1,260	105			50	3		

Zone-4: Total Subject Area 23,380ha

Crops/Cropping Season	I. Without Project 1/				II. With Project				Increment (II - I)			
	Cropped Area (ha)	Cropping Intensity (%)	Paddy Yield (ton)	Production (ton)	Cropped Area (ha)	Cropping Intensity (%)	Paddy Yield (ton)	Production (ton)	Cropped Area (ha)	Cropping Intensity (%)	Paddy Yield (ton)	Production (ton)
Rainy Season Rice												
- Medium Variety (rainfed)	23,380	100	1.50	35,070	23,380	100	2.00	46,760	0	0	0.5	11,690
Annual Paddy	23,380	100	1.50	35,070	23,380	100	2.00	46,760	0	0	0.5	11,690
Upland Crop					230	1	0.45	104	230	1	0.5	104
Vegetable									0	0		0
Upland Crops/Vegetables Total	0	0			230	1		104	230	1		104
Total	23,380	100			23,610	101			230	1		

Overall: Overall Subject Area 41,280ha

Crops/Cropping Season	I. Without Project 1/				II. With Project				Increment (II - I)			
	Cropped Area (ha)	Cropping Intensity (%)	Paddy Yield (ton)	Production (ton)	Cropped Area (ha)	Cropping Intensity (%)	Paddy Yield (ton)	Production (ton)	Cropped Area (ha)	Cropping Intensity (%)	Paddy Yield (ton)	Production (ton)
Early Rainy Season Rice												
- Early Variety (HYV)	500	1.2	2.4	1,200	2,100	5	3.3	6,930	1,600	4	0.9	5,730
Rainy Season Rice												
- Early Variety (HYV)	0			0	500	1	3.3	1,650	500	1		1,650
- Medium Variety (irrigated)	6,300	15	2.1	13,230	17,400	42	2.9	49,752	11,100	27	0.8	36,522
- Medium Variety (rainfed)	35,200	85	1.5	52,800	23,380	57	2.0	46,760	-11,820	-28	0.5	-6,040
Sub-total	41,500	100	1.6	66,030	41,280	100	2.4	98,162	-220	0	0.8	32,132
Annual Paddy	42,000	101	1.6	67,230	43,380	105	2.4	105,092	1,380	4	0.8	37,862
Upland Crop	164	0	0.45	74	1,029	2	0.64	663	865	2	0.2	589
Vegetable	16	0	9.25	148	91	0	9.25	842	75	0	0	694
Upland Crops/Vegetables Total	180	0		222	1,120	3		1,505	940	2		1,283
Total	42,180	102			44,500	108			2,320	6		

1/: Without-project conditions before the functional failure of the Roleang Chery Regulator

Table D.5.4.2 Proposed Farming Practices of Rice

Farming Practices	Irrigated Field	Rainfed Field
Major rice varieties	Early Variety: Sen Pidao, IR 66 Medium Variety: Phka Rumduol, Riang Chey, Santepheap 3	Medium Variety: Phka Rumduol, Riang Chey, Other local varieties
Seeding rate (kg/ha)	30 ~ 40 kg/ha	30 ~ 40 kg/ha
Land preparation	Draft animal: 2 plow + 2 harrow	Draft animal: 2 plow + 2 harrow
Planting method	Transplanting	Transplanting
Planting distance	Depending on soil conditions & variety 20 x 20 cm (regular or line planting) 25 x 25 cm (regular or line planting)	Depending on soil conditions 25 x 25 cm (regular or line planting) 30 x 30 cm (regular or line planting)
No. of Plants/Hill	2~3 plants/hill (or less)	2~3 plants/hill (or less)
Age of seedling	Early Variety: ± 20 days (or less) Medium Variety: ± 25 days (or less)	20 ~ 30 days (or less)
Fertilization		
1st application	Timing: at time of land preparation	Timing: at time of land preparation
- Urea (kg/ha)	45 ~ 50 kg/ha	20 ~ 40kg/ha
- DAP (kg/ha)	110 ~ 115kg/ha	50 ~ 60 kg/ha
- KCl (kg/ha)	40 ~ 60 kg/ha	30 ~ 40 kg/ha
- Compost	> 1.0 ton/ha depending on availability	> 1.0 ton/ha depending on availability
2nd application	Timing: 30 ~ 45 days after transplanting	Timing: 30 ~ 45 days after transplanting
- Urea (kg/ha)	60 ~ 65 kg/ha	20 ~ 40kg/ha
Agro-chemical spray	When necessary	When necessary
Manual weeding	3 times per a cropping season	3 times per a cropping season
Harvesting	Manual	Manual
Threshing	Pedal or engine thresher	Pedal or engine thresher
Drying	Sun drying in home yard after threshing	Sun drying in home yard after threshing
Yield Level: rainy season	Well managed > 3.5 ton/ha Poorly managed 2.5 ~ 3.0 ton/ha Average 3.0 ~ 3.5 ton/ha	Well managed > 2.5 ton/ha Poorly managed 1.5 ~ 2.5 ton/ha Average 2.5 ton/ha
Yield Level: dry season	Well managed > 3.5 ton/ha Poorly managed 2.5 ~ 3.0 ton/ha Average 3.0 ~ 3.5 ton/ha	(normal year)

Source: Prepared based on recommendations of CARDI & PDA Kampong Speu & Kandal

Table D.6.1.1 Agriculture Development Plan by Project: Zone - 1

1. Irrigated Agriculture Improvement Model Project: Project Area 570 ha

Crops/Cropping Season	I. Without Project 1/				II. With Project				Increment (II - I)			
	Cropped Area (ha)	Cropping Intensity (%)	Paddy Yield (ton)	Production (ton)	Cropped Area (ha)	Cropping Intensity (%)	Paddy Yield (ton)	Production (ton)	Cropped Area (ha)	Cropping Intensity (%)	Paddy Yield (ton)	Production (ton)
Early Rainy Season Rice												
- Early Variety (HYV)	285	50	2.40	684	285	50	3.30	941	0	0	0.90	257
Rainy Season Rice												
- Early Variety (HYV)					285	50	3.30	941	285	50		941
- Medium Variety (irrigated)	575	100	2.10	1,208	285	50	3.00	855	-290	-50	0.90	-353
- Medium Variety (rainfed)									0	0		0
Sub-total	575	100	2.10	1,208	570	100	3.15	1,796	-5	0	1.05	588
Annual Paddy	860	150	2.20	1,892	855	150	3.20	2,736	-5	0	1.00	845
Upland Crop	27	4.7	0.45	12	27	5	0.70	19	0	0	0.25	7
Vegetable	3	0.5	9.25	28	3	1	9.25	28	0	0	0	0
Upland Crops/Vegetables Total	30	5.2		40	30	5		47	0	0		7
Total	890	155	-	-	885	155	-	-	-5	0	-	-

2. Upper North Main Canal Irrigated Agriculture Improvement Project: Project Area 2,210 ha

Crops/Cropping Season	I. Without Project 1/				II. With Project				Increment (II - I)			
	Cropped Area (ha)	Cropping Intensity (%)	Paddy Yield (ton)	Production (ton)	Cropped Area (ha)	Cropping Intensity (%)	Paddy Yield (ton)	Production (ton)	Cropped Area (ha)	Cropping Intensity (%)	Paddy Yield (ton)	Production (ton)
Early Rainy Season Rice												
- Early Variety (HYV)	215	10	2.40	516	215	10	3.30	710	0	0	0.90	194
Rainy Season Rice												
- Early Variety (HYV)					215	10	3.30	710	215	10		710
- Medium Variety (irrigated)	1,560	70	2.10	3,276	1,995	90	3.00	5,985	435	20	0.90	2,709
- Medium Variety (rainfed)	670	30	1.50	1,005					-670	-30		-1,005
Sub-total	2,230	100	1.92	4,281	2,210	100	3.03	6,695	-20	0	1.11	2,414
Annual Paddy	2,445	110	1.96	4,797	2,425	110	3.05	7,404	-20	0	1.09	2,607
Upland Crop	18	0.8	0.45	8	99	4.5	0.70	69	81	4	0.25	61
Vegetable	2	0.1	9.25	19	11	0.5	9.25	102	9	0	0	83
Upland Crops/Vegetables Total	20	1		27	110	5		171	90	4		144
Total	2,465	111	-	-	2,535	115	-	-	70	4	-	-

3. Upper South Main Canal Irrigated Agriculture Improvement Project: Project Area 2,880 ha

Crops/Cropping Season	I. Without Project 1/				II. With Project				Increment (II - I)			
	Cropped Area (ha)	Cropping Intensity (%)	Paddy Yield (ton)	Production (ton)	Cropped Area (ha)	Cropping Intensity (%)	Paddy Yield (ton)	Production (ton)	Cropped Area (ha)	Cropping Intensity (%)	Paddy Yield (ton)	Production (ton)
Early Rainy Season Rice												
- Early Variety (HYV)												
Rainy Season Rice												
- Early Variety (HYV)												
- Medium Variety (irrigated)	1,855	64	2.10	3,896	2,880	100	3.00	8,640	1,025	36	0.90	4,745
- Medium Variety (rainfed)	1,050	36	1.50	1,575					-1,050	-36		-1,575
Sub-total	2,905	100	1.88	5,471	2,880	100	3.00	8,640	-25	0	1.12	3,170
Annual Paddy	2,905	100	1.88	5,471	2,880	100	3.00	8,640	-25	0	1.12	3,170
Upland Crop	9	0.31	0.45	4	124	4	0.70	87	115	4	0.25	83
Vegetable	1	0.03	9.25	9	16	1	9.25	148	15	1	0	139
Upland Crops/Vegetables Total	10	0.34		13	140	5		235	130	5		222
Total	2,915	100	-	-	3,020	105	-	-	105	5	-	-

Overall: Zone - 1: Total Irrigation Command Area 5,660ha

Crops/Cropping Season	I. Without Project 1/				II. With Project				Increment (II - I)			
	Cropped Area (ha)	Cropping Intensity (%)	Paddy Yield (ton)	Production (ton)	Cropped Area (ha)	Cropping Intensity (%)	Paddy Yield (ton)	Production (ton)	Cropped Area (ha)	Cropping Intensity (%)	Paddy Yield (ton)	Production (ton)
Early Rainy Season Rice												
- Early Variety (HYV)	500	9	2.40	1,200	500	9	3.30	1,650	0	0	0.90	450
Rainy Season Rice												
- Early Variety (HYV)	0			0	500	9	3.30	1,650	500	9		1,650
- Medium Variety (irrigated)	3,990	70	2.10	8,379	5,160	91	3.00	15,480	1,170	21	0.90	7,101
- Medium Variety (rainfed)	1,720	30	1.50	2,580					-1,720	-30		-2,580
Sub-total	5,710	100	1.92	10,959	5,660	100	3.03	17,130	-50	0	1.11	6,171
Annual Paddy	6,210	109	1.96	12,159	6,160	109	3.05	18,780	-50	0	1.09	6,621
Upland Crop	54	0.9	0.45	24	250	4	0.70	175	196	3	0.25	151
Vegetable	6	0.1	9.25	56	30	1	9.25	278	24	0	0	222
Upland Crops/Vegetables Total	60	1		80	280	5		453	220	4		373
Total	6,270	110	-	-	6,440	114	-	-	170	4	-	-

1/: Without-project conditions before the functional failure of the Roleang Chery Regulator

Table D.6.1.2 Cost Estimates for Agricultural Support Services - Zone-1 - 1/3 1/

Activities	Unit	2010												2011				Overall	
		2009				2010				2011				Overall		Overall			
		Volume		Amount (US\$)		Volume		Amount (US\$)		Volume		Amount (US\$)		Volume		Amount (US\$)			
		Early Rainy Season	Rainy Season	Annual	Amount (US\$)	Early Rainy Season	Rainy Season	Annual	Amount (US\$)	Early Rainy Season	Rainy Season	Annual	Amount (US\$)	Early Rainy Season	Rainy Season	Annual	Amount (US\$)		
1. Field Programs	unit																		
1.1 Field Adaptability Test	unit	500	1	1	500	1	1	1	500										
1.2 Demonstration Plot (1.0ha)	unit	370	2	2	740	2	2	4	1,480										
- Irrigated Rice	unit	330		0	0			0	0	2	2	4	1,480	4	6	10	3,700		
- Upland Crops	unit	330		0	0			0	0			0	0			0	0		
- Vegetables	unit	330		0	0			0	0			0	0			0	0		
1.3 Demonstration Farm (5.0ha)	unit	910		0	0	1	1	2	1,820	1	1	2	1,820	2	2	4	3,640		
- Irrigated Rice	unit	2,330		0	0			0	0	1	1	2	4,660	1	1	2	4,660		
- Irrigated Rice	unit	330	1	1	330	1	1	1	330	1	1	1	330	0	3	3	990		
1.5 Seed Multiplication	unit		0	4	1,570	4	4	8	4,130	4	5	9	8,290	8	13	21	13,990		
Sub-total																			
2. Farmer/Farmer Group Training Programs	unit																		
2.1 Training Course	unit	340	1	1	340	1	1	1	340	1	1	1	340	3	0	3	1,020		
- 5 Days (30 participants)	unit	770		0	0			0	0	1	1	2	1,540	1	1	2	1,540		
2.2 FFS/IPM (50 participants)	unit	300	1	1	300	1	1	1	300	1	1	1	300	1	1	2	600		
2.3 Study Tour	unit	1,800			0				0				0				0		
2.4 VEA Training	unit				0				0				0				0		
Sub-total			1	1	2	3	1	4	2,180	3	1	4	2,180	5	2	7	3,160		
3. Mass Guidance/Workshop	unit	110		0	0				0				0				0		
3.1 50 Participants	unit				0				0				0				0		
4. Support Fund for Extension Staff	VEA	360		2	720				0				0				0		
Farmer-to-farmer Extension Support	VEA	600		1	600				0				0				0		
Field Guidance Staff	staff			3	1,320				0				0				0		
Sub-total																			
5. Staff Empowerment	unit	500			0				0				0				0		
6. Provision of Transportation Means	unit	100		2	200				0				0				0		
- Bicycle	unit	1,000		1	1,000				0				0				0		
- Motorcycle	unit			3	1200				0				0				0		
Sub-total																			
Total					4,730				7,740				10,060				22,530		

1/3: Program direct cost rounded 23,000

Table D.6.1.2 Cost Estimates for Agricultural Support Services - Zone-1 - 2/3 1/

Activities		2012						2013						2014						Overall							
		Volume		Amount (US\$)	Volume		Amount (US\$)	Volume		Amount (US\$)	Volume		Amount (US\$)	Volume		Amount (US\$)	Volume		Amount (US\$)								
		Early Rainy Season	Rainy Season		Annual	Early Rainy Season		Rainy Season	Annual		Early Rainy Season	Rainy Season		Annual	Early Rainy Season		Rainy Season	Annual		Early Rainy Season	Rainy Season	Annual					
Unit	Program Cost (US\$)																										
Unit	Program Cost (US\$)																										
unit	500	1	1	1	3	1,500	2	1	3	1,500																	
unit	370	5	5	5	9	1,850	2	7	9	3,330	1	7	8	2,960													
unit	330	0	0	0	1	330	1	1	1	330	1	1	1	330	2	0	2	660									
unit	330	0	0	0	1	330	1	1	1	330	1	1	1	330	2	0	2	660									
unit	910	0	0	0	2	1,820	1	1	2	1,820	1	1	1	910	1	2	3	2,730									
unit	2,330	0	0	0	0	0	1	1	1	2,330	1	1	1	2,330	0	1	1	2,330									
unit	330	1	1	1	3	990	1	2	3	990	1	1	1	330	1	4	5	1,650									
Sub-total		0	7	7	19	8,300	8	11	19	8,300	3	10	13	7,190	11	28	39	18,170									
2. Farmer/Farmer Group Training Programs																											
unit	340	1	1	1	2	680	2	2	2	680	1	1	1	340	4	0	4	1,360									
unit	770	0	0	0	1	770	1	1	1	770	1	1	1	770	0	2	2	1,540									
unit	300	4	4	4	5	1,500		5	5	1,500						0	9	2,700									
unit	1,800	1	1	1	1	1,800										0	1	1,800									
Sub-total		1	4	5	8	2,950	2	6	8	2,950	1	1	2	1,110	4	11	15	5,600									
3. Mass Guidance/Workshop																											
unit	110	1	1	1	1	110	1	1	1	110	2	2	2	220	4	0	4	440									
4. Support Fund for Extension Staff Farmer-to-farmer Extension Support																											
VEA	360			9	9	3,240			9	3,240			9	3,240			27	9,720									
staff	600			2	2	1,200			2	1,200			2	1,200			6	3,600									
Sub-total				11	11	4,440			11	4,440			11	4,440			33	13,320									
unit	500			1	1	500			1	500			1	500			3	1,500									
5. Staff Empowerment																											
6. Provision of Transportation Means																											
unit	100			9	9	900			9	900			9	900			9	900									
unit	1,000			2	2	2,000			2	2,000			2	2,000			2	2,000									
Sub-total				11	11	2,900			11	2,900			11	2,900			11	2,900									
Total						12,170				16,300			13,460			41,930											

rounded

Table D.6.1.2 Cost Estimates for Agricultural Support Services - Zone-1 - 3/3 1/

3. Upper South Main Canal Irrigated Agriculture Improvement Project: Project Area 2,880ha & 58 villages

Activities	Unit	Unit Cost (US\$)	2012			2013			2014			2015			Overall							
			Volume			Volume			Volume			Volume			Volume							
			Early Rainy Season	Rainy Season	Annual	Early Rainy Season	Rainy Season	Annual	Early Rainy Season	Rainy Season	Annual	Early Rainy Season	Rainy Season	Annual	Early Rainy Season	Rainy Season	Annual	Amount (US\$)				
1. Field Programs																						
1.1 Field Adaptability Test	unit	500	2		2	4	4	2,000			0											
1.2 Demonstration Plot (1.0ha)																						
- Irrigated Rice	unit	370	5		5	8	2,960			8	8	2,960										
- Upland Crops	unit	330			0	1	330			1	1	330										
- Vegetables	unit	330			0	1	330			1	1	330										
1.3 Demonstration Farm (5.0ha)																						
- Irrigated Rice	unit	910			0	1	910			1	1	910										
1.4 Demonstration Area (20ha)																						
- Irrigated Rice	unit	2,330	1		0		0			1	1	2,330										
1.5 Seed Multiplication	unit	330	1		1	2	660			2	2	660										
Sub-total			0	8	8	15	17	7,190	2	12	14	7,520	2	11	13	7,190	6	46	52	25,080		
2. Farmer/Farmer Group Training Programs																						
2.1 Training Course																						
- 5 Days (30 participants)	unit	340	2		2	4	1,360			0	0	0										
2.2 FFS/IFPM (50 participants)	unit	770	1		1	1	770			0	0	0										
2.3 Study Tour	unit	300	3		3	4	1,200			4	4	1,200										
2.4 VEA Training																						
- 10 Participants	unit	1,800	1		1	1	1,800															
Sub-total			2	4	6	5	9	3,330	4	4	4	1200	0	0	0	0	0	6	13	19	6,880	
3. Mass Guidance/Workshop																						
3.1 50 Participants	unit	110	3		3	3	330															
3.2 100 Participants	unit	190																				
Sub-total			3	0	3	3	330	3	0	0	0	0	0	0	0	0	0	6	0	0	660	
4. Support Fund for Extension Staff																						
Farmer-to-farmer Extension Support	VEA	360			12		4,320			12	4,320											
Field Guidance Staff	staff	600			2		1,200			2	1,200											
Sub-total					14		5,520			14	5,520											
5. Staff Empowerment	unit	500			1		500			1	500											
6. Provision of Transportation Means																						
- Bicycle	unit	100			12		1,200															
- Motorcycle	unit	1,000			2		2,000															
Sub-total					14		3,200			0	0											
Total							15,080				16,870					14,740					7,190	

1/ Program direct cost rounded 54,000

Table D.6.1.3 Agriculture Development Plan by Project: Zone-2

1. Lower North Main Canal Irrigated Agriculture Improvement Project: Project Area 1,390ha

Crops/Cropping Season	I. Without Project 1/				II. With Project				Increment (II - I)			
	Cropped Area (ha)	Cropping Intensity (%)	Paddy Yield (ton)	Production (ton)	Cropped Area (ha) 2/	Cropping Intensity (%)	Paddy Yield (ton)	Production (ton)	Cropped Area (ha)	Cropping Intensity (%)	Paddy Yield (ton)	Production (ton)
Early Rainy Season Rice					200	14	3.30	660	200	14		660
- Early Variety (HYV)												
Rainy Season Rice												
- Medium Variety (irrigated)	550	39	2.10	1,155	1,390	100	2.80	3,892	840	61	0.7	2,737
- Medium Variety (rainfed)	850	61	1.50	1,275					-850	-61		-1,275
Sub-total	1,400	100	1.74	2,430	1,390	100	2.80	3,892	-10	0	1.1	1,462
Annual Paddy	1,400	100	1.74	2,430	1,590	114	2.86	4,552	190	14	1.1	2,122
Upland Crop	8	0.6	0.45	4	63	5	0.70	44	55	4	0.3	41
Vegetable	2	0.1	9.25	19	7	1	9.25	65	5	0	0	46
Upland Crops/Vegetables Total	10	1		22	70	5		109	60	4		87
Total	1,410	101	-	-	1,660	119	-	-	250	19	-	-

2. Lower South Main Canal Irrigated Agriculture Improvement Project: Project Area 6,750ha

Crops/Cropping Season	I. Without Project 1/				II. With Project				Increment (II - I)			
	Cropped Area (ha)	Cropping Intensity (%)	Paddy Yield (ton)	Production (ton)	Cropped Area (ha) 2/	Cropping Intensity (%)	Paddy Yield (ton)	Production (ton)	Cropped Area (ha)	Cropping Intensity (%)	Paddy Yield (ton)	Production (ton)
Early Rainy Season Rice					1,000	15	3.30	3,300	1,000	15		3,300
- Early Variety (HYV)												
Rainy Season Rice												
- Medium Variety (irrigated)					6,750	100	2.80	18,900	6,750	100	2.8	18,900
- Medium Variety (rainfed)	6,880	100	1.50	10,320					-6,880	-100		-10,320
Sub-total	6,880	100	1.50	10,320	6,750	100	2.80	18,900	-130	0	1.3	8,580
Annual Paddy	6,880	100	1.50	10,320	7,750	115	2.86	22,200	870	15	1.4	11,880
Upland Crop	74	1	0.45	33	297	4	0.70	208	223	3	0.3	175
Vegetable	6	0	9.25	56	33	0.5	9.25	305	27	0	0	250
Upland Crops/Vegetables Total	80	1		89	330	5		513	250	4		424
Total	6,960	101	-	-	8,080	120	-	-	1,120	19	-	-

3. Ou Krang Ambel Irrigated Agriculture Improvement Project: Project Area 2,900ha

Crops/Cropping Season	I. Without Project 1/				II. With Project				Increment (II - I)			
	Cropped Area (ha)	Cropping Intensity (%)	Paddy Yield (ton)	Production (ton)	Cropped Area (ha) 2/	Cropping Intensity (%)	Paddy Yield (ton)	Production (ton)	Cropped Area (ha)	Cropping Intensity (%)	Paddy Yield (ton)	Production (ton)
Early Rainy Season Rice					400	14	3.30	1,320	400	14		1,320
- Early Variety (HYV)												
Rainy Season Rice												
- Medium Variety (irrigated)	1,160	40	2.10	2,436	2,900	100	2.80	8,120	1,740	60	0.7	5,684
- Medium Variety (rainfed)	1,770	60	1.50	2,655					-1,770	-60		-2,655
Sub-total	2,930	100	1.74	5,091	2,900	100	2.80	8,120	-30	0	1.1	3,029
Annual Paddy	2,930	100	1.74	5,091	3,300	114	2.86	9,440	370	14	1.1	4,349
Upland Crop	18	1	0.45	8	135	5	0.70	95	117	4	0.3	86
Vegetable	2	0.1	9.25	19	15	1	9.25	139	13	0	0	120
Upland Crops/Vegetables Total	20	1		27	150	5		233	130	4		207
Total	2,950	101	-	-	3,450	119	-	-	500	18	-	-

Overall Zone-2: Total Irrigation Command Area 11,040ha

Crops/Cropping Season	I. Without Project 1/				II. With Project				Increment (II - I)			
	Cropped Area (ha)	Cropping Intensity (%)	Paddy Yield (ton)	Production (ton)	Cropped Area (ha) 2/	Cropping Intensity (%)	Paddy Yield (ton)	Production (ton)	Cropped Area (ha)	Cropping Intensity (%)	Paddy Yield (ton)	Production (ton)
Early Rainy Season Rice					1,600	14	3.30	5,280	1,600	14		5,280
- Early Variety (HYV)												
Rainy Season Rice					0			0				
- Medium Variety (irrigated)	1,710	15	2.10	3,591	11,040	100	2.80	30,912	9,330	85	0.7	27,321
- Medium Variety (rainfed)	9,500	85	1.50	14,250					-9,500	-85		-14,250
Sub-total	11,210	100	1.59	17,841	11,040	100	2.80	30,912	-170	0	1.2	13,071
Annual Paddy	11,210	100	1.59	17,841	12,640	114	2.86	36,192	1,430	14	1.3	18,351
Upland Crop	100	1	0.45	45	495	4	0.70	347	395	4	0.3	302
Vegetable	10	0	9.25	93	55	0	9.25	509	45	0	0	416
Upland Crops/Vegetables Total	110	1		138	550	5		855	440	4		718
Total	11,320	101	-	-	13,190	119	-	-	1,870	18	-	-

1/: Without-project conditions before the functional failure of the Roleang Chery Regulator

2/: Early Rainy Season: 400 ha, 800ha & 2,000 ha can be irrigated by 50% dependability; average annual irrigated area estimated at 200 ha, 400 ha & 1,000 ha for benefit evaluation purpose

Table D.6.1.4 Cost Estimates for Agricultural Support Services - Zone-2 1/3 1/

1. Lower North Main Canal Irrigated Agriculture Improvement Project: Project 1,390ha & 28 villages		2014												Overall					
		2013				2014				Volume				Volume			Amount (US\$)		
Unit	Unit	Program Cost (US\$)	Early Rainy Season	Rainy Season	Annual	Amount (US\$)	Early Rainy Season	Rainy Season	Annual	Amount (US\$)	Early Rainy Season	Rainy Season	Annual	Amount (US\$)	Early Rainy Season	Rainy Season	Annual	Amount (US\$)	
1. Field Programs		500	1	2	3	1,500	1	1	2	1,000				0	2	3	5	2,500	
1.1 Field Adaptability Test																			
1.2 Demonstration Plot (1.0ha)																			
- Irrigated Rice		370	2	7	9	3,330		7	7	2,590				0	2	14	16	5,920	
- Upland Crops		330	1		1	330	1		1	330				0	2	0	2	660	
- Vegetables		330			0	0	1		1	330				0	1	0	1	330	
1.3 Demonstration Farm (5.0ha)																			
- Irrigated Rice		910			0	0		1	1	910				0	0	1	1	910	
1.4 Demonstration Area (20ha)																			
- Irrigated Rice		2,330			0	0			0	0				0	0	0	0	0	
1.5 Seed Multiplication		330		1	1	330		2	2	660				0	0	3	3	990	
Sub-total			4	10	14	5,490	3	11	14	5,820	0	0	0	0	7	21	28	11,310	
2. Farmer/Farmer Group Training Programs																			
2.1 Training Course																			
- 5 Days (30 participants)		340	1		1	340	2		2	680				0	3	0	3	1,020	
2.2 FFS/IPM (50 participants)		770			0	0		1	1	770				0	0	1	1	770	
2.3 Study Tour		300		3	3	900		2	2	600				0	0	5	5	1,500	
2.4 VEA Training																			
- 25 Participants		3,000			1	1,800								0	0	1	1	1,800	
- 10 Participants		1,800		4	5	3,040	2	3	5	2,050	0	0	0	0	3	7	10	5,090	
Sub-total			1	4	5	3,040	2	3	5	2,050	0	0	0	0	3	7	10	5,090	
3. Mass Guidance/Workshop																			
3.1 50 Participants		110	2		2	220	1		1	110				0	3	0	3	330	
3.2 100 Participants		190			0	0	3		2	600				0	0	0	0	0	
Sub-total			2	0	2	220	1	0	1	110	0	0	0	0	3	0	3	330	
4. Support Fund for Extension Staff																			
Farmer-to-farmer Extension Support		360			6	2,160			6	2,160				0					
Field Guidance Staff		600		1	1	600		1	1	600				0					
Sub-total				7	7	2,760		7	7	2,760				0					
5. Staff Empowerment		250		1	1	250		1	1	250				0					
6. Provision of Transportation Means																			
- Bicycle		100			6	600													
- Motorcycle		1,000		1	1,000														
Sub-total				7	7	1,600			0	0				0	0	0	7	1,600	
Total						13,360				10,990								24,350	
1/ Program direct cost																		24,000 rounded	

Table D.6.1.4 Cost Estimates for Agricultural Support Services - Zone-2 2/3 1/

2. Lower South Main Canal Irrigated Agriculture Improvement Project: Project Area 6,750ha & 135 villages																			
Activities	Unit	Unit Program Cost (US\$)	2013			2014			2015			Overall							
			Volume			Volume			Volume			Volume							
			Early Rainy Season	Rainy Season	Annual	Amount (US\$)	Early Rainy Season	Rainy Season	Annual	Amount (US\$)	Early Rainy Season	Rainy Season	Annual	Amount (US\$)	Early Rainy Season	Rainy Season	Annual	Amount (US\$)	
1. Field Programs																			
1.1 Field Adaptability Test	unit	500	1	3	4	2,000	1	5	6	3,000									
1.2 Demonstration Plot (1.0ha)																			
- Irrigated Rice	unit	370	5	15	20	7,400	2	20	23	8,510									
- Upland Crops	unit	330	2		2	660			2	660									
- Vegetables	unit	330	1		1	330	3		3	990									
1.3 Demonstration Farm (5.0ha)																			
- Irrigated Rice	unit	910		1	1	910		2	2	1,820									
1.4 Demonstration Area (20ha)																			
- Irrigated Rice	unit	2,330			0	0		1	1	2,330									
1.5 Seed Multiplication	unit	330	3	3	3	990	3	3	3	990									
Sub-total			9	22	31	12,290	6	31	37	17,190	8	28	36	18,540	23	81	104	48,020	
2. Farmer/Farmer Group Training Programs																			
2.1 Training Course																			
- 5 Days (30 participants)	unit	340	3		3	1,020	5		5	1,700									
2.2 FFS/IFM (50 participants)	unit	770		2	2	1,540		2	2	1,540									
2.3 Study Tour	unit	300		9	9	2,700		9	9	2,700									
2.4 VEA Training																			
- 25 Participants	unit	3,000		1	1	3,000													
- 10 Participants	unit	1,800			0	0													
Sub-total			3	12	15	8,260	5	11	16	5,940	5	11	16	5,940	13	34	47	20,140	
3. Mass Guidance/Workshop																			
3.1 50 Participants	unit	110	4		4	440	4		4	440									
3.2 100 Participants	unit	190		0	0	0		0	0	0									
Sub-total			4	0	4	440	4	0	4	440	5	0	5	550	13	0	13	1,430	
4. Support Fund for Extension Staff Farmer-to-farmer Extension Support	VEA	360			27	9,720			27	9,720									
Field Guidance Staff	staff	600			3	1,800			3	1,800									
Sub-total					30	11,520			30	11,520									
5. Staff Empowerment	unit	500			2	1,000			2	1,000									
6. Provision of Transportation Means																			
- Bicycle	unit	100			27	2,700			27	2,700									
- Motorcycle	unit	1,000			3	3,000			3	3,000									
Sub-total					30	5,700			30	5,700									
Total						39,210				36,090									
1/ Program direct cost														37,550					112,850
																			rounded 113,000

Table D.6.1.4 Cost Estimates for Agricultural Support Services - Zone-2 3/3 1/

3. Ou Krang Ambel Irrigated Agriculture Improvement Project: Project Area 2,900ha & 58 villages																	
2013											2014			Overall			
Activities	Unit	Unit Program Cost (US\$)	Volume			Amount (US\$)	Volume			Amount (US\$)	Volume			Amount (US\$)			
			Early Rainy Season	Rainy Season	Annual		Early Rainy Season	Rainy Season	Annual		Early Rainy Season	Rainy Season	Annual				
1. Field Programs																	
1.1 Field Adaptability Test	unit	500	1	3	4	2,000		2	2	1,000		0	0	1	5	6	3,000
1.2 Demonstration Plot (1.0ha)	unit	370	4	10	14	5,180		10	10	3,700		0	0	4	20	24	8,880
- Irrigated Rice	unit	330	2		2	660	1		1	330		0	0	3	0	3	990
- Upland Crops	unit	330			0	0	3		3	990		0	0	3	0	3	990
- Vegetables	unit																
1.3 Demonstration Farm (5.0ha)	unit	910			0	0		3	3	2,730		0	0	0	3	3	2,730
- Irrigated Rice	unit				0	0											
1.4 Demonstration Area (20ha)	unit	2,330			0	0		1	1	2,330		0	0	0	1	1	2,330
- Irrigated Rice	unit	330	7	15	22	8,500	4	19	23	12,070	0	0	0	11	34	45	20,570
1.5 Seed Multiplication	unit																
Sub-total																	
2. Farmer/Farmer Group Training Programs																	
2.1 Training Course	unit	340	2		2	680	4		4	1,360							
- 5 Days (30 participants)	unit	770			1	770			1	770		1	1	6	0	6	2,040
2.2 FFS/IPM (50 participants)	unit	300			6	1,800		6	6	1,800				0	3	3	2,310
2.3 Study Tour	unit													0	12	12	3,600
2.4 VEA Training	unit	3,000			1	1,800								0	0	0	0
- 25 Participants	unit	1,800			1	1,800								0	1	1	1,800
- 10 Participants	unit													0	0	0	0
Sub-total			2	8	10	5,050	4	7	11	3,930	0	1	1	6	16	22	9,750
3. Mass Guidance/Workshop																	
3.1 50 Participants	unit	110	3		3	330	3		3	330				6	0	6	660
3.2 100 Participants	unit	190												0	0	0	0
Sub-total			3	0	3	330	3	0	3	330	0	0	0	6	0	6	660
4. Support Fund for Extension Staff Farmer-to-farmer Extension Support	VEA	360			12	4,320			12	4,320						24	8,640
Field Guidance Staff	staff	600			3	1,800			3	1,800						6	3,600
Sub-total					15	6,120			15	6,120						30	12,240
5. Staff Empowerment	unit	500			1	500			1	500						3	1,500
6. Provision of Transportation Means																	
- Bicycle	unit	100			12	1,200											1,200
- Motorcycle	unit	1,000			3	3,000											3,000
Sub-total					15	4,200			0	0				0	0	15	4,200
Total						24,700				22,950				1,270			48,920
1/: Program direct cost																	rounded 49,000

Table D.6.1.5 Agricultural Development Plan by Project: Zone - 3, Zone-4 & Overall Projects

Zone-3: Project Area 1,200ha

Crops/Cropping Season	I. Without Project 1/				II. With Project				Increment (II - I)			
	Cropped Area (ha)	Cropping Intensity (%)	Paddy Yield (ton)	Production (ton)	Cropped Area (ha)	Cropping Intensity (%)	Paddy Yield (ton)	Production (ton)	Cropped Area (ha)	Cropping Intensity (%)	Paddy Yield (ton)	Production (ton)
Rainy Season Rice												
- Medium Variety (irrigated)	600	50	2.10	1,260	1,200	100	2.80	3,360	600	50	0.7	2,100
- Medium Variety (rainfed)	600	50	1.50	900					-600	-50		-900
Annual Paddy	1,200	100	1.80	2,160	1,200	100	2.80	3,360	0	0	1.0	1,200
Upland Crop	10	1	0.45	5	54	5	0.70	38	44	4	0.3	33
Vegetable					6	1	9.25	56	6	1		56
Upland Crops/Vegetables Total	10	1		5	60	5		93	50	4		89
Total	1,210	101	-	-	1,260	105	-	-	50	4	-	-

1/: Without-project conditions before the functional failure of the Roleang Chery Regulator

Zone-4: Project Area 23,380ha

Crops/Cropping Season	I. Without Project 1/				II. With Project				Increment (II - I)			
	Cropped Area (ha)	Cropping Intensity (%)	Paddy Yield (ton)	Production (ton)	Cropped Area (ha)	Cropping Intensity (%)	Paddy Yield (ton)	Production (ton)	Cropped Area (ha)	Cropping Intensity (%)	Paddy Yield (ton)	Production (ton)
Rainy Season Rice												
- Medium Variety (rainfed)	23,380	100	1.50	35,070	23,380	97	2.00	46,760	0	-3	0.5	11,690
Annual Paddy	23,380	100	1.50	35,070	23,380	97	2.00	46,760	0	-3	0.5	11,690
Upland Crop					230	1	0.45	104	230	1		104
Vegetable									0	0		0
Upland Crops/Vegetables Total	0	0			230	1		104	230	1		104
Total	23,380	100	-	-	23,610	98	-	-	230	-2	-	-

1/: Without-project conditions before the functional failure of the Roleang Chery Regulator

Overall: Overall Project Area 41,280ha

Crops/Cropping Season	I. Without Project 1/				II. With Project				Increment (II - I)			
	Cropped Area (ha)	Cropping Intensity (%)	Paddy Yield (ton)	Production (ton)	Cropped Area (ha)	Cropping Intensity (%)	Paddy Yield (ton)	Production (ton)	Cropped Area (ha)	Cropping Intensity (%)	Paddy Yield (ton)	Production (ton)
Early Rainy Season Rice												
- Early Variety (HYV)	500	1.2	2.4	1,200	2,100	5	3.3	6,930	1,600	4	0.9	5,730
Rainy Season Rice												
- Early Variety (HYV)	0			0	500	1	3.3	1,650	500	1		1,650
- Medium Variety (irrigated)	6,300	15	2.1	13,230	17,400	42	2.9	49,752	11,100	27	0.8	36,522
- Medium Variety (rainfed)	35,200	85	1.5	52,800	23,380	57	2.0	46,760	-11,820	-28	0.5	-6,040
Sub-total	41,500	100	1.6	66,030	41,280	100	2.4	98,162	-220	0	0.8	32,132
Annual Paddy	42,000	101	1.6	67,230	43,380	105	2.4	105,092	1,380	4	0.8	37,862
Upland Crop	164	0	0.45	74	1,029	2	0.64	663	865	2	0.2	589
Vegetable	16	0	9.25	148	91	0	9.25	842	75	0	0	694
Upland Crops/Vegetables Total	180	0		222	1,120	3		1,505	940	2		1,283
Total	42,180	102	-	-	44,500	108	-	-	2,320	6	-	-

1/: Without-project conditions before the functional failure of the Roleang Chery Regulator

Table D.6.1.6 Cost Estimates for Agricultural Support Services - Zone-3 1/

Zone-3: Project Area 1,200ha	Activities	Unit	Program Cost (US\$)	2008			2009			2010			2011			2012			2013			Overall				
				Volume			Volume			Volume			Volume			Volume			Volume			Volume				
				Early Rainy Season	Rainy Season	Annual	Early Rainy Season	Rainy Season	Annual	Amount (US\$)	Early Rainy Season	Rainy Season	Annual	Amount (US\$)	Early Rainy Season	Rainy Season	Annual	Amount (US\$)	Early Rainy Season	Rainy Season	Annual	Amount (US\$)	Early Rainy Season	Rainy Season	Annual	Amount (US\$)
1. Field Programs																										
1.1 Field Adaptability Test																										
1.2 Demonstration Plot (1.0ha)																										
- Irrigated Rice	unit	500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
- Upland Crops	unit	370	2	740	2	740	2	740	2	740	2	740	2	740	2	740	2	740	2	740	2	740	2	740	2	740
- Vegetables	unit	330	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.3 Demonstration Farm (5.0ha)																										
- Irrigated Rice	unit	910	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.4 Demonstration Area (20ha)																										
- Irrigated Rice	unit	2,330	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.5 Seed Multiplication	unit	330	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sub-total			0	2	2	740	0	2	2	740	0	2	2	740	0	2	2	740	0	2	2	740	0	2	2	740
2. Farmer/Farmer Group Training Programs																										
2.1 Training Course																										
- 5 Days (30 participants)	unit	340	1	340	1	340	1	340	1	340	1	340	1	340	1	340	1	340	1	340	1	340	1	340	1	340
2.2 FFS/PM (50 participants)	unit	770	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.3 Study Tour	unit	300	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.4 VEA Training																										
- 25 Participants	unit	3,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
- 10 Participants	unit	1,800	1	1,800	1	1,800	1	1,800	1	1,800	1	1,800	1	1,800	1	1,800	1	1,800	1	1,800	1	1,800	1	1,800	1	1,800
Sub-total			0	1	1	340	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3. Mass Guidance/Workshop																										
3.1 50 Participants	unit	110	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.2 100 Participants	unit	190	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sub-total			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4. Support Fund for Extension Staff																										
Farmer-to-farmer Extension Support	VEA	360	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Field Guidance Staff	staff	600	1	600	1	600	1	600	1	600	1	600	1	600	1	600	1	600	1	600	1	600	1	600	1	600
Sub-total			0	1	1	600	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5. Staff Empowerment																										
Provision of Transportation Means																										
- Bicycle	unit	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
- Motorcycle	unit	1,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sub-total			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total			0	2	2	1,680	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1/ Program direct cost			1,680			1,680				2,180				2,020				2,520				1,420				11,500

rounded 12,000

Table D.6.1.7 PDM for Rainfed Agricultural Improvement Project

(Target Group: Farmers in Zone-4)

Narrative Summary	Objectively Verifiable Indicator	Means of Verification	Important Assumption
Overall Goal Agricultural productivity centering rice is improved in the Target Area	1-1 Agricultural productivity in the Target Area is improved as proposed in the Master Plan by year 201	1-1 Agricultural statistics	/
Project Purpose Rice productivity in the project area is improved	1-1 Rice productivity in the project area is improved as proposed in the Master Plan	1-1 Agricultural statistics	All the proposed activities in the Master Plan in post-project stage are implemented as scheduled No significant climatic change
Outputs 1 Strategy to improve rainfed agriculture in the Target Area is set 2 Capacity of related organizations on rainfed agriculture is strengthened 3 Further improved rainfed rice production system is developed and disseminated in the Target Area	1-1 Prepared strategy is appreciated by well informed experts 2-1 No. of trained staff of related organizations 3-1 Rice production from rainfed area in the Target Area 3-2 No. of villages applying the further improved rice production system	1-1 Minutes of steering committee meetings 2-1 Record of training 3-1 Agricultural statistics 3.2 Monitoring survey	There are no significant changes in supply demand balance and prices of rice There is no significant hike in farm input prices No significant climatic change in the project period
Activities 1-1 To formulate Annual Work Plan for strengthening agricultural support services 2-1 To implement capacity building of local authorities, NGOs and other stakeholders 2-2 To support formation of farmer groups 2-3 To train & deploy village extension agents to villages 2-4 To strengthen agricultural support services including farmer group empowerment in the Project Area 3-1 To develop further improved rainfed rice production system 3-2 To verify adoptability of the improved rainfed rice production system with participation of farmers (including plot demonstration) 3-3 To disseminate the further improved rainfed rice production system to farmers/farmer groups in a pilot scale (including area demonstration) 3-4 To disseminate the further improved rainfed rice production system in the Project Area through strengthening of support services 3-5 To implement field guidance & monitoring on further improved rainfed rice production system continuously	<p style="text-align: center;">Input</p> <p style="text-align: center;">Donor Cambodia</p> Foreign/Local Consultant/ NGO Team Leader (rice agronomist) Co-team Leader Extension Farmer Organization Other experts Project Cost	Provincial government Counterparts from PDA Central government Counterparts from MAFF CARDI Counterparts from CARDI Part of project cost NGO Facilitators Office spaces, training & extension facilities	Continuous involvement of related government agencies during the project period Precondition High need for rice production in the Target Area Good understanding of related organizations on the Master Plan and importance of rice production Related proposed activities in the Master Plan in pre-project stage are implemented as scheduled

Table D.6.1.8 Implementation Schedule for Rainfed Agriculture Improvement Project

Activities	Expected Results	Year					In-charge Project
		2008	2009	2010	2011	2012	
(1) Capacity building of local authorities, NGOs and other stakeholders	Local authorities, NGOs and other stakeholders are trained & involved in or provide support to the Project						Project
(2) Baseline survey	Present agricultural & socio-economic conditions identified						PDA/DAO/CARD/NGO Project
(3) Formulation of Annual Work Plan	Formulation of Annual Work Plan						PDA/DAO/NGO Project
(4) Farmer groups formation	Small scale farmer groups formed as target groups of extension						PDA Project
(5) Training & deployment of village extension agents (VEAs) to villages	VEAs are trained and deployed at village level						PDA/DAO/NGO Project
(6) Strengthening of agricultural support services in the Project Area	Strengthened agricultural support services in the Project Area						PDA/DAO/CARD/NGO Project
(7) Adaptability test /technology development of improved rainfed rice production system	Adaptability of improved rainfed rice production system is confirmed						MAFF/PDA Project
(8) Verification of adaptability of the improved rainfed rice production system in farmers field with participation of farmers (including plot demonstration)	Improved rainfed rice production system verified in farmers fields with participation of farmers						PDA/DAO/CARD/NGO Project
(9) Dissemination of the verified improved rainfed rice production system to farmers/farmer groups in a pilot scale through strengthening of support services	Dissemination of improved production system in a pilot scale						PDA/DAO/CARD/NGO Project
(10) Dissemination of the improved rainfed rice production system in the Project Area through strengthening of support services	Dissemination of improved production system in the Project						Project PDA/DAO/NGO Project
(11) Field guidance & monitoring by PDA/DAO staffs	Continuous field guidance by PDA/DAO staffs						PDA/DAO Project

Table D.6.1.10 Overall Agricultural Development Plan under Master Plan - 1/2

Zone-1

1. Irrigated Agriculture Improvement Model Project: Project Area 570 ha

Crops/Cropping Season	I. Without Project 1/				II. With Project				Increment (II - I)		
	Cropped Area (ha)	Cropping Intensity (%)	Paddy Yield (ton)	Production (ton)	Cropped Area (ha)	Cropping Intensity (%)	Paddy Yield (ton)	Production (ton)	Cropped Area (ha)	Paddy Yield (ton)	Production (ton)
Early Rainy Season Rice	285	50	2.40	684	285	50	3.30	941	0	0.90	257
Rainy Season Rice	575	100	2.10	1,208	570	100	3.15	1,796	-5	1.05	588
Annual Paddy	860	150	2.20	1,892	855	150	3.20	2,736	-5	1.00	845
Upland Crops/Vegetables Total	30	5.2		40	30	5		47	0		7
Total	890	155	-	-	885	155	-	-	-5	-	-

2. Upper North Main Canal Irrigated Agriculture Improvement Project: Project Area 2,210 ha

Crops/Cropping Season	I. Without Project 1/				II. With Project				Increment (II - I)		
	Cropped Area (ha)	Cropping Intensity (%)	Paddy Yield (ton)	Production (ton)	Cropped Area (ha)	Cropping Intensity (%)	Paddy Yield (ton)	Production (ton)	Cropped Area (ha)	Paddy Yield (ton)	Production (ton)
Early Rainy Season Rice	215	10	2.40	516	215	10	3.30	710	0	0.90	194
Rainy Season Rice	2,230	100	1.92	4,281	2,210	100	3.03	6,695	-20	1.11	2,414
Annual Paddy	2,445	110	1.96	4,797	2,425	110	3.05	7,404	-20	1.09	2,607
Upland Crops/Vegetables Total	20	1		27	110	5		171	90		144
Total	2,465	111	-	-	2,535	115	-	-	70	-	-

3. Upper South Main Canal Irrigated Agriculture Improvement Project: Project Area 2,880 ha

Crops/Cropping Season	I. Without Project 1/				II. With Project				Increment (II - I)		
	Cropped Area (ha)	Cropping Intensity (%)	Paddy Yield (ton)	Production (ton)	Cropped Area (ha)	Cropping Intensity (%)	Paddy Yield (ton)	Production (ton)	Cropped Area (ha)	Paddy Yield (ton)	Production (ton)
Early Rainy Season Rice											
Rainy Season Rice	2,905	100	1.88	5,471	2,880	100	3.00	8,640	-25	1.12	3,170
Annual Paddy	2,905	100	1.88	5,471	2,880	100	3.00	8,640	-25	1.12	3,170
Upland Crops/Vegetables Total	10	0.34		13	140	5		235	130		222
Total	2,915	100	-	-	3,020	105	-	-	105	-	-

Overall: Zone - 1: Total Irrigation Command Area 5,660ha

Crops/Cropping Season	I. Without Project 1/				II. With Project				Increment (II - I)		
	Cropped Area (ha)	Cropping Intensity (%)	Paddy Yield (ton)	Production (ton)	Cropped Area (ha)	Cropping Intensity (%)	Paddy Yield (ton)	Production (ton)	Cropped Area (ha)	Paddy Yield (ton)	Production (ton)
Early Rainy Season Rice	500	9	2.40	1,200	500	9	3.30	1,650	0	0.90	450
Rainy Season Rice	5,710	100	1.92	10,959	5,660	100	3.03	17,130	-50	1.11	6,171
Annual Paddy	6,210	109	1.96	12,159	6,160	109	3.05	18,780	-50	1.09	6,621
Upland Crops/Vegetables Total	60	1		80	280	5		453	220		373
Total	6,270	110	-	-	6,440	114	-	-	170	-	-

Zone-2

1. Lower North Main Canal Irrigated Agriculture Improvement Project: Project Area 1,390ha

Crops/Cropping Season	I. Without Project 1/				II. With Project				Increment (II - I)		
	Cropped Area (ha)	Cropping Intensity (%)	Paddy Yield (ton)	Production (ton)	Cropped Area (ha) 2/	Cropping Intensity (%)	Paddy Yield (ton)	Production (ton)	Cropped Area (ha)	Paddy Yield (ton)	Production (ton)
Early Rainy Season Rice					200	14	3.30	660	200		660
Rainy Season Rice	1,400	100	1.74	2,430	1,390	100	2.80	3,892	-10	1.1	1,462
Annual Paddy	1,400	100	1.74	2,430	1,590	114	2.86	4,552	190	1.1	2,122
Upland Crops/Vegetables Total	10	1		22	70	5		109	60		87
Total	1,410	101	-	-	1,660	119	-	-	250	-	-

2. OU Krang Ambel Irrigated Agriculture Improvement Project: Project Area 2,900ha

Crops/Cropping Season	I. Without Project 1/				II. With Project				Increment (II - I)		
	Cropped Area (ha)	Cropping Intensity (%)	Paddy Yield (ton)	Production (ton)	Cropped Area (ha) 2/	Cropping Intensity (%)	Paddy Yield (ton)	Production (ton)	Cropped Area (ha)	Paddy Yield (ton)	Production (ton)
Early Rainy Season Rice					400	14	3.30	1,320	400		1,320
Rainy Season Rice	2,930	100	1.74	5,091	2,900	100	2.80	8,120	-30	1.1	3,029
Annual Paddy	2,930	100	1.74	5,091	3,300	114	2.86	9,440	370	1.1	4,349
Upland Crops/Vegetables Total	20	1		27	150	5		233	130		207
Total	2,950	101	-	-	3,450	119	-	-	500	-	-

Table D.6.1.10 Overall Agricultural Development Plan under Master Plan - 2/2

Zone-2 - continued

3. Lower South Main Canal Irrigated Agriculture Improvement Project: Project Area 6,750ha

Crops/Cropping Season	I. Without Project 1/				II. With Project				Increment (II - I)		
	Cropped Area (ha)	Cropping Intensity (%)	Paddy Yield (ton)	Production (ton)	Cropped Area (ha) 2/	Cropping Intensity (%)	Paddy Yield (ton)	Production (ton)	Cropped Area (ha)	Paddy Yield (ton)	Production (ton)
Early Rainy Season Rice					1,000	15	3.30	3,300	1,000		3,300
Rainy Season Rice	6,880	100	1.50	10,320	6,750	100	2.80	18,900	-130	1.3	8,580
Annual Paddy	6,880	100	1.50	10,320	7,750	115	2.86	22,200	870	1.4	11,880
Upland Crops/Vegetables Total	80	1		89	330	5		513	250		424
Total	6,960	101	-	-	8,080	120	-	-	1,120	-	-

Overall Zone-2: Total Irrigation Command Area 11,040ha

Crops/Cropping Season	I. Without Project 1/				II. With Project				Increment (II - I)		
	Cropped Area (ha)	Cropping Intensity (%)	Paddy Yield (ton)	Production (ton)	Cropped Area (ha) 2/	Cropping Intensity (%)	Paddy Yield (ton)	Production (ton)	Cropped Area (ha)	Paddy Yield (ton)	Production (ton)
Early Rainy Season Rice					1,600	14	3.30	5,280	1,600		5,280
Rainy Season Rice	11,210	100	1.59	17,841	11,040	100	2.80	30,912	-170	1.2	13,071
Annual Paddy	11,210	100	1.59	17,841	12,640	114	2.86	36,192	1,430	1.3	18,351
Upland Crops/Vegetables Total	110	1		138	550	5		855	440		718
Total	11,320	101	-	-	13,190	119	-	-	1,870	-	-

Zone-3: Project Area 1,200ha

Crops/Cropping Season	I. Without Project 1/				II. With Project				Increment (II - I)		
	Cropped Area (ha)	Cropping Intensity (%)	Paddy Yield (ton)	Production (ton)	Cropped Area (ha)	Cropping Intensity (%)	Paddy Yield (ton)	Production (ton)	Cropped Area (ha)	Paddy Yield (ton)	Production (ton)
Rainy Season Rice	1,200	100	1.80	2,160	1,200	100	2.80	3,360	0	1.0	1,200
Upland Crops/Vegetables Total	10	1		5	60	5		93	50		89
Total	1,210	101	-	-	1,260	105	-	-	50	-	-

Zone-4: Project Area 23,380ha

Crops/Cropping Season	I. Without Project 1/				II. With Project				Increment (II - I)		
	Cropped Area (ha)	Cropping Intensity (%)	Paddy Yield (ton)	Production (ton)	Cropped Area (ha)	Cropping Intensity (%)	Paddy Yield (ton)	Production (ton)	Cropped Area (ha)	Paddy Yield (ton)	Production (ton)
Rainy Season Rice	23,380	100	1.50	35,070	23,380	100	2.00	46,760	0	0.5	11,690
Upland Crops/Vegetables Total	0	0			230	1		104	230		104
Total	23,380	100	-	-	23,610	101	-	-	230	-	-

Overall: Overall Project Area 41,280ha

Crops/Cropping Season	I. Without Project 1/				II. With Project				Increment (II - I)		
	Cropped Area (ha)	Cropping Intensity (%)	Paddy Yield (ton)	Production (ton)	Cropped Area (ha)	Cropping Intensity (%)	Paddy Yield (ton)	Production (ton)	Cropped Area (ha)	Paddy Yield (ton)	Production (ton)
Early Rainy Season Rice	500	1.2	2.4	1,200	2,100	5	3.3	6,930	1,600	0.9	5,730
Rainy Season Rice	41,500	100	1.6	66,030	41,280	100	2.4	98,162	-220	0.8	32,132
Annual Paddy	42,000	101	1.6	67,230	43,380	105	2.4	105,092	1,380	0.8	37,862
Upland Crops/Vegetables Total	180	0		222	1,120	3		1,505	940		1,283
Total	42,180	102	-	-	44,500	108	-	-	2,320	-	-

1/: Without-project conditions before the functional failure of the Roleang Chery Regulator

Table D.6.1.11 Estimation of Current Population in the Target Area

Province/District	Commune	Type 1/	Total Population in 2004 1/	Proportion of Commune Located in Target Area (%)	Estimated Population in Target Area in 2004
Kampong Speu Chbar Mon	Chbar Mon	Urban	7,781	100	7,781
	Kandaol Dom	Urban	7,173	100	7,173
	Roka Thum	Urban	13,876	100	13,876
	Sopoar Tep	Urban	6,071	100	6,071
	Svay Kravan	Urban	7,648	100	7,648
District/Project Communes Total		Urban	42,549		42,549
Kong Pisei	Angk Popel	Rural	5,478	100	5,478
	Preah Nipean	Rural	11,730	100	11,730
	Roka Kaoh	Rural	6,632	100	6,632
	Veal	Rural	8,537	100	8,537
	Chongruk	Rural	12,603	50	6,302
	Prey Nheat	Rural	9,737	60	5,842
	Pechr Muni	Rural	4,791	100	4,791
	Tuek L'ak	Rural	5,714	60	3,428
Project Communes Total		Rural	65,222		52,740
Samraong Tong	Roleang Chak	Rural	7,957	100	7,957
	Kahaeng	Rural	6,808	100	6,808
	Roleang Kreul	Rural	11,751	100	11,751
	Saen Dei	Rural	11,156	100	11,156
	Tang Krouch	Rural	7,416	80	5,933
	Trapeang Kong	Rural	14,090	100	14,090
	Voa Sa	Rural	12,659	100	12,659
	Khtum Krang	Rural	6,733	100	6,733
	Krang Ampil	Rural	8,286	100	8,286
	Pncay	Rural	10,991	100	10,991
	Samraong Tong	Rural	6,033	100	6,033
	Sambour	Rural	7,402	100	7,402
	Skuh	Rural	9,896	100	9,896
	Thommoda Ar	Rural	9,266	100	9,266
Tumpoar Meas	Rural	5,729	10	573	
District/Project Communes Total		Rural	136,173		129,534
Project Communes in Kp. Speu		Rural/Urban	243,944		224,823
Kandal Kandal Stueng	Daeum Rues	Rural	7,970	100	7,970
	Roka	Rural	3,089	100	3,089
	Roleang Kaen	Rural	5,116	100	5,116
Project Communes Total		Rural	16,175		16,175
Angk Snuol	Baek Chan	Rural	9,303	100	9,303
	Boeng Thum	Rural	5,903	100	5,903
	Chhak Ch. Neang	Rural	3,492	100	3,492
	Damnak Ampil	Rural	4,690	100	4,690
	Kamboul	Rural	6,336	100	6,336
	Kantaok	Rural	10,087	100	10,087
	Krang Mkak	Rural	4,398	100	4,398
	Lumhach	Rural	7,154	100	7,154
	Peuk	Rural	6,552	100	6,552
	Prey Puok	Rural	6,945	100	6,945
	Ovlaok	Rural	3,464	80	2,771
	Samraong Leu	Rural	8,235	80	6,588
	Snao	Rural	4,106	30	1,232
Project Communes Total		Rural	80,665		75,451
Project Communes in Kandal		Rural	96,840		91,626
Overall Project Communes		Rural/Urban	340,784		316,449

1/: Source: SEILA Commune Data Base,2004

Table D.6.1.12 Projected Population in the Target Area

Year	Projected Population in Province			Projected Population in the Target Area			Total
	Kampong Speu		Kandal	Kampong Speu		Kandal	
	Population 1/	Growth Rate (%)	Population 1/	Growth Rate (%)	Population 1/	Growth Rate (%)	
2004	713,967	2.18	1,224,433	1.48	224,823	91,626	316,449
2005	729,552	2.22	1,242,506	1.51	229,724	92,982	322,706
2006	745,730	2.25	1,261,297	1.54	234,824	94,386	329,210
2007	762,500	2.28	1,280,781	1.58	240,108	95,840	335,947
2008	779,910	2.31	1,300,974	1.60	245,582	97,354	342,936
2009	797,956	2.34	1,321,841	1.63	251,255	98,912	350,167
2010	816,615	2.35	1,343,407	1.65	257,134	100,524	357,658
2011	835,823	2.36	1,365,608	1.67	263,177	102,182	365,359
2012	855,569	2.36	1,388,360	1.68	269,388	103,889	373,277
2013	875,799	2.36	1,411,617	1.68	275,746	105,634	381,380
2014	896,468	2.36	1,435,326	1.68	282,253	107,409	389,662
2015	917,552	2.35	1,459,431	1.68	288,886	109,213	398,099
2016	939,064	2.34	1,483,957	1.68	295,646	111,048	406,694
2017	960,928	2.33	1,508,852	1.68	302,535	112,914	415,448
2018	982,827	2.28	1,533,720	1.65	309,432	114,777	424,209
2019	1,004,657	2.22	1,558,305	1.60	316,302	116,613	432,915
2020	1,026,473	2.17	1,582,712	1.57	323,165	118,444	441,610
Increase from 2004 to 2020	1.44		1.29		1.44	1.29	1.40

1/: Projected based on population projections for Kampong Speu & Kandal Province

Source: First Revision, Population Projections for Cambodia 1998 - 2020, National Institute of Statistics, Ministry of Planning

Table D.6.1.13 Food Balance for Rice in the Target Area: Future With- and Without-Project

Year	Projected Population in Target Area	Milled Rice Requirement (ton) 3/	Converted into Paddy (ton) 4/	Seed & Post-harvest Losses (ton) 5/	Annual Paddy Production Required (ton)	Present/Without-Project 1/			With-Project 2/		
						Current Without-Paddy (ton)	Deficit/Surplus of Paddy (ton)	Food Sufficiency %	With-Project Paddy (ton)	Deficit/Surplus of Paddy (ton)	Food Sufficiency %
2004	316,449	45,252	70,707	10,565	81,272						
2005	322,706	46,147	72,105	10,774	82,879	56,670	-26,209	68			
2006	329,210	47,077	73,558	10,991	84,549	56,670	-27,879	67			
2007	335,947	48,040	75,063	11,216	86,280	56,670	-29,610	66			
2008	342,936	49,040	76,625	11,450	88,074	56,670	-31,404	64			66
2009	350,167	50,074	78,240	11,691	89,931	56,670	-33,261	63			64
2010	357,658	51,145	79,914	11,941	91,855	56,670	-35,185	62			74
2011	365,359	52,246	81,635	12,198	93,833	56,670	-37,163	60			78
2012	373,277	53,379	83,404	12,463	95,867	56,670	-39,197	59			77
2013	381,380	54,537	85,215	12,733	97,948	56,670	-41,278	58			80
2014	389,662	55,722	87,065	13,010	100,075	56,670	-43,405	57			84
2015	398,099	56,928	88,950	13,291	102,242	56,670	-45,572	55			93
2016	406,694	58,157	90,871	13,578	104,449	56,670	-47,779	54			96
2017	415,448	59,409	92,827	13,871	106,697	56,670	-50,027	53			97
2018	424,209	60,662	94,784	14,163	108,947	56,670	-52,277	52			95
2019	432,915	61,907	96,729	14,454	111,183	56,670	-54,513	51			95
2020	441,610	63,150	98,672	14,744	113,416	56,670	-56,746	50			93
									105,092	-6,091	95
									105,092	-8,324	93

1/: No change in rice production level in the Area is assumed in future

2/: The irrigated and rainfed agriculture improvement plans proposed in the Master Plan are implemented as scheduled in the implementation plan.
The full development stage of the plans is attained in 2020.

3/: Annual per capita consumption of rice = 143 kg

4/: Milled rice / 0.64 (milled rice = 64% x paddy)

5/: 13% of paddy production

6/: Proportion of annual production volumes to the target production are estimated as follows;

2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019/20
55%	55%	65%	70%	70%	75%	80%	90%	95%	98%	99%	100%

Note: The target production production volume is 105,092 tons

Table D.6.2.1 PDM for Veterinary Services Strengthening and Livestock Raising Improvement Project

(Target Group: Livestock Farmers in the Target Area)

Narrative Summary	Objectively Verifiable Indicator	Means of Verification	Important Assumption
Overall Goal Agricultural productivity centering rice is improved in the Target Area	1-1 Agricultural productivity in the Target Area is improved as proposed in the Master Plan by year 2015	1-1 Agricultural statistics	/
Project Purpose Veterinary services & livestock extension services are intensified through the increased deployment of qualified & well-trained VLAs (Village Livestock Agents) in the Target Area	1-1 No. of VLAs deployed 2-1 No. veterinary services provided by VLAs 3-1 Mortality rate of livestock in the Area	1-1 Monitoring record of PDA 2-1 VLAs activity report Monitoring by DAO 3-1 Sample survey	All the proposed activities in the Master Plan in post-project stage are implemented as scheduled No significant climatic change No disastrous livestock diseases does occur Marketing prices of livestock do not decline drastically
Outputs 1 Strategy to strengthen veterinary services and improve livestock raising is set 2 Extension activities on animal health and livestock extension services at village level is strengthened 3 Improved livestock raising technology is applied in villages	1-1 Prepared strategy is appreciated by well-informed experts 2-1 No. of well-trained VLAs in the Target Area 3-1 No. of villages applying the improved livestock raising technology	1-1 Minutes of steering committee meetings 2-1 Monitoring survey 3-1 Monitoring survey	VLAs continue to provide services in the Target Area
Activities. 1-1 To prepare Overall & Annual Work Plan 2-1 To prepare guidance & training materials 2-2 To train PDA/DAO staffs in trainer training 2-3 To recruit VLAs candidates 2-4 To train & qualify VLAs candidates & existing VLAs 2-5 To provide veterinary equipment & seed medicine to VLAs 2-6 To deploy trained VLAs to field 2-7 To provide field guidance to VLAs & monitor / supervise VLAs activities 3-1 To operate field demonstration on improved livestock raising at selected village	<p align="center">Input</p> <p align="center">Donor</p> <p align="center">Cambodia</p> 1. Local Consultant (120 M/M) 2. Livestock husbandry expert 3. Veterinary expert 4. Project Cost	<p align="center"><u>Counterparts</u></p> Full time counterparts corresponding to consultant experts in number & specialty Part of project cost Office space & facilities	1. Continuous involvement of related government agencies and beneficiaries during the project period 2. No severe damage of irrigation facilities by natural disaster within the project period Precondition High need for livestock development in the Target Area Good understanding of related organizations on the Master Plan and importance of livestock development SLPP does not expand its Target Area to cover the project area Related proposed activities in the Master Plan in pre-project stage are implemented as scheduled

Table D.6.2.2 Implementation Schedule for Veterinary Services Strengthening and Livestock Raising Improvement Project

Activities	Expected Results	Year					In-charge
		2008	2009	2010	2011	2012	
(1) Trainers Training of PDA/DAO Staffs	Trained trainers for the Project	■					Project PDA/DAO
(2) Recruiting VLAs Candidates	VLAs candidate recruited	■	■				Project PDA/DAO
(3) Preparation of Overall Plan & Annual Work Plan	Overall Plan & Annual Work Plan prepared	■					Project PDA/DAO
(4) Preparation of guidance & training materials	Guidance & training materials prepared	■	■				Project PDA/DAO
(5) Train & Qualify VLAs Candidates & Existing VLAs	Trained & qualified VLAs	■	■	■			Project PDA/DAO
(6) Provision of Veterinary Equipment & Seed Medicine to VLAs	Veterinary equipment & seed medicine are provided to VLAs	■	■	■	■		Project PDA/DAO
(7) Deployment of Trained VLAs to Field	Trained VLAs are deployed to village	■	■	■	■		Project PDA/DAO
(8) To operate field demonstration on improved livestock raising at selected	Field demonstration on improved livestock raising at selected village						Project VLAs
(9) Field Guidance to VLAs & Monitoring/Supervision VLAs Activities	Field guidance to VLAs & monitoring/supervision VLAs activities implemented	Project PDA/DAO

Table D.6.2.3 Cost Schedule for Veterinary Services Strengthening and Livestock Raising Improvement Project

	Year												Overall					
	1st			2nd			3rd			4th			5th			No. Training	Amount (US\$)	
	No. Training	Amount (US\$)	Qty	No. Training	Amount (US\$)	Qty	No. Training	Amount (US\$)	Qty	No. Training	Amount (US\$)	Qty	No. Training	Amount (US\$)	Qty			
Target Group 1/																		
Newly Recruited VLAs: 25 participants; 30 days course	100		25	4	1	50	100	4	2	100	4	1	100	4	100	4	16	4,000
Existing VLAs: 25 participants; 14 days course	25		25	1	1,000	1	100	1	1,000	1	1,000	1	1,000	1	100	4	4,000	
		Unit Price (US\$)																
1. Preparatory Works																		
1-1. Recruiting Target Groups	time	1,000	1	1,000	1	1,000	1	1,000	1	1,000	1	1,000	1	1,000	1	1,000	4	4,000
1-2. PDA/DAO Staffs Training	time	3,000	1	3,000	1	3,000	1	3,000	1	3,000	1	3,000	1	3,000	1	3,000	2	3,000
1-3. Preparation Guidance & Training Materials	LS	2,000		2,000		2,000		2,000		2,000		2,000		2,000		2,000	2	8,000
Sub-total		6,000		6,000		6,000		6,000		6,000		6,000		6,000		6,000	0	15,000
2. VLA Training 2/																		
2-1. New VLA Training	No.	6,250	4	25,000	4	25,000	4	25,000	4	25,000	4	25,000	4	25,000	4	25,000	16	100,000
2-2. Existing VLA Training	No.	3,000	1	3,000	2	6,000	1	3,000	1	3,000	1	3,000	1	3,000	1	3,000	4	12,000
Sub-total		28,000		28,000		31,000		28,000		28,000		28,000		25,000		25,000	20	112,000
3. Field Demonstration on Improved Livestock Raising																		
- Pig Fattening 3/	No.	380		380		380		380		380		380		380		380	10	3,800
- Chick & Hen Management 3/	No.	330		330		330		330		330		330		330		330	10	3,300
Sub-total		710		710		710		710		710		710		710		710	20	7,100
4. Field Guidance																		
4-1. DAO Staff	month	100	5	500	10	1,000	10	1,000	10	1,000	10	1,000	10	1,000	10	1,000	15	1,500
4-2. SMS	month	200	1	200	2	400	2	400	3	600	3	600	3	600	3	600	15	1,500
Sub-total		300		700		1,400		1,400		2,100		2,100		2,100		2,100	3	2,100
Annual Project Direct Cost				34,700		42,500		42,500		40,200		40,200		37,200		37,200		170,900
Consulting Services				28,600		28,600		28,600		28,600		28,600		28,600		28,600		143,000
Overall Project Cost				63,300		71,100		71,100		68,800		68,800		65,800		65,800		313,900
Consulting Services																		314,000
Remuneration				34,700		42,500		42,500		40,200		40,200		37,200		37,200		170,900
Overhead cost				28,600		28,600		28,600		28,600		28,600		28,600		28,600		143,000
				63,300		71,100		71,100		68,800		68,800		65,800		65,800		313,900
																		rounded

Consulting Services
 Remuneration Local consultant A 60 man month x US\$ 1,000 = US\$ 60,000.- Local consultant B 60 man month x US\$ 700 = US\$ 42,000.-
 Overhead cost 40% of remuneration = US\$ 41,000.- Total Cost for Consulting Services US\$143,000.-

1/: Target Groups

	(1) No. of Existing VLA in District	(2) No. of Village in District 4/	(3) No. of New VLA to Be Trained in Target Area (2) - (1)	Target Groups of the Project
				Refresher Training
				New VLA Training
Chbar Mon	20	56	36	
Angk Snuol	20	154	134	
Kandal Stueung	66	307	241	
Total	106	517	411	100
				400

2/: Estimated based on the similar program costs implemented in PDA Kampong Speu & Kandal
 3/: Base Cost for TIP, DAE & CAAEP II
 4/: No. of villages in project communes

Table D.6.2.4 PDM for Livestock Sub-sector Development Study

(Target Group: Livestock farmers in the Target Area)

Narrative Summary	Objectively Verifiable Indicator	Means of Verification	Important Assumption
Overall Goal Agricultural productivity centering rice is improved in the Target Area	1-1 Agricultural productivity in the Target Area is improved as proposed in the Master Plan by year 2015.	1-1 Agricultural statistics	/
Project Purpose Integrated livestock sub-sector development plan in the Target Area of international standard eligible for requesting financing for donors or international organizations is formulated	1-1 Integrated livestock sub-sector development plan is formulated as scheduled	1-1 Integrated livestock sub-sector development plan report	All the proposed activities in the Master Plan in post-project stage will be implemented as scheduled No significant climatic change There are no significant changes in market prices of livestock Development plans are successfully executed
Outputs 1. Study report on integrated livestock sub-sector development plan is prepared	1-1 Prepared report meets requirements for international cooperation project	1-1 Minutes of meeting of steering committee of the study	Steering committee of the study is held with well-informed experts on time
Activities 1-1 To identify present conditions of the livestock sub-sector in the Target Area - Data collection, analysis & compilation - Field survey & market survey - Baseline survey (sample survey) - Other related survey & study 1-2 To study development constraints & potentials on the basis of the findings of 1. 1-3 To study on development concepts from technical, socio-economic, institutional & marketing aspects 1-4 To study and formulate integrated development plan	Input Donor Cambodia <u>Study Team</u> <u>Counterparts</u> Team Leader / Livestock Development Livestock Raising Animal Health Animal Feed Animal Breed Agronomist Socio-economist Institutional Expert Study Cost Full time counterparts corresponding to number & specialty of the Study Team Office space & facilities		Counterparts & local authorities staffs trained are continuously stationed at the Project or continuously support the Project Precondition High need for livestock development in the Target Area Good understanding of related organizations on the Master Plan and importance of livestock development Related proposed activities in the Master Plan in pre-project stage are implemented as scheduled

Table D.6.2.5 Implementation Schedule and Cost Estimate for Livestock Sub-sector Development Study

1. Implementation Schedule

Activities	Expected Results	Month												In-charge		
		1	2	3	4	5	6	7	8	9	10	11	12			
(1) Inception meeting	Study approach & method mutually agreed	-														Study Team Counterpart
(2) Identification of present conditions of the livestock sub-sector in the Target Area	Present conditions of the sub-sector identified															Study Team Counterpart
(3) Study on development constraints & potentials	Development constraints & potentials of the sub-sector identified															Study Team Counterpart
(4) Study on development concepts from technical, socio-economic, institutional & marketing aspects	Development concepts formulated															Study Team Counterpart
(5) Study and formulation of integrated development plan - Formulation of development plan - Estimation of cost for projects/schemes accommodated in the development plan - Study on institutional set-up for project implementation Project evaluation	Development study report															Study Team Counterpart
(6) Workshop/seminar/meeting																Study Team Counterpart Stakeholders
(7) Reporting Schedule		▲						▲						▲	▲	Study Team Counterpart Stakeholders
		I/R						IT						DF	F	

2. Cost Estimate

Basis for cost estimation for the Study

- Consulting service fees
- Study cost

40 manmonths x US\$ 22,000/month = US\$ 880,000.-
 60 % of consulting services fee = US\$ 880,000 x 0.6 = US\$ 530,000.- **Estimated cost US\$ 1,410,000.-**

Table D.6.3.1 PDM for Community Inland Fisheries Development Project

(Target Group: FWUGs or FWUCs in Zone-3)

Narrative Summary	Objectively Verifiable Indicator	Means of Verification	Important Assumption
Overall Goal Agricultural productivity centering rice is improved in the Target Area	1-1 Agricultural productivity in the Target Area is improved as proposed in the Master Plan by year 2015	1-1 Agricultural statistics	/
Project Purpose Fish production in the ponds for the water harvesting irrigated agriculture improvement project is increased	1-1 Annual fish production (volume & amount)	1-1 FWUG's (FWUC's) monitoring record 1-2 PDA/DAO monitoring record	All the proposed activities in the Master Plan in post-project stage will be implemented as scheduled No significant climatic change No severe damage on the small ponds by natural disaster O&M of ponds are properly carried out by FWUGs (FWUCs)
Outputs 1 Action plan & annual work plan for the project implementation is prepared 2 Capacity of target FWUGs (FWUCs) is strengthened 3 Fingerings are stocked in target ponds	1-1 Action plan & annual work plan 2-1 No. of FWUCs/ FWUGs & members trained 3-1 No. of fingerings stocked in each pond	1-1 Monitoring survey 2-1 Monitoring survey 3-1 Monitoring survey	No severe damage of small ponds by natural disaster No serious outbreak of fish diseases does occur No serious drought to dry up pond does take place
Activities 1-1 To carry out inventory survey on candidate ponds for the selection of target ponds for the project implementation 1-2 To get consent of a target FWUG (FWUC) 1-3 To prepare an action plan & annual work plan 2-1 To prepare guidance/extension materials 2-2 To implement technical training of PDA/DAO staffs 2-3 To provide initial technical guidance to target FWUGs (FWUCs) 2-4 To implement periodical field guidance & monitoring 3-1 To provide fingerings, fertilizers, fishing gear & boat to target FWUGs (FWUCs)	<p style="text-align: center;">Input</p> <p style="text-align: center;">Donor</p> <p style="text-align: center;">Cambodia</p> <p style="text-align: center;"><u>Foreign/Local Consultant</u></p> Foreign 30 M/M (ASEAN) Local 120 M/M Project Cost	<p style="text-align: center;">Cambodia</p> <p style="text-align: center;"><u>Counterparts</u></p> Full time counterparts corresponding to foreign & local consultant in number & specialty Part of project cost Office space & facilities	1. Continuous involvement of related government agencies and beneficiaries during the project period 2. No severe damage of small ponds by natural disaster within the project period Precondition High need for inland fisheries in the Target Area Good understanding of related organizations on the Master Plan and importance of inland fisheries development Fish culture right is vested to FWUG (FWUC) Related proposed activities in the Master Plan in pre-project stage are implemented as scheduled

Table D.6.3.2 Implementation Schedule for Community Inland Fisheries Development Project

Activities	Expected Results	Year						In-charge
		2008	2009	2010	2011	2012	2013	
(1) Inventory survey on candidate reservoirs for the selection of target reservoirs	List of eligible reservoirs &	█	█	█	█	█	█	Project PDA/DAO FWUG
(2) Selection of target FWUGs (FWUC)	Project target FWUGs & reservoirs selected	█	█	█	█	█	█	Project PDA/DAO FWUG
(3) Preparation of an action plan & annual work plan	Action plan & annual work plan	█	█	█	█	█	█	Project PDA/DAO
(4) Technical training of PDA/DAO staffs	PDA/DAO staffs trained	█	█	█	█	█	█	Project PDA/DAO
(5) Preparation of guidance/extension materials	Guidance/extension materials prepared	█	█	█	█	█	█	Project PDA/DAO
(6) Initial technical guidance to a target FWUG (FWUC)	Target FWUGs are trained & ready for project implementation	█	█	█	█	█	█	Project PDA/DAO
(7) Provision of fingerings, fishing gear & boat to a target FWUG	Fingerings, fishing net & boat provided to a target FWUG	█	█	█	█	█	█	Project PDA/DAO FWUG
(8) Periodical field guidance & monitoring	Periodical field guidance & monitoring made by PDA/DAO	█	█	█	█	█	█	Project PDA/DAO FWUG
(9) Monitoring of fish production	Fish production data obtained	█	█	█	█	█	█	Project PDA/DAO
Project Target Ponds by Year		5						Total 5
- Mini-scale Pond		4	6	6	6	5		27
- Small-scale Pond			3	3	4	4		14
- Medium-scale Pond						3		3
- Large-scale Pond		9	9	9	10	12		49
Overall								

Table D.6.3.3 Cost Estimate and Schedule for Community Inland Fisheries Development Project - 1/2

Item	unit	Unit Price (US\$)	Year												Overall Amount (US\$000)	
			1st		2nd		3rd		4th		5th		Overall Qty			
			Qty	Amount (US\$000)	Qty	Amount (US\$000)	Qty	Amount (US\$000)	Qty	Amount (US\$000)	Qty	Amount (US\$000)				
1. Overall Project Direct Cost Schedule																
1. Preparatory Works																
1-1. Inventory Survey	time	5,000	2	10,000	1	5,000	1	5,000	1	5,000						25,000
1-2. PDA/DAO Staffs Training	time	500	1	500			1	500								1,000
1-3. Preparation Guidance & Training Materials	LS			500		600		600		700					2,300	4,700
Sub-total				11,000		5,600		6,100		5,700					2,300	30,700
2. Project Implementation																
2-1. Micro-scale Pond	No.	400	5	2,000												2,000
2-2. Small-scale Pond	No.	720	4	2,880	6	4,320	6	4,320	6	4,320	6	4,320	5	3,600		19,440
2-3. Medium-scale Pond	No.	1,420		0	3	4,260	3	4,260	4	5,680	4	5,680	4	5,680		19,880
2-4. Large-scale Pond	No.	2,630		4,880									3	7,890		7,890
Sub-total						8,580		8,580		10,000			3	17,170		49,210
3. Field Guidance																
4-1. DAO Staff	month	100	10	1,000	15	1,500	20	2,000	25	2,500	25	2,500	30	3,000	100	10,000
4-2. SMS	month	200	3	600	8	1,600	10	2,000	12	2,400	12	2,400	15	3,000	48	9,600
Sub-total				1,600		3,100		4,000		4,900				6,000		19,600
Annual Project Direct Cost				17,480		17,280		18,680		20,600				25,470		99,510
Consulting Services				48,800		48,800		48,800		48,800				48,800		244,000
Overall Project Cost				66,280		66,080		67,480		69,400				74,270		343,510
Consulting Services														rounded		344,000
Remuneration																
Overhead cost																
				ASEAN consultant 30 man month x US\$ 3,000 = US\$ 90,000.-				Local consultant 120 man month x US\$ 700 = US\$ 84,000.-				Total Costs for Consulting Services US\$ 244,000.-				

Table D.6.3.3 Cost Estimate and Schedule for Community Inland Fisheries Development Project - 2/2

Pond Category/Item	Quantity	Unit Price (US\$)	Amount (US\$)	Remarks
2. Project Direct Cost per Pond I/				
1. Micro-scale Pond (Avg. area = 1.6 ha)				
1. Technical Guidance to FWUG	1 time	180	180	25 participants x US\$ 2 + DAO staff US\$ 2 + SMS US\$10 x2 ≈ 180
2. Equipment				
- Fishing Net	1 set	60	60	1 set : 12 traps; 5US\$/trap
- Fishing Boat	1 unit	100	100	1 boat ± Riel 400,000.-
			160	
3. Fingering	2,400 No.	0.025	60	1500/ha x 1.6 = 2,400
Total			400	rounded
2. Small-scale Pond (Avg. area = 6.5 ha)				
1. Technical Guidance to FWUG	1 time	180	180	25 participants x US\$ 2 + DAO staff US\$ 2 + SMS US\$10 x2 ≈ 180
2. Equipment				
- Fishing Net	3 set	60	180	1 set : 12 traps; 5US\$/trap
- Fishing Boat	2 unit	100	200	1 boat ± Riel 400,000.-
			380	
3. Fingering	6,500 No.	0.025	163	1000/ha x 6.5 = 6,500
Total			720	rounded
3. Medium-scale Pond (Avg. area = 17.3 ha)				
1. Technical Guidance to FWUG	1 time	90	90	50 participants x US\$ 2 + DAO staff US\$ 3 x 4 + SMS US\$10 x 2 ≈ 330
2. Equipment				
- Fishing Net	10 set	60	600	1 set : 12 traps; 5US\$/trap
- Fishing Boat	4 unit	100	400	1 boat ± Riel 400,000.-
			1,000	
3. Fingering	13,000 No.	0.025	325	750/ha x 17.3 ≈ 13,000
Total			1,420	rounded
4. Large-scale Pond (Avg. area = 81.3 ha)				
1. Technical Guidance to FWUG	2 time	90	180	50 participants x US\$ 2 + DAO staff US\$ 3 x 3 + SMS US\$10 ≈ 170
2. Equipment				
- Fishing Net	20 set	60	1,200	1 set : 12 traps; 5US\$/trap
- Fishing Boat	10 unit	100	1,000	1 boat ± Riel 400,000.-
			2,200	
3. Fingering	10,000 No.	0.025	250	500/ha x 17.3 ≈ 10,000
Total			2,630	rounded

I/: Pond are categorized into micro-scale

Micro-scale: Average area = 1.6 ha (0.4 - 3.0ha), in total 3 ponds

Medium-scale: Average area = 17.3 ha (11.5 - 34.3ha); in total 16 ponds

Small-scale: Average area = 6.5 ha (3.6 - 10.3ha), in total 27 ponds

Large-scale: Average area = 81.3 ha (57.6 - 111.4ha), in total 3 ponds

Table D.6.4.1 PDM for Income Generation Project for Marginal Farmers

(Target Group: Marginal farmers in the Target Area)

Narrative Summary	Objectively Verifiable Indicator	Means of Verification	Important Assumption
Overall Goal Poverty in the Target Area is alleviated	1-1 Poverty ratio in the Target Area is decreased	1-1 Monitoring survey	
Project Purpose Income of marginal farmers in the Target Area from agricultural activities is increased	1-1 Gross & net returns of marginal farmers from the schemes	2-1 Performance reports by Self-help Groups 2-2 Monitoring/supervision report	All the proposed activities in the Master Plan in post-project stage will be implemented as scheduled No significant climatic change There are no significant changes in market prices of products
Outputs 1 Project implementation plan is prepared 2 Farmer groups (Self-help Groups) based on schemes selected by individual farmers are formed 3 IFFSs are operated to train Self-help Groups at target villages 4 Credit for procurement of necessities for schemes are provided to Self-help Groups being trained 5 Income generation schemes are implemented by members of Self-help Groups with assistance of field staffs (extension staffs)	1-1 Project implementation plan 2-1 No. of Self-help Groups formed by scheme 3-1 No. of IFFSs implemented & their performances 4-1 No. of Self-help Groups received credit & credit amount 5-1 No. of schemes implemented & performances	1-1 Monitoring survey 2-1 Monitoring survey 3-1 Monitoring survey 4-1 Monitoring survey 5-1 Monitoring survey	Natural disaster, pest & diseases and other detrimental damages do not occur in scheme operation There are no significant changes in market prices of products during the project period There is no significant hike in prices of necessities Field staffs trained are continuously involved in the Project
Activities 1-1 To conduct inventory survey to select of target groups and villages 1-2 To prepare Annual Work Plan 1-3 To prepare candidate scheme lists & scheme guidelines 2-1 To execute PRA at village level 2-2 To assist farmers to form farmer group (Self-help Group) 3-1 To develop IFFS curriculum 3-2 To conduct IFFS at target villages 4-1 To provide credit for farm inputs, seedlings, farm tools, fingerling, animal and poultry etc. depending on beneficiaries needs 5-1 To conduct field staffs (PDA/DAO/NGO staffs) training; trainer training 5-2 To provide field guidance, monitoring & evaluation are implemented by trainers 5-3 To implement income generation schemes by members of Self-help Groups	<p style="text-align: center;">Input</p> <p style="text-align: center;">Donor</p> <p style="text-align: center;">Cambodia</p> <p style="text-align: center;"><u>Counterparts</u></p> Consultant Services Cost (local /NGO) Long-term Experts - Chief Adviser - Operation Officers Short-term Experts - Livestock Expert - Inland Fishery Expert - Rural Credit - Others as required Provision of Equipment - Training equipment & office equipment & facilities Project Cost	<p style="text-align: center;">Cambodia</p> <p style="text-align: center;"><u>Counterparts</u></p> Full time counterparts corresponding to expert in number & specialty Office space & facilities Part of project cost	Counterparts & local authorities staffs trained are continuously stationed at the Project or continuously support the Project Precondition High need for income generation of marginal farmers Good understanding of related organizations on the Master Plan and importance of income generation of marginal farmers Related proposed activities in the Master Plan in pre-project stage are implemented as scheduled

Table D.6.4.2 Implementation Schedule for Income Generation Project for Marginal Farmers

Activities	Expected Results	Year					In-charge
		2009	2010	2011	2012	2013	
Project Target Groups by Year							
No. of Target Self-help Groups		10	20	30	40	40	Total
No. of Target Self-help Groups Members		300	600	900	###	###	140
Preparatory Stage							4,200
(1) Inventory survey (selection of target groups and villages)	Target groups and prioritization of villages are selected						Project PDA/DAO Communities
(2) Preparation of Annual Work Plan	Annual Work Plans are prepared						Project PDA/DAO Communities
(3) Preparation of candidate scheme lists & scheme guidelines	Scheme guidelines are prepared						Project PDA/DAO
(4) Field staffs (PDA/DAO/NGO staffs) training; trainer training	Field staffs (extension staffs) are trained as project trainers						Project PDA/DAO
Operation Stage							
(1) PRA at village level	PRA at village level implemented & village features identified						Project PDA/DAO Communities
(2) Farmer group (Self-help Group) formation	Self-help Groups formulated						Project PDA/DAO Self-help Group
(3) IFFS (Integrated Farmer Field School) curriculum development	IFFS curriculum are developed						Project PDA/DAO
(3) IFFS (Integrated Farmer Field School; including pilot plot or scheme operation) at	IFFSs at target villages are implemented and Self-help Groups & group members are trained for a proposed scheme implementation						Project PDA/DAO Self-help Group Members
(4) Provision of credit for farm inputs, seedlings, farm tools, fingering, animal and poultry etc. depending on beneficiaries	Credit for farm inputs, seedlings, farm tools, fingering, animal and poultry are provided to Self-help Group members						Project PDA/DAO Self-help Group Members
(5) Implementation of income generation schemes by members of Self-help Group	Income generation schemes are implemented by members of Self-help Groups						Project PDA/DAO Self-help Group Members
(6) Field guidance, monitoring & evaluation	Periodical field guidance & monitoring made by trainers						Project PDA/DAO

Table D. 6.4.3 Cost Schedule for Income Generation Project for Marginal Farmers

Item	Unit	Unit Price (US\$)	Year										Overall Amount (US\$)	Remarks			
			1st		2nd		3rd		4th		5th				Overall Qty		
			Qty	Amount (US\$)	Qty	Amount (US\$)	Qty	Amount (US\$)	Qty	Amount (US\$)	Qty	Amount (US\$)					
1. Project Direct Cost																	
Project Plan																	
No. of Target Self-help Groups	group	-	10	20	30	40	40	40	40	40	40	40	140	30 members/group			
No. of Target Self-help Groups Members	member	-	300	600	900	1,200	1,200	1,200	1,200	1,200	1,200	1,200	4,200	30 members/group			
Preparatory Stage																	
1. Inventory Survey & preparation of Annual Work Plan	time	3,000	1	3,000	2	6,000	3	9,000	4	12,000	4	12,000	4	12,000	14	42,000	
2. Preparation Scheme Guidelines	LS	10,000	1	10,000	1	10,000	1	10,000	1	500	1	500	1	500	2	20,000	
3. PDA/DAONGOS Staffs Training, trainer training	time	500	1	500	1	500	1	500	1	500	1	500	1	500	5	2,500	
Total			13,500	6,500	19,500	12,500	12,500	12,500	4,800	4,800	4,800	4,800	140	16,800	30x4times		
Project Operation Stage																	
1. PRA & Self-help Groups Formation	group	120	10	1,200	20	2,400	30	3,600	40	4,800	40	4,800	40	4,800	140	16,800	30x4times
2. FFS Curriculum		60	10	600	20	1,200	30	1,800	40	2,400	40	2,400	40	2,400	140	8,400	per group
3. IFFS Operation	No.	340	10	3,400	20	6,800	30	10,200	40	13,600	40	13,600	140	47,600	20 weeks		
4. Provision of Credit to Group 1/	member	50	300	15,000	600	30,000	900	45,000	1,200	60,000	1,200	60,000	4,200	210,000	30 members/group		
5. Field Guidance	man-month	50	12	600	24	1,200	36	1,800	48	2,400	48	2,400	168	8,400			
Total			20,800	41,600	62,400	83,200	83,200	83,200	95,700	95,700	95,700	95,700	291,200				
Annual Project Direct Cost			34,300	48,100	81,900	81,900	81,900	81,900	95,700	95,700	95,700	95,700	355,700				
Consulting Services			42,000	42,000	42,000	42,000	42,000	42,000	42,000	42,000	42,000	42,000	210,000				
Overall Project Cost			76,300	90,100	123,900	137,700	137,700	137,700	137,700	137,700	137,700	137,700	565,700				
Consulting Services																	
Remuneration														rounded			
Overhead cost																	
1/: Average per farm cost of 4 representative schemes of:																	

Local consultant A 60 man month x US\$ 1,000 = US\$ 60,000.-
 Local consultant B 180 man month x US\$ 500 = US\$ 90,000.-
 Total Cost for Consulting Services US\$ 210,000.-
 Village Chick & Hen Management Scheme; Fish Culture Scheme in Rice Field; Fruit Seedling Production Scheme
 Small-scale Fish Culture Scheme

Table D.6.4.4 Scheme Cost Estimate for Some Income Generation Project for Marginal Farmers -1/2

1. Village Chick & Hen Management Scheme 1/

Item	Quantity	Unit Price (Riel. 000)	Amount (Riel. 000)	Remarks
1. Cash Expenses				
1.1 Investment				
- Hen	5 heads	12.0	60.0	Annual depreciation cost = Riel. 39,600 (30%)
- Chic House	1 unit	30.0	30.0	
- Hen House	1 unit	80.0	80.0	
Sub-total			170.0	
1.2 Operation Cost) Raising Cost				
- Feed				
- Broken rice	24 kg	0.8	19.2	
- Rice bran	9 kg	0.55	4.95	
- Fishmeal	9.5 kg	2.0	19.0	
- Duckweed	84 kg	0.05	4.2	
- Salt	0.2 kg	0.4	0.08	
- Premix	0.2 kg	10.0	2.0	
- Vaccination	160 doses	0.1	16.0	
Sub-total			65.4	
Total			235.4	US\$ ≈ 59 (rounded)
2. Gross Income				
Chicks	200 heads	2.5	500.0	US\$ ≈ 140
Hen	5 heads	12.0	60.0	
Total			560.0	
3. Net Income				
			324.6	US\$ ≈ 81
Goal of improving feeding & management is to increase the survival rate of chicks & productivity of hens.				

1/: Scheme formulated as TIP (Technology Implementation Procedure) by Dr. Khieu Borin, Center for Livestock & Agricultural Development for CAAEPII

2. Fish Culture Scheme in Rice Field (1,000m2) 1/

Item	Quantity	Unit Price (Riel. 000)	Amount (Riel. 000)	Remarks
1. Cash Expenses				
1.1 Materials				
- Lime	30 kg	0.6	18.0	US\$ ≈ 10
- DAP	5 kg	1.6	8.0	
- Urea	10 kg	1.4	14.0	
Sub-total			40.0	
1.2 Fingering				
	700 No.	0.05	35.0	US\$ ≈ 9 Tilapia, silver carp, common carp
1.3 Feed				
- Rice bran	50 kg	0.8	40.0	US\$ ≈ 10
1.4 Equipment				
- Bamboo barrage	140 m	0.40	56.0	US\$ ≈ 14
Total			171.0	US\$ ≈ 43
2. Gross Income				
Fish	400 kg	2.0	800.0	Stocking period ± 8 months Average of 30 to 50 kg/100m2
Total			800.0	US\$ ≈ 200
3. Net Income				
			629.0	US\$ ≈ 157

1/: Source - Project Document on Rice-Fish Culture in SPFS-WIN Pilot Sites by SPFS, 2002; modified

Table D.6.4.4 Scheme Cost Estimate for Some Income Generation Project for Marginal Farmers - 2/2

3. Fruit Seedling Production Scheme (per 10 farmers)1/

Item	Quantity	Unit Price (Riel. 000)	Amount (Riel. 000)	Remarks
I. Cash Expenses				
1.1 Seedling & Fertilizer				
- Young Seedlings	500 plants	0.6	300	
- DAP	100 kg	1.6	160	
- NPK Fertilizer	100 kg	1.4	140	
Sub-total			600	US\$ ≈ 150
1.2 Materials				
- Compost Pit	5 pit	20	100	
- Cover Net	5 unit	30	150	
- Plastic Bag	3 kg	12.5	38	
- Well/Pump	2 unit	280	560	
- Equipment/Tool	1 set	300	300	
Sub-total			1,148	US\$ ≈ 287
Total			1,748	US\$ ≈ 437 Per farm= 44
2. Gross Income				
Seedlings	1,600 kg	4.0	6,400	
Total			6,400	US\$ ≈ 1600 Per farm= ##
3. Net Income				
			4,653	US\$ ≈ 1163 Per farm= ##

1/: Source - Project Document on Family Fruit Tree Development at SPFS-WIN Target Village by SPFS, 2002; modified

4. Small-scale Fish Culture Scheme (50m2) 1/

Item	Quantity	Unit Price (Riel. 000)	Amount (Riel. 000)	Remarks
1. Cash Expenses				
1.1 Materials				
- Lime	3.5 kg	0.6	2.1	7-10kg/100m2
- DAP	2 kg	1.6	3.2	4kg/100m2
- Urea	2 kg	1.4	2.8	4kg/100m2
- Animal/Green Manure	30 kg	-	-	25-40kg/100m2
Sub-total			8.1	US\$ ≈ 2.0
1.2 Fingering				
	100 No.	0.05	5.0	US\$ ≈ 1.3 Tilapia, silver carp, common carp 1-3 fish/m2
1.3 Feed				
- Rice bran	32 kg	0.8	25.6	US\$ ≈ 6.4
1.4 Equipment				
- Fishing Net	1 set	20.0	20.0	US\$ ≈ 5.0
Sub-total				
1.5 Incentives				
	LS	150	150	Subsidy for labor costs
Total			208.7	US\$ ≈ 52
2. Gross Income				
Fish	16 kg	4.5	72.0	Stocking period ± 8 months Average of 30 to 50 kg/100m2
Total			72.0	US\$ ≈ 18
3. Net Income 2/				
			26.6	US\$ ≈ 7

1/: Department of Fishery, MAFF; modified

2/: Not including incentives & include 1/3 of fishing net cost

Table D.6.5.1 PDM for Institutional and Agricultural Support Services Strengthening Project

(Target Group: Farmers in the Target Area)

Narrative Summary	Objectively Verifiable Indicator	Means of Verification	Important Assumption
Overall Goal Agricultural productivity centering rice is improved in the Target Area	1-1 Agricultural productivity in the Target Area is improved as proposed in the Master Plan by year 2015	1-1 Agricultural statistics	
Project Purpose Agricultural support services and project related institutions are strengthened and sustained in the Target Area for the agricultural productivity improvement	1-1 Agricultural support services provided by the project & VEAs	1-1 Project monitoring report 1-2 VEA activity reports	All the proposed activities in the Master Plan in post-project stage are implemented as scheduled No significant climatic change Agriculture development policy is not changed Demand and prices of rice is not changed Farm inputs prices are not changed
Outputs 1 Related institutions for agricultural production in the Target Area are strengthened 2 Rice production system in the Target Area is improved	1-1 No. of Steering Committee Meeting & Task Force Meeting held 1-2 Performance of Project Office 1-3 No. of local authorities staffs trained 1-4 No. of farmers/FWUC/FWUG trained 2-1 No. of villages applying the improved rice production system	1-1 Record of meetings 1-2 Monitoring survey 1-3 Record of training 1-4 Record of training 2-1 Monitoring survey	Necessary budget or support funds are allocated to the Project
Activities 1-1 To conduct government institutional strengthening 1-2 To establish Village Extension Agent (VEA) 1-3 To strengthen farmer organizations 1-4 To improve coordination & partnership arrangement 2-1 To improve irrigated rice production system with farmers participation 2-2 To introduce proper water management & O&M system 2-3 To improve rainfed rice productivity with farmers participation	<p style="text-align: center;">Input</p> <p style="text-align: center;">Donor</p> <p style="text-align: center;"><u>Long-term Experts</u></p> Chief Adviser Agronomist Water management Farmer Organization <u>Short-term Experts</u> As required <u>Equipment</u> Vehicle, training equipment & office equipment & facilities Project operation cost	<p style="text-align: center;">Cambodia</p> <p style="text-align: center;"><u>MAFF, MOWRAM, PDAs & PDOWRAMs</u></p> Full time counterparts corresponding to long term experts in number & specialty Office Space Extension & Training Facilities Part of project operation cost	Counterparts & local authorities staffs trained are continuously stationed at the Project or continuously support the Project Precondition Related proposed activities in the Master Plan in pre-project stage are implemented as scheduled

Table D.6.5.2 Implementation Schedule & Cost Estimate for Institutional and Agricultural Support Services Strengthening Project- 1/2

Activities	Expected Results	Year							In-charge	
		0	1st	2nd	3rd	4th	5th			
		2009	2010	2011	2012	2013	2014			
1. Institutional Strengthening										
(1) Establishment of Standing Steering Committee & Task Force Team	Standing Steering Committee & Task Force Team are established									MAFF/MOWWRAM/
(2) Establishment of Project Office (Project Management Unit)	Project Office established									MAFF/MOWWRAM
(3) Capacity building of local authorities, NGOs and other stakeholders	Local authorities, NGOs and other stakeholders are trained & involved in or provide support to the Project									PDA/DAO Project
2. Improvement of Irrigated Rice Production System with Farmers Participation										MAFF/MOWWRAM CARDI/PDA/DAO
(1) Adaptability test or technology development on water saving improved irrigated rice production system	Water saving improved irrigated rice production system is verified or developed									Project CARDI/PDA
(2) Verification of adaptability of the water saving improved irrigated rice production system with participation of farmers	Adaptability of the water saving improved irrigated rice production system is verified with participation									Project CARDI/PDA/DAO
(3) Dissemination of the verified improved irrigated rice production system to farmers/farmer groups in a pilot scale	The verified improved irrigated rice production system is disseminated to farmers/farmer groups in a pilot scale									Project PDA/DAO VEAs
3. Improvement of Rainfed Rice Productivity										Project CARDI/PDA
(1) Adaptability test or technology development on rainfed rice production system	Improved rainfed rice production system is verified or developed									Project CARDI/PDA
(2) Verification of adaptability of the improved rainfed rice production system with participation of farmers	Adaptability of the improved rainfed rice production system is verified with participation of farmers									Project CARDI/PDA
(3) Dissemination of the verified improved rainfed rice production system to farmers/farmer groups in a pilot scale	The verified improved rainfed rice production system is disseminated to farmers/farmer groups in a pilot scale									Project PDA/DAO VEAs
4. Establishment of Village Extension Agent (VEA)										Project PDA/DAO
(1) Training of VEAs candidate farmers (course & OJT)	VEAs candidate farmers are trained									Project PDA/DAO
(2) Qualification of trained farmers as VEAs	Trained farmers are qualified as VEAs and are deployed									Project PDA/DAO/VEAs

Table D.6.5.2 Implementation Schedule & Cost Estimate for Institutional and Agricultural Support Services Strengthening Project- 2/2

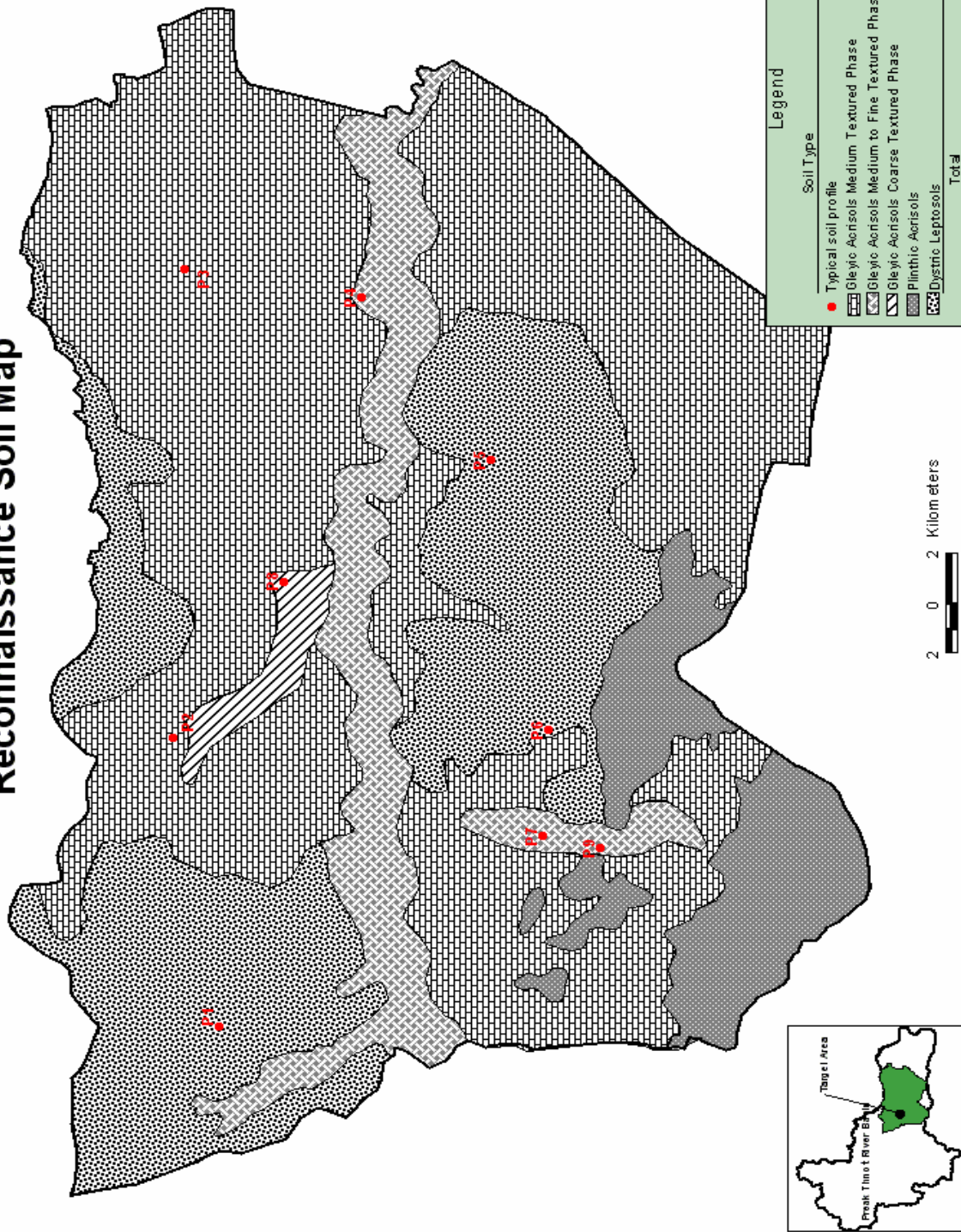
Activities	Expected Results	Year						In-charge
		0	1st	2nd	3rd	4th	5th	
		2009	2010	2011	2012	2013	2014	
5. Introduction of Proper Water Management & O&M System	Necessary manuals on proper water management & O&M system are prepared Local authorities are trained on the water management & O&M system Farmers/FWUCs/FWUGs are trained on the water management & O&M system The water management & O&M system is introduced in a pilot scale							
(1) Preparation of manuals on proper water management & O&M system based on sufficient field tests								
(2) Training of local authorities on the water management & O&M system								
(3) Training of farmers/FWUCs/FWUGs on the water management & O&M system								
(4) Introduction of the water management & O&M system in a pilot scale								
6. Capacity Building of Farmer Organizations	FWUC/FWUG & other farmer organizations needed are formed to a pilot scale The farmer groups formed are trained Continuous field guidance are provided to the farmer groups							
(1) Supporting formation of FWUC/FWUG & other farmer organizations to a pilot scale								
(2) Capacity building programs for the farmer groups formed								
(3) Continuous field guidance to the farmer groups under collaboration with NGOs								
7. Coordination & Partnership Arrangement	Coordination committee with donor agencies & NGOs operated in & around the Target Area is established							
(1) Establishing coordination committee with donor agencies & NGOs operated in & around the Target Area								
Project Cost Estimate								
Remuneration & overhead costs for experts		5 experts	x	US\$ 170,000	=	US\$ 850,000		
Short Term Experts		20 M/M	x	US\$ 17,000	=	US\$ 340,000		
Project Operation Costs		US\$ 250,000./year	x	5 years	=	US\$ 1,250,000		
Total Project Cost						US\$ 2,440,000		
Annual Allocation of Project Cost								
2009	2010	2011	2012	2013	2014			
244,000	488,000	488,000	488,000	488,000	244,000			

Table D.6.6.1 Overall Implementation and Cost Schedules for Agricultural Development Projects

Project	Schedule	Year							Total
		2008	2009	2010	2011	2012	2013	2014	
1. Rainfed Agricultural Improvement Project	Implementation								
	Cost (US\$)	496,000	507,000	492,000	493,000	491,000			2,479,000
2. Institutional and Agricultural Support Services Strengthening Project	Implementation		244,000	488,000	488,000	488,000	488,000	244,000	2,440,000
	Cost (US\$)								
3. Veterinary Services Strengthening and Livestock Raising Improvement Project	Implementation		71,100	68,800	65,800	44,900			313,900
	Cost (US\$)	63,300							
4. Livestock Sub-sector Development Study	Implementation								1,410,000
	Cost (US\$)	1,410,000							
5. Community Inland Fisheries Development Project	Implementation								
	Cost (US\$)	33,140	66,180	66,780	68,440	71,835	37,135		343,510
6. Income Generation Project for Marginal Farmers	Implementation		76,300	90,100	123,900	137,700	137,700		565,700
	Cost (US\$)								
Overall	Implementation								
	Cost (US\$)	2,002,000	965,000	1,206,000	1,239,000	1,233,000	663,000	244,000	7,552,000

Figures

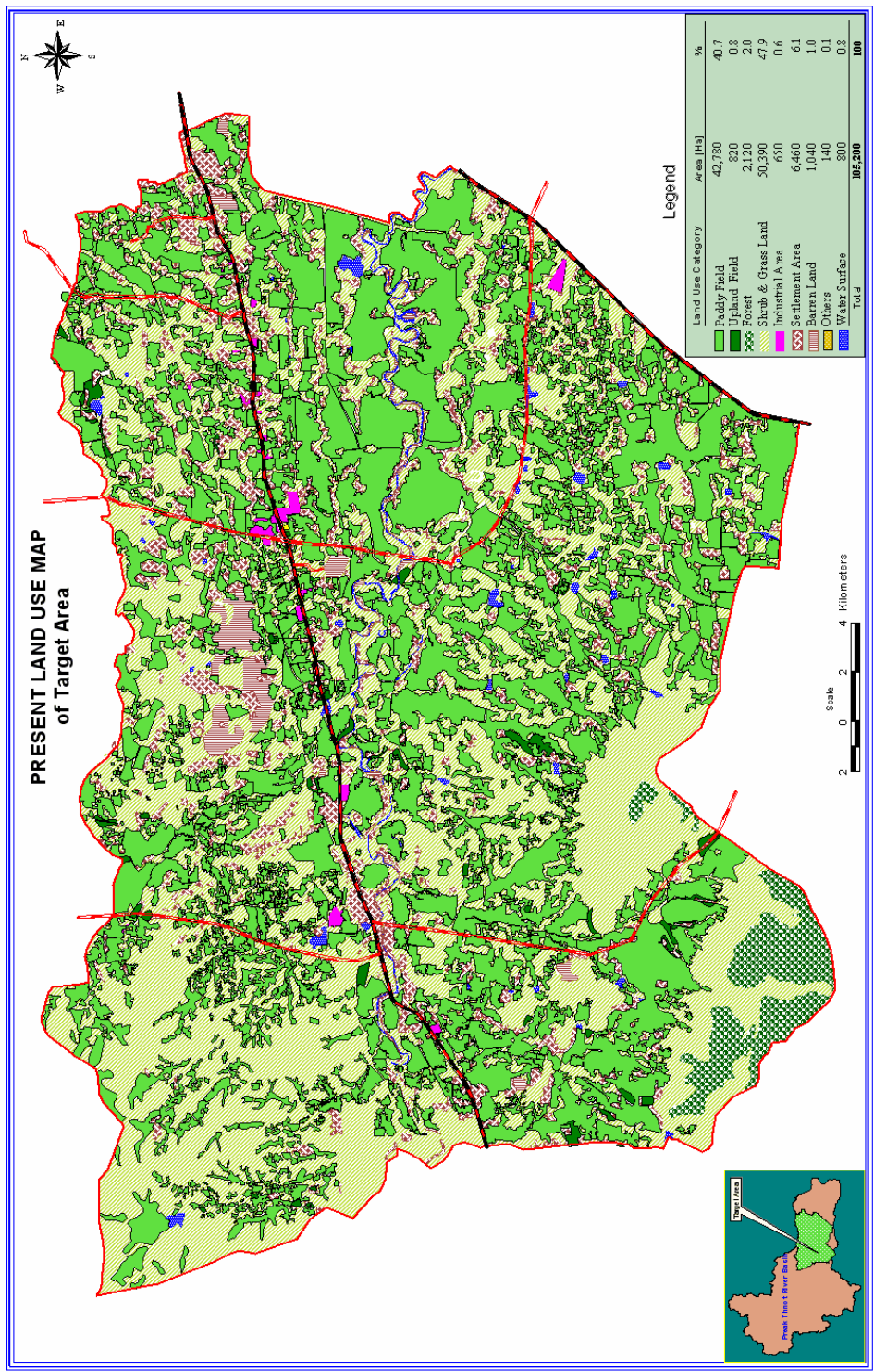
Reconnaissance Soil Map



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Figure D.1.1.1
Reconnaissance Soil Map
of the Target Area

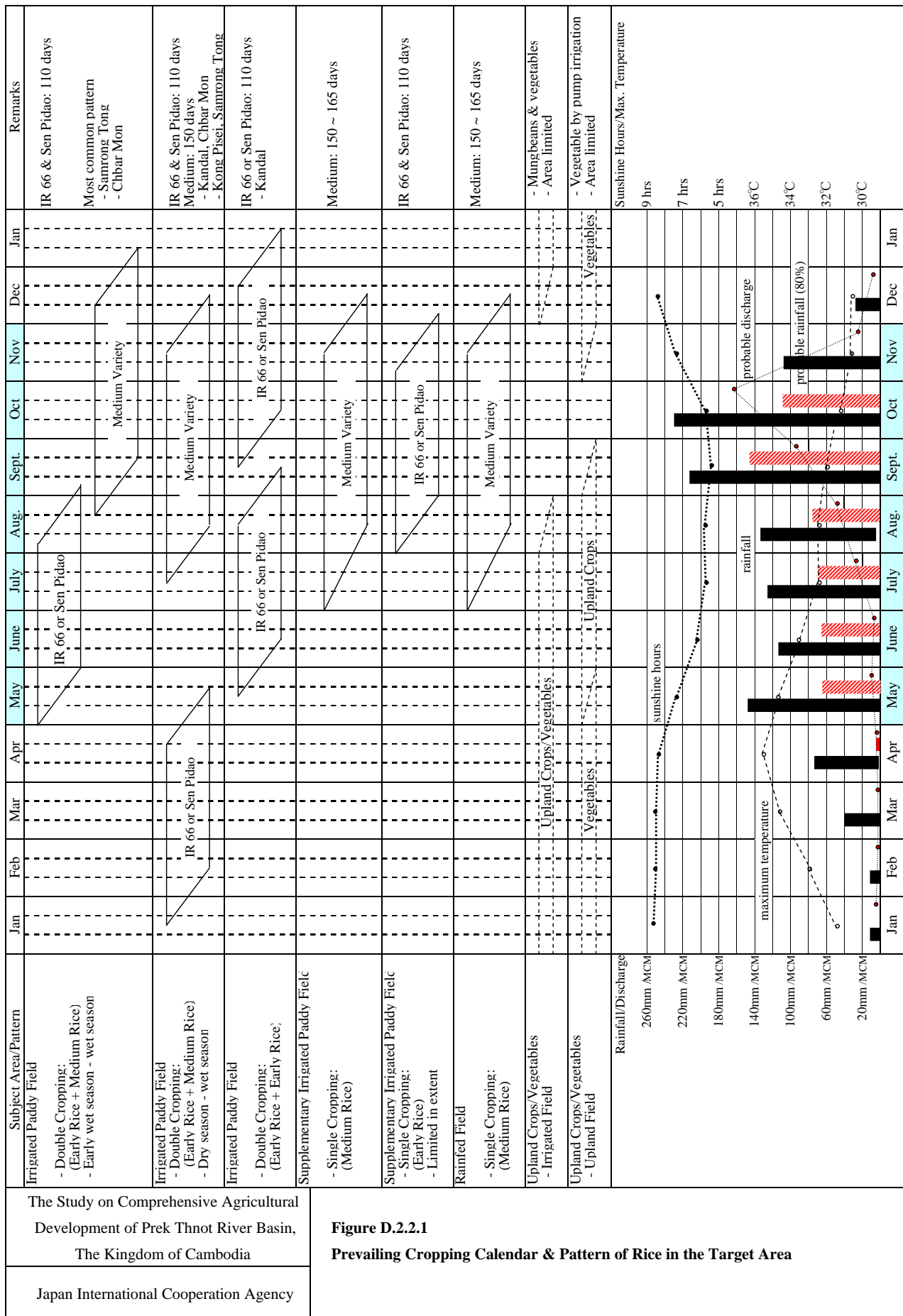


prepared based on aerial photos taken in 2004 and the result of site inspection

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**Figure D.2.1.1
Present Land Use Map of the Target Area**



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Figure D.2.2.1
Prevailing Cropping Calendar & Pattern of Rice in the Target Area

Rainfall: mean monthly rainfall at Kampong Speu from 1901-2004 except for 1973-1980 & 15

Probable discharge: At Roleng Chrey Headwork, Prek Khnot Riv Sunshine hour/maximum temperature: 1995 to 2005, source Department of Meteorology

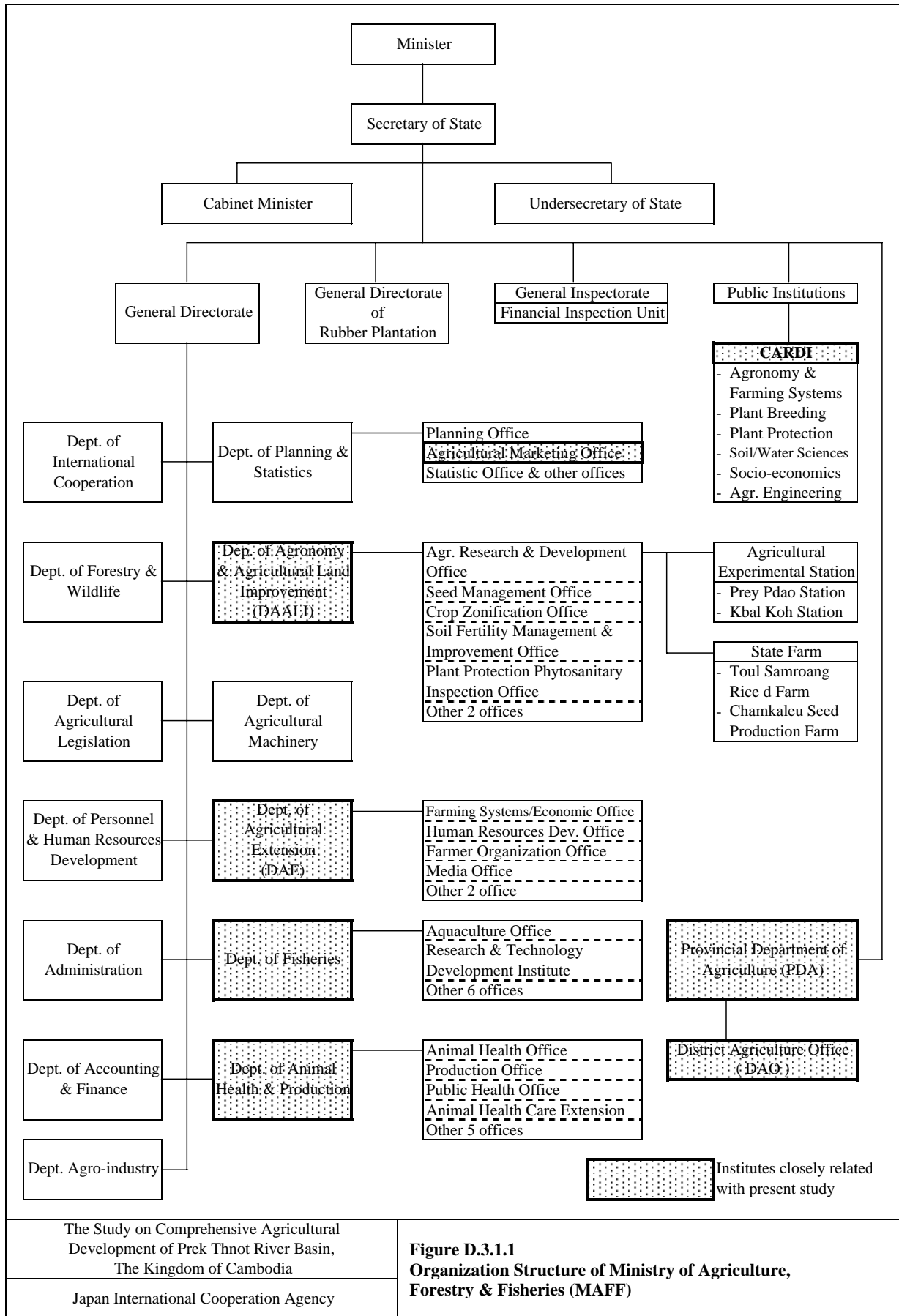
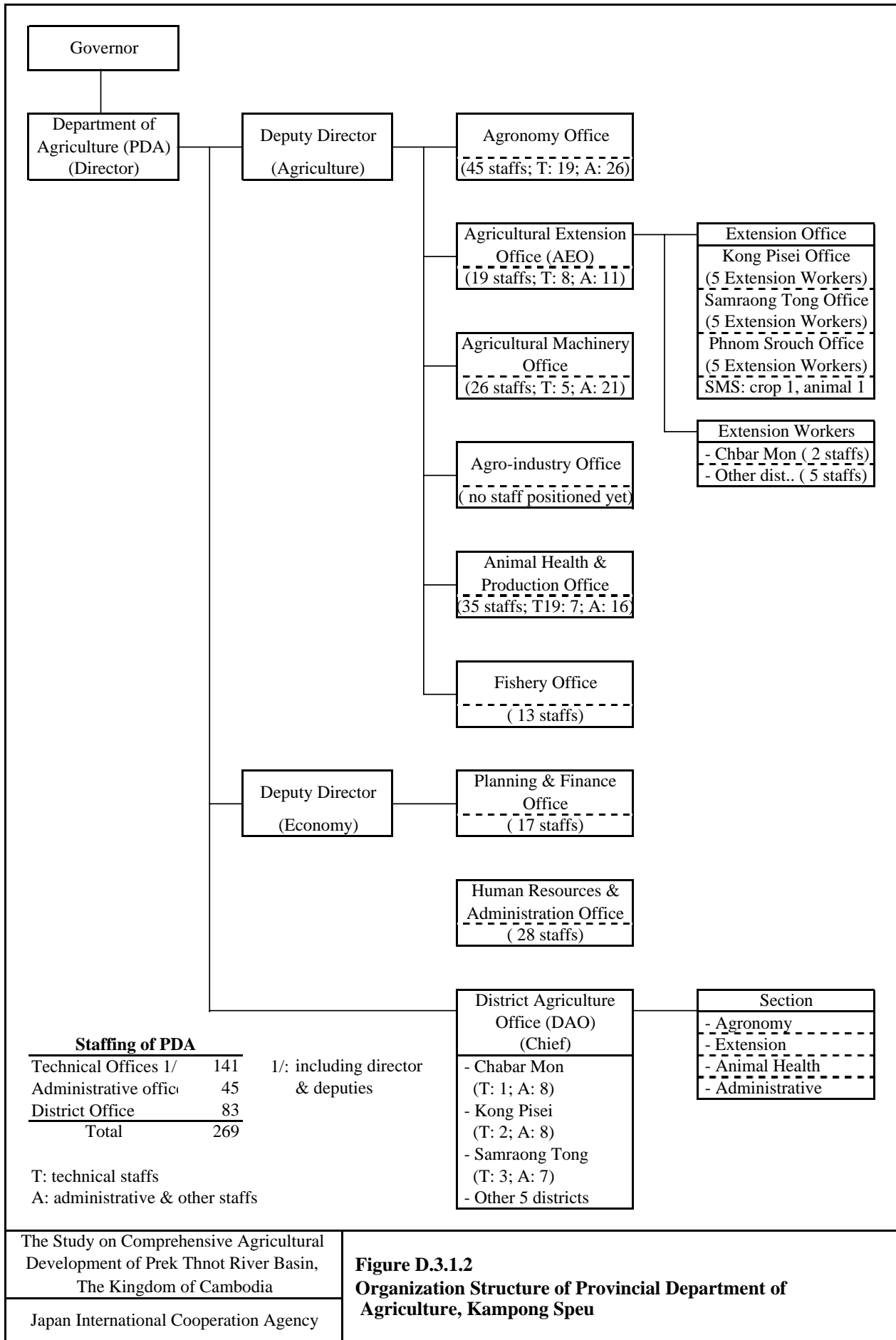
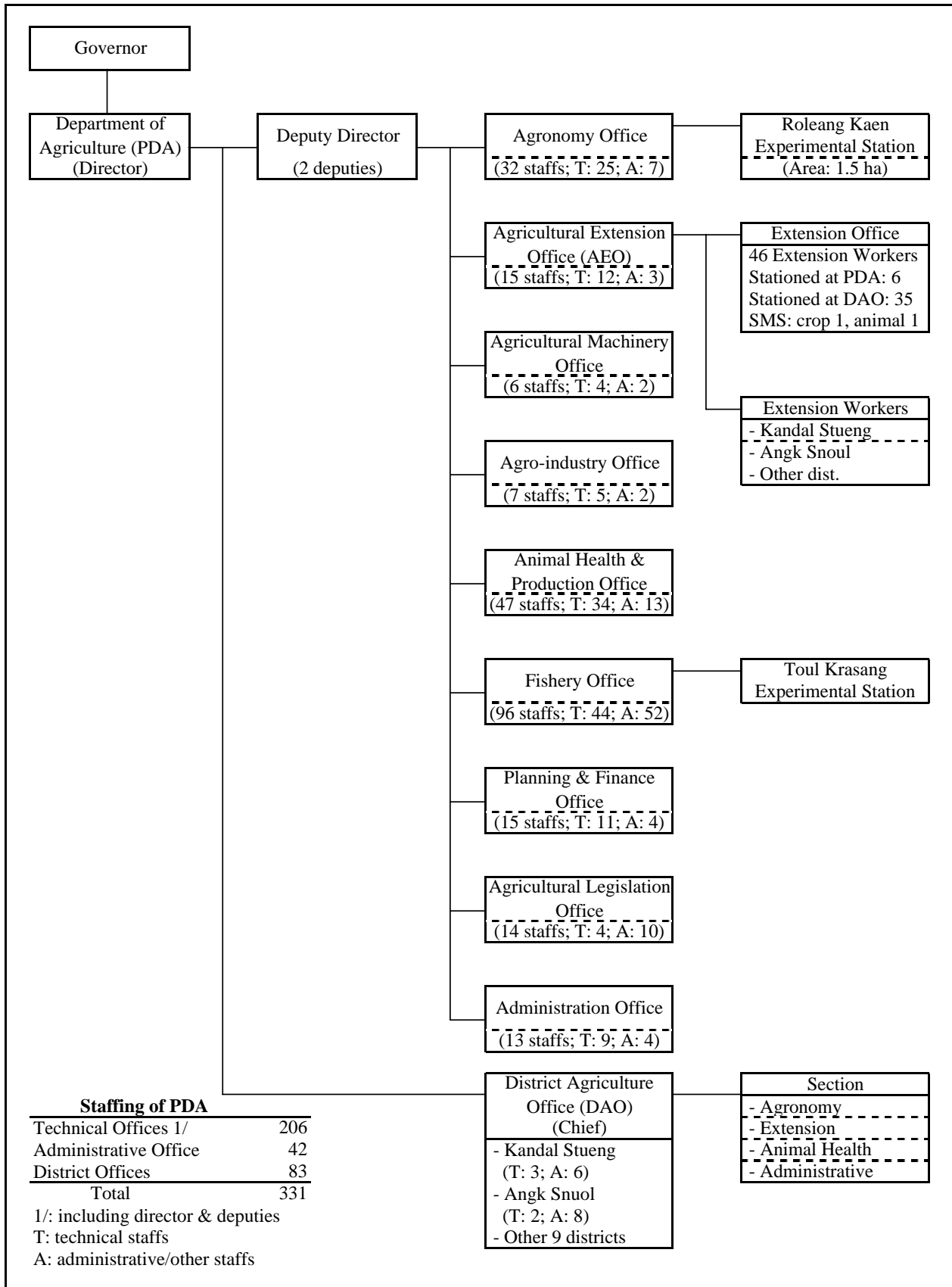


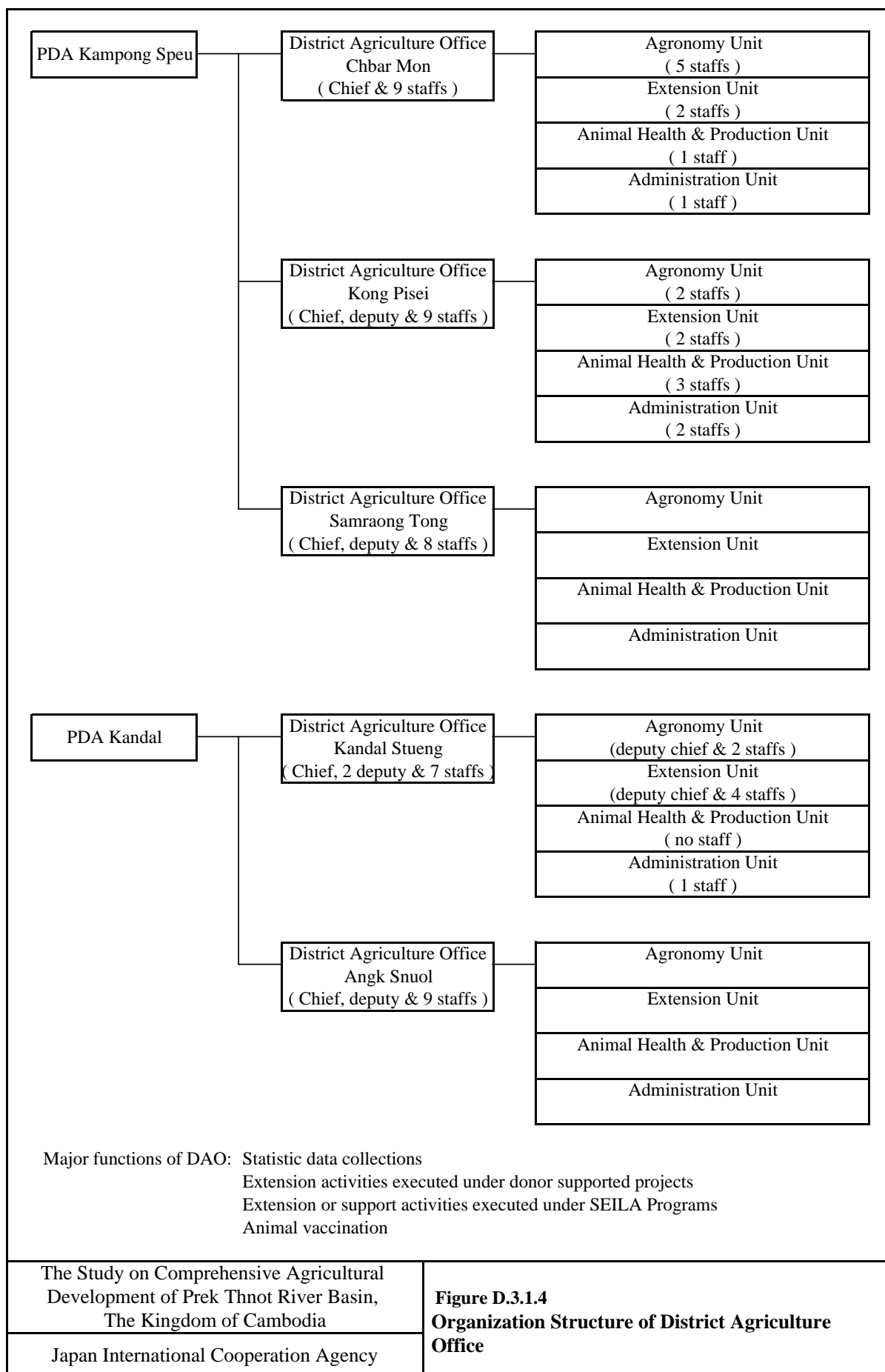
Figure D.3.1.1
Organization Structure of Ministry of Agriculture, Forestry & Fisheries (MAFF)

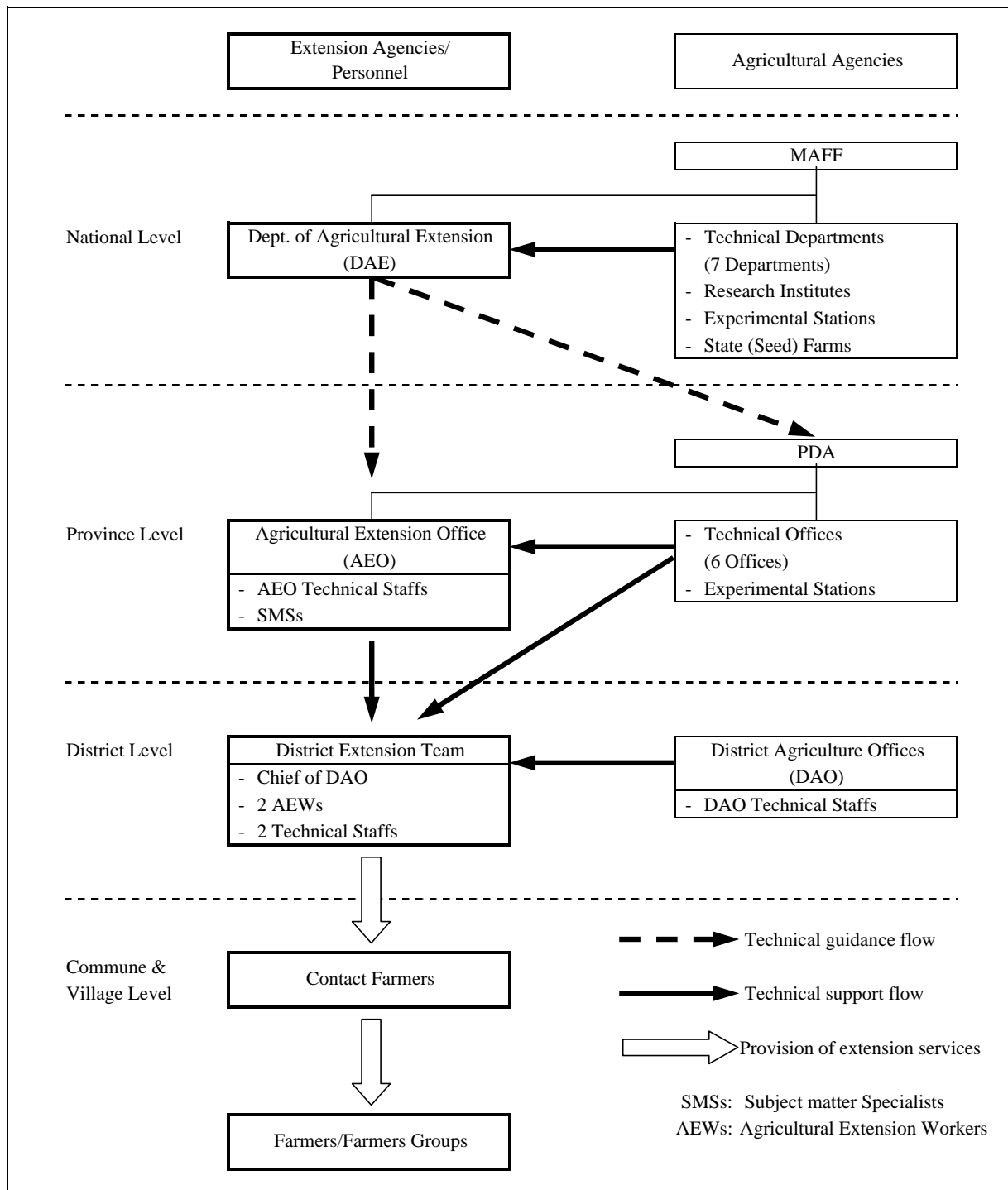




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Figure D.3.1.3
Organization Structure of Provincial Department of Agriculture, Kandal

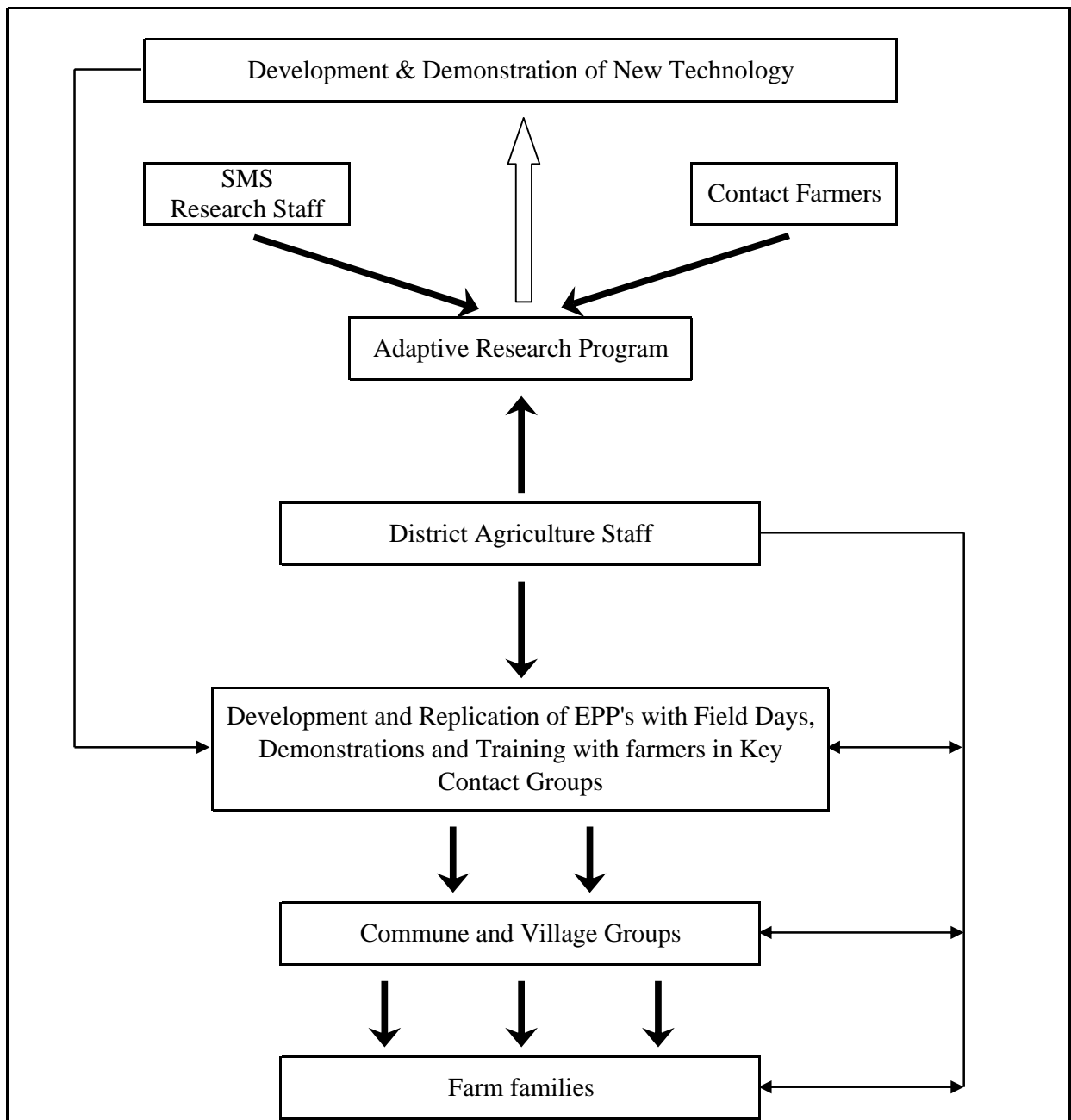




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Figure D.3.3.1
Institutional Set-up of Proposed Agricultural Extension System in Cambodia

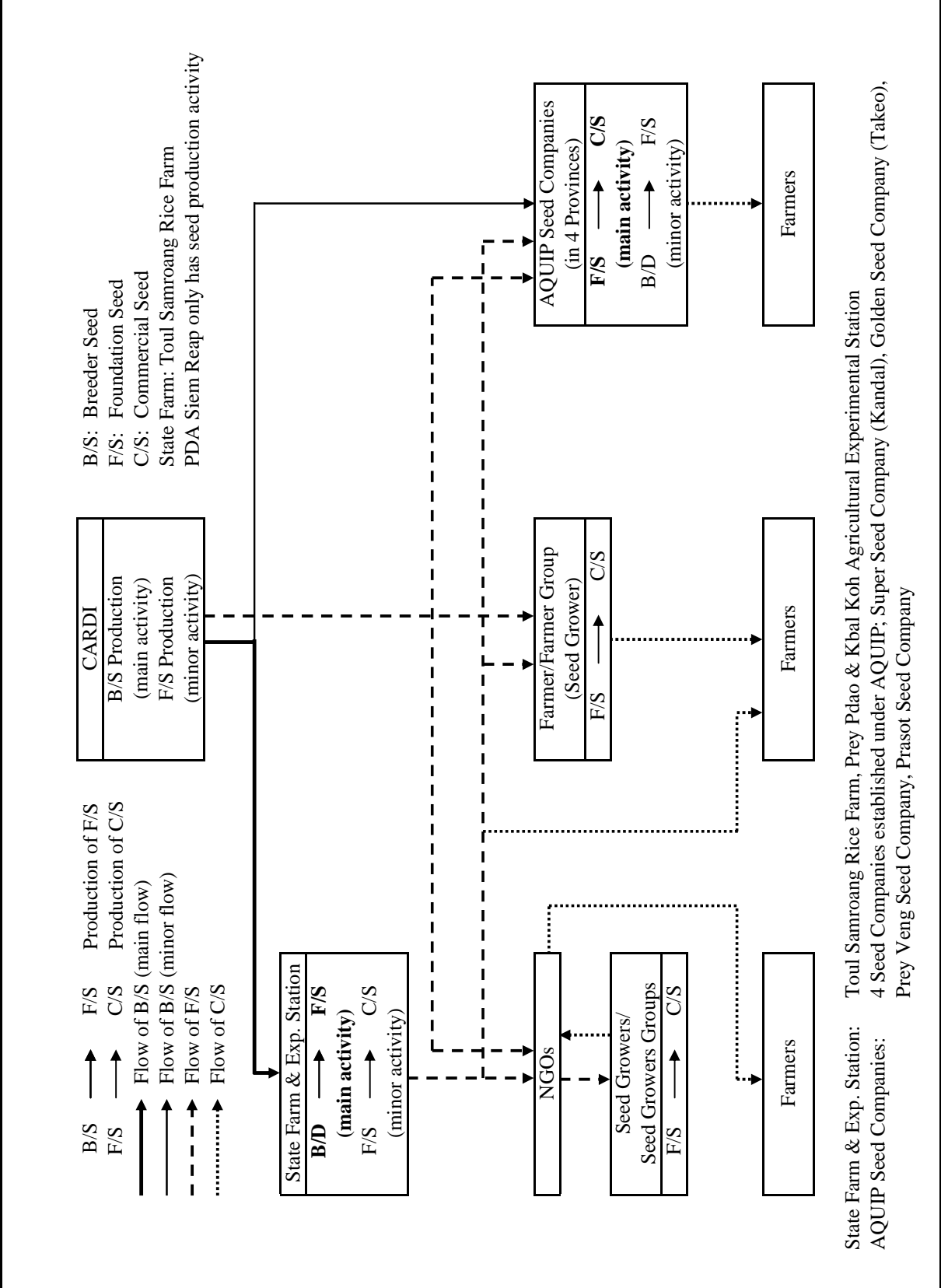


EPP: Extension Programs Package (currently named as TIP/Technical Implementation Procedures)

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Figure D.3.3.2
Schematic Presentation of Technology Transfer Role of District Agriculture Staff

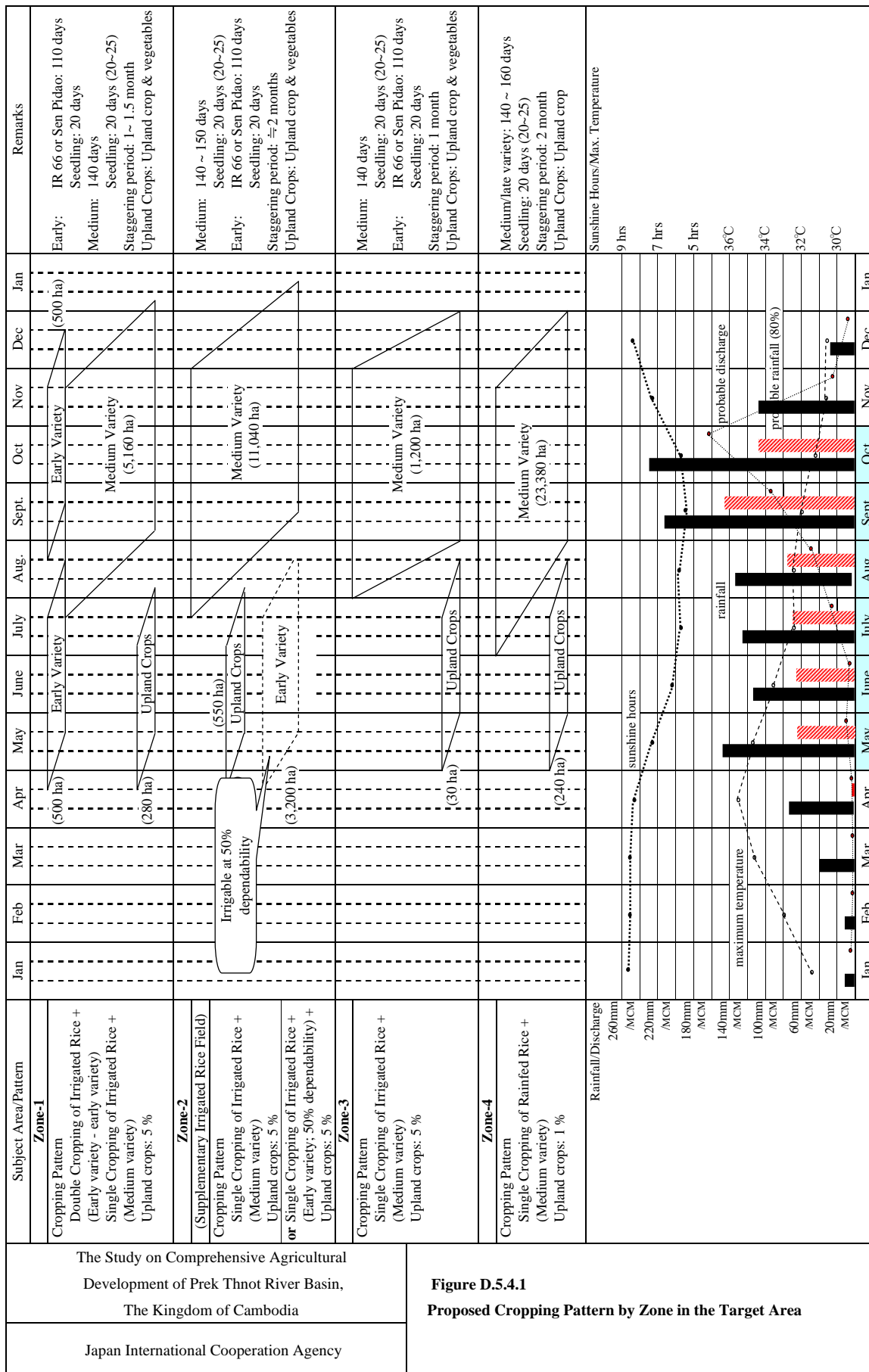
Source: Guidelines for Agricultural Extension in Cambodia, 2000, CAAEP



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Figure D.3.4.1
Current Predominant Rice Seed Production & Supply System in Cambodia



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Figure D.5.4.1
Proposed Cropping Pattern by Zone in the Target Area

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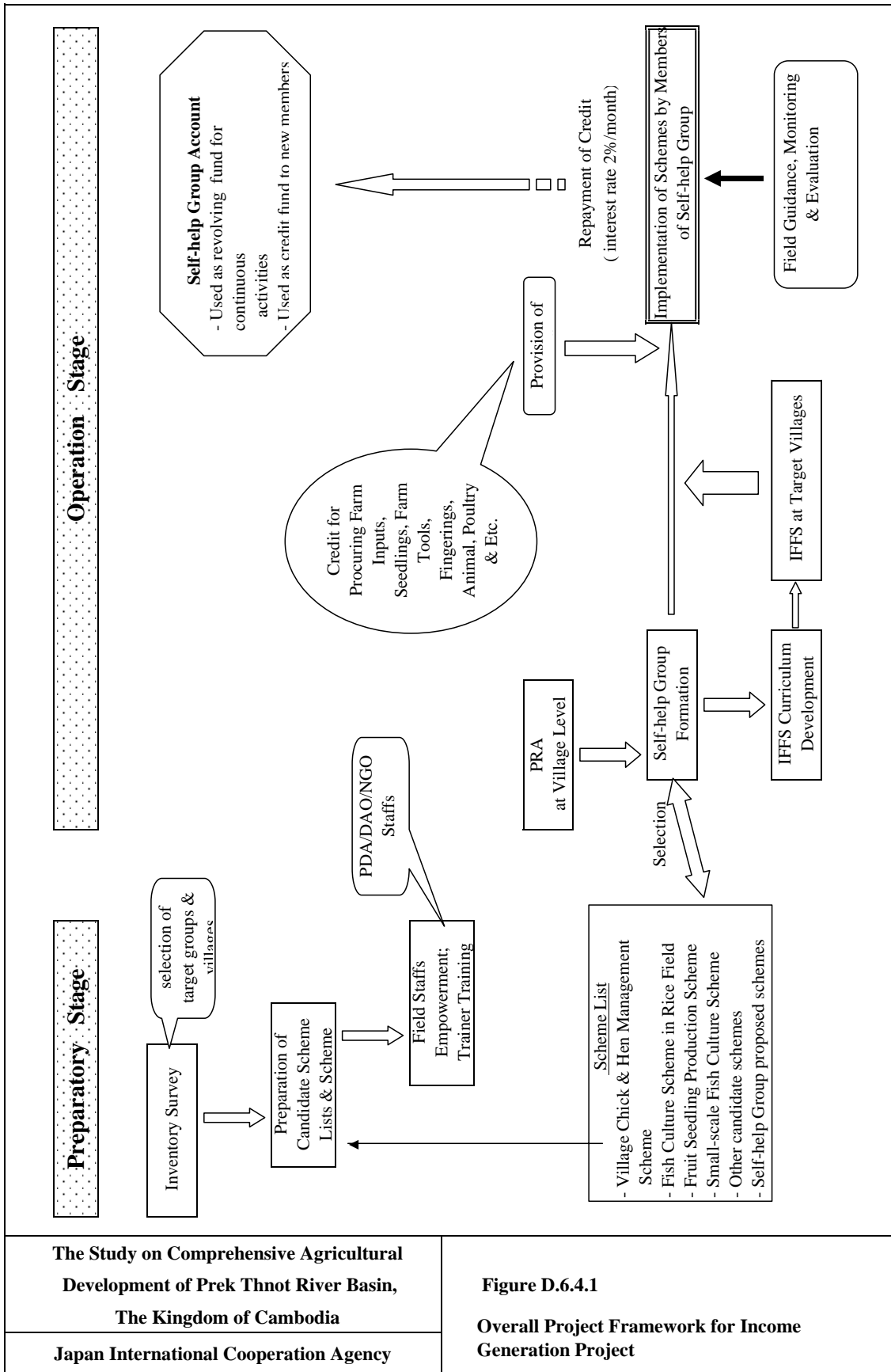
Rainfall: mean monthly rainfall at Kampong Speu from 1901~2004 except for 1973~1980 &
 Probable discharge: At Roleng Chrey Headwork, Prek Khnot River
 Sunshine hour/maximum temperature: 1995 to 2005, source Department of Metc

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Subject Project/Pattern		Jan	Feb	Mar	Apr	May	June	July	Aug.	Sept.	Oct	Nov	Dec	Jan	Remarks
Zone-1	Model Project (570ha) Cropping Pattern Double Cropping of Irrigated Rice + (Early variety - early variety) Single Cropping of Irrigated Rice + Upland crops: 5 %						Early Variety (285ha)				Early Variety (285ha)				Early: IR 66 or Sen Pidao: 110 days Seedling: 20 days Medium: 140 days Seedling: 20 days (20-25) Staggering period: 1~ 1.5 month Upland Crops: Upland crop & vegetables
							Upland Crops (30 ha)				Medium Variety (285 ha)				
								Early Variety (215ha)				Early Variety (215ha)			
Upper North Main Canal Project (2,210ha) Cropping Pattern Double Cropping of Irrigated Rice + (Early variety - early variety) Single Cropping of Irrigated Rice + Upland crops: 5 %							Upland Crops (110ha)				Medium Variety (1,995ha)				
											Medium Variety (2,880ha)				Medium: 140 days Seedling: 20 days (20-25) Staggering period: 1.5 month Upland Crops: Upland crop & vegetables
								Upland Crops (140ha)							
Zone-2	Lower North Main Canal Project (1,390ha) Cropping Pattern Single Cropping of Irrigated Rice + (Medium variety) Upland crops: 5 %														
Lower South Main Canal Project (6,750ha) Cropping Pattern Single Cropping of Irrigated Rice + (Medium variety) Upland crops: 5 %															
On Krang Ambel Project (2,900ha) Cropping Pattern Single Cropping of Irrigated Rice + (Medium variety) Upland crops: 5 %															

Figure D.6.1.1
Proposed Cropping Pattern by Project

The Study on Comprehensive Agricultural
Development of Prek Thnot River Basin,
The Kingdom of Cambodia
Japan International Cooperation Agency



Attachments

Attachment-1
Description of Typical Soil Profile

Attachment 1 Description of Typical Soil Profile - 1/9

Soil Unit : Plinthic Acrisols (PA)
Distribution : 28,580 ha (27%) Land Suitability Class : S3

Typical Soil Profile

Location : Sob Ngor, Ktom Krang Commune, Samraong Tong District
Pit Number : P 1 Land Use : Shrub land
Topography : Flat to slightly undulating Elevation : 35 m
Groundwater : > 1.5 m

Soil depth (cm)

0 - 20	7.5YR 4/6, medium size plinthite common (10YR 3/1, size <0.5cm), sandy loam (SL), slightly sticky, slightly plastic, very hard when dry, gradual wavy boundary
20 - 30	7.5YR 4/6, many medium size plinthite (10YR 3/1, size <0.5cm), sandy loam (SL), slightly sticky, slightly plastic, very hard when dry, gradual wavy boundary
30 - 80	5YR 6/4, rich in medium size plinthite (5YR 6/6, size <1cm), sandy loam (SL), slightly sticky, slightly plastic, very hard when dry, clear wavy boundary
>80	5YR 6/4, very rich in medium size plinthite (5YR 6/6, size <1cm), clay loam (CL) to sandy clay (SC), sticky, slightly plastic, very hard when dry



Attachment 1 Description of Typical Soil Profile - 2/9

Soil Unit : Gleyic Acrisols Medium Textured Phase (GAm)
 Distribution : 55,410 ha (53 %) Land Suitability Class S2 :

Typical Soil Profile

Location : Bheng, Phneay Commune, Samraong Tong District
 Pit Number : P 2 Land Use : Rainfed paddy field
 Topography : Flat Elevation : 35 m
 Groundwater : > 1.5 m

Soil depth (cm)

- | | |
|----------|--|
| 0 - 15 | 10YR 6/3 (10YR 7/3 when dry), many medium size mottling (10YR 1.7/1), sandy loam (SL), slightly sticky, slightly plastic, very friable when moist, slightly hard when dry, clear & wavy boundary
pH (H ₂ O) 4.4, total nitrogen low at 0.03%, total carbon low at 0.2%, CEC very low, exchangeable K, Ca & Mg, respectively 0.7, 6.5 & 0.2 meq/100g |
| 15 - 30 | 10YR 6/3 (10YR 7/3 when dry), many medium size mottling (10YR 1.7/1), plinthite concretion common, sandy loam (SL), slightly sticky, slightly plastic, very friable when moist, slightly hard when dry, diffused boundary
pH (H ₂ O) 7.8, total nitrogen low at 0.01%, total carbon low at 0.1%, CEC very low, exchangeable K, Ca & Mg respectively 0.6, 13.4 & 0.3 meq/100g |
| 30 - 100 | 10YR 6/3 (10YR 7/2 when dry), few fine mottling (10YR 1.7/1), medium size plinthite concretion common, sandy clay loam (SCL), slightly sticky, slightly plastic, friable when moist, hard when dry
pH (H ₂ O) 9.6, total nitrogen low at 0.01%, total carbon low at 0.07%, CEC low, exchangeable K, Ca & Mg respectively 1.6, 8.6 & 9.2 meq/100g |



Attachment 1 Description of Typical Soil Profile - 3/9

Soil Unit : Gleyic Acrisols Medium Textured Phase (GAm)
Distribution : 55,410 ha (53%) Land Suitability Class : S2

Typical Soil Profile

Location : Kla Kon, Peuk Commune, Ang Snoul District
Pit Number : P 3 Land Use : Rainfed paddy field
Topography : Flat Elevation : 17 m
Groundwater : 1.5 m

Soil depth (cm)

- | | |
|-----------|--|
| 0 - 10 | 5YR 6/2, medium size mottling common, sandy loam (SL), slightly sticky, slightly plastic, very friable when moist, hard when dry, weak blocky structure, gradual straight boundary |
| 10 - 25 | 5YR 6/3, few medium size mottling, sandy loam to sandy clay loam (SL~SCL), slightly sticky, slightly plastic, very friable when moist, very hard when dry, massive, wavy diffused boundary |
| 25 - >100 | 5YR 7/3, coarse distinct mottling common (5YR 5/8), coarse sandy clay loam to sandy clay (SCL~SC), sticky, plastic, extremely hard when dry, massive, |



Attachment 1 Description of Typical Soil Profile - 4/9

Soil Unit : Gleyic Acrisols Medium to Fine Textured Phase (GAF)
 Distribution : 10,750ha (10%) Land Suitability Class : S2

Typical Soil Profile

Location : Sor Romang, Krang Mkak Commune, Ang Snoul District
 Pit Number : P 4 Land Use : Irrigated paddy field
 Topography : Flat, Prek Thnot R. flood plain Elevation : 18 m
 Groundwater : 1.0 m

Soil depth (cm)

- | | |
|----------|---|
| 0 - 10 | 10YR 6/3, many medium size mottling (10YR 6/6), light clay (LiC), slightly sticky, slightly plastic, very friable when moist, slightly hard when dry, weak blocky structure, diffused wavy boundary
pH (H2O) 4.7, total nitrogen low at 0.05%, total carbon low at 0.5%, CEC low to very low, exchangeable K, Ca & Mg res. 3.7, 9.2 & 2.5 meq/100g |
| 10 - 25 | 10YR 6/3, medium size mottling common (10YR 5/6), light clay (LiC), slightly sticky, slightly plastic, very friable when moist, slightly hard when dry, weak blocky structure, gradual wavy boundary
pH (H2O) 5.0, total nitrogen low at 0.1%, total carbon low at 0.5%, CEC very low, exchangeable K, Ca & Mg respect. 5.0, 7.2 & 1.5 meq/100g |
| 25 - 50 | 10YR 7/2, many coarse mottling (10YR 4/4), light clay (LiC), slightly sticky to sticky, slightly plastic to plastic, firm when moist, hard when dry, massive, clear wavy boundary
pH (H2O) 6.4, total nitrogen low at 0.03%, total carbon low at 0.1%, CEC very low, exchangeable K, Ca & Mg respec. 5.0, 11.7 & 4.7 meq/100g |
| 50 - >80 | 10YR 5/3, many medium size mottling (10YR 4/4), silty clay to clay (SiC~C), sticky, plastic, very firm when moist, very hard when dry, massive, |



Attachment 1 Description of Typical Soil Profile - 5/9

Soil Unit : Plinthic Acrisols (PA)
 Distribution : 28,580ha (27%) Land Suitability Class : S3

Typical Soil Profile

Location : Prey Taouk, Roka Koh Commune, Kong Pisei District
 Pit Number : P 5 Land Use : Irrigated paddy field
 Topography : Flat, Prek Thnot R. flood plain Elevation : 22 m
 Remarks : 23 years after development of paddy field

Soil depth (cm)

0 - 10	7.5YR 5/4, medium size mottling common (2.5YR 4/6), sandy loam (SL), none sticky, none plastic, very friable when moist, soft when dry, weak crumble structure, clear wavy boundary pH (H2O) 4.9, total nitrogen low at 0.03%, total carbon low at 0.8%, CEC very low, exchangeable K, Ca & Mg respec. 1.0, 6.0 & 5.7 meq/100g
10 - 25	7.5YR 5/4, medium size mottling common (7.5YR 5/2), sandy clay loam (SCL), none sticky, none plastic, very friable when moist, soft when dry, massive, gradual wavy boundary pH (H2O) 6.3, total nitrogen low at 0.04%, total carbon low at 0.6%, CEC very low, exchangeable K, Ca & Mg respec. 5.0, 7.2 & 1.5 meq/100g
25 - 50	7.5YR 5/3, medium size mottling common (7.5YR 5/2), sandy clay loam (SCL), slightly sticky, slightly plastic, massive, clear wavy boundary pH (H2O) 6.5, total nitrogen low at 0.04%, total carbon low at 0.6%, CEC very low, exchangeable K, Ca & Mg respec. 0.7, 10.8 & 3.2 meq/100g
>50	7.5YR 5/3 + 2.5YR 4/8, many coarse mottling, sandy clay loam (SCL), rich in small plinthite concretion or plinthite layer, slightly sticky, slightly plastic, massive



Attachment 1 Description of Typical Soil Profile - 7/9

Soil Unit : Gleyic Acrisols Medium to Fine Textured Phase (Gaf)
Distribution : 10,750ha (10%) Land Suitability Class : S2

Typical Soil Profile

Location : Krang Ampil, Sukuh Commune, Samraong Tong District
Pit Number : P 7 Land Use : Rainfed paddy field
Topography : Flat Elevation : 39 m
Groundwater : > 1.0 m

Soil depth (cm)

0 - 10 10YR 7/4 (dry), fine mottling common (10YR 5/8), sandy loam to sandy clay loam (SL~SCL), slightly sticky, slightly plastic, firm when moist, slightly hard when dry, strong coarse blocky structure, gradual wavy boundary

10 - 30 10YR 7/4 (dry), medium size mottling common (10YR 5/8), silty loam to clay loam (SiL~CL), slightly sticky to sticky, slightly plastic to plastic, firm when moist, hard when dry, strong coarse blocky structure, clear wavy boundary

>30 10YR 7/4 (dry), no mottling, clay (C), sticky, plastic, very firm when moist, very hard when dry, strong coarse blocky structure,



Attachment 1 Description of Typical Soil Profile - 8/9

Soil Unit : Gleyic Acrisols Coarse Textured Phase (GAc)
 Distribution : 1,460ha (1%) Land Suitability Class : S3C

Typical Soil Profile

Location : Oukrang Ambel, Trapeang Kong Commune, Samraong Tong District
 Pit Number : P 8 Land Use : Irrigated paddy field
 Topography : Flat Elevation : 30 m
 Groundwater : > 1.0 m

Soil depth (cm)

0 - 18	7.5YR 6/4 + 5/3, no mottling, loamy sand (LS), none sticky, none plastic, very friable when moist, loose when dry, gradual wavy boundary pH (H2O) 6.4, total nitrogen low at 0.03%, total carbon low at 0.2%, CEC very low, exchangeable K, Ca & Mg respec. 0.9, 9.2 & 14.9 meq/100g
18 - 48	7.5YR 6/4, medium size mottling common (7.5YR 6/6), sand (S), none sticky, none plastic, very friable when moist, loose when dry, gradual wavy boundary pH (H2O) 7.5, total nitrogen low at 0.02%, total carbon low at 0.2%, CEC very low, exchangeable K, Ca & Mg respec. 0.6, 7.6 & 3.3 meq/100g
48 - 68	7.5YR 6/3, many coarse mottling (7.5YR 6/8), sandy clay loam (SCL), slightly sticky, slightly plastic, firm when moist, hard when dry, medium platy fine structure, gradual wavy boundary pH (H2O) 6.3, total nitrogen low at 0.01%, total carbon low at 0.2%, CEC very low, exchangeable K, Ca & Mg respec. 0.8, 5.9 & 1.9 meq/100g
> 68	7.5YR 7/3, many coarse mottling (7.5YR 6/8), sandy clay loam (SCL), slightly sticky & plastic, very firm when moist, very hard when dry, massive,



Attachment 1 Description of Typical Soil Profile - 9/9

Soil Unit : Gleyic Acrisols Medium to Fine Textured Phase (GAf)
 Distribution : 10,750ha (10%) Land Suitability Class : S2

Typical Soil Profile

Location : Trapeang Kak, Krang Ampil Commune, Samraong Tong District
 Pit Number : P 9 Land Use : Rainfed paddy field
 Topography : Flat Elevation : 46 m
 Groundwater : > 1.5 m

Soil depth (cm)

0 - 15	7.5YR 5/2, fine distinct mottling common (7.5YR 5/6), clay loam (to silty clay loam) (CL), slightly sticky, slightly plastic, firm when moist, hard when dry, massive, clear wavy boundary pH (H2O) 6.8, total nitrogen low at 0.05%, total carbon low at 0.4%, CEC low, exchangeable K, Ca & Mg respec. 5.9, 23.6 & 8.7 meq/100g
15 - 32	7.5YR 4/1, many medium size mottling (7.5YR 5/3), clay loam to clay (CL~C), slightly sticky to sticky, slightly plastic to plastic, firm when moist, hard when dry, medium coarse blocky structure, gradual wavy boundary pH (H2O) 7.9, total nitrogen low at 0.04%, total carbon low at 0.6%, CEC low, exchangeable K, Ca & Mg respec. 2.4, 41.5 & 13.9 meq/100g (measurement of free Ca & Mg ??)
32 - 52	7.5YR 4/2, many medium size mottling (7.5YR 5/3), clay (C), sticky, plastic, very firm when moist, very hard when dry, strong blocky structure, gradual wavy boundary pH (H2O) 7.8, total nitrogen low at 0.05%, total carbon low at 0.3%, CEC low, exchangeable K, Ca & Mg respec. 2.4, 35.3 & 14.2 meq/100g
> 52	7.5YR 5/2, medium size mottling common (7.5YR 5/3), few Mn-concretion, clay (C), sticky, plastic, very firm when moist, very hard when dry, massive



Attachment-2

***Results of Questionnaire Survey on Farming Practices,
Farm Inputs Supply and Marketing***

Attachment 2 Results of Questionnaire Survey on Farming Practices, Farm Inputs Supply and Marketing - 1/8

A. Farming Practices

A-1. Reason for fallow of rice field

Response (one alternative)	Category Area-1		Category Area-2		Category Area-3		Category Area-4		All Categories	
	n	%	n	%	n	%	n	%	n	%
Wet Season										
Labor shortage	1	25							1	6
Working capital shortage	2	50	1	50					3	19
Water shortage	1	25	1	50	2	100	8	100	12	75
Total	4	100	2	100	2	100	8	100	16	100
Dry Season										
Labor shortage	2	11	1	2					3	2
Working capital shortage	1	6							1	1
Water shortage	14	78	42	98	45	100	47	98	148	96
Others (specify)	1	6					1	2	2	1
Total	18	100	43	100	45	100	48	100	154	100

A-2. Reasons for selection of rice variety

Response (plural alternatives)	Category Area-1		Category Area-2		Category Area-3		Category Area-4		All Categories	
	n	%	n	%	n	%	n	%	n	%
Resistant to pest disease	6	12	6	13			5	10	17	9
Tolerant to nature	2	4			2	4	2	4	6	3
High yield	37	76	38	79	35	71	27	54	137	70
Need less water	2	4	1	2			1	2	4	2
Short time	17	35	5	10	4	8	5	10	31	16
Popular	1	2	1	2					2	1
Strong plant	2	4							2	1
Cooke rice is soft	7	14	3	6	10	20	19	38	39	20
Heavy rice	2	4	3	6	4	8	3	6	12	6
Resistant to water					1	2			1	1

Totals exceed 100% due to multiple responses

A-3. Land preparation method

Response (one alternative)	Category Area-1		Category Area-2		Category Area-3		Category Area-4		All Categories	
	n	%	n	%	n	%	n	%	n	%
Draft animal	42	84	43	86	48	96	49	98	182	91
Machinery	8	16	7	14	2	4	1	2	18	9
Total	50	100	50	100	50	100	50	100	200	100

A-4. Fertilization Volume: Urea (unit: kg/ha)

	Category Area-1	Category Area-2	Category Area-3	Category Area-4	All Categories
N	50	50	50	50	200
Median	36.6	29.7	28.7	35.7	33.3
Mean	58.6	50.5	42.6	49.7	50.3
SE Mean	10.8	7.9	8.7	13.1	5.1
Minimum	0	0	0	0	0
Maximum	416.7	300.0	322.6	666.7	666.7

A-5. Fertilization Volume: DAP (unit: kg/ha)

	Category Area-1	Category Area-2	Category Area-3	Category Area-4	All Categories
N	50	50	50	50	200
Median	34.4	50.0	29.9	43.2	37.1
Mean	49.2	52.6	39.6	79.2	55.2
SE Mean	6.8	6.6	6.7	32.8	8.7
Minimum	0	0	0	0	0
Maximum	210.5	200.0	312.5	1,666.7	1,666.7

A-6. KCL

	Category Area-1	Category Area-2	Category Area-3	Category Area-4	All Categories
N	50	50	50	50	200
Mean	0	0	0	0	0
Minimum	0	0	0	0	0
Maximum	0	0	0	0	0

A-7. Other (Compost/Manure)

	Category Area-1	Category Area-2	Category Area-3	Category Area-4	All Categories
N	50	50	50	50	200
Median	154	379	333	500	360
Mean	442	702	791	1,043	744
SE Mean	90	162	197	334	108
Minimum	0	0	0	0	0
Maximum	2,778	7,500	6,667	16,667	16,667

Attachment 2 Results of Questionnaire Survey on Farming Practices, Farm Inputs Supply and Marketing - 2/8

A-8. Threshing (method)

Response	Category Area-1		Category Area-2		Category Area-3		Category Area-4		All Categories	
	n	%	n	%	n	%	n	%	n	%
Engine thresher	6	12			1	2			7	4
Manual threshing	44	88	50	100	49	98	50	100	193	97
Total	50	100	50	100	50	100	50	100	200	100

A-8. Drying (method)

Response	Category Area-1		Category Area-2		Category Area-3		Category Area-4		All Categories	
	n	%	n	%	n	%	n	%	n	%
Sun drying	50	100	50	100	50	100	50	100	200	100
Total	50	100	50	100	50	100	50	100	200	100

A-9. Cleaning (method)

Response	Category Area-1		Category Area-2		Category Area-3		Category Area-4		All Categories	
	n	%	n	%	n	%	n	%	n	%
Engine winnower	19	38	19	38	24	48	12	24	74	37
Manual winnower	22	44	20	40	13	26	22	44	77	39
Manual without winnower	9	18	11	22	13	26	16	32	49	25
Total	50	100	50	100	50	100	50	100	200	100

A-10. Cleaning (charging in case borrowing; riel)

	Category Area-1	Category Area-2	Category Area-3	Category Area-4	All Categories
N	11	21	15	7	54
Median	10,000	11,560	12,000	9,000	10,500
Mean	13,364	26,527	22,753	9,186	20,549
SE Mean	2,508	6,377	6,678	1,252	3,210
Minimum	2,500	7,200	6,800	6,000	2,500
Maximum	25,000	90,000	90,000	16,000	90,000

B. Farm Input Supply

B-1. Seed source of rice

Response (one alternative)	Category Area-1		Category Area-2		Category Area-3		Category Area-4		All Categories	
	n	%	n	%	n	%	n	%	n	%
Own product	38	76	33	66	33	66	40	80	144	72
Exchange with others	11	22	16	32	12	24	6	12	45	23
Produced at local market	1	2	1	2	5	10	2	4	9	5
Certified seed purchased							2	4	2	1
Total	50	100	50	100	50	100	50	100	200	100

B-2. Frequency of seed replacement

Response (one alternative)	Category Area-1		Category Area-2		Category Area-3		Category Area-4		All Categories	
	n	%	n	%	n	%	n	%	n	%
Once per 3 cropping	23	46	21	42	27	54	21	42	92	46
Once per 4-6 cropping	14	28	10	20	7	14	10	20	41	21
Once > 6 cropping	13	26	19	38	16	32	19	38	67	34
Total	50	100	50	100	50	100	50	100	200	100

B-3. Seed source/upland crop

Response (plural alternatives)	Category Area-1		Category Area-2		Category Area-3		Category Area-4		All Categories	
	n	%	n	%	n	%	n	%	n	%
Own product	13	38	12	50	6	23	6	25	37	34
Exchange with others	3	9	3	13	1	4	1	4	8	7
Produced at local market	19	56	9	38	19	73	17	71	64	59

Totals exceed 100% due to multiple responses

B-4. Seed source/vegetable

Response (plural alternatives)	Category Area-1		Category Area-2		Category Area-3		Category Area-4		All Categories	
	n	%	n	%	n	%	n	%	n	%
Own product	12	40	6	38	10	33	4	19	32	33
Exchange with others	4	13	5	31			1	5	10	10
Produced at local market	19	63	5	31	23	77	16	76	63	65

Totals exceed 100% due to multiple responses

B-5. Procurement of wanted seed

Response (one alternative)	Category Area-1		Category Area-2		Category Area-3		Category Area-4		All Categories	
	n	%	n	%	n	%	n	%	n	%
Easy	50	100	43	86	46	92	44	88	183	92
Difficult			7	14	4	8	6	12	17	9
Total	50	100	50	100	50	100	50	100	200	100

Attachment 2 Results of Questionnaire Survey on Farming Practices, Farm Inputs Supply and Marketing - 3/8

B-6. Procurement of certified seed

Response (one alternative)	Category Area-1		Category Area-2		Category Area-3		Category Area-4		All Categories	
	n	%	n	%	n	%	n	%	n	%
Easy	24	48	27	54	29	58	28	56	108	54
Difficult	25	50	22	44	17	34	19	38	83	42
Not possible	1	2	1	2	4	8	3	6	9	5
Total	50	100	50	100	50	100	50	100	200	100

B-7. Seed supply timing

Response (one alternative)	Category Area-1		Category Area-2		Category Area-3		Category Area-4		All Categories	
	n	%	n	%	n	%	n	%	n	%
In time	38	76	37	74	35	70	30	60	140	70
Delayed	8	16	13	26	9	18	17	34	47	24
Not obtained	4	8			6	12	3	6	13	7
Total	50	100	50	100	50	100	50	100	200	100

B-8. Quality seed price

Response (one alternative)	Category Area-1		Category Area-2		Category Area-3		Category Area-4		All Categories	
	n	%	n	%	n	%	n	%	n	%
Too expensive	19	38.00	22	44.00	19	38.00	23	46.00	83	41.50
Acceptable	29	58.00	27	54.00	27	54.00	25	50.00	108	54.00
Not purchased	2	4.00	1	2.00	4	8.00	2	4.00	9	4.50
Total	50	100.00	50	100.00	50	100.00	50	100.00	200	100.00

B-9. Procurement of wanted fertilizer

Response (one alternative)	Category Area-1		Category Area-2		Category Area-3		Category Area-4		All Categories	
	n	%	n	%	n	%	n	%	n	%
Easy	48	96.00	48	96.00	43	86.00	41	82.00	180	90.00
Difficult	2	4.00	2	4.00	7	14.00	9	18.00	20	10.00
Total	50	100.00	50	100.00	50	100.00	50	100.00	200	100.00

B-10. Fertilizer supply timing

Response (one alternative)	Category Area-1		Category Area-2		Category Area-3		Category Area-4		All Categories	
	n	%	n	%	n	%	n	%	n	%
In time	47	94	46	92	42	84	40	80	175	88
Delayed	3	6	4	8	8	16	10	20	25	13
Total	50	100	50	100	50	100	50	100	200	100

B-11. Fertilizer price

Response (one alternative)	Category Area-1		Category Area-2		Category Area-3		Category Area-4		All Categories	
	n	%	n	%	n	%	n	%	n	%
Too expensive	39	78.00	40	80.00	40	80.00	44	88.00	163	81.50
Acceptable	11	22.00	10	20.00	10	20.00	6	12.00	37	18.50
Total	50	100.00	50	100.00	50	100.00	50	100.00	200	100.00

C. Post-harvest

C-1. Rice milling cost (bran received by interviewee; riel/ton)

	Category Area-1	Category Area-2	Category Area-3	Category Area-4	All Categories
N	50	50	50	50	200
Median	80,000	80,000	75,000	80,000	80,000
Mean	83,050	78,900	76,140	83,300	80,348
SE Mean	1,900	1,547	1,595	2,073	914
Minimum	60,000	60,000	60,000	60,000	60,000
Maximum	120,000	110,000	100,000	120,000	120,000

C-2. Paddy storage (king of container used)

	Category Area-1		Category Area-2		Category Area-3		Category Area-4		All Categories	
	n	%	n	%	n	%	n	%	n	%
Bag	5	10.00	4	8.00	3	6.00	15	30.00	27	13.50
Bamboo basket	16	32.00	21	42.00	14	28.00	14	28.00	65	32.50
Wooden box	24	48.00	22	44.00	31	62.00	21	42.00	98	49.00
Others	5	10.00	3	6.00	2	4.00			10	5.00
Total	50	100.00	50	100.00	50	100.00	50	100.00	200	100.00

C-3. Paddy (Maximum storage period; month)

	Category Area-1	Category Area-2	Category Area-3	Category Area-4	All Categories
N	50	50	50	50	200
Median	11.5	11.0	11.0	7.5	11.0
Mean	9.3	8.9	9.6	6.9	8.7
SE Mean	0.5	0.6	0.5	0.7	0.3
Minimum	1.0	0.5	1.0	0.5	0.5
Maximum	12.0	12.0	12.0	12.0	12.0

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C-4. Rice (kind of container)

	Category Area-1		Category Area-2		Category Area-3		Category Area-4		All Categories	
	n	%	n	%	n	%	n	%	n	%
Bag	22	44	27	54	23	46	26	52	98	49
Bamboo basket	1	2	1	2	1	2	1	2	4	2
Wooden box							1	2	1	1
Others	27	54	22	44	26	52	22	44	97	49
Total	50	100	50	100	50	100	50	100	200	100

C-5. Rice (storage amount; kg)

	Category Area-1	Category Area-2	Category Area-3	Category Area-4	All Categories
N	50	50	50	50	200
Median	50	40	50	50	50
Mean	56	42	41	43	45
SE Mean	10	3	2	2	3
Minimum	10	15	15	15	10
Maximum	500	100	60	70	500

C-6. Rice (Maximum storage period; month)

	Category Area-1	Category Area-2	Category Area-3	Category Area-4	All Categories
N	50	50	50	50	200
Median	1.0	0.7	0.5	0.8	0.7
Mean	0.8	0.7	0.6	0.7	0.7
SE Mean	0.1	0.0	0.0	0.1	0.0
Minimum	0.1	0.1	0.1	0.1	0.1
Maximum	2.0	2.0	1.3	2.0	2.0

C-7. Use of fumigant

	Category Area-1		Category Area-2		Category Area-3		Category Area-4		All Categories	
	n	%	n	%	n	%	n	%	n	%
No	50	100	50	100	50	100	50	100	200	100

C-8. Most dominant loss of paddy

Response (one alternative)	Category Area-1		Category Area-2		Category Area-3		Category Area-4		All Categories	
	n	%	n	%	n	%	n	%	n	%
During harvesting	23	46	20	40	20	40	6	12	69	35
At threshing,	23	46	23	46	21	42	33	66	100	50
At drying	1	2	2	4			3	6	6	3
At cleaning			1	2			2	4	3	2
At storage			1	2	2	4	1	2	4	2
At other time	3	6	3	6	7	14	5	10	18	9
Total	50	100	50	100	50	100	50	100	200	100

C-9. Second dominant loss

Response (one alternative)	Category Area-1		Category Area-2		Category Area-3		Category Area-4		All Categories	
	n	%	n	%	n	%	n	%	n	%
During harvesting	10	20	9	18	13	26	14	28	46	23
At threshing,	10	20	13	26	13	26	9	18	45	23
At drying	8	16	5	10	2	4	3	6	18	9
At cleaning	9	18	16	32	13	26	7	14	45	23
At storage	1	2	2	4	2	4	8	16	13	7
At other time	12	24	5	10	7	14	9	18	33	17
Total	50	100	50	100	50	100	50	100	200	100

C-10. Roughly estimated total losses (% of production)

	Category Area-1	Category Area-2	Category Area-3	Category Area-4	All Categories
N	50	50	50	50	200
Median	3	3	4	5	4
Mean	5	4	6	6	5
SE Mean	1	0	1	1	0
Minimum	0	1	1	1	0
Maximum	31	10	25	30	31

C-11. Processing of rice

Response	Category Area-1		Category Area-2		Category Area-3		Category Area-4		All Categories	
	n	%	n	%	n	%	n	%	n	%
Confectionary	1	100					1	100	2	100
Total	1	100					1	100	2	100

Attachment 2 Results of Questionnaire Survey on Farming Practices, Farm Inputs Supply and Marketing - 5/8

D. Marketing

D-1. Farm gate price of irrigated paddy in wet season (Riel/kg)

	Category Area-1	Category Area-2	Category Area-3	Category Area-4	All Categories
N	34	26	19		79
Median	500	600	500		550
Mean	545	582	537		555
SE Mean	15	16	22		10
Minimum	400	400	400		400
Maximum	780	750	700		780

D-2. Farm gate price of irrigated paddy in dry season (riel/kg)

	Category Area-1	Category Area-2	Category Area-3	Category Area-4	All Categories
N	32	1	3		36
Median	500	600	400		500
Mean	516	600	373		506
SE Mean	12		27		13
Minimum	350	600	320		320
Maximum	700	600	400		700

D-3. Farm gate price of rainfed rice (riel/ka)

	Category Area-1	Category Area-2	Category Area-3	Category Area-4	All Categories
N	8	4	12	13	37
Median	500	600	500	500	500
Mean	481	575	546	523	527
SE Mean	23	25	30	21	14
Minimum	400	500	400	400	400
Maximum	600	600	700	600	700

D-4. Marketing time of rice: just after harvest (proportion to total marketing volume)

	Category Area-1	Category Area-2	Category Area-3	Category Area-4	All Categories
N	31	15	11	10	67
Median	50	20	25	15	25
Mean	48	26	43	16	37
SE Mean	6	6	10	2	4
Minimum	10	10	10	5	5
Maximum	100	100	100	30	100

D-5. Marketing time of rice: when cash is needed (proportion to total marketing volume)

	Category Area-1	Category Area-2	Category Area-3	Category Area-4	All Categories
N	36	27	21	14	98
Median	50	70	60	40	50
Mean	47	68	61	45	55
SE Mean	4	5	7	7	3
Minimum	10	7	10	20	7
Maximum	100	100	100	100	100

D-6. Marketing time of rice: when price is high (proportion to total marketing volume)

	Category Area-1	Category Area-2	Category Area-3	Category Area-4	All Categories
N	26	16	15	13	70
Median	40	39	40	60	40
Mean	43	42	44	55	45
SE Mean	4	7	7	6	3
Minimum	10	10	5	20	5
Maximum	90	100	100	100	100

D-7. Sold product

Response (one alternative)	Category Area-1		Category Area-2		Category Area-3		Category Area-4		All Categories	
	n	%	n	%	n	%	n	%	n	%
Field dried paddy	8	19	5	17	4	17	2	13	19	17
Sun dried paddy	35	81	24	83	20	83	13	87	92	83
Total	43	100	29	100	24	100	15	100	111	100

D-8. Market Destination

Response	Category Area-1		Category Area-2		Category Area-3		Category Area-4		All Categories	
	n	%	n	%	n	%	n	%	n	%
Rice miller in village	13	30	12	41	12	50	10	67	47	42
Rice miller in commune center	2	5	1	3	5	21	4	27	12	11
Rice miller in district center	4	9	2	7	1	4			7	6
Collector/middleman	24	56	13	45	6	25	1	7	44	40
Local market			1	3					1	1
Total	43	100	29	100	24	100	15	100	111	100

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D-9. Marketing of vegetable

Response	Category Area-1		Category Area-2		Category Area-3		Category Area-4		All Categories	
	n	%	n	%	n	%	n	%	n	%
Market in village	4	15	19	73	9	31	14	61	46	44
Market in commune center	2	7			4	14	2	9	8	8
Market in district center	15	56	1	4	9	31	5	22	30	29
Collector/middleman	6	22	2	8	7	24			15	14
Other (specify)			4	15			2	9	6	6
Total	27	100	26	100	29	100	23	100	105	100

D-10. Marketing of field crops

Response	Category Area-1		Category Area-2		Category Area-3		Category Area-4		All Categories	
	n	%	n	%	n	%	n	%	n	%
Market in village	8	32	13	57	10	31	14	56	45	43
Market in commune center	3	12	2	9	5	16			10	10
Market in district center	6	24	2	9	3	9	7	28	18	17
Collector/middleman	8	32	3	13	14	44	3	12	28	27
Other (specify)			3	13			1	4	4	4
Total	25	100	23	100	32	100	25	100	105	100

D-11. Marketing of livestock

Response	Category Area-1		Category Area-2		Category Area-3		Category Area-4		All Categories	
	n	%	n	%	n	%	n	%	n	%
Market in village	5	14	11	32	7	18	11	28	34	23
Market in commune center	3	9	1	3	4	10	2	5	10	7
Market in district center	7	20	1	3	3	8	5	13	16	11
Collector/middleman	20	57	19	56	25	64	20	50	84	57
Other (specify)			2	6			2	5	4	3
Total	35	100	34	100	39	100	40	100	148	100

D-12. Marketing of other product (fish)

Response	Category Area-1		Category Area-2		Category Area-3		Category Area-4		All Categories	
	n	%	n	%	n	%	n	%	n	%
Market in village	5	45	13	100	5	71	13	81	36	77
Market in commune center	2	18			2	29			4	9
Market in district center	4	36					2	13	6	13
Other (specify)							1	6	1	2
Total	11	100	13	100	7	100	16	100	47	100

E. Food Supply Conditions

E-1. Food supply condition (rice)

Response (one alternative)	Category Area-1		Category Area-2		Category Area-3		Category Area-4		All Categories	
	n	%	n	%	n	%	n	%	n	%
Own harvest/ product exceed the household demand	25	50	20	40	18	36	11	22	74	37
Own harvest/ product is just enough to the household	17	34	23	46	11	22	4	8	55	28
Purchased (or exchanged) to meet the household demand	7	14	6	12	20	40	32	64	65	33
Insufficient	1	2	1	2	1	2	3	6	6	3
Total	50	100	50	100	50	100	50	100	200	100

E-2. Food supply condition (vegetables)

Response (one alternative)	Category Area-1		Category Area-2		Category Area-3		Category Area-4		All Categories	
	n	%	n	%	n	%	n	%	n	%
Own harvest/ product exceed the household demand	8	16	4	8	10	20	1	2	23	12
Own harvest/ product is just enough to the household	11	22	8	16	6	12	9	18	34	17
Purchased (or exchanged) to meet the household demand	31	62	38	76	34	68	40	80	143	72
Total	50	100	50	100	50	100	50	100	200	100

E-3. Food supply condition (other cereals)

Response (one alternative)	Category Area-1		Category Area-2		Category Area-3		Category Area-4		All Categories	
	n	%	n	%	n	%	n	%	n	%
Own harvest/ product exceed the household demand	2	4	1	2					3	2
Own harvest/ product is just enough to the household demand	8	16	4	8	6	12	4	8	22	11
Purchased (or exchanged) to meet the household demand	40	80	45	90	44	88	46	92	175	88
Total	50	100	50	100	50	100	50	100	200	100

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E-4. Food supply condition (meat)

Response (one alternative)	Category Area-1		Category Area-2		Category Area-3		Category Area-4		All Categories	
	n	%	n	%	n	%	n	%	n	%
Own harvest/ product exceed the household demand					3	6	1	2	4	2
Own harvest/ product is just enough to the household demand	1	2	2	4	3	6			6	3
Purchased (or exchanged) to meet the household demand	45	90	41	82	40	80	40	80	166	83
Insufficient	4	8	7	14	4	8	9	18	24	12
Total	50	100	50	100	50	100	50	100	200	100

E-5. Food supply condition (roots and tuber crops)

Response (one alternative)	Category Area-1		Category Area-2		Category Area-3		Category Area-4		All Categories	
	n	%	n	%	n	%	n	%	n	%
Own harvest/ product exceed the household demand	4	8							4	2
Own harvest/ product is just enough to the household	2	4	1	2	3	6	2	4	8	4
Purchased (or exchanged) to meet the household demand	44	88	49	98	47	94	48	96	188	94
Total	50	100	50	100	50	100	50	100	200	100

E-6. Food condition (fish)

Response (one alternative)	Category Area-1		Category Area-2		Category Area-3		Category Area-4		All Categories	
	n	%	n	%	n	%	n	%	n	%
Own harvest/ product is just enough to the household	1	2	1	2					2	1
Purchased (or exchanged) to meet the household demand	45	90	42	84	46	92	41	82	174	87
Insufficient	4	8	7	14	4	8	9	18	24	12
Total	50	100	50	100	50	100	50	100	200	100

E-7. Food supply condition (beans)

Response (one alternative)	Category Area-1		Category Area-2		Category Area-3		Category Area-4		All Categories	
	n	%	n	%	n	%	n	%	n	%
Own harvest/ product exceed the household demand	4	8	2	4	5	10	4	8	15	8
Own harvest/ product is just enough to the household	2	4	1	2	3	6	4	8	10	5
Purchased (or exchanged) to meet the household demand	44	88	47	94	41	82	42	84	174	87
Insufficient					1	2			1	1
Total	50	100	50	100	50	100	50	100	200	100

E-8. Volume of rice purchased in last year (kg)

	Category Area-1	Category Area-2	Category Area-3	Category Area-4	All Categories
N	2	2	8	20	32
Proportion to sample farmers (50)	4%	4%	16%	40%	16%
Median	350	425	550	1,075	905
Mean	350	425	651	1,207	965
SE Mean	50	75	161	129	106
Minimum	300	350	200	300	200
Maximum	400	500	1,500	2,500	2,500

F. Extension Services

F-1. Visit of extension worker

Response (one alternative)	Category Area-1		Category Area-2		Category Area-3		Category Area-4		All Categories	
	n	%	n	%	n	%	n	%	n	%
One per < week	9	18	5	10	6	12	2	4	22	11
Once per 2 weeks-1 month	11	22	13	26	1	2			25	13
Seldom visited	30	60	32	64	43	86	48	96	153	77
Total	50	100	50	100	50	100	50	100	200	100

F-2. Technical capability of extension workers

Response (one alternative)	Category Area-1		Category Area-2		Category Area-3		Category Area-4		All Categories	
	n	%	n	%	n	%	n	%	n	%
Sufficient	42	84	38	76	30	60	31	62	141	71
Not sufficient	5	10	6	12	1	2	2	4	14	7
No service provided	3	6	6	12	19	38	17	34	45	23
Total	50	100	50	100	50	100	50	100	200	100

F-3. Are you satisfied with current extension services

Response (one alternative)	Category Area-1		Category Area-2		Category Area-3		Category Area-4		All Categories	
	n	%	n	%	n	%	n	%	n	%
Satisfied	46	92	44	88	29	58	32	64	151	76
Not satisfied					2	4	1	2	3	2
No service provided	4	8	6	12	19	38	17	34	46	23
Total	50	100	50	100	50	100	50	100	200	100

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F-4. What kind of extension services are you needed

Response (specified)	Category Area-1		Category Area-2		Category Area-3		Category Area-4		All Categories	
	n	%	n	%	n	%	n	%	n	%
Training on raising livestock	16	32	22	44	28	56	29	58	95	48
Training on vegetable farming	7	14	8	16	15	30	14	28	44	22
Rice farm	2	4			1	2			3	2
Agricultural training	32	64	36	72	34	68	32	64	134	67
Insect protection	1	2	2	4			1	2	4	2
IPM	3	6	2	4	1	2	2	4	8	4
Make compose and utilization	4	8	2	4	1	2	4	8	11	6
Seed selection and utilization	2	4	2	4					4	2

Totals exceed 100% due to multiple responses

G. Farm Credit

G-1. Access to farm credit

Response (one alternative)	Category Area-1		Category Area-2		Category Area-3		Category Area-4		All Categories	
	n	%	n	%	n	%	n	%	n	%
Easy	24	48	27	54	21	42	25	50	97	49
Difficult	18	36	15	30	23	46	15	30	71	36
Not provided	8	16	8	16	6	12	10	20	32	16
Total	50	100	50	100	50	100	50	100	200	100

G-2. Timing of provision

Response (one alternative)	Category Area-1		Category Area-2		Category Area-3		Category Area-4		All Categories	
	n	%	n	%	n	%	n	%	n	%
In time	23	46	29	58	19	38	29	58	100	50
Delayed	17	34	12	24	23	46	11	22	63	32
Not provided	10	20	9	18	8	16	10	20	37	19
Total	50	100	50	100	50	100	50	100	200	100

G-3. Amount of credit

Response (one alternative)	Category Area-1		Category Area-2		Category Area-3		Category Area-4		All Categories	
	n	%	n	%	n	%	n	%	n	%
Sufficient	31	62	32	64	29	58	26	52	118	59
Not sufficient	8	16	9	18	14	28	14	28	45	23
Not provided	11	22	9	18	7	14	10	20	37	19
Total	50	100	50	100	50	100	50	100	200	100

G-4. Procedures for credit application

Response (one alternative)	Category Area-1		Category Area-2		Category Area-3		Category Area-4		All Categories	
	n	%	n	%	n	%	n	%	n	%
Easy	15	30	14	28	11	22	21	42	61	31
Difficult	26	52	28	56	29	58	19	38	102	51
Not provided	9	18	8	16	10	20	10	20	37	19
Total	50	100	50	100	50	100	50	100	200	100

Attachment-3

***Results of Socio-economic Survey on Farming Constraints,
Improvement Measures & Expectations***

Attachment 3 Results of Socio-economic Survey on Farming Constraints, Improvement Measures & Expectations - 1/12

1. Design of Sample Survey

Target Area/Zone	Irrigation Status of Paddy Field	Sample No.	Survey Method
Category Area-1	Double cropping of paddy	50	Interview survey by enumerator
Category Area-2	Supplemental irrigation in wet season/Canal system	50	
Category Area-3	Supplemental irrigation in wet season/Small reservoir	50	
Category Area-4	Rainfed paddy field	50	
Total		200	

2. Farming Constraints and Improvement

2-1. Farming Constraints (agronomic & farm management)

Question What are serious agronomic & farm management constraints for farming ? (select plural answer)

Target Area: Category Area-1 Farming constraint (agronomic/farm management)	Degree of Constraints												Total Score	Rating
	Most Serious Score: 4			2nd Serious Score: 3			3rd Serious Score: 2			4th Serious Score: 1				
	No.	%	Score	No.	%	Score	No.	%	Score	No.	%	Score		
Low yield of crops (paddy)	9	18	36	4	8	12	3	6	6	3	6	3	57	3
Crop losses due to pest & disease	17	34	68	5	10	15	8	16	16	7	14	7	106	1
Weed problem	1	2	4	3	6	9	4	8	8	5	10	5	26	
Crop losses due to wild animal	1	2	4	4	8	12	2	4	4	3	6	3	23	
Difficulty for hiring draft animal/machinery	2	4	8	5	10	15		0		2	4	2	25	
Labor shortage	1	2	4	4	8	12	5	10	10	4	8	4	30	
Insufficient extension services	1	2	4		0	0	6	12	12	5	10	5	21	
Shortage of farming capital	3	6	12	1	2	3	7	14	14	7	14	7	36	
Difficulty for obtaining quality seeds		0		5	10	15	2	4	4	1	2	1	20	
Difficulty for purchasing fertilizers	7	14	28	7	14	21	4	8	8	2	4	2	59	2
Expensive farm inputs	3	6	12	5	10	15	5	10	10	1	2	1	38	4
Poor soil conditions	3	6	12	5	10	15	1	2	2	3	6	3	32	
Marketing problems of products		0			0	0	2	4	4	2	4	2	6	
Lack of farm credit	2	4	8	2	4	6	1	2	2	5	10	5	21	
Total	50	100	200	50	100	150	50	100	100	50	100	50	500	

Target Area: Category Area-2 Farming constraint (agronomic/farm management)	Degree of Constraints												Total Score	Rating
	Most Serious Score: 4			2nd Serious Score: 3			3rd Serious Score: 2			4th Serious Score: 1				
	No.	%	Score	No.	%	Score	No.	%	Score	No.	%	Score		
Low yield of crops (paddy)	8	16	32	4	8	12		0		5	10	5	49	
Crop losses due to pest & disease	9	18	36	14	28	42	11	22	22	9	18	9	109	1
Weed problem	1	2	4	5	10	15	3	6	6	2	4	2	27	
Crop losses due to wild animal	1	2	4		0			0		3	6	3	7	
Difficulty for hiring draft animal/machinery	6	12	24	6	12	18	7	14	14	4	8	4	60	3
Labor shortage	3	6	12	2	4	6	4	8	8	2	4	2	28	
Insufficient extension services		0		1	2	3	6	12	12	7	14	7	22	
Shortage of farming capital	5	10	20	7	14	21	8	16	16	4	8	4	61	2
Difficulty for obtaining quality seeds	2	4	8	1	2	3	4	8	8	5	10	5	24	
Difficulty for purchasing fertilizers	7	14	28	7	14	21	1	2	2		0		51	4
Expensive farm inputs	7	14	28	2	4	6	2	4	4	2	4	2	40	
Poor soil conditions	1	2	4		0		2	4	4	3	6	3	11	
Marketing problems of products		0			0			0			0		0	
Lack of farm credit		0		1	2	3	2	4	4	4	8	4	11	
Others		0			0	0		0			0			
Total	50	100	200	50	100	150	50	100	100	50	100	50	500	

Target Area: Category Area-3 Farming constraint (agronomic/farm management)	Degree of Constraints												Total Score	Rating
	Most Serious Score: 4			2nd Serious Score: 3			3rd Serious Score: 2			4th Serious Score: 1				
	No.	%	Score	No.	%	Score	No.	%	Score	No.	%	Score		
Low yield of crops (paddy)	11	22	44	4	8	12	9	18	18	7	14	7	81	2
Crop losses due to pest & disease	13	26	52	11	22	33	7	14	14	5	10	5	104	1
Weed problem		0		2	4	6	6	12	12	2	4	2	20	
Crop losses due to wild animal		0		2	4	6	1	2	2		0		8	
Difficulty for hiring draft animal/machinery	4	8	16	5	10	15	2	4	4		0		35	
Labor shortage	1	2	4	3	6	9	3	6	6	4	8	4	23	
Insufficient extension services	2	4	8	5	10	15	2	4	4	6	12	6	33	
Shortage of farming capital	5	10	20	8	16	24	5	10	10	5	10	5	59	3
Difficulty for obtaining quality seeds		0		1	2	3	4	8	8	3	6	3	14	
Difficulty for purchasing fertilizers	1	2	4	3	6	9	3	6	6	3	6	3	22	
Expensive farm inputs	7	14	28	4	8	12	3	6	6	5	10	5	51	4
Poor soil conditions	4	8	16	2	4	6	4	8	8	5	10	5	35	
Marketing problems of products	1	2	4		0			0		2	4	2	6	
Lack of farm credit	1	2	4		0		1	2	2	3	6	3	9	
Others		0			0			0			0			
Total	50	100	200	50	100	150	50	100	100	50	100	50	500	

Attachment 3 Results of Socio-economic Survey on Farming Constraints, Improvement Measures & Expectations - 2/12

Target Area: Category Area-4 Farming constraint (agronomic/farm management)	Degree of Constraints												Total Score	Rating
	Most Serious Score: 4			2nd Serious Score: 3			3rd Serious Score: 2			4th Serious Score: 1				
	No.	%	Score	No.	%	Score	No.	%	Score	No.	%	Score		
Low yield of crops (paddy)	23	46	92	3	6	9		0	0	8	16	8	109	1
Crop losses due to pest & disease	5	10	20	13	26	39	9	18	18	8	16	8	85	2
Weed problem		0		2	4	6	5	10	10	6	12	6	22	
Crop losses due to wild animal		0			0			0		3	6	3	3	
Difficulty for hiring draft animal/machinery	2	4	8	2	4	6	4	8	8	2	4	2	24	
Labor shortage	2	4	8	4	8	12	4	8	8	4	8	4	32	
Insufficient extension services		0	0	2	4	6	3	6	6	3	6	3	15	
Shortage of farming capital	6	12	24	7	14	21	10	20	20	2	4	2	67	3
Difficulty for obtaining quality seeds	2	4	8	3	6	9	3	6	6	3	6	3	26	
Difficulty for purchasing fertilizers	1	2	4	6	12	18	4	8	8	1	2	1	31	
Expensive farm inputs	6	12	24	4	8	12	3	6	6	1	2	1	43	4
Poor soil conditions	2	4	8	3	6	9	4	8	8	6	12	6	31	
Marketing problems of products		0			0			0		1	2	1	1	
Lack of farm credit		0		1	2	3	1	2	2	2	4	2	7	
Others	1	2	4		0			0			0		4	
Total	50	100	200	50	100	150	50	100	100	50	100	50	500	

Target Area: Overall Farming constraint (agronomic/farm management)	Degree of Constraints												Total Score	Rating
	Most Serious Score: 4			2nd Serious Score: 3			3rd Serious Score: 2			4th Serious Score: 1				
	No.	%	Score	No.	%	Score	No.	%	Score	No.	%	Score		
Low yield of crops (paddy)	51	26	204	15	8	45	12	6	24	23	12	23	296	2
Crop losses due to pest & disease	44	22	176	43	22	129	35	18	70	29	15	29	404	1
Weed problem	2	1	8	12	6	36	18	9	36	15	8	15	95	
Crop losses due to wild animal	2	1	8	6	3	18	3	2	6	9	5	9	41	
Difficulty for hiring draft animal/machinery	14	7	56	18	9	54	13	7	26	8	4	8	144	
Labor shortage	7	4	28	13	7	39	16	8	32	14	7	14	113	
Insufficient extension services	3	2	12	8	4	24	17	9	34	21	11	21	91	
Shortage of farming capital	19	10	76	23	12	69	30	15	60	18	9	18	223	3
Difficulty for obtaining quality seeds	4	2	16	10	5	30	13	7	26	12	6	12	84	
Difficulty for purchasing fertilizers	16	8	64	23	12	69	12	6	24	6	3	6	163	5
Expensive farm inputs	23	12	92	15	8	45	13	7	26	9	5	9	172	4
Poor soil conditions	10	5	40	10	5	30	11	6	22	17	9	17	109	
Marketing problems of products	1	1	4	0	0		2	1	4	5	3	5	13	
Lack of farm credit	3	2	12	4	2	12	5	3	10	14	7	14	48	
Others	1	1	4	0	0		0	0	0	0	0	0	4	
Total	200	100	800	200	100	600	200	100	400	200	100	200	2,000	

2-2. Farming Constraints (physical)

Question: What are serious physical constraints for farming ? (select plural answer)

Target Area: Category Area-1 Farming Constraints/Physical (Answer)	Degree of Constraints									Total Score	Rating
	Most Serious Score: 3			2nd Serious Score: 2			3rd Serious Score: 1				
	No.	%	Score	No.	%	Score	No.	%	Score		
Irrigation water shortage in wet season	26	52	78	3	6	6	4	8	4	88	1
Irrigation water shortage in dry season	10	20	30	21	42	42	6	12	6	78	2
Inundation/flooding	2	4	6	6	12	12	2	4	2	20	
Drainage problem		0	0		0			0		0	
Lack of farm road	1	2	3	1	2	2	10	20	10	15	
Lack of transportation means	2	4	6	5	10	10	6	12	6	22	
Leveling problem of paddy field	1	2	3	3	6	6	9	18	9	18	
Insufficient irrigation system	8	16	24	11	22	22	13	26	13	59	3
Others		0			0			0			
Total	50	100	150	50	100	100	50	100	50	300	

Target Area: Category Area-2 Farming Constraints/Physical (Answer)	Degree of Constraints									Total Score	Rating
	Most Serious Score: 3			2nd Serious Score: 2			3rd Serious Score: 1				
	No.	%	Score	No.	%	Score	No.	%	Score		
Irrigation water shortage in wet season	35	70	105	10	20	20	1	2	1	126	1
Irrigation water shortage in dry season	9	18	27	13	26	26	10	20	10	63	3
Inundation/flooding		0		2	4	4	3	6	3	7	
Drainage problem		0			0			0		0	
Lack of farm road		0			0		4	8	4	4	
Lack of transportation means		0		3	6	6	7	14	7	13	
Leveling problem of paddy field	1	2	3	6	12	12	7	14	7	22	
Insufficient irrigation system	5	10	15	16	32	32	18	36	18	65	2
Others		0			0			0			
Total	50	100	150	50	100	100	50	100	50	300	

Attachment 3 Results of Socio-economic Survey on Farming Constraints, Improvement Measures & Expectations - 3/12

Target Area: Category Area-3	Degree of Constraints									Total Score	Rating
	Most Serious Score: 3			2nd Serious Score: 2			3rd Serious Score: 1				
	No.	%	Score	No.	%	Score	No.	%	Score		
Faming Constraints/Physical (Answer)											
Irrigation water shortage in wet season	40	80	120	5	10	10	3	6	3	133	1
Irrigation water shortage in dry season	4	8	12	26	52	52	9	18	9	73	2
Inundation/flooding		0		1	2	2		0		2	
Drainage problem		0			0		1	2	1	1	
Lack of farm road	1	2	3		0		4	8	4	7	
Lack of transportation means	2	4	6	3	6	6	4	8	4	16	
Leveling problem of paddy field	1	2	3	3	6	6	7	14	7	16	
Insufficient irrigation system	2	4	6	12	24	24	22	44	22	52	3
Others		0			0			0			
Total	50	100	150	50	100	100	50	100	50	300	

Target Area: Category Area-4	Degree of Constraints									Total Score	Rating
	Most Serious Score: 3			2nd Serious Score: 2			3rd Serious Score: 1				
	No.	%	Score	No.	%	Score	No.	%	Score		
Faming Constraints/Physical (Answer)											
Irrigation water shortage in wet season	45	90	135	1	2	2	1	2	1	138	1
Irrigation water shortage in dry season	3	6	9	5	10	10	5	10	5	24	
Inundation/flooding		0			0			0		0	
Drainage problem		0			0			0	0	0	
Lack of farm road		0		2	4	4	2	4	2	6	
Lack of transportation means		0		6	12	12	6	12	6	18	
Leveling problem of paddy field	1	2	3	13	26	26	13	26	13	42	3
Insufficient irrigation system	1	2	3	23	46	46	23	46	23	72	2
Others		0			0			0			
Total	50	100	150	50	100	100	50	100	50	300	

Target Area: Overall	Degree of Constraints									Total Score	Rating
	Most Serious Score: 3			2nd Serious Score: 2			3rd Serious Score: 1				
	No.	%	Score	No.	%	Score	No.	%	Score		
Faming Constraints/Physical (Answer)											
Irrigation water shortage in wet season	146	73	438	19	9.5	38	9	4.5	9	485	1
Irrigation water shortage in dry season	26	13	78	65	32.5	130	30	15	30	238	3
Inundation/flooding	2	1	6	9	4.5	18	5	2.5	5	29	
Drainage problem		0			0		1	0.5	1	1	
Lack of farm road	2	1	6	3	1.5	6	20	10	20	32	
Lack of transportation means	4	2	12	17	8.5	34	23	11.5	23	69	
Leveling problem of paddy field	4	2	12	25	12.5	50	36	18	36	98	
Insufficient irrigation system	16	8	48	62	31	124	76	38	76	248	2
Others		0			0			0			
Total	200	100	600	200	100	400	200	100	200	1,200	

2-3. Marketing constraints

Target Area: Category Area-1	Degree of Constraints									Total Score	Rating
	Most Serious Score: 3			2nd Serious Score: 2			3rd Serious Score: 1				
	No.	%	Score	No.	%	Score	No.	%	Score		
Marketing Constraints (Answer)											
Unstable market prices of paddy/rice	24	48	72	8	16	16	3	6	3	91	1
Low market prices of paddy/rice	18	36	54	10	20	20	4	8	4	78	2
Limitation of market of paddy/rice	3	6	9	4	8	8	6	12	6	23	
Unstable market prices of other crops	2	4	6	7	14	14	5	10	5	25	
Low market prices of other crops	1	2	3	13	26	26	4	8	4	33	3
Limitation of market of other crops	1	2	3	3	6	6	3	6	3	12	
Unstable market prices of livestock	1	2	3	3	6	6	10	20	10	19	
Low market prices of livestock		0		1	2	2	8	16	8	10	
Limitation of market of livestock		0			0		3	6	3	3	
Lack of or poor farm to market road		0		1	2	2	4	8	4	6	
Total	50	100	150	50	100	100	50	100	50	300	

Target Area: Category Area-2	Degree of Constraints									Total Score	Rating
	Most Serious Score: 3			2nd Serious Score: 2			3rd Serious Score: 1				
	No.	%	Score	No.	%	Score	No.	%	Score		
Marketing Constraints (Answer)											
Unstable market prices of paddy/rice	23	46	69	3	6	6	5	10	5	80	1
Low market prices of paddy/rice	19	38	57	12	24	24	4	8	4	85	2
Limitation of market of paddy/rice	5	10	15	10	20	20	4	8	4	39	3
Unstable market prices of other crops	2	4	6	4	8	8	3	6	3	17	
Low market prices of other crops	1	2	3	9	18	18	3	6	3	24	
Limitation of market of other crops		0	0	1	2	2	5	10	5	7	
Unstable market prices of livestock		0	0	3	6	6	12	24	12	18	
Low market prices of livestock		0		4	8	8	7	14	7	15	
Limitation of market of livestock		0		3	6	6	2	4	2	8	
Lack of or poor farm to market road		0		1	2	2	5	10	5	7	
Total	50	100	150	50	100	100	50	100	50	300	

Attachment 3 Results of Socio-economic Survey on Farming Constraints, Improvement Measures & Expectations - 4/12

Target Area: Category Area-3	Degree of Constraints									Total Score	Rating
	Most Serious Score: 3			2nd Serious Score: 2			3rd Serious Score: 1				
	No.	%	Score	No.	%	Score	No.	%	Score		
Marketing Constraints (Answer)											
Unstable market prices of paddy/rice	17	34	51	1	2	2	5	10	5	58	2
Low market prices of paddy/rice	20	40	60	13	26	26	2	4	2	88	1
Limitation of market of paddy/rice	3	6	9	4	8	8	2	4	2	19	
Unstable market prices of other crops	2	4	6	7	14	14	3	6	3	23	
Low market prices of other crops	8	16	24	9	18	18	2	4	2	44	3
Limitation of market of other crops		0	0	2	4	4	5	10	5	9	
Unstable market prices of livestock		0	0	5	10	10	9	18	9	19	
Low market prices of livestock		0		6	12	12	9	18	9	21	
Limitation of market of livestock		0		2	4	4	9	18	9	13	
Lack of or poor farm to market road		0		1	2	2	4	8	4	6	
Total	50	100	150	50	100	100	50	100	50	300	

Target Area: Category Area-4	Degree of Constraints									Total Score	Rating
	Most Serious Score: 3			2nd Serious Score: 2			3rd Serious Score: 1				
	No.	%	Score	No.	%	Score	No.	%	Score		
Marketing Constraints (Answer)											
Unstable market prices of paddy/rice	24	48	72	3	6	6	1	2	1	79	2
Low market prices of paddy/rice	18	36	54	13	26	26	9	18	9	89	1
Limitation of market of paddy/rice	1	2	3	2	4	4	10	20	10	17	
Unstable market prices of other crops		0	0	5	10	10	4	8	4	14	
Low market prices of other crops	5	10	15	14	28	28	4	8	4	47	3
Limitation of market of other crops	1	2	3	1	2	2	4	8	4	9	
Unstable market prices of livestock		0	0	3	6	6	5	10	5	11	
Low market prices of livestock		0		6	12	12	9	18	9	21	
Limitation of market of livestock	1	2	3	3	6	6	3	6	3	9	
Lack of or poor farm to market road		0			0	0	1	2	1	1	
Total	50	100	147	50	100	100	50	100	50	297	

Target Area: Overall	Degree of Constraints									Total Score	Rating
	Most Serious Score: 3			2nd Serious Score: 2			3rd Serious Score: 1				
	No.	%	Score	No.	%	Score	No.	%	Score		
Marketing Constraints (Answer)											
Unstable market prices of paddy/rice	88	176	264	15	30	30	14	28	14	308	2
Low market prices of paddy/rice	75	150	225	48	96	96	19	38	19	340	1
Limitation of market of paddy/rice	12	24	36	20	40	40	22	44	22	98	
Unstable market prices of other crops	6	12	18	23	46	46	15	30	15	79	
Low market prices of other crops	15	30	45	45	90	90	13	26	13	148	3
Limitation of market of other crops	2	4	6	7	14	14	17	34	17	37	
Unstable market prices of livestock	1	2	3	14	28	28	36	72	36	67	
Low market prices of livestock	0	0		17	34	34	33	66	33	67	
Limitation of market of livestock	1	2	3	8	16	16	17	34	17	36	
Lack of or poor farm to market road	0	0		3	6	6	14	28	14	20	
Total	200	400	600	200	400	400	200	400	200	1,200	

2-4. Reasons for limited productivity of crops in the rice field of interviewee (not specific to last year)

Target Area: Category Area-1	Degree of Constraints									Total Score	Rating
	Most Serious Score: 3			2nd Serious Score: 2			3rd Serious Score: 1				
	No.	%	Score	No.	%	Score	No.	%	Score		
Reasons for Limited Productivity (Answer)											
Drought in wet season	27	54	81	6	12	12	3	6	3	96	1
Water shortage in dry season	8	16	24	11	22	22	5	10	5	51	2
Shortage of farming capital	2	4	6	6	12	12	4	8	4	22	
Poor seed quality	1	2	3	3	6	6	1	2	1	10	
Poor soil	1	2	3	5	10	10	3	6	3	16	
Limited application of fertilizer	3	6	9	6	12	12	5	10	5	26	3
Damages caused by wild animal (rat)	1	2	3	1	2	2	5	10	5	10	
Poor drainage		0	0		0	0		0	0	0	
Flooding/inundation		0	0	2	4	4	2	4	2	6	
Inadequate farming technologies	2	4	6	2	4	4	4	8	4	14	
Damages caused by pest & disease	3	6	9	5	10	10	6	12	6	25	
Others	2	4	6	3	6	6	12	24	12	24	
Total	50	100	150	50	100	100	50	100	50	300	

Attachment 3 Results of Socio-economic Survey on Farming Constraints, Improvement Measures & Expectations - 5/12

Target Area: Category Area-2	Degree of Constraints									Total Score	Rating
	Most Serious Score: 3			2nd Serious Score: 2			3rd Serious Score: 1				
	No.	%	Score	No.	%	Score	No.	%	Score		
Reasons for Limited Productivity (Answer)											
Drought in wet season	37	74	111	9	18	18	3	6	3	132	1
Water shortage in dry season	5	10	15	13	26	26	2	4	2	43	2
Shortage of farming capital	1	2	3	4	8	8	4	8	4	15	
Poor seed quality		0	0	3	6	6		0	0	6	
Poor soil	1	2	3	2	4	4	4	8	4	11	
Limited application of fertilizer	3	6	9	8	16	16	9	18	9	34	3
Damages caused by wild animal (rat)		0	0	1	2	2	5	10	5	7	
Poor drainage		0	0		0	0		0	0	0	
Flooding/inundation	1	2	3		0	0		0	0	3	
Inadequate farming technologies	1	2	3		0	0	5	10	5	8	
Damages caused by pest & disease	1	2	3	5	10	10	4	8	4	17	
Others		0	0	5	10	10	14	28	14	24	
Total	50	100	150	50	100	100	50	100	50	300	

Target Area: Category Area-3	Degree of Constraints									Total Score	Rating
	Most Serious Score: 3			2nd Serious Score: 2			3rd Serious Score: 1				
	No.	%	Score	No.	%	Score	No.	%	Score		
Reasons for Limited Productivity (Answer)											
Drought in wet season	40	80	120	5	10	10	1	2	1	131	1
Water shortage in dry season	2	4	6	14	28	28	1	2	1	35	2
Shortage of farming capital	1	2	3	6	12	12	6	12	6	21	
Poor seed quality		0	0	2	4	4	4	8	4	8	
Poor soil	3	6	9	2	4	4	7	14	7	20	
Limited application of fertilizer	2	4	6	8	16	16	8	16	8	30	3
Damages caused by wild animal (rat)		0	0	2	4	4	5	10	5	9	
Poor drainage		0	0		0	0		0	0	0	
Flooding/inundation		0	0		0	0		0	0	0	
Inadequate farming technologies		0	0	1	2	2	3	6	3	5	
Damages caused by pest & disease	1	2	3	4	8	8	6	12	6	17	
Others	1	2	3	6	12	12	9	18	9	24	
Total	50	100	150	50	100	100	50	100	50	300	

Target Area: Category Area-4	Degree of Constraints									Total Score	Rating
	Most Serious Score: 3			2nd Serious Score: 2			3rd Serious Score: 1				
	No.	%	Score	No.	%	Score	No.	%	Score		
Reasons for Limited Productivity (Answer)											
Drought in wet season	47	94	141	1	2	2	1	2	1	144	1
Water shortage in dry season	1	2	3	19	38	38	1	2	1	42	2
Shortage of farming capital		0	0	4	8	8	7	14	7	15	
Poor seed quality		0	0	2	4	4	5	10	5	9	
Poor soil		0	0	7	14	14	3	6	3	17	
Limited application of fertilizer		0	0	9	18	18	14	28	14	32	3
Damages caused by wild animal (rat)	1	2	3	1	2	2	3	6	3	8	
Poor drainage		0	0		0	0		0	0	0	
Flooding/inundation		0	0		0	0		0	0	0	
Inadequate farming technologies		0	0		0	0	5	10	5	5	
Damages caused by pest & disease	1	2	3	5	10	10	8	16	8	21	
Others		0	0	2	4	4	3	6	3	7	
Total	50	100	150	50	100	100	50	100	50	300	

Target Area: Overall	Degree of Constraints									Total Score	Rating
	Most Serious Score: 3			2nd Serious Score: 2			3rd Serious Score: 1				
	No.	%	Score	No.	%	Score	No.	%	Score		
Reasons for Limited Productivity (Answer)											
Drought in wet season	151	302	453	21	42	42	8	16	8	503	1
Water shortage in dry season	16	32	48	57	114	114	9	18	9	171	2
Shortage of farming capital	4	8	12	20	40	40	21	42	21	73	
Poor seed quality	1	2	3	10	20	20	10	20	10	33	
Poor soil	5	10	15	16	32	32	17	34	17	64	
Limited application of fertilizer	8	16	24	31	62	62	36	72	36	122	3
Damages caused by wild animal (rat)	2	4	6	5	10	10	18	36	18	34	
Poor drainage	0	0	0	0	0	0	0	0	0	0	
Flooding/inundation	1	2	3	2	4	4	2	4	2	9	
Inadequate farming technologies	3	6	9	3	6	6	17	34	17	32	
Damages caused by pest & disease	6	12	18	19	38	38	24	48	24	80	
Others	3	6	9	16	32	32	38	76	38	79	
Total	200	400	600	200	400	400	200	400	200	1,200	

Attachment 3 Results of Socio-economic Survey on Farming Constraints, Improvement Measures & Expectations - 6/12

2-5. Activities/practices to improve rice productivity implemented by the interviewee in the past 3 years (plural answer)

Activities Implemented	No. & Proportion of Respondents Implemented Activities/Practices										Remarks
	Cat. Area-1		Cat. Area-2		Cat. Area-3		Cat. Area-4		Overall		
	No.	%	No.	%	No.	%	No.	%	No.	%	
Increased fertilization doses	39	78	44	88	42	84	45	90	170	85	No. of respondents per category : 50 Total respondent: 200 4 activities selected/respondent Total answers per category: 200
Applied of compost/manure	39	78	29	58	32	64	37	74	137	69	
Used quality seed (local variety)	9	18	16	32	8	16	14	28	47	24	
Used quality seed (high yielding variety)	27	54	33	66	34	68	34	68	128	64	
Constructed of farm pond	6	12	3	6	12	24	18	36	39	20	
Started to use water pump for irrigation	37	74	38	76	39	78	27	54	141	71	
Improved farming practices	26	52	27	54	17	34	14	28	84	42	
Improved post-harvest practices	12	24	7	14	5	10	6	12	30	15	
Changed marketing methods	3	6		0	8	16	3	6	14	7	
Others	2	4	3	6	3	6	2	4	10	5	
Total	200	-	200	-	200	-	200	-	800	-	

2-6. Necessary activities to improve rice productivity in the field of the interviewee (farming & farm management; plural answer)

Necessary Activities	Degree of Necessity of Activity												Total Score	Rating
	Most Required Score: 4			2nd Most Required Score: 3			3rd Most Required Score: 2			4th Most Required Score: 1				
	No.	%	Score	No.	%	Score	No.	%	Score	No.	%	Score		
Improvement of farming practices	21	42	84	1	2	3	3	6	6	3	6	3	96	2
Use of quality seed (local variety)	4	8	16	8	16	24	1	2	2	2	4	2	44	
Use of quality seed (high yielding variety)	4	8	16	11	22	33	4	8	8	2	4	2	59	4
Use of adequate doses of fertilizer	9	18	36	12	24	36	9	18	18	8	16	8	98	1
Improved leveling of paddy field	3	6	12	7	14	21	6	12	12	11	22	11	56	
Planting at proper time	3	6	12	2	4	6	12	24	24	7	14	7	49	
Intensive weeding	3	6	12	7	14	21	12	24	24	14	28	14	71	3
Formation/strengthening of farmers organization	2	4	8	2	4	6	2	4	4	2	4	2	20	
Others	1	2	4		0	0	1	2	2	1	2	1	7	
Total	50	100	200	50	100	150	50	100	100	50	100	50	500	

Necessary Activities	Degree of Necessity of Activity												Total Score	Rating
	Most Required Score: 4			2nd Most Required Score: 3			3rd Most Required Score: 2			4th Most Required Score: 1				
	No.	%	Score	No.	%	Score	No.	%	Score	No.	%	Score		
Improvement of farming practices	17	34	68	3	6	9	5	10	10	5	10	5	92	2
Use of quality seed (local variety)	2	4	8	4	8	12	2	4	4	2	4	2	26	
Use of quality seed (high yielding variety)	6	12	24	7	14	21	9	18	18	5	10	5	68	4
Use of adequate doses of fertilizer	15	30	60	17	34	51	6	12	12	8	16	8	131	1
Improved leveling of paddy field	9	18	36	4	8	12	10	20	20	6	12	6	74	3
Planting at proper time	1	2	4	7	14	21	6	12	12	4	8	4	41	
Intensive weeding		0	0	8	16	24	11	22	22	16	32	16	62	
Formation/strengthening of farmers organization		0	0		0	0	1	2	2	4	8	4	6	
Others		0	0		0	0		0	0		0	0	0	
Total	50	100	200	50	100	150	50	100	100	50	100	50	500	

Necessary Activities	Degree of Necessity of Activity												Total Score	Rating
	Most Required Score: 4			2nd Most Required Score: 3			3rd Most Required Score: 2			4th Most Required Score: 1				
	No.	%	Score	No.	%	Score	No.	%	Score	No.	%	Score		
Improvement of farming practices	9	18	36	2	4	6	6	12	12	5	10	5	59	4
Use of quality seed (local variety)		0	0	2	4	6	2	4	4	3	6	3	13	
Use of quality seed (high yielding variety)	9	18	36	12	24	36	6	12	12	8	16	8	92	2
Use of adequate doses of fertilizer	18	36	72	16	32	48	9	18	18	2	4	2	140	1
Improved leveling of paddy field	9	18	36	8	16	24	11	22	22	7	14	7	89	3
Planting at proper time	3	6	12	3	6	9	3	6	6	4	8	4	31	
Intensive weeding		0	0	7	14	21	10	20	20	16	32	16	57	
Formation/strengthening of farmers organization	2	4	8		0	0	3	6	6	5	10	5	19	
Others		0	0		0	0		0	0		0	0	0	
Total	50	100	200	50	100	150	50	100	100	50	100	50	500	

Necessary Activities	Degree of Necessity of Activity												Total Score	Rating
	Most Required Score: 4			2nd Most Required Score: 3			3rd Most Required Score: 2			4th Most Required Score: 1				
	No.	%	Score	No.	%	Score	No.	%	Score	No.	%	Score		
Improvement of farming practices	20	40	80	1	2	3	1	2	2	9	18	9	94	2
Use of quality seed (local variety)		0	0	2	4	6		0	0	3	6	3	9	
Use of quality seed (high yielding variety)	5	10	20	11	22	33	5	10	10	8	16	8	71	4
Use of adequate doses of fertilizer	6	12	24	12	24	36	19	38	38	5	10	5	103	1
Improved leveling of paddy field	10	20	40	8	16	24	5	10	10	11	22	11	85	3
Planting at proper time	3	6	12	4	8	12	10	20	20	7	14	7	51	
Intensive weeding	3	6	12	12	24	36	7	14	14	7	14	7	69	
Formation/strengthening of farmers organization	2	4	8		0	0	3	6	6		0	0	14	
Others	1	2	4		0	0		0	0		0	0	4	
Total	50	100	200	50	100	150	50	100	100	50	100	50	500	

Attachment 3 Results of Socio-economic Survey on Farming Constraints, Improvement Measures & Expectations - 7/12

Target Area: Overall	Degree of Necessity of Activity												Total Score	Rating
	Most Required Score: 4			2nd Most Required Score: 3			3rd Most Required Score: 2			4th Most Required Score: 1				
	No.	%	Score	No.	%	Score	No.	%	Score	No.	%	Score		
Necessary Activities	67	34	268	7	4	21	15	8	30	22	11	22	341	2
Improvement of farming practices	6	3	24	16	8	48	5	3	10	10	5	10	92	
Use of quality seed (local variety)	24	12	96	41	21	123	24	12	48	23	12	23	290	4
Use of quality seed (high yielding variety)	48	24	192	57	29	171	43	22	86	23	12	23	472	1
Use of adequate doses of fertilizer	31	16	124	27	14	81	32	16	64	35	18	35	304	3
Improved leveling of paddy field	10	5	40	16	8	48	31	16	62	22	11	22	172	
Planting at proper time	6	3	24	34	17	102	40	20	80	53	27	53	259	
Intensive weeding	6	3	24	2	1	6	9	5	18	11	6	11	59	
Formation/strengthening of farmers organization	2	1	8	0	0	0	1	1	2	1	1	1	11	
Others	2	1	8	0	0	0	1	1	2	1	1	1	11	
Total	200	100	800	200	100	600	200	100	400	200	100	200	2,000	

2-7. Necessary physical works to improve rice productivity in the field of the interviewee (plural answer)

Target Area: Category Area-1	Degree of Necessity of Activity									Total Score	Rating
	Most Required Score: 3			2nd Most Required Score: 2			3rd Most Required Score: 1				
	No.	%	Score	No.	%	Score	No.	%	Score		
Necessary Physical Works	31	62	93	11	22	22	3	6	3	118	1
Irrigation water supply for wet season	8	16	24	24	48	48	11	22	11	83	2
Irrigation water supply for dry season		0	0	3	6	6	11	22	11	17	
Mitigation of inundation/flooding		0	0		0	0		0	0	0	
Drainage improvement	11	22	33	11	22	22	23	46	23	78	3
Improvement of irrigation system		0	0	1	2	2	2	4	2	4	
Others		0	0		0	0		0	0	0	
Total	50	100	150	50	100	100	50	100	50	300	

Target Area: Category Area-2	Degree of Necessity of Activity									Total Score	Rating
	Most Required Score: 3			2nd Most Required Score: 2			3rd Most Required Score: 1				
	No.	%	Score	No.	%	Score	No.	%	Score		
Necessary Physical Works	37	74	111	11	22	22	1	2	1	134	1
Irrigation water supply for wet season	7	14	21	23	46	46	12	24	12	79	2
Irrigation water supply for dry season	1	2	3	5	10	10	6	12	6	19	
Mitigation of inundation/flooding		0	0		0	0		0	0	0	
Drainage improvement	5	10	15	11	22	22	30	60	30	67	3
Improvement of irrigation system		0	0		0	0	1	2	1	1	
Others		0	0		0	0		0	0	0	
Total	50	100	150	50	100	100	50	100	50	300	

Target Area: Category Area-3	Degree of Necessity of Activity									Total Score	Rating
	Most Required Score: 3			2nd Most Required Score: 2			3rd Most Required Score: 1				
	No.	%	Score	No.	%	Score	No.	%	Score		
Necessary Physical Works	43	86	129	3	6	6	4	8	4	139	1
Irrigation water supply for wet season	5	10	15	36	72	72	6	12	6	93	2
Irrigation water supply for dry season	1	2	3		0	0	2	4	2	5	
Mitigation of inundation/flooding		0	0		0	0		0	0	0	
Drainage improvement	1	2	3	11	22	22	37	74	37	62	3
Improvement of irrigation system		0	0		0	0	1	2	1	1	
Others		0	0		0	0		0	0	0	
Total	50	100	150	50	100	100	50	100	50	300	

Target Area: Category Area-4	Degree of Necessity of Activity									Total Score	Rating
	Most Required Score: 3			2nd Most Required Score: 2			3rd Most Required Score: 1				
	No.	%	Score	No.	%	Score	No.	%	Score		
Necessary Physical Works	46	92	138	5	10	10		0	0	148	1
Irrigation water supply for wet season	4	8	12	42	84	84		0	0	96	2
Irrigation water supply for dry season		0	0		0	0	12	24	12	12	
Mitigation of inundation/flooding		0	0		0	0		0	0	0	
Drainage improvement		0	0	1	2	2	31	62	31	33	3
Improvement of irrigation system		0	0	2	4	4	7	14	7	11	
Others		0	0		0	0		0	0	0	
Total	50	100	150	50	100	100	50	100	50	300	

Target Area: Overall	Degree of Necessity of Activity									Total Score	Rating
	Most Required Score: 3			2nd Most Required Score: 2			3rd Most Required Score: 1				
	No.	%	Score	No.	%	Score	No.	%	Score		
Necessary Physical Works	157	314	471	30	60	60	8	16	8	539	1
Irrigation water supply for wet season	24	48	72	125	250	250	29	58	29	351	2
Irrigation water supply for dry season	2	4	6	8	16	16	31	62	31	53	
Mitigation of inundation/flooding		0	0		0	0		0	0	0	
Drainage improvement	17	34	51	34	68	68	121	242	121	240	3
Improvement of irrigation system		0	0	3	6	6	11	22	11	17	
Others		0	0		0	0		0	0	0	
Total	200	400	600	200	400	400	200	400	200	1,200	

Attachment 3 Results of Socio-economic Survey on Farming Constraints, Improvement Measures & Expectations - 8/12

3. Livestock Constraints

Target Area: Category Area-1	Degree of Constraints									Total Score	Rating
	Most Serious Score: 3			2nd Serious Score: 2			3rd Serious Score: 1				
	No.	%	Score	No.	%	Score	No.	%	Score		
Livestock Constraints											
Low productivity	6	12	18	4	8	8	3	6	3	29	3
Shortage of feed	3	6	9	7	14	14	6	12	6	29	3
Low or unstable market prices	3	6	9	4	8	8	4	8	4	21	
Market availability	1	2	3	1	2	2	3	6	3	8	
Losses due to diseases	28	56	84	13	26	26	3	6	3	113	1
Insufficient veterinary services	5	10	15	15	30	30	14	28	14	59	2
Insufficient extension services	1	2	3	1	2	2	10	20	10	15	
Difficulty in obtaining good breed		0	0	3	6	6	7	14	7	13	
Others	3	6	9	2	4	4		0	0	13	
Total	50	100	150	50	100	100	50	100	50	300	

Target Area: Category Area-2	Degree of Constraints									Total Score	Rating
	Most Serious Score: 3			2nd Serious Score: 2			3rd Serious Score: 1				
	No.	%	Score	No.	%	Score	No.	%	Score		
Livestock Constraints											
Low productivity	2	4	6	3	6	6	8	16	8	20	
Shortage of feed		0	0	8	16	16	8	16	8	24	3
Low or unstable market prices	1	2	3	2	4	4	2	4	2	9	
Market availability	1	2	3		0	0	1	2	1	4	
Losses due to diseases	37	74	111	7	14	14	1	2	1	126	1
Insufficient veterinary services	3	6	9	20	40	40	16	32	16	65	2
Insufficient extension services	1	2	3	6	12	12	7	14	7	22	
Difficulty in obtaining good breed	2	4	6	2	4	4	5	10	5	15	
Others	3	6	9	2	4	4	2	4	2	15	
Total	50	100	150	50	100	100	50	100	50	300	

Target Area: Category Area-3	Degree of Constraints									Total Score	Rating
	Most Serious Score: 3			2nd Serious Score: 2			3rd Serious Score: 1				
	No.	%	Score	No.	%	Score	No.	%	Score		
Livestock Constraints											
Low productivity	1	2	3	7	14	14	7	14	7	24	
Shortage of feed	1	2	3	8	16	16	8	16	8	27	3
Low or unstable market prices	1	2	3	3	6	6	4	8	4	13	
Market availability	1	2	3		0	0		0	0	3	
Losses due to diseases	42	84	126	4	8	8	1	2	1	135	1
Insufficient veterinary services	2	4	6	17	34	34	17	34	17	57	2
Insufficient extension services	2	4	6	7	14	14	6	12	6	26	
Difficulty in obtaining good breed		0	0	2	4	4	6	12	6	10	
Others		0	0	2	4	4	1	2	1	5	
Total	50	100	150	50	100	100	50	100	50	300	

Target Area: Category Area-4	Degree of Constraints									Total Score	Rating
	Most Serious Score: 3			2nd Serious Score: 2			3rd Serious Score: 1				
	No.	%	Score	No.	%	Score	No.	%	Score		
Livestock Constraints											
Low productivity	4	8	12	7	14	14	11	22	11	37	
Shortage of feed	2	4	6	10	20	20	14	28	14	40	3
Low or unstable market prices	2	4	6		0	0	5	10	5	11	
Market availability		0	0		0	0	1	2	1	1	
Losses due to diseases	42	84	126	4	8	8	3	6	3	137	1
Insufficient veterinary services		0	0	21	42	42	10	20	10	52	2
Insufficient extension services		0	0	5	10	10	3	6	3	13	
Difficulty in obtaining good breed		0	0	3	6	6	3	6	3	9	
Others		0	0		0	0		0	0	0	
Total	50	100	150	50	100	100	50	100	50	300	

Target Area: Overall	Degree of Constraints									Total Score	Rating
	Most Serious Score: 3			2nd Serious Score: 2			3rd Serious Score: 1				
	No.	%	Score	No.	%	Score	No.	%	Score		
Livestock Constraints											
Low productivity	13	7	39	21	11	42	29	15	29	110	
Shortage of feed	6	3	18	33	17	66	36	18	36	120	3
Low or unstable market prices	7	4	21	9	5	18	15	8	15	54	
Market availability	3	2	9	1	1	2	5	3	5	16	
Losses due to diseases	149	75	447	28	14	56	8	4	8	511	1
Insufficient veterinary services	10	5	30	73	37	146	57	29	57	233	2
Insufficient extension services	4	2	12	19	10	38	26	13	26	76	
Difficulty in obtaining good breed	2	1	6	10	5	20	21	11	21	47	
Others	6	3	18	6	3	12	3	2	3	33	
Total	200	100	600	200	100	400	200	100	200	1,200	

Attachment 3 Results of Socio-economic Survey on Farming Constraints, Improvement Measures & Expectations - 9/12

4. Expectations for Improvement

4-1. Farming (agronomic & farm management)

Target Area: Category Area-1	Degree of Expectation									Total Score	Rating
	Most Expected Score: 3			2nd Most Expected Score: 2			3rd Most Expected Score: 1				
	No.	%	Score	No.	%	Score	No.	%	Score		
Expectations for Improvement											
Productivity improvement of wet season rice	30	60	90	7	14	14	5	10	5	109	1
Productivity improvement of dry season rice	10	20	30	21	42	42	2	4	2	74	2
Productivity improvement of field crops		0	0	11	22	22	5	10	5	27	3
Productivity improvement of vegetables	2	4	6	1	2	2	5	10	5	13	
Productivity improvement of livestock/poultry	3	6	9	1	2	2	11	22	11	22	
Increasing livestock holding size & production	1	2	3	4	8	8	13	26	13	24	
Increasing poultry holding size & production	1	2	3	2	4	4	3	6	3	10	
Strengthening/formation of farmers organizations		0	0	2	4	4	3	6	3	7	
Improvement of post-harvest operation	2	4	6	1	2	2	3	6	3	11	
Others	1	2	3		0	0		0	0	3	
Total	50	100	150	50	100	100	50	100	50	300	

Target Area: Category Area-2	Degree of Expectation									Total Score	Rating
	Most Expected Score: 3			2nd Most Expected Score: 2			3rd Most Expected Score: 1				
	No.	%	Score	No.	%	Score	No.	%	Score		
Expectations for Improvement											
Productivity improvement of wet season rice	37	74	111	10	20	20	2	4	2	133	1
Productivity improvement of dry season rice	9	18	27	20	40	40	4	8	4	71	2
Productivity improvement of field crops	1	2	3	3	6	6	5	10	5	14	
Productivity improvement of vegetables	1	2	3	3	6	6	4	8	4	13	
Productivity improvement of livestock/poultry	2	4	6	6	12	12	15	30	15	33	3
Increasing livestock holding size & production		0	0	5	10	10	13	26	13	23	
Increasing poultry holding size & production		0	0	1	2	2	4	8	4	6	
Strengthening/formation of farmers organizations		0	0	1	2	2	2	4	2	4	
Improvement of post-harvest operation		0	0	1	2	2	1	2	1	3	
Others		0	0		0	0		0	0	0	
Total	50	100	150	50	100	100	50	100	50	300	

Target Area: Category Area-3	Degree of Expectation									Total Score	Rating
	Most Expected Score: 3			2nd Most Expected Score: 2			3rd Most Expected Score: 1				
	No.	%	Score	No.	%	Score	No.	%	Score		
Expectations for Improvement											
Productivity improvement of wet season rice	41	82	123	4	8	8	3	6	3	134	1
Productivity improvement of dry season rice	7	14	21	19	38	38	1	2	1	60	2
Productivity improvement of field crops		0	0	7	14	14	8	16	8	22	
Productivity improvement of vegetables	1	2	3	5	10	10	9	18	9	22	
Productivity improvement of livestock/poultry	1	2	3	4	8	8	14	28	14	25	3
Increasing livestock holding size & production		0	0	7	14	14	9	18	9	23	
Increasing poultry holding size & production		0	0	3	6	6	2	4	2	8	
Strengthening/formation of farmers organizations		0	0	1	2	2	3	6	3	5	
Improvement of post-harvest operation		0	0		0	0	1	2	1	1	
Others		0	0		0	0		0	0	0	
Total	50	100	150	50	100	100	50	100	50	300	

Target Area: Category Area-4	Degree of Expectation									Total Score	Rating
	Most Expected Score: 3			2nd Most Expected Score: 2			3rd Most Expected Score: 1				
	No.	%	Score	No.	%	Score	No.	%	Score		
Expectations for Improvement											
Productivity improvement of wet season rice	41	82	123	4	8	8	1	2	1	132	1
Productivity improvement of dry season rice	9	18	27	24	48	48	3	6	3	78	2
Productivity improvement of field crops		0	0	3	6	6	5	10	5	11	
Productivity improvement of vegetables		0	0	6	12	12	5	10	5	17	
Productivity improvement of livestock/poultry		0	0	9	18	18	12	24	12	30	3
Increasing livestock holding size & production		0	0	4	8	8	20	40	20	28	
Increasing poultry holding size & production		0	0		0	0	1	2	1	1	
Strengthening/formation of farmers organizations		0	0		0	0	2	4	2	2	
Improvement of post-harvest operation		0	0		0	0	1	2	1	1	
Others		0	0		0	0		0	0	0	
Total	50	100	150	50	100	100	50	100	50	300	

Target Area: Overall	Degree of Expectation									Total Score	Rating
	Most Expected Score: 3			2nd Most Expected Score: 2			3rd Most Expected Score: 1				
	No.	%	Score	No.	%	Score	No.	%	Score		
Expectations for Improvement											
Productivity improvement of wet season rice	149	75	447	25	13	50	11	6	11	508	1
Productivity improvement of dry season rice	35	18	105	84	42	168	10	5	10	283	2
Productivity improvement of field crops	1	1	3	24	12	48	23	12	23	74	
Productivity improvement of vegetables	4	2	12	15	8	30	23	12	23	65	
Productivity improvement of livestock/poultry	6	3	18	20	10	40	52	26	52	110	3
Increasing livestock holding size & production	1	1	3	20	10	40	55	28	55	98	
Increasing poultry holding size & production	1	1	3	6	3	12	10	5	10	25	
Strengthening/formation of farmers organizations	0	0	0	4	2	8	10	5	10	18	
Improvement of post-harvest operation	2	1	6	2	1	4	6	3	6	16	
Others	1	1	3	0	0	0	0	0	0	3	
Total	200	100	600	200	100	400	200	100	200	1,200	

Attachment 3 Results of Socio-economic Survey on Farming Constraints, Improvement Measures & Expectations - 10/12

4-2. Farming (farming system)

Target Area: Category Area-1	Degree of Expectation									Total Score	Rating
	Primarily Intended Score: 3			Secondary Intended Score: 2			Thirdly Intended Score: 1				
	No.	%	Score	No.	%	Score	No.	%	Score		
Farming System											
Double cropping of rice	40	80	120	7	14	14	4	8	4	138	1
Stable single cropping of rice	4	8	12	7	14	14	5	10	5	31	
Multiple farming (crop + livestock etc.)	5	10	15	30	60	60	10	20	10	85	2
Crop diversification	1	2	3	6	12	12	31	62	31	46	3
Total	50	100	150	50	100	100	50	100	50	300	

Target Area: Category Area-2	Degree of Expectation									Total Score	Rating
	Primarily Intended Score: 3			Secondary Intended Score: 2			Thirdly Intended Score: 1				
	No.	%	Score	No.	%	Score	No.	%	Score		
Farming System											
Double cropping of rice	41	82	123	3	6	6	1	2	1	130	1
Stable single cropping of rice	5	10	15	10	20	20	4	8	4	39	3
Multiple farming (crop + livestock etc.)	4	8	12	35	70	70	11	22	11	93	2
Crop diversification	0	0	0	2	4	4	34	68	34	38	
Total	50	100	150	50	100	100	50	100	50	300	

Target Area: Category Area-3	Degree of Expectation									Total Score	Rating
	Primarily Intended Score: 3			Secondary Intended Score: 2			Thirdly Intended Score: 1				
	No.	%	Score	No.	%	Score	No.	%	Score		
Farming System											
Double cropping of rice	40	80	120	4	8	8	2	4	2	130	1
Stable single cropping of rice	6	12	18	5	10	10	4	8	4	32	
Multiple farming (crop + livestock etc.)	4	8	12	35	70	70	10	20	10	92	2
Crop diversification	0	0	0	6	12	12	34	68	34	46	3
Total	50	100	150	50	100	100	50	100	50	300	

Target Area: Category Area-4	Degree of Expectation									Total Score	Rating
	Primarily Intended Score: 3			Secondary Intended Score: 2			Thirdly Intended Score: 1				
	No.	%	Score	No.	%	Score	No.	%	Score		
Farming System											
Double cropping of rice	45	90	135	1	2	2	1	2	1	138	1
Stable single cropping of rice	4	8	12	11	22	22	5	10	5	39	3
Multiple farming (crop + livestock etc.)	1	2	3	34	68	68	14	28	14	85	2
Crop diversification	0	0	0	4	8	8	30	60	30	38	
Total	50	100	150	50	100	100	50	100	50	300	

Target Area: Overall	Degree of Expectation									Total Score	Rating
	Primarily Intended Score: 3			Secondary Intended Score: 2			Thirdly Intended Score: 1				
	No.	%	Score	No.	%	Score	No.	%	Score		
Farming System											
Double cropping of rice	166	83	498	15	8	30	8	4	8	536	1
Stable single cropping of rice	19	10	57	33	17	66	18	9	18	141	
Multiple farming (crop + livestock etc.)	14	7	42	134	67	268	45	23	45	355	2
Crop diversification	1	1	3	18	9	36	129	65	129	168	3
Total	200	100	600	200	100	400	200	100	200	1,200	

4-3. Farming (physical)

Target Area: Category Area-1	Degree of Expectation									Total Score	Rating
	Primarily Expected Score: 3			Secondary Expected Score: 2			Thirdly Expected Score: 1				
	No.	%	Score	No.	%	Score	No.	%	Score		
Farming (physical)											
Adequate irrigation water supply in wet season	36	72	108	6	12	12	4	8	4	124	1
Adequate irrigation water supply in dry season	8	16	24	19	38	38	7	14	7	69	3
Mitigation of inundation & flooding				1	2	2	3	6	3	5	
Construction/rehabilitation of farm road				3	6	6	11	22	11	17	
Construction/rehabilitation of farm to market road				1	2	2		0		2	
Drainage improvement	6	12	18	17	34	34	19	38	19	71	2
Leveling of paddy field				3	6	6	6	12	6	12	
Total	50	100	150	50	100	100	50	100	50	300	

Target Area: Category Area-2	Degree of Expectation									Total Score	Rating
	Primarily Expected Score: 3			Secondary Expected Score: 2			Thirdly Expected Score: 1				
	No.	%	Score	No.	%	Score	No.	%	Score		
Farming (physical)											
Adequate irrigation water supply in wet season	35	70	105	9	18	18	3	6	3	126	1
Adequate irrigation water supply in dry season	7	14	21	19	38	38	10	20	10	69	3
Mitigation of inundation & flooding				3	6	6	5	10	5	11	
Construction/rehabilitation of farm road				1	2	2	3	6	3	5	
Construction/rehabilitation of farm to market road				0	0	0	1	2	1	1	
Drainage improvement	8	16	24	15	30	30	21	42	21	75	2
Leveling of paddy field				3	6	6	7	14	7	13	
Total	50	100	150	50	100	100	50	100	50	300	

Attachment 3 Results of Socio-economic Survey on Farming Constraints, Improvement Measures & Expectations - 11/12

Target Area: Category Area-3	Degree of Expectation									Total Score	Rating
	Primarily Expected Score: 3			Secondary Expected Score: 2			Thirdly Expected Score: 1				
	No.	%	Score	No.	%	Score	No.	%	Score		
Farming (physical)											
Adequate irrigation water supply in wet season	40	80	120	4	8	8	4	8	4	132	1
Adequate irrigation water supply in dry season	3	6	9	20	40	40	9	18	9	58	3
Mitigation of inundation & flooding	1	2	3		0	0	1	2	1	4	
Construction/rehabilitation of farm road				3	6	6	5	10	5	11	
Construction/rehabilitation of farm to market road					0	0	4	8	4	4	
Drainage improvement	5	10	15	16	32	32	19	38	19	66	2
Leveling of paddy field	1	2	3	7	14	14	8	16	8	25	
Total	50	100	150	50	100	100	50	100	50	300	

Target Area: Category Area-4	Degree of Expectation									Total Score	Rating
	Primarily Expected Score: 3			Secondary Expected Score: 2			Thirdly Expected Score: 1				
	No.	%	Score	No.	%	Score	No.	%	Score		
Farming (physical)											
Adequate irrigation water supply in wet season	45	90	135	3	6	6	2	4	2	143	1
Adequate irrigation water supply in dry season	4	8	12	32	64	64	4	8	4	80	2
Mitigation of inundation & flooding		0	0		0	0	1	2	1	1	
Construction/rehabilitation of farm road				1	2	2	4	8	4	6	
Construction/rehabilitation of farm to market road					0	0	4	8	4	4	
Drainage improvement	1	2	3	7	14	14	25	50	25	42	3
Leveling of paddy field		0	0	7	14	14	10	20	10	24	
Total	50	100	150	50	100	100	50	100	50	300	

Target Area: Overall	Degree of Expectation									Total Score	Rating
	Primarily Expected Score: 3			Secondary Expected Score: 2			Thirdly Expected Score: 1				
	No.	%	Score	No.	%	Score	No.	%	Score		
Farming (physical)											
Adequate irrigation water supply in wet season	156	78	468	22	11	44	13	6.5	13	525	1
Adequate irrigation water supply in dry season	22	11	66	90	45	180	30	15	30	276	2
Mitigation of inundation & flooding	1	0.5	3	4	2	8	10	5	10	21	
Construction/rehabilitation of farm road	0	0		8	4	16	23	11.5	23	39	
Construction/rehabilitation of farm to market road	0	0		1	0.5	2	9	4.5	9	11	
Drainage improvement	20	10	60	55	27.5	110	84	42	84	254	3
Leveling of paddy field	1	0.5	3	20	10	40	31	15.5	31	74	
Total	200	100	600	200	100	400	200	100	200	1200	

4-4. Agricultural support services

Target Area: Category Area-1	Degree of Necessity of Support									Total Score	Rating
	Most Required Score: 3			2nd Most Required Score: 2			3rd Most Required Score: 1				
	No.	%	Score	No.	%	Score	No.	%	Score		
Agricultural Support Required											
Field Extension services (demonstration / field guidance)	20	40	60	16	32	32	6	12	6	98	1
Provision of quality seed	11	22	33	10	20	20	10	20	10	63	3
Farmer training (technical & host-harvest operation)	15	30	45	16	32	32	8	16	8	85	2
Farmer training (organization, marketing, farm management)				2		4	2		2	6	
Support to organize farmers				1		2	1		1	3	
Provision of market information	1	2	3	1	2	2	5	10	5	10	
Provision of farm credit				2		4	7		7	11	
Provision of fertilizer	3	6	9	2	4		11	22	11	20	
Others (specify)										0	
Total	50	100	150	50	100	150	50	100	150	450	

Target Area: Category Area-2	Degree of Necessity of Support									Total Score	Rating
	Most Required Score: 3			2nd Most Required Score: 2			3rd Most Required Score: 1				
	No.	%	Score	No.	%	Score	No.	%	Score		
Agricultural Support Required											
Field Extension services (demonstration / field guidance)	26	52	78	9	18	18	7	14	7	103	1
Provision of quality seed	7	14	21	12	24	24	12	24	12	57	2
Farmer training (technical & host-harvest operation)	9	18	27	13	26	26	2	4	2	55	3
Farmer training (organization, marketing, farm management)	6	12	18	5	10	10	2	4	2	30	
Support to organize farmers		0	0	1	2	2	2	4	2	4	
Provision of market information	1	2	3	1	2	2	5	10	5	10	
Provision of farm credit	1	2	3	4	8	8	7	14	7	18	
Provision of fertilizer		0	0	5	10	10	13	26	13	23	
Others (specify)										0	
Total	50	100	150	50	100	150	50	100	50	300	

Attachment 3 Results of Socio-economic Survey on Farming Constraints, Improvement Measures & Expectations - 12/12

Target Area: Category Area-3	Degree of Necessity of Support									Total Score	Rating
	Most Required Score: 3			2nd Most Required Score: 2			3rd Most Required Score: 1				
	No.	%	Score	No.	%	Score	No.	%	Score		
Agricultural Support Required											
Field Extension services (demonstration / field guidance)	26	52	78	3	6	6	6	12	6	90	1
Provision of quality seed	9	18	27	13	26	26	13	26	13	66	3
Farmer training (technical & host-harvest operation)	10	20	30	17	34	34	7	14	7	71	2
Farmer training (organization, marketing, farm management)		0	0	1	2	2	5	10	5	7	
Support to organize farmers		0	0	2	4	4	1	2	1	5	
Provision of market information	1	2	3	5	10	10	10	20	10	23	
Provision of farm credit	1	2	3	4	8	8	5	10	5	16	
Provision of fertilizer	3	6	9	5	10	10	3	6	3	22	
Others (specify)										0	
Total	50	100	150	50	100	100	50	100	50	300	

Target Area: Category Area-4	Degree of Necessity of Support									Total Score	Rating
	Most Required Score: 3			2nd Most Required Score: 2			3rd Most Required Score: 1				
	No.	%	Score	No.	%	Score	No.	%	Score		
Agricultural Support Required											
Field Extension services (demonstration / field guidance)	27	54	81	7	14	14	5	10	5	100	1
Provision of quality seed	4	8	12	17	34	34	10	20	10	56	3
Farmer training (technical & host-harvest operation)	15	30	45	13	26	26	1	2	1	72	2
Farmer training (organization, marketing, farm management)	1	2	3	5	10	10	5	10	5	18	
Support to organize farmers		0	0		0	0	1	2	1	1	
Provision of market information		0	0	1	2	2	10	20	10	12	
Provision of farm credit		0	0	5	10	10	8	16	8	18	
Provision of fertilizer	3	6	9	2	4	4	10	20	10	23	
Others (specify)										0	
Total	50	100	150	50	100	100	50	100	50	300	

Target Area: Overall	Degree of Necessity of Support									Total Score	Rating
	Most Required Score: 3			2nd Most Required Score: 2			3rd Most Required Score: 1				
	No.	%	Score	No.	%	Score	No.	%	Score		
Agricultural Support Required											
Field Extension services (demonstration / field guidance)	99	50	297	35	18	70	24	12	24	391	1
Provision of quality seed	31	16	93	52	26	104	45	23	45	242	3
Farmer training (technical & host-harvest operation)	49	25	147	59	30	118	18	9	18	283	2
Farmer training (organization, marketing, farm management)	7	4	21	13	7	26	14	7	14	61	
Support to organize farmers	0	0	0	4	2	8	5	3	5	13	
Provision of market information	3	2	9	8	4	16	30	15	30	55	
Provision of farm credit	2	1	6	15	8	30	27	14	27	63	
Provision of fertilizer	9	5	27	14	7	28	37	19	37	92	
Others (specify)	0	0	0	0	0	0	0	0	0	0	
Total	200	400	600	200	400	400	200	400	200	1,200	