

Appendix-E
Cost Estimate

**BASIN-WIDE BASIC IRRIGATION & DRAINAGE MASTER PLAN STUDY
IN
THE KINGDOM OF CAMBODIA**

FINAL REPORT

APPENDIX-E COST ESTIMATE

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CHAPTER E1 SUMMARY OF COST ESTIMATE

E1.1 Components of the Investment Cost

The investment cost of a proposed project consists of the construction costs, other costs such as FWUC training and Agricultural support services, and land acquisition cost as follows:

No.	Description
I.	General Items
II.	Weir, major intake and major structure
III.	Canals and related structures
IV.	Dykes
V.	Miscellaneous works
Sub Total I to V	
VI.	Contractor's Expence (O/H, tax, misc.)
VII.	Detailed Design and Supervision Works
Sub Total I to VII	
VIII.	Physical Contingencies
Total of Construction Costs (Total I to VIII)	
Other Costs	
FWUC level training & mobilization	
Agricultural & other support services	
Sub Total (Total of Construction Costs + Other Costs)	
Land Acquisition cost	
Total Investment Costs	

E1.2 Basic Assumption for Cost Estimate

Estimates of direct construction costs of weir, canals including structures, dyke rehabilitation, and unit costs for major civil works are based on similar types of construction in Cambodia.

The base year for unit costs of the similar construction was 2002. Therefore, the costs applied to this master plan are set 1.2 times higher than that of similar construction reflecting price escalation recorded in the last 5 years between 2002 and 2007.

Other basic assumptions:

- General items are 2 % of direct construction costs.
- Miscellaneous works are 2 % of direct construction costs.
- Contractor's expense is 25.4 % of direct construction costs.

- Detailed design and supervision works are 10 % of direct construction costs.
- Physical contingency is 10 % of general items, direct construction costs, miscellaneous works, contractor's expense, and detailed design and supervision works.
- FWUC level training and mobilization is 4% of total construction costs.
- Agricultural & other support services are estimated in each project.
- Land acquisition cost (& resettlement costs, if any) is 3 % of total construction costs.
- Construction costs are divided into local and foreign currency portions. Ratios of foreign currency portion and local currency portions are those of similar type of construction.

Foreign = 70 %, Local = 30%

- Annual O&M cost is estimated at about 3 % of direct construction costs
- Major repair will be executed every 10 years, and the cost would be about 20 % of direct construction costs.
- Price escalation rate is estimated at 5%.

E1.3 Summary of Cost Estimate Result

The "Summary of Investment Costs" for each project is summarized in the following table and presented in Tables E2.2 in detail.

Investment Cost of Each Project

No.	Project Name	Proposed Irrigation Area (ha)	Total Construction Costs (1,000USD)	Other Costs			Total Investment Cost (1,000USD)
				FWUC level training & mobilization (1,000USD)	Agricultural & other support services (1,000USD)	Land Acquisition Cost (1,000USD)	
1	Kong Hort Rehab. (Phase I)	10,040	25,375	1,015	116	761	27,267
2	Kong Hort Rehab. (Phase II)	2,733	8,700	348	31	261	9,340
3	Sala Taon Weir Rehab.	10,400	54,317	2,173	119	1,630	58,239
4	Ratanak-Battambang Water Harvesting	580	2,109	84	10	63	2,266
5	Bassac Irrigation System Rehab.	3,500	6,920	277	42	208	7,447
6	Ream Kon Rehab.	2,300	4,983	199	26	149	5,357
7	Por Canal Rehab.	1,200	2,232	89	14	67	2,402
8	Nikom/Dai Ta Chan Rehab.	600	2,000	80	10	60	2,150
9	Beoun Preah Ponley Rehab.	8,500	17,571	703	96	527	18,897
10	Damnak Ampil Ext.	8,000	15,964	639	93	479	17,175
11	Wat Loung Rehab.	3,940	7,943	318	46	238	8,545
12	Wat Chre Rehab.	1,000	2,604	104	14	78	2,800
13	Anlong Khouch, Wat Leap, Kosh Khsach Water Harvest. & Recess. Rice Rehab.	2,602	5,610	224	34	168	6,036
14	Lum Hach Rehab.	3,700	9,467	379	44	284	10,174
15	7th January Canal Rehab.	2,000	4,967	199	24	149	5,339
16	Khvet Rehab.	250	825	33	7	25	890
17	Ta Ram Rehab.	180	911	36	7	27	981
18	Chak Teum, Trapeang Khlong, Don Pov Rehab.	980	2,291	92	13	69	2,465
19	Teuk Laak, Trapeang Thlan Rehab.	230	688	28	7	21	744
20	Toul Champey Rehab.	360	633	25	8	19	685
21	Chan Keak Rehab.	110	326	13	6	10	355
	TOTAL	63,205	176,436	7,058	766	5,293	189,553

CHAPTER E2 CONSTRUCTION COST

E2.1 Components of the Construction Cost

In the table in section E1.1, the construction cost consists of Item I to VIII. Of them, however, the Items II to IV are major part of construction cost. The Item III is included in every project, however Item II and IV are contained or not contained in accordance with project type. The others Items are estimated based on the assumptions described in section E1.2.

E2.2 Breakdown of Construction Cost

The breakdown of components items II, III and IV are shown in Tables E2.3, in the following manner (xx means number of the table):

- E2.3- xx A : Cost breakdown for II. Weir, major intake and major structure
- E2.3- xx B : Cost breakdown for III. Canals and related structures
- E2.3- xx C : Cost breakdown for IV. Dykes

Tables

Table E2.2-1 Summary Investment Costs for Proposed Project

Project Name: Kong Hort Rehabilitaion Phase I Project
 River Basin: Battambang River Basin
 Province: Battambang Province
 Proposed Irri. Area: 10,040 ha \$ 2,527 /ha

Summary Investment Costs

No.	Description	Amount (USD)
I.	General Items	\$ 330,000.00
II.	Weir, major intake and major structure	\$ 3,300,000.00
III.	Canals and related structures	\$ 13,124,000.00
IV.	Dykes	\$ 77,000.00
V.	Miscellaneous works	\$ 330,000.00
Sub Total I to V		\$ 17,161,000.00
VI.	Contractor's Expence (O/H, tax, misc.)	\$ 4,191,000.00
VII.	Detailed Design and Supervision Works	\$ 1,716,000.00
Sub Total I to VII		\$ 23,068,000.00
VIII.	Physical Contingencies	\$ 2,307,000.00
Total of Construction Costs		\$ 25,375,000.00
Other Costs		
	FWUC level training & mobilization	\$ 1,015,000.00
	Agricultural & other support services	\$ 115,750.00
Sub Total (Total of Construction Costs + Other Costs)		\$ 26,505,750.00
	Land Acquisition cost	\$ 761,000.00
Total Investment Costs		\$ 27,266,750.00

Project O&M costs	
Annual O&M Cost	\$ 548,000.00
Major repairs (every 10th year)	\$ 3,566,000.00

Table E2.3-1A Summary Sheet for Weir, major intake and major structure

Project Name: Kong Hort Rehabilitation Phase I Project
 River Basin: Battambang River Basin
 Province Name: Battambang
 System Name: Kong Hort
 Proposed Area: 10,040 Ha (Project Total)

COST ESTIMATES

Item No	Description	Unit	Quantity	Amount (USD)	Remarks
1	Kong Hort Weir	nos.	1.00	2,900,000.00	
2	Intake Canal (incl. new structure & demolish)	nos.	1.00	350,000.00	
3	Acces Road (3km, Laterite t=15cm)	nos.	1.00	30,000.00	
4	Weir Operation and Maintenance Office	nos.	1.00	20,000.00	
	Total Cost Estimate			3,300,000.00	

Table E2.3-1B Summary Sheet for Canals and Related Structures

Project Name: Kong Hort Rehabilitation Phase I Project
 River Basin: Battambang River Basin
 Province Name: Battambang
 System Name: Kong Hort, Tourl Thnorng Moury, Kampong Kor (Total of 3 systems)
 Proposed Area: 10,040 Ha (Project Total)

COST ESTIMATES

Item No	Description	Unit	Quantity	Amount (USD)	Remarks
1	Intake Structure (Other than Major Intake)	L.S	1.00	27,000.00	
2	Main Canal Rehabilitation	L.S	1.00	320,300.00	L=10.9km
3	Secondary Canal Rehabilitation	L.S	1.00	6,800.00	L=0.4km
4	Tertiary Canal Rehabilitation	L.S	1.00	3,406,800.00	L=200.3km
5	Main Canal (New)	L.S	1.00	3,092,450.00	L=47.7km
6	Secondary Canal (New)	L.S	1.00	2,003,400.00	L=100.2km
7	Drainage Canal	L.S	1.00	502,000.00	L=50.2km
8	Related Structures (Main Canal)	L.S	1.00	753,000.00	
9	Related Structures (Secondary Canal)	L.S	1.00	2,008,000.00	
10	Related Structures (Tertiary Canal)	L.S	1.00	1,004,000.00	
	Total Cost Estimate			13,123,750.00	
				13,124,000.00	

Table E2.3-1C Summary Sheet for Dyke Rehabilitation

Item No	Description	Unit	Quantity	Amount (USD)	Remarks
1	Dykes	L.S	1.00	21,000.00	L=0.6km
2	Structures (Spillway, Outlet, etc.)	L.S	1.00	55,900.00	(S:1, O:1)
	Total Cost Estimate			76,900.00	
				77,000.00	

Table E2.2-2 Summary Investment Costs for Proposed Project

Project Name: Kong Hort Rehabilitaion Phase II Project

River Basin: Battambang River Basin

Province: Battambang Province

Proposed Irri. Area: 2,733 ha

\$ 3,183 /ha

Summary Investment Costs

No.	Description	Amount (USD)
I.	General Items	\$ 113,000.00
II.	Weir, major intake and major structure	\$ 0.00
III.	Canals and related structures	\$ 4,210,000.00
IV.	Dykes	\$ 1,448,000.00
V.	Miscellaneous works	\$ 113,000.00
Sub Total I to V		\$ 5,884,000.00
VI.	Contractor's Expencc (O/H, tax, misc.)	\$ 1,437,000.00
VII.	Detailed Design and Supervision Works	\$ 588,000.00
Sub Total I to VII		\$ 7,909,000.00
VIII.	Physical Contingencies	\$ 791,000.00
Total of Construction Costs		\$ 8,700,000.00
Other Costs		
FWUC level training & mobilization		\$ 348,000.00
Agricultural & other support services		\$ 31,420.00
Sub Total (Total of Construction Costs + Other Costs)		\$ 9,079,420.00
Land Acquisition cost		\$ 261,000.00
Total Investment Costs		\$ 9,340,420.00

Project O&M costs	
Annual O&M Cost	\$ 221,000.00
Major repairs (every 10th year)	\$ 1,387,000.00

Table E2.3-2B Summary Sheet for Canals and Related Structures

Project Name: Kong Hort Rehabilitation Phase II Project
 River Basin: Battambang River Basin
 Province Name: Battambang
 System Name: Kong Hort (Total of 30 systems)
 Proposed Area: 2,733 Ha (Project Total)

COST ESTIMATES

Item No	Description	Unit	Quantity	Amount (USD)	Remarks
1	Intake Structure (Other than Major Intake)	L.S	1.00	750,600.00	
2	Main Canal Rehabilitation	L.S	1.00	941,825.00	L=40.8km
3	Secondary Canal Rehabilitation	L.S	1.00	90,000.00	L=4.5km
4	Tertiary Canal Rehabilitation	L.S	1.00	757,520.00	L=44.6km
5	Main Canal (New)	L.S	1.00	31,380.00	L=1.7km
6	Secondary Canal (New)	L.S	1.00	477,460.00	L=24.8km
7	Drainage Canal	L.S	1.00	136,650.00	L=13.7km
8	Related Structures (Main Canal)	L.S	1.00	204,975.00	
9	Related Structures (Secondary Canal)	L.S	1.00	546,600.00	
10	Related Structures (Tertiary Canal)	L.S	1.00	273,300.00	
	Total Cost Estimate			4,210,310.00	
				4,210,000.00	

Table E2.3-2C Summary Sheet for Dyke Rehabilitation

Item No	Description	Unit	Quantity	Amount (USD)	Remarks
1	Dykes	L.S	1.00	883,050.00	L=25.4km
2	Structures (Spillway, Outlet, etc.)	L.S	1.00	564,640.00	(S:8, O:10)
	Total Cost Estimate			1,447,690.00	
				1,448,000.00	

Table E2.2-3 Summary Investment Costs for Proposed Project

Project Name: Sala Taon Weir Rehabilitaion Project

River Basin: Battambang River Basin

Province: Battambang Province

Proposed Irri. Area: 10,400 ha

\$ 5,223 /ha

Summary Investment Costs

No.	Description	Amount (USD)
I.	General Items	\$ 706,000.00
II.	Weir, major intake and major structure	\$ 22,700,000.00
III.	Canals and related structures	\$ 12,622,000.00
IV.	Dykes	\$ 0.00
V.	Miscellaneous works	\$ 706,000.00
Sub Total I to V		\$ 36,734,000.00
VI.	Contractor's Expencc (O/H, tax, misc.)	\$ 8,972,000.00
VII.	Detailed Design and Supervision Works	\$ 3,673,000.00
Sub Total I to VII		\$ 49,379,000.00
VIII.	Physical Contingencies	\$ 4,938,000.00
Total of Construction Costs		\$ 54,317,000.00
Other Costs		
	FWUC level training & mobilization	\$ 2,173,000.00
	Agricultural & other support services	\$ 118,590.00
Sub Total (Total of Construction Costs + Other Costs)		\$ 56,608,590.00
	Land Acquisition cost	\$ 1,630,000.00
Total Investment Costs		\$ 58,238,590.00

Project O&M costs	
Annual O&M Cost	\$ 797,000.00
Major repairs (every 10th year)	\$ 5,753,000.00

Table E2.3-3A Summary Sheet for Weir, major intake and major structure

Project Name: Sala Taon Weir Rehabilitation Project
 River Basin: Battambang River Basin
 Province Name: Battambang
 System Name: Or Samrong Knong
 Proposed Area: 10,400 Ha (Project Total)

COST ESTIMATES

Item No	Description	Unit	Quantity	Amount (USD)	Remarks
1	Sala Taon Weir	nos.	1.00	2,500,000.00	
	Electrical System for Sala Taon Weir	nos.	1.00	1,000,000.00	
2	Intake Structure	nos.	5.00	950,000.00	Cost for 5
3	Boat Pass Way	nos.	1.00	810,000.00	
4	Fish Ladder	nos.	1.00	720,000.00	
5	Back water Protection Wall (5.0 km x 2)	nos.	1.00	16,700,000.00	
6	Office	nos.	1.00	20,000.00	
	Total Cost Estimate			22,700,000.00	

Table E2.3-3B Summary Sheet for Canals and Related Structures

Project Name: Sala Taon Weir Rehabilitation Project
River Basin: Battambang River Basin
Province Name: Battambang
System Name: Or Samrong Knong (Total of 17 systems)
Proposed Area: 10,400 Ha (Project Total)

COST ESTIMATES

Item No	Description	Unit	Quantity	Amount (USD)	Remarks
1	Intake Structure (Other than Major Intake)	L.S	1.00	1,026,000.00	
2	Main Canal Rehabilitation	L.S	1.00	548,300.00	L=23.7km
3	Secondary Canal Rehabilitation	L.S	1.00	433,800.00	L=21.8km
4	Tertiary Canal Rehabilitation	L.S	1.00	3,225,750.00	L=189.8km
5	Main Canal (New)	L.S	1.00	1,252,750.00	L=21.7km
6	Secondary Canal (New)	L.S	1.00	1,715,325.00	L=86.1km
7	Drainage Canal	L.S	1.00	520,000.00	L=52.0km
8	Related Structures (Main Canal)	L.S	1.00	780,000.00	
9	Related Structures (Secondary Canal)	L.S	1.00	2,080,000.00	
10	Related Structures (Tertiary Canal)	L.S	1.00	1,040,000.00	
	Total Cost Estimate			12,621,925.00	
				12,622,000.00	

Table E2.2-4 Summary Investment Costs for Proposed Project

Project Name: Ratanak-Battambang Water Harvesting Rehabilitation Project
 River Basin: Battambang River Basin
 Province: Battambang Province
 Proposed Irrig. Area: 580 ha \$ 3,636 /ha

Summary Investment Costs

No.	Description	Amount (USD)
I.	General Items	\$ 27,000.00
II.	Weir, major intake and major structure	\$ 0.00
III.	Canals and related structures	\$ 154,000.00
IV.	Dykes	\$ 1,218,000.00
V.	Miscellaneous works	\$ 27,000.00
Sub Total I to V		\$ 1,426,000.00
VI.	Contractor's Expense (O/H, tax, misc.)	\$ 348,000.00
VII.	Detailed Design and Supervision Works	\$ 143,000.00
Sub Total I to VII		\$ 1,917,000.00
VIII.	Physical Contingencies	\$ 192,000.00
Total of Construction Costs		\$ 2,109,000.00
Other Costs		
	FWUC level training & mobilization	\$ 84,000.00
	Agricultural & other support services	\$ 10,060.00
Sub Total (Total of Construction Costs + Other Costs)		\$ 2,203,060.00
	Land Acquisition cost	\$ 63,000.00
Total Investment Costs		\$ 2,266,060.00

Project O&M costs	
Annual O&M Cost	\$ 57,000.00
Major repairs (every 10th year)	\$ 354,000.00

Table E2.2-5 Summary Investment Costs for Proposed Project

Project Name: Bassac Irrigation System Rehabilitation Project

River Basin: Moung Russey River Basin

Province: Battambang Province

Proposed Irri. Area: 3,500 ha

\$ 1,977 /ha

Summary Investment Costs

No.	Description	Amount (USD)
I.	General Items	\$ 90,000.00
II.	Weir, major intake and major structure	\$ 300,000.00
III.	Canals and related structures	\$ 4,200,000.00
IV.	Dykes	\$ 0.00
V.	Miscellaneous works	\$ 90,000.00
Sub Total I to V		\$ 4,680,000.00
VI.	Contractor's Expencc (O/H, tax, misc.)	\$ 1,143,000.00
VII.	Detailed Design and Supervision Works	\$ 468,000.00
Sub Total I to VII		\$ 6,291,000.00
VIII.	Physical Contingencies	\$ 629,000.00
Total of Construction Costs		\$ 6,920,000.00
Other Costs		
	FWUC level training & mobilization	\$ 277,000.00
	Agricultural & other support services	\$ 42,370.00
Sub Total (Total of Construction Costs + Other Costs)		\$ 7,239,370.00
	Land Acquisition cost	\$ 208,000.00
Total Investment Costs		\$ 7,447,370.00

Project O&M costs	
Annual O&M Cost	\$ 164,000.00
Major repairs (every 10th year)	\$ 1,044,000.00

Table E2.3-5A Summary Sheet for Weir, major intake and major structure

Project Name: Basac Irrigation System Rehabilitation Project
 River Basin: Moung Russey River Basin
 Province Name: Battambang
 System Name: Bassac
 Proposed Area: 3,500 Ha (Project Total)

COST ESTIMATES

Item No	Description	Unit	Quantity	Amount (USD)	Remarks
1	Reservoir Operation & Maintenance Office	nos.	1.00	20,000.00	
2	Erosion Protection Extention	nos.	1.00	200,000.00	
3	Canal Extention (L= 1 km)	nos.	1.00	80,000.00	
	Total Cost Estimate			300,000.00	

Table E2.2-6 Summary Investment Costs for Proposed Project

Project Name: Ream Kon Rehabilitaion Project

River Basin: Moung Russey River Basin

Province: Battambang Province

Proposed Irri. Area: 2,300 ha

\$ 2,167 /ha

Summary Investment Costs

No.	Description	Amount (USD)
I.	General Items	\$ 65,000.00
II.	Weir, major intake and major structure	\$ 600,000.00
III.	Canals and related structures	\$ 2,640,000.00
IV.	Dykes	\$ 0.00
V.	Miscellaneous works	\$ 65,000.00
Sub Total I to V		\$ 3,370,000.00
VI.	Contractor's Expence (O/H, tax, misc.)	\$ 823,000.00
VII.	Detailed Design and Supervision Works	\$ 337,000.00
Sub Total I to VII		\$ 4,530,000.00
VIII.	Physical Contingencies	\$ 453,000.00
Total of Construction Costs		\$ 4,983,000.00
Other Costs		
	FWUC level training & mobilization	\$ 199,000.00
	Agricultural & other support services	\$ 25,630.00
Sub Total (Total of Construction Costs + Other Costs)		\$ 5,207,630.00
	Land Acquisition cost	\$ 149,000.00
Total Investment Costs		\$ 5,356,630.00

Project O&M costs	
Annual O&M Cost	\$ 109,000.00
Major repairs (every 10th year)	\$ 706,000.00

Table E2.3-6A Summary Sheet for Weir, major intake and major structure

Project Name: Ream Kon Rehabilitation Project
 River Basin: Moung Russey River Basin
 Province Name: Battambang
 System Name: Ream Kon
 Proposed Area: 2,300 Ha (Project Total)

COST ESTIMATES

Item No	Description	Unit	Quantity	Amount (USD)	Remarks
1	Ream Kon Weir	nos.	1.00	410,000.00	
2	Intake Structure	nos.	1.00	190,000.00	
	Total Cost Estimate			600,000.00	

Table E2.3-6B Summary Sheet for Canals and Related Structures

Project Name: Ream Kon Rehabilitaion Project
 River Basin: Moung Russey River Basin
 Province Name: Battambang
 System Name: Ream Kon (Total of 1 systems)
 Proposed Area: 2,300 Ha (Project Total)

COST ESTIMATES

Item No	Description	Unit	Quantity	Amount (USD)	Remarks
1	Intake Structure (Other than Major Intake)	L.S	1.00	0.00	-
2	Main Canal Rehabilitation	L.S	1.00	360,000.00	L=12.0km
3	Secondary Canal Rehabilitation	L.S	1.00	520,000.00	L=26.0km
4	Tertiary Canal Rehabilitation	L.S	1.00	782,000.00	L=46.0km
5	Main Canal (New)	L.S	1.00	0.00	-
6	Secondary Canal (New)	L.S	1.00	0.00	-
7	Drainage Canal	L.S	1.00	115,000.00	L=11.5km
8	Related Structures (Main Canal)	L.S	1.00	172,500.00	
9	Related Structures (Secondary Canal)	L.S	1.00	460,000.00	
10	Related Structures (Tertiary Canal)	L.S	1.00	230,000.00	
	Total Cost Estimate			2,639,500.00	
				2,640,000.00	

Table E2.2-7 Summary Investment Costs for Proposed Project

Project Name: Por Canal Rehabilitaion Project

River Basin: Mounng Russey River Basin

Province: Battambang Province

Proposed Irri. Area: 1,200 ha

\$ 1,860 /ha

Summary Investment Costs

No.	Description	Amount (USD)
I.	General Items	\$ 29,000.00
II.	Weir, major intake and major structure	\$ 0.00
III.	Canals and related structures	\$ 1,451,000.00
IV.	Dykes	\$ 0.00
V.	Miscellaneous works	\$ 29,000.00
Sub Total I to V		\$ 1,509,000.00
VI.	Contractor's Expencc (O/H, tax, misc.)	\$ 369,000.00
VII.	Detailed Design and Supervision Works	\$ 151,000.00
Sub Total I to VII		\$ 2,029,000.00
VIII.	Physical Contingencies	\$ 203,000.00
Total of Construction Costs		\$ 2,232,000.00
Other Costs		
	FWUC level training & mobilization	\$ 89,000.00
	Agricultural & other support services	\$ 14,040.00
Sub Total (Total of Construction Costs + Other Costs)		\$ 2,335,040.00
	Land Acquisition cost	\$ 67,000.00
Total Investment Costs		\$ 2,402,040.00

Project O&M costs	
Annual O&M Cost	\$ 55,000.00
Major repairs (every 10th year)	\$ 348,000.00

Table E2.3-7B Summary Sheet for Canals and Related Structures

Project Name: Por Canal Rehabilitaion Project
 River Basin: Moung Russey River Basin
 Province Name: Battambang
 System Name: Por Canal (Total of 1 systems)
 Proposed Area: 1,200 Ha (Project Total)

COST ESTIMATES

Item No	Description	Unit	Quantity	Amount (USD)	Remarks
1	Intake Structure (Other than Major Intake)	L.S	1.00	67,500.00	
2	Main Canal Rehabilitation	L.S	1.00	315,000.00	L=10.5km
3	Secondary Canal Rehabilitation	L.S	1.00	86,000.00	L=4.3km
4	Tertiary Canal Rehabilitation	L.S	1.00	408,000.00	L=24.0km
5	Main Canal (New)	L.S	1.00	0.00	-
6	Secondary Canal (New)	L.S	1.00	64,000.00	L=3.2km
7	Drainage Canal	L.S	1.00	60,000.00	L=6.0km
8	Related Structures (Main Canal)	L.S	1.00	90,000.00	
9	Related Structures (Secondary Canal)	L.S	1.00	240,000.00	
10	Related Structures (Tertiary Canal)	L.S	1.00	120,000.00	
	Total Cost Estimate			1,450,500.00	
				1,451,000.00	

Table E2.2-8 Summary Investment Costs for Proposed Project

Project Name: Nikom/Dai Ta Chan Rehabilitaion Project
 River Basin: Moung Russey River Basin Svay Don Keo River
 Province: Pursat Province
 Proposed Irri. Area: 600 ha \$ 3,333 /ha

Summary Investment Costs

No.	Description	Amount (USD)
I.	General Items	\$ 26,000.00
II.	Weir, major intake and major structure	\$ 540,000.00
III.	Canals and related structures	\$ 761,000.00
IV.	Dykes	\$ 0.00
V.	Miscellaneous works	\$ 26,000.00
Sub Total I to V		\$ 1,353,000.00
VI.	Contractor's Expencc (O/H, tax, misc.)	\$ 330,000.00
VII.	Detailed Design and Supervision Works	\$ 135,000.00
Sub Total I to VII		\$ 1,818,000.00
VIII.	Physical Contingencies	\$ 182,000.00
Total of Construction Costs		\$ 2,000,000.00
Other Costs		
FWUC level training & mobilization		\$ 80,000.00
Agricultural & other support services		\$ 10,140.00
Sub Total (Total of Construction Costs + Other Costs)		\$ 2,090,140.00
Land Acquisition cost		\$ 60,000.00
Total Investment Costs		\$ 2,150,140.00

Project O&M costs	
Annual O&M Cost	\$ 36,000.00
Major repairs (every 10th year)	\$ 247,000.00

Table E2.3-8A Summary Sheet for Weir, major intake and major structure

Project Name: Nikom / Dai Ta Chan Rehabilitation Project
 River Basin: Moung Russey River Basin (Svay Don Keo)
 Province Name: Battambang
 System Name: Dai Ta Chan
 Proposed Area: 600 Ha (Project Total)

COST ESTIMATES

Item No	Description	Unit	Quantity	Amount (USD)	Remarks
1	Dai Ta Chan Weir	nos.	1.00	350,000.00	
2	Intake Structure	nos.	1.00	190,000.00	
	Total Cost Estimate			540,000.00	

Table E2.3-8B Summary Sheet for Canals and Related Structures

Project Name: Nikom/Dai Ta Chan Rehabilitaion Project
 River Basin: MOUNG RUSSEY RIVER BASIN (SVAY DON KEO)
 Province Name: Battambang
 System Name: Dai Ta Chan, Nikom Le (Total of 2 systems)
 Proposed Area: 600 Ha (Project Total)

COST ESTIMATES

Item No	Description	Unit	Quantity	Amount (USD)	Remarks
1	Intake Structure (Other than Major Intake)	L.S	1.00	40,500.00	
2	Main Canal Rehabilitation	L.S	1.00	243,900.00	L=8.1km
3	Secondary Canal Rehabilitation	L.S	1.00	17,400.00	L=0.9km
4	Tertiary Canal Rehabilitation	L.S	1.00	204,000.00	L=12.0km
5	Main Canal (New)	L.S	1.00	0.00	-
6	Secondary Canal (New)	L.S	1.00	0.00	-
7	Drainage Canal	L.S	1.00	30,000.00	L=3.0km
8	Related Structures (Main Canal)	L.S	1.00	45,000.00	
9	Related Structures (Secondary Canal)	L.S	1.00	120,000.00	
10	Related Structures (Tertiary Canal)	L.S	1.00	60,000.00	
	Total Cost Estimate			760,800.00	
				761,000.00	

Table E2.2-9 Summary Investment Costs for Proposed Project

Project Name: Beoung Preah Ponley Rehabilitaion Project

River Basin: Pursat River Basin

Province: Pursat Province

Proposed Irri. Area: 8,500 ha

\$ 2,067 /ha

Summary Investment Costs

No.	Description	Amount (USD)
I.	General Items	\$ 229,000.00
II.	Weir, major intake and major structure	\$ 720,000.00
III.	Canals and related structures	\$ 10,596,000.00
IV.	Dykes	\$ 110,000.00
V.	Miscellaneous works	\$ 229,000.00
Sub Total I to V		\$ 11,884,000.00
VI.	Contractor's Expence (O/H, tax, misc.)	\$ 2,902,000.00
VII.	Detailed Design and Supervision Works	\$ 1,188,000.00
Sub Total I to VII		\$ 15,974,000.00
VIII.	Physical Contingencies	\$ 1,597,000.00
Total of Construction Costs		\$ 17,571,000.00
Other Costs		
	FWUC level training & mobilization	\$ 703,000.00
	Agricultural & other support services	\$ 95,840.00
Sub Total (Total of Construction Costs + Other Costs)		\$ 18,369,840.00
	Land Acquisition cost	\$ 527,000.00
Total Investment Costs		\$ 18,896,840.00

Project O&M costs	
Annual O&M Cost	\$ 417,000.00
Major repairs (every 10th year)	\$ 2,658,000.00

Table E2.3-9A Summary Sheet for Weir, major intake and major structure

Project Name: Beoung Preah Ponley Rehabilitation Project
 River Basin: Pursat River Basin
 Province Name: Pursat
 System Name: Domnak Chhe Kram
 Proposed Area: 8,500 Ha (Project Total)

COST ESTIMATES

Item No	Description	Unit	Quantity	Amount (USD)	Remarks
1	Beoun Preah Ponley Weir	nos.	1.00	530,000.00	
2	Intake Structure	nos.	1.00	190,000.00	
	Total Cost Estimate			720,000.00	

Table E2.3-9B Summary Sheet for Canals and Related Structures

Project Name: Beoung Preah Ponley Rehabilitaion Project
 River Basin: Pursat River Basin
 Province Name: Pursat
 System Name: Beoung Preah Ponley, Domnak Chheu Kram (Total of 2 systems)
 Proposed Area: 8,500 Ha (Project Total)

COST ESTIMATES

Item No	Description	Unit	Quantity	Amount (USD)	Remarks
1	Intake Structure (Other than Major Intake)	L.S	1.00	40,500.00	
2	Main Canal Rehabilitation	L.S	1.00	330,000.00	L=11.0km
3	Secondary Canal Rehabilitation	L.S	1.00	240,000.00	L=12.0km
4	Tertiary Canal Rehabilitation	L.S	1.00	2,890,000.00	L=170.0km
5	Main Canal (New)	L.S	1.00	2,022,500.00	L=31.5km
6	Secondary Canal (New)	L.S	1.00	1,460,000.00	L=73.0km
7	Drainage Canal	L.S	1.00	425,000.00	L=42.5km
8	Related Structures (Main Canal)	L.S	1.00	637,500.00	
9	Related Structures (Secondary Canal)	L.S	1.00	1,700,000.00	
10	Related Structures (Tertiary Canal)	L.S	1.00	850,000.00	
	Total Cost Estimate			10,595,500.00	
				10,596,000.00	

Table E2.3-9C Summary Sheet for Dyke Rehabilitation

Item No	Description	Unit	Quantity	Amount (USD)	Remarks
1	Dykes	L.S	1.00	35,000.00	L=1.0km
2	Structures (Spillway, Outlet, etc.)	L.S	1.00	74,600.00	(S:1, O:1)
	Total Cost Estimate			109,600.00	
				110,000.00	

Table E2.2-10 Summary Investment Costs for Proposed Project

Project Name: Damnak Ampil Extention Project

River Basin: Pursat River Basin

Province: Pursat Province

Proposed Irri. Area: 8,000 ha

\$ 1,996 /ha

Summary Investment Costs

No.	Description	Amount (USD)
I.	General Items	\$ 208,000.00
II.	Weir, major intake and major structure	\$ 780,000.00
III.	Canals and related structures	\$ 9,600,000.00
IV.	Dykes	\$ 0.00
V.	Miscellaneous works	\$ 208,000.00
Sub Total I to V		\$ 10,796,000.00
VI.	Contractor's Expence (O/H, tax, misc.)	\$ 2,637,000.00
VII.	Detailed Design and Supervision Works	\$ 1,080,000.00
Sub Total I to VII		\$ 14,513,000.00
VIII.	Physical Contingencies	\$ 1,451,000.00
Total of Construction Costs		\$ 15,964,000.00
Other Costs		
	FWUC level training & mobilization	\$ 639,000.00
	Agricultural & other support services	\$ 93,290.00
Sub Total (Total of Construction Costs + Other Costs)		\$ 16,696,290.00
	Land Acquisition cost	\$ 479,000.00
Total Investment Costs		\$ 17,175,290.00

Project O&M costs	
Annual O&M Cost	\$ 376,000.00
Major repairs (every 10th year)	\$ 2,398,000.00

Table E2.3-10A Summary Sheet for Weir, major intake and major structure

Project Name: Damnak Ampil Extention Project
 River Basin: Pursat River Basin
 Province Name: Pursat
 System Name: Damnak Ampil
 Proposed Area: 8,000 Ha (Project Total)

COST ESTIMATES

Item No	Description	Unit	Quantity	Amount (USD)	Remarks
1	Gate Improvement for Damnak Ampil Wei (Including Erosion Protection Extention)	L.S	1.00	780,000.00	
	Total Cost Estimate			780,000.00	

Table E2.3-10B Summary Sheet for Canals and Related Structures

Project Name: Damnak Ampil Extention Project
River Basin: Pursat River Basin
Province Name: Pursat
System Name: Damnak Ampil (Total of 2 systems)
Proposed Area: 8,000 Ha (Project Total)

COST ESTIMATES

Item No	Description	Unit	Quantity	Amount (USD)	Remarks
1	Intake Structure (Other than Major Intake)	L.S	1.00	0.00	
2	Main Canal Rehabilitation	L.S	1.00	480,000.00	L=16.0km
3	Secondary Canal Rehabilitation	L.S	1.00	3,000,000.00	L=150.0km
4	Tertiary Canal Rehabilitation	L.S	1.00	2,720,000.00	L=160.0km
5	Main Canal (New)	L.S	1.00	0.00	-
6	Secondary Canal (New)	L.S	1.00	0.00	-
7	Drainage Canal	L.S	1.00	400,000.00	L=40.0km
8	Related Structures (Main Canal)	L.S	1.00	600,000.00	
9	Related Structures (Secondary Canal)	L.S	1.00	1,600,000.00	
10	Related Structures (Tertiary Canal)	L.S	1.00	800,000.00	
	Total Cost Estimate			9,600,000.00	
				9,600,000.00	

Table E2.2-11 Summary Investment Costs for Proposed Project

Project Name: Wat Loung Rehabilitation Project

River Basin: Pursat River Basin

Province: Pursat Province

Proposed Irri. Area: 3,940 ha

\$ 2,016 /ha

Summary Investment Costs

No.	Description	Amount (USD)
I.	General Items	\$ 103,000.00
II.	Weir, major intake and major structure	\$ 0.00
III.	Canals and related structures	\$ 5,166,000.00
IV.	Dykes	\$ 0.00
V.	Miscellaneous works	\$ 103,000.00
Sub Total I to V		\$ 5,372,000.00
VI.	Contractor's Expence (O/H, tax, misc.)	\$ 1,312,000.00
VII.	Detailed Design and Supervision Works	\$ 537,000.00
Sub Total I to VII		\$ 7,221,000.00
VIII.	Physical Contingencies	\$ 722,000.00
Total of Construction Costs		\$ 7,943,000.00
Other Costs		
	FWUC level training & mobilization	\$ 318,000.00
	Agricultural & other support services	\$ 45,700.00
Sub Total (Total of Construction Costs + Other Costs)		\$ 8,306,700.00
	Land Acquisition cost	\$ 238,000.00
Total Investment Costs		\$ 8,544,700.00

Project O&M costs	
Annual O&M Cost	\$ 196,000.00
Major repairs (every 10th year)	\$ 1,240,000.00

Table E2.3-11B Summary Sheet for Canals and Related Structures

Project Name: Wat Loung Rehabilitation Project
 River Basin: Pursat River Basin
 Province Name: Pursat
 System Name: Wat Loung, Thnos Tachap, Bakan (Total of 3 systems)
 Proposed Area: 3,940 Ha (Project Total)

COST ESTIMATES

Item No	Description	Unit	Quantity	Amount (USD)	Remarks
1	Intake Structure (Other than Major Intake)	L.S	1.00	0.00	
2	Main Canal Rehabilitation	L.S	1.00	750,000.00	L=25.0km
3	Secondary Canal Rehabilitation	L.S	1.00	154,000.00	L=7.7km
4	Tertiary Canal Rehabilitation	L.S	1.00	1,339,600.00	L=78.8km
5	Main Canal (New)	L.S	1.00	613,250.00	L=11.2km
6	Secondary Canal (New)	L.S	1.00	634,000.00	L=31.7km
7	Drainage Canal	L.S	1.00	197,000.00	L=19.7km
8	Related Structures (Main Canal)	L.S	1.00	295,500.00	
9	Related Structures (Secondary Canal)	L.S	1.00	788,000.00	
10	Related Structures (Tertiary Canal)	L.S	1.00	394,000.00	
	Total Cost Estimate			5,165,350.00	
				5,166,000.00	

Table E2.2-12 Summary Investment Costs for Proposed Project

Project Name: Wat Chre Rehabilitaion Project

River Basin: Pursat River Basin

Province: Pursat Province

Proposed Irri. Area: 1,000 ha

\$ 2,604 /ha

Summary Investment Costs

No.	Description	Amount (USD)
I.	General Items	\$ 34,000.00
II.	Weir, major intake and major structure	\$ 540,000.00
III.	Canals and related structures	\$ 1,153,000.00
IV.	Dykes	\$ 0.00
V.	Miscellaneous works	\$ 34,000.00
Sub Total I to V		\$ 1,761,000.00
VI.	Contractor's Expencc (O/H, tax, misc.)	\$ 430,000.00
VII.	Detailed Design and Supervision Works	\$ 176,000.00
Sub Total I to VII		\$ 2,367,000.00
VIII.	Physical Contingencies	\$ 237,000.00
Total of Construction Costs		\$ 2,604,000.00
Other Costs		
FWUC level training & mobilization		\$ 104,000.00
Agricultural & other support services		\$ 14,040.00
Sub Total (Total of Construction Costs + Other Costs)		\$ 2,722,040.00
Land Acquisition cost		\$ 78,000.00
Total Investment Costs		\$ 2,800,040.00

Project O&M costs	
Annual O&M Cost	\$ 51,000.00
Major repairs (every 10th year)	\$ 342,000.00

Table E2.3-12A Summary Sheet for Weir, major intake and major structure

Project Name: Wat Chre Rehabilitation Project
 River Basin: Pursat River Basin
 Province Name: Pursat
 System Name: Wat Chre
 Proposed Area: 1,000 Ha (Project Total)

COST ESTIMATES

Item No	Description	Unit	Quantity	Amount (USD)	Remarks
1	Wat Chre Weir	nos.	1.00	350,000.00	
2	Intake Structure	nos.	1.00	190,000.00	
3					
4					
5					
6					
7					
Total Cost Estimate				540,000.00	

Table E2.3-12B Summary Sheet for Canals and Related Structures

Project Name: Wat Chre Rehabilitation Project
 River Basin: Pursat River Basin
 Province Name: Pursat
 System Name: Wat Chre (Total of 1 systems)
 Proposed Area: 1,000 Ha (Project Total)

COST ESTIMATES

Item No	Description	Unit	Quantity	Amount (USD)	Remarks
1	Intake Structure (Other than Major Intake)	L.S	1.00	0.00	
2	Main Canal Rehabilitation	L.S	1.00	105,000.00	L=3.5km
3	Secondary Canal Rehabilitation	L.S	1.00	174,000.00	L=8.7km
4	Tertiary Canal Rehabilitation	L.S	1.00	340,000.00	L=20.0km
5	Main Canal (New)	L.S	1.00	82,500.00	L=1.5km
6	Secondary Canal (New)	L.S	1.00	26,000.00	L=1.3km
7	Drainage Canal	L.S	1.00	50,000.00	L=5.0km
8	Related Structures (Main Canal)	L.S	1.00	75,000.00	
9	Related Structures (Secondary Canal)	L.S	1.00	200,000.00	
10	Related Structures (Tertiary Canal)	L.S	1.00	100,000.00	
	Total Cost Estimate			1,152,500.00	
				1,153,000.00	

Table E2.2-13 Summary Investment Costs for Proposed Project

Project Name: Anlong Khouch, Wat Leap, Kosh Khsach Water Harvesting and
 River Basin: Pursat River Basin Recession Rice Project
 Province: Pursat Province
 Proposed Irri. Area: 2,602 ha \$ 2,156 /ha

Summary Investment Costs

No.	Description	Amount (USD)
I.	General Items	\$ 73,000.00
II.	Weir, major intake and major structure	\$ 0.00
III.	Canals and related structures	\$ 3,080,000.00
IV.	Dykes	\$ 568,000.00
V.	Miscellaneous works	\$ 73,000.00
Sub Total I to V		\$ 3,794,000.00
VI.	Contractor's Expencc (O/H, tax, misc.)	\$ 927,000.00
VII.	Detailed Design and Supervision Works	\$ 379,000.00
Sub Total I to VII		\$ 5,100,000.00
VIII.	Physical Contingencies	\$ 510,000.00
Total of Construction Costs		\$ 5,610,000.00
Other Costs		
	FWUC level training & mobilization	\$ 224,000.00
	Agricultural & other support services	\$ 34,190.00
Sub Total (Total of Construction Costs + Other Costs)		\$ 5,868,190.00
	Land Acquisition cost	\$ 168,000.00
Total Investment Costs		\$ 6,036,190.00

Project O&M costs	
Annual O&M Cost	\$ 141,000.00
Major repairs (every 10th year)	\$ 887,000.00

Table E2.2-14 Summary Investment Costs for Proposed Project

Project Name: Lum Hach Rehabilitaion Project

River Basin: Boribo River Basin

Province: Kg Chhnang Province

Proposed Irri. Area: 3,700 ha

\$ 2,559 /ha

Summary Investment Costs

No.	Description	Amount (USD)
I.	General Items	\$ 123,000.00
II.	Weir, major intake and major structure	\$ 2,130,000.00
III.	Canals and related structures	\$ 4,026,000.00
IV.	Dykes	\$ 0.00
V.	Miscellaneous works	\$ 123,000.00
Sub Total I to V		\$ 6,402,000.00
VI.	Contractor's Expence (O/H, tax, misc.)	\$ 1,564,000.00
VII.	Detailed Design and Supervision Works	\$ 640,000.00
Sub Total I to VII		\$ 8,606,000.00
VIII.	Physical Contingencies	\$ 861,000.00
Total of Construction Costs		\$ 9,467,000.00
Other Costs		
	FWUC level training & mobilization	\$ 379,000.00
	Agricultural & other support services	\$ 44,160.00
Sub Total (Total of Construction Costs + Other Costs)		\$ 9,890,160.00
	Land Acquisition cost	\$ 284,000.00
Total Investment Costs		\$ 10,174,160.00

Project O&M costs	
Annual O&M Cost	\$ 183,000.00
Major repairs (every 10th year)	\$ 1,222,000.00

Table E2.3-14A Summary Sheet for Weir, major intake and major structure

Project Name: Lum Hach Rehabilitation Project
 River Basin: Boribo River Basin
 Province Name: Kompong Chhnang
 System Name: Lum Hach
 Proposed Area: 3,700 Ha (Project Total)

COST ESTIMATES

Item No	Description	Unit	Quantity	Amount (USD)	Remarks
1	Lum Hach Weir	nos.	1.00	1,700,000.00	
2	Intake Structure	nos.	2.00	380,000.00	Cost for 2
3	Acces Road (3km, Laterite t=15cm)	nos.	1.00	30,000.00	
4	Weir Operation and Maintenance Office	nos.	1.00	20,000.00	
	Total Cost Estimate			2,130,000.00	

Table E2.3-14B Summary Sheet for Canals and Related Structures

Project Name: Lum Hach Rehabilitation Project
River Basin: Boribo River Basin
Province Name: Kampong Chhnang
System Name: Lum Hach (Total of 1 systems) 30 sub systems
Proposed Area: 3,700 Ha (Project Total)

COST ESTIMATES

Item No	Description	Unit	Quantity	Amount (USD)	Remarks
1	Intake Structure (Other than Major Intake)	L.S	1.00	0.00	
2	Main Canal Rehabilitation	L.S	1.00	0.00	-
3	Secondary Canal Rehabilitation	L.S	1.00	240,000.00	L=12.0km
4	Tertiary Canal Rehabilitation	L.S	1.00	1,258,000.00	L=74.0km
5	Main Canal (New)	L.S	1.00	455,000.00	L=7.0km
6	Secondary Canal (New)	L.S	1.00	500,000.00	L=25.0km
7	Drainage Canal	L.S	1.00	185,000.00	L=18.5km
8	Related Structures (Main Canal)	L.S	1.00	277,500.00	
9	Related Structures (Secondary Canal)	L.S	1.00	740,000.00	
10	Related Structures (Tertiary Canal)	L.S	1.00	370,000.00	
	Total Cost Estimate			4,025,500.00	
				4,026,000.00	

Table E2.2-15 Summary Investment Costs for Proposed Project

Project Name: 7th January Canal Rehabilitaion Project

River Basin: Boribo River Basin

Province: Kg Chhnang Province

Proposed Irri. Area: 2,000 ha

\$ 2,484 /ha

Summary Investment Costs

No.	Description	Amount (USD)
I.	General Items	\$ 65,000.00
II.	Weir, major intake and major structure	\$ 0.00
III.	Canals and related structures	\$ 3,229,000.00
IV.	Dykes	\$ 0.00
V.	Miscellaneous works	\$ 65,000.00
Sub Total I to V		\$ 3,359,000.00
VI.	Contractor's Expence (O/H, tax, misc.)	\$ 820,000.00
VII.	Detailed Design and Supervision Works	\$ 336,000.00
Sub Total I to VII		\$ 4,515,000.00
VIII.	Physical Contingencies	\$ 452,000.00
Total of Construction Costs		\$ 4,967,000.00
Other Costs		
FWUC level training & mobilization		\$ 199,000.00
Agricultural & other support services		\$ 24,270.00
Sub Total (Total of Construction Costs + Other Costs)		\$ 5,190,270.00
Land Acquisition cost		\$ 149,000.00
Total Investment Costs		\$ 5,339,270.00

Project O&M costs	
Annual O&M Cost	\$ 123,000.00
Major repairs (every 10th year)	\$ 775,000.00

Table E2.2-16 Summary Investment Costs for Proposed Project

Project Name: Khvet Rehabilitaion Project

River Basin: Boribo River Basin

Province: Kg Chhnang Province

Proposed Irri. Area: 250 ha

\$ 3,300 /ha

Summary Investment Costs

No.	Description	Amount (USD)
I.	General Items	\$ 11,000.00
II.	Weir, major intake and major structure	\$ 250,000.00
III.	Canals and related structures	\$ 286,000.00
IV.	Dykes	\$ 0.00
V.	Miscellaneous works	\$ 11,000.00
Sub Total I to V		\$ 558,000.00
VI.	Contractor's Expencc (O/H, tax, misc.)	\$ 136,000.00
VII.	Detailed Design and Supervision Works	\$ 56,000.00
Sub Total I to VII		\$ 750,000.00
VIII.	Physical Contingencies	\$ 75,000.00
Total of Construction Costs		\$ 825,000.00
Other Costs		
	FWUC level training & mobilization	\$ 33,000.00
	Agricultural & other support services	\$ 7,060.00
Sub Total (Total of Construction Costs + Other Costs)		\$ 865,060.00
	Land Acquisition cost	\$ 25,000.00
Total Investment Costs		\$ 890,060.00

Project O&M costs	
Annual O&M Cost	\$ 14,000.00
Major repairs (every 10th year)	\$ 99,000.00

Table E2.3-16A Summary Sheet for Weir, major intake and major structure

Project Name: Khvet Rehabilitation Project
 River Basin: Boribo River Basin
 Province Name: Kompong Chhnang
 System Name: Khvet
 Proposed Area: 250 Ha (Project Total)

COST ESTIMATES

Item No	Description	Unit	Quantity	Amount (USD)	Remarks
1	Khvet Weir	nos.	1.00	190,000.00	
2	Intake Structure	nos.	1.00	60,000.00	
	Total Cost Estimate			250,000.00	

Table E2.3-16B Summary Sheet for Canals and Related Structures

Project Name: Khvet Rehabilitation Project
 River Basin: Boribo River Basin
 Province Name: Kampong Chhnang
 System Name: Khvet (Total of 1 systems)
 Proposed Area: 250 Ha (Project Total)

COST ESTIMATES

Item No	Description	Unit	Quantity	Amount (USD)	Remarks
1	Intake Structure (Other than Major Intake)	L.S	1.00	0.00	
2	Main Canal Rehabilitation	L.S	1.00	45,000.00	L=1.5km
3	Secondary Canal Rehabilitation	L.S	1.00	0.00	-
4	Tertiary Canal Rehabilitation	L.S	1.00	85,000.00	L=5.0km
5	Main Canal (New)	L.S	1.00	0.00	-
6	Secondary Canal (New)	L.S	1.00	50,000.00	L=2.5km
7	Drainage Canal	L.S	1.00	12,500.00	L=1.3km
8	Related Structures (Main Canal)	L.S	1.00	18,750.00	
9	Related Structures (Secondary Canal)	L.S	1.00	50,000.00	
10	Related Structures (Tertiary Canal)	L.S	1.00	25,000.00	
	Total Cost Estimate			286,250.00	
				286,000.00	

Table E2.2-17 Summary Investment Costs for Proposed Project

Project Name: Ta Ram Rehabilitaion Project

River Basin: Boribo River Basin

Province: Kg Chhnang Province

Proposed Irri. Area: 180 ha

\$ 5,061 /ha

Summary Investment Costs

No.	Description	Amount (USD)
I.	General Items	\$ 12,000.00
II.	Weir, major intake and major structure	\$ 250,000.00
III.	Canals and related structures	\$ 244,000.00
IV.	Dykes	\$ 98,000.00
V.	Miscellaneous works	\$ 12,000.00
Sub Total I to V		\$ 616,000.00
VI.	Contractor's Expencc (O/H, tax, misc.)	\$ 150,000.00
VII.	Detailed Design and Supervision Works	\$ 62,000.00
Sub Total I to VII		\$ 828,000.00
VIII.	Physical Contingencies	\$ 83,000.00
Total of Construction Costs		\$ 911,000.00
Other Costs		
	FWUC level training & mobilization	\$ 36,000.00
	Agricultural & other support services	\$ 6,610.00
Sub Total (Total of Construction Costs + Other Costs)		\$ 953,610.00
	Land Acquisition cost	\$ 27,000.00
Total Investment Costs		\$ 980,610.00

Project O&M costs	
Annual O&M Cost	\$ 17,000.00
Major repairs (every 10th year)	\$ 114,000.00

Table E2.3-17A Summary Sheet for Weir, major intake and major structure

Project Name: Ta Ram Rehabilitation Project
River Basin: Boribo River Basin
Province Name: Kompong Chhnang
System Name: Ta Ram
Proposed Area: 180 Ha (Project Total)

COST ESTIMATES

Item No	Description	Unit	Quantity	Amount	Remarks
1	Ta Ram Weir	nos.	1.00	190,000.00	
2	Intake Structure	nos.	1.00	60,000.00	
	Total Cost Estimate			250,000.00	

Table E2.3-17B Summary Sheet for Canals and Related Structures

Project Name: Ta Ram Rehabilitation Project
 River Basin: Boribo River Basin
 Province Name: Kampong Chhnang
 System Name: Ta Ram (Total of 1 systems)
 Proposed Area: 180 Ha (Project Total)

COST ESTIMATES

Item No	Description	Unit	Quantity	Amount (USD)	Remarks
1	Intake Structure (Other than Major Intake)	L.S	1.00	0.00	
2	Main Canal Rehabilitation	L.S	1.00	70,000.00	L=3.5km
3	Secondary Canal Rehabilitation	L.S	1.00	0.00	-
4	Tertiary Canal Rehabilitation	L.S	1.00	61,200.00	L=3.6km
5	Main Canal (New)	L.S	1.00	0.00	-
6	Secondary Canal (New)	L.S	1.00	36,000.00	L=1.8km
7	Drainage Canal	L.S	1.00	9,000.00	L=0.9km
8	Related Structures (Main Canal)	L.S	1.00	13,500.00	
9	Related Structures (Secondary Canal)	L.S	1.00	36,000.00	
10	Related Structures (Tertiary Canal)	L.S	1.00	18,000.00	
	Total Cost Estimate			243,700.00	
				244,000.00	

Table E2.3-17C Summary Sheet for Dyke Rehabilitation

Item No	Description	Unit	Quantity	Amount (USD)	Remarks
1	Dykes	L.S	1.00	17,500.00	L=0.5km
2	Structures (Spillway, Outlet, etc.)	L.S	1.00	80,000.00	(S:1, O:1)
	Total Cost Estimate			97,500.00	
				98,000.00	

Table E2.2-18 Summary Investment Costs for Proposed Project

Project Name: Chak Teum, Trapeang Khlong, Don Pov Rehabilitaion Project
 River Basin: Boribo River Basin
 Province: Kg Chhnang Province
 Proposed Irri. Area: 980 ha \$ 2,338 /ha

Summary Investment Costs

No.	Description	Amount (USD)
I.	General Items	\$ 30,000.00
II.	Weir, major intake and major structure	\$ 250,000.00
III.	Canals and related structures	\$ 1,195,000.00
IV.	Dykes	\$ 45,000.00
V.	Miscellaneous works	\$ 30,000.00
Sub Total I to V		\$ 1,550,000.00
VI.	Contractor's Expence (O/H, tax, misc.)	\$ 378,000.00
VII.	Detailed Design and Supervision Works	\$ 155,000.00
Sub Total I to VII		\$ 2,083,000.00
VIII.	Physical Contingencies	\$ 208,000.00
Total of Construction Costs		\$ 2,291,000.00
Other Costs		
	FWUC level training & mobilization	\$ 92,000.00
	Agricultural & other support services	\$ 12,680.00
Sub Total (Total of Construction Costs + Other Costs)		\$ 2,395,680.00
	Land Acquisition cost	\$ 69,000.00
Total Investment Costs		\$ 2,464,680.00

Project O&M costs	
Annual O&M Cost	\$ 51,000.00
Major repairs (every 10th year)	\$ 329,000.00

Table E2.3-18B Summary Sheet for Canals and Related Structures

Project Name: Chak Teum, Trapeang Khlong, Don Pov Rehabilitaion Project
 River Basin: Boribo River Basin
 Province Name: Kampong Chhnang
 System Name: Chak Teum, Trapeang Khlong, Don Pov (Total of 3 systems)
 Proposed Area: 980 Ha (Project Total)

COST ESTIMATES

Item No	Description	Unit	Quantity	Amount (USD)	Remarks
1	Intake Structure (Other than Major Intake)	L.S	1.00	54,000.00	
2	Main Canal Rehabilitation	L.S	1.00	150,000.00	L=5.0km
3	Secondary Canal Rehabilitation	L.S	1.00	0.00	L=0.0km
4	Tertiary Canal Rehabilitation	L.S	1.00	287,300.00	L=16.9km
5	Main Canal (New)	L.S	1.00	90,750.00	L=1.7km
6	Secondary Canal (New)	L.S	1.00	196,000.00	L=9.8km
7	Drainage Canal	L.S	1.00	49,000.00	L=4.9km
8	Related Structures (Main Canal)	L.S	1.00	73,500.00	
9	Related Structures (Secondary Canal)	L.S	1.00	196,000.00	
10	Related Structures (Tertiary Canal)	L.S	1.00	98,000.00	
	Total Cost Estimate			1,194,550.00	
				1,195,000.00	

Table E2.3-18C Summary Sheet for Dyke Rehabilitation

Item No	Description	Unit	Quantity	Amount (USD)	Remarks
1	Dykes	L.S	1.00	17,500.00	L=0.5km
2	Structures (Spillway, Outlet, Intake, etc.)	L.S	1.00	27,000.00	(S:1, I:1)
	Total Cost Estimate			44,500.00	
				45,000.00	

Table E2.2-19 Summary Investment Costs for Proposed Project

Project Name: Teuk Laak, Trapeang Thlan Rehabilitaion Project

River Basin: Boribo River Basin

Province: Kg Chhnang Province

Proposed Irri. Area: 230 ha

\$ 2,991 /ha

Summary Investment Costs

No.	Description	Amount (USD)
I.	General Items	\$ 22,000.00
II.	Weir, major intake and major structure	\$ 0.00
III.	Canals and related structures	\$ 312,000.00
IV.	Dykes	\$ 124,000.00
V.	Miscellaneous works	\$ 9,000.00
Sub Total I to V		\$ 467,000.00
VI.	Contractor's Expence (O/H, tax, misc.)	\$ 111,000.00
VII.	Detailed Design and Supervision Works	\$ 47,000.00
Sub Total I to VII		\$ 625,000.00
VIII.	Physical Contingencies	\$ 63,000.00
Total of Construction Costs		\$ 688,000.00
Other Costs		
FWUC level training & mobilization		\$ 28,000.00
Agricultural & other support services		\$ 6,630.00
Sub Total (Total of Construction Costs + Other Costs)		\$ 722,630.00
Land Acquisition cost		\$ 21,000.00
Total Investment Costs		\$ 743,630.00

Project O&M costs	
Annual O&M Cost	\$ 17,000.00
Major repairs (every 10th year)	\$ 107,000.00

Table E2.3-19B Summary Sheet for Canals and Related Structures

Project Name: Teuk Laak, Trapeang Thlan Rehabilitaion Project
 River Basin: Boribo River Basin
 Province Name: Kampong Chhnang
 System Name: Teuk Laak, Trapeang Thlan (Total of 2 systems)
 Proposed Area: 230 Ha (Project Total)

COST ESTIMATES

Item No	Description	Unit	Quantity	Amount (USD)	Remarks
1	Intake Structure (Other than Major Intake)	L.S	1.00	0.00	
2	Main Canal Rehabilitation	L.S	1.00	92,500.00	L=5.0km
3	Secondary Canal Rehabilitation	L.S	1.00	10,000.00	L=0.5km
4	Tertiary Canal Rehabilitation	L.S	1.00	78,200.00	L=4.6km
5	Main Canal (New)	L.S	1.00	0.00	-
6	Secondary Canal (New)	L.S	1.00	33,300.00	L=1.8km
7	Drainage Canal	L.S	1.00	11,500.00	L=1.2km
8	Related Structures (Main Canal)	L.S	1.00	17,250.00	
9	Related Structures (Secondary Canal)	L.S	1.00	46,000.00	
10	Related Structures (Tertiary Canal)	L.S	1.00	23,000.00	
	Total Cost Estimate			311,750.00	
				312,000.00	

Table E2.3-19C Summary Sheet for Dyke Rehabilitation

Item No	Description	Unit	Quantity	Amount (USD)	Remarks
1	Dykes	L.S	1.00	70,000.00	L=2.0km
2	Structures (Spillway, Outlet, Intake, etc.)	L.S	1.00	54,000.00	(1:2)
	Total Cost Estimate			124,000.00	
				124,000.00	

Table E2.2-20 Summary Investment Costs for Proposed Project

Project Name: Toul Champey Rehabilitaion Project

River Basin: Boribo River Basin

Province: Kg Chhnang Province

Proposed Irri. Area: 360 ha

\$ 1,758 /ha

Summary Investment Costs

No.	Description	Amount (USD)
I.	General Items	\$ 20,000.00
II.	Weir, major intake and major structure	\$ 0.00
III.	Canals and related structures	\$ 347,000.00
IV.	Dykes	\$ 55,000.00
V.	Miscellaneous works	\$ 8,000.00
Sub Total I to V		\$ 430,000.00
VI.	Contractor's Expencc (O/H, tax, misc.)	\$ 102,000.00
VII.	Detailed Design and Supervision Works	\$ 43,000.00
Sub Total I to VII		\$ 575,000.00
VIII.	Physical Contingencies	\$ 58,000.00
Total of Construction Costs		\$ 633,000.00
Other Costs		
FWUC level training & mobilization		\$ 25,000.00
Agricultural & other support services		\$ 7,530.00
Sub Total (Total of Construction Costs + Other Costs)		\$ 665,530.00
Land Acquisition cost		\$ 19,000.00
Total Investment Costs		\$ 684,530.00

Project O&M costs	
Annual O&M Cost	\$ 15,000.00
Major repairs (every 10th year)	\$ 98,000.00

Table E2.3-20B Summary Sheet for Canals and Related Structures

Project Name: Toul Champey Rehabilitaion Project
 River Basin: Boribo River Basin
 Province Name: Kampong Chhnang
 System Name: Toul Champey (Total of 1 systems)
 Proposed Area: 360 Ha (Project Total)

COST ESTIMATES

Item No	Description	Unit	Quantity	Amount (USD)	Remarks
1	Intake Structure (Other than Major Intake)	L.S	1.00	0.00	
2	Main Canal Rehabilitation	L.S	1.00	0.00	-
3	Secondary Canal Rehabilitation	L.S	1.00	0.00	-
4	Tertiary Canal Rehabilitation	L.S	1.00	122,400.00	L=7.2km
5	Main Canal (New)	L.S	1.00	0.00	-
6	Secondary Canal (New)	L.S	1.00	72,000.00	L=3.6km
7	Drainage Canal	L.S	1.00	18,000.00	L=1.8km
8	Related Structures (Main Canal)	L.S	1.00	27,000.00	
9	Related Structures (Secondary Canal)	L.S	1.00	72,000.00	
10	Related Structures (Tertiary Canal)	L.S	1.00	36,000.00	
	Total Cost Estimate			347,400.00	
				347,000.00	

Table E2.3-20C Summary Sheet for Dyke Rehabilitation

Item No	Description	Unit	Quantity	Amount (USD)	Remarks
1	Dykes	L.S	1.00	28,000.00	L=0.8km
2	Structures (Spillway, Outlet, Intake, etc.)	L.S	1.00	27,000.00	1 intakes
	Total Cost Estimate			55,000.00	
				55,000.00	

Table E2.2-21 Summary Investment Costs for Proposed Project

Project Name: Chan Keak Rehabilitaion Project

River Basin: Boribo River Basin

Province: Kg Chhnang Province

Proposed Irri. Area: 110 ha

\$ 2,964 /ha

Summary Investment Costs

No.	Description	Amount (USD)
I.	General Items	\$ 10,000.00
II.	Weir, major intake and major structure	\$ 0.00
III.	Canals and related structures	\$ 123,000.00
IV.	Dykes	\$ 84,000.00
V.	Miscellaneous works	\$ 4,000.00
Sub Total I to V		\$ 221,000.00
VI.	Contractor's Expence (O/H, tax, misc.)	\$ 53,000.00
VII.	Detailed Design and Supervision Works	\$ 22,000.00
Sub Total I to VII		\$ 296,000.00
VIII.	Physical Contingencies	\$ 30,000.00
Total of Construction Costs		\$ 326,000.00
Other Costs		
FWUC level training & mobilization		\$ 13,000.00
Agricultural & other support services		\$ 6,230.00
Sub Total (Total of Construction Costs + Other Costs)		\$ 345,230.00
Land Acquisition cost		\$ 10,000.00
Total Investment Costs		\$ 355,230.00

Project O&M costs	
Annual O&M Cost	\$ 8,000.00
Major repairs (every 10th year)	\$ 51,000.00

Table E2.3-21B Summary Sheet for Canals and Related Structures

Project Name: Chan Keak Rehabilitaion Project
 River Basin: Boribo River Basin
 Province Name: Kampong Chhnang
 System Name: Chan Keak (Total of 1 systems)
 Proposed Area: 110 Ha (Project Total)

COST ESTIMATES

Item No	Description	Unit	Quantity	Amount (USD)	Remarks
1	Intake Structure (Other than Major Intake)	L.S	1.00	0.00	
2	Main Canal Rehabilitation	L.S	1.00	18,500.00	L=1.0km
3	Secondary Canal Rehabilitation	L.S	1.00	0.00	-
4	Tertiary Canal Rehabilitation	L.S	1.00	37,400.00	L=2.2km
5	Main Canal (New)	L.S	1.00	0.00	-
6	Secondary Canal (New)	L.S	1.00	20,350.00	L=1.1km
7	Drainage Canal	L.S	1.00	5,500.00	L=0.6km
8	Related Structures (Main Canal)	L.S	1.00	8,250.00	
9	Related Structures (Secondary Canal)	L.S	1.00	22,000.00	
10	Related Structures (Tertiary Canal)	L.S	1.00	11,000.00	
	Total Cost Estimate			123,000.00	
				123,000.00	

Table E2.3-21C Summary Sheet for Dyke Rehabilitation

Item No	Description	Unit	Quantity	Amount (USD)	Remarks
1	Dykes	L.S	1.00	19,250.00	L=0.6km
2	Structures (Spillway, Outlet, Intake, etc.)	L.S	1.00	64,700.00	(S:1, I:1)
	Total Cost Estimate			83,950.00	
				84,000.00	

Table E2.2-22 Summary Investment Costs for Proposed Project

Project Name: Sala Taon Rehabilitaion Project (Alternative)

River Basin: Battambang River Basin

Province: Battambang Province

Proposed Irri. 10,400 ha

\$ 3,762 /ha

Summary Investment Costs

No.	Description	Amount (USD)
I.	General Items	\$ 509,000.00
II.	Pump Station (5) and Regulator	\$ 12,820,000.00
III.	Canals and related structures	\$ 12,622,000.00
IV.	Dykes	\$ 0.00
V.	Miscellaneous works	\$ 509,000.00
Sub Total I to V		\$ 26,460,000.00
VI.	Contractor's Expencc (O/H, tax, misc.)	\$ 6,462,000.00
VII.	Detailed Design and Supervision Works	\$ 2,646,000.00
Sub Total I to VII		\$ 35,568,000.00
VIII.	Physical Contingencies	\$ 3,557,000.00
Total of Construction Costs		\$ 39,125,000.00
Other Costs		
	FWUC level training & mobilization	\$ 1,565,000.00
	Agricultural & other support services	\$ 118,590.00
Sub Total (Total of Construction Costs + Other Costs)		\$ 40,808,590.00
	Land Acquisition cost	\$ 1,174,000.00
Total Investment Costs		\$ 41,982,590.00

Project O&M costs	
Annual O&M Cost	\$ 659,000.00
Major repairs (every 10th year)	\$ 4,568,000.00

Table E2.3-22A Summary Sheet for Weir, major intake and major structure

Project Name: Sala Taon Rehabilitation Project (Alternative)
River Basin: Battambang River Basin
Province Name: Battambang
System Name: Or Samrong Knong
Proposed Area: 10,400 Ha (Project Total)

COST ESTIMATES

Item No	Description	Unit	Quantity	Amount (USD)	Remarks
1	Pump Station (fixed type) at 5 stations	nos.	1.00	11,070,000.00	
2	Building and other civil facility	nos.	1.00	800,000.00	
3	Regulator Structure	nos.	5.00	950,000.00	Cost for 5
	Total Cost Estimate			12,820,000.00	

Diesel fuel	589,000	\$/Year	for	10,400 ha
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Diesel fuel	57	\$/ha/Year
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Table E2.3-22B Summary Sheet for Canals and Related Structures

Project Name: Sala Taon Rehabilitation Project (Alternative)
 River Basin: Battambang River Basin
 Province Name: Battambang
 System Name: Or Samrong Knong (Total of 17 systems)
 Proposed Area: 10,400 Ha (Project Total)

COST ESTIMATES

Item No	Description	Unit	Quantity	Amount (USD)	Remarks
1	Intake Structure (Other than Major Intake)	L.S	1.00	1,026,000.00	
2	Main Canal Rehabilitation	L.S	1.00	548,300.00	L=23.7km
3	Secondary Canal Rehabilitation	L.S	1.00	433,800.00	L=21.8km
4	Tertiary Canal Rehabilitation	L.S	1.00	3,225,750.00	L=189.8km
5	Main Canal (New)	L.S	1.00	1,252,750.00	L=21.7km
6	Secondary Canal (New)	L.S	1.00	1,715,325.00	L=86.1km
7	Drainage Canal	L.S	1.00	520,000.00	L=52.0km
8	Related Structures (Main Canal)	L.S	1.00	780,000.00	
9	Related Structures (Secondary Canal)	L.S	1.00	2,080,000.00	
10	Related Structures (Tertiary Canal)	L.S	1.00	1,040,000.00	
	Total Cost Estimate			12,621,925.00	
				12,622,000.00	