

Appendix-J
PROJECT IMPLEMENTATION
AND
COST ESTIMATE

**THE STUDY
ON
CRITICAL LAND
AND
PROTECTION FOREST REHABILITATION
AT TONDANO WATERSHED
IN
THE REPUBLIC OF INDONESIA**

Volume-III

APPENDIX-J

PROJECT IMPLEMENTATION AND COST ESTIMATE

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PROJECT IMPLEMENTATION AND COST ESTIMATE

CHAPTER 1 INTRODUCTION

This Appendix J provides the project implementation plan and result of the project cost estimation.

Chapter 2 provides basic assumption and consideration for the cost estimation. In this chapter, estimation basis of the required factors, such as exchange rate, percentage of price contingency etc. was presented.

Chapter 3 describes a project implementation plan. Since the Project consists of four major plans, project implementation plan of each plan was presented in the chapter.

Chapter 4 presents result of the cost estimation. In this chapter, two types of the cost are estimated. The one is 'Capital Cost' and the other is 'Running Cost'. The capital cost will be provided by the Project to establish the Project works. Meanwhile, running cost will be arranged by the Indonesian side and will be used for the operation and maintenance of the project.

CHAPTER 2 BASIC CONSIDERATION AND ASSUMPTIONS

The construction cost consists of direct construction cost, engineering services and physical and price contingencies. Following basic consideration and assumption are made for estimate the project cost:

- The exchange rate used in the cost estimate is:
US\$ 1.00 = Rp. 9,100 = \ 115
as of December 2000.
- The unit rates of the works are divided into the foreign and local currency portions. Respective currency portions include the following costs:

Demarcation of Local and Foreign Currency	
Currency	Item
Local currency portion:	Local labor cost, Cost of local material, Inland transportation cost, etc.
Foreign currency portion:	Foreign labor cost, Cost of imported materials, etc.

- The unit rates of the works are estimated at the December 2000 price on the basis of the current price prevailing in North Sulawesi and data obtained from standard price list of several government agencies and similar projects.
- It is assumed that the Project will be commenced in the fiscal year 2002, considering the required period of project preparatory works.
- Price contingency is calculated at 2.0% for the foreign currency portion and 10.0% for the local currency portion on the basis of annual escalation rate. The calculated escalation rates for the respective years from fiscal year 2000 are shown in the right.
- The project running cost to be financed by the Government of Indonesia and communities after the completion of the project activities, are not included in the project cost.

Price Contingency by Fiscal Year		
Fiscal Year	Foreign Currency (%)	Local Currency (%)
2000	0.0	0.0
2001	2.0	10.0
2002	4.0	21.0
2003	6.1	33.1
2004	8.2	46.4
2005	10.4	61.1
2006	12.6	77.2
2007	14.9	94.9
2008	17.2	114.4
2009	19.5	135.8
2010	21.9	159.4
2011	24.3	185.3
2012	26.8	213.8

CHAPTER 3 PROJECT IMPLEMENTATION

3.1 Proposed Project Works

The Project has four major components and several sub-components under them, as shown below.

- 1) Physical watershed conservation measures
 - a) Forestry management and rehabilitation
 - b) Agriculture/agroforestry improvement
 - c) Erosion control facility development
- 2) Institutional development
- 3) Community empowerment
- 4) Monitoring and evaluation system development
 - a) Engineering items
 - b) Socio-economic items

3.2 Implementation Plan

3.2.1 General

The above-mentioned components will be implemented according to the following schedule.

Project Implementation Plan

Component	Year1	Year2	Year3	Year4	Year5	Year6	Year7	Year8	Year9	Year10	Year11	Year12	Year13	Year14
1 Physical Watershed Conservation Measures														
1.1 Forestry Management and Rehabilitation														
(1) Boundary survey for protection forests														
(2) Community forestry plan														
(3) Reforestation plan														
(4) Strengthening plan of forest patrol														
(5) Research plan for non-wood forest products														
(6) Fuel wood planting plan														
(7) Timber tree planting plan														
(8) Strengthening of extension services														
1.2 Agriculture and Agroforestry Improvement Plan														
(1) Agriculture														
(2) Agroforestry														
1.3 Erosion Control Facilities														
2 Institutional Development Plan														
(1) Community institutional development														
(2) Technical institutional development														
(3) Institutional development of forestry services														
(4) Accurate village boundary mapping														
(5) Institutional integration and strengthening of legal and regulatory framework														
(6) Strengthening of watershed conservation capacity at University of Manado														
(7) Strengthening of local NGO														
3 Community Empowerment Plan														
(1) Micro planning of sustainable land use														
(2) Awareness raising and environmental education														
(3) Organizing of local people and reorienting of officials														
(4) Strengthening of social safety network														
(5) Gender and conservation														
4 Monitoring and Evaluation System Development Plan														
(1) Engineering items														
(2) Socio-economic items														
5 Operation and Maintenance														

The proposed watershed conservation plan will be implemented for 14 years. Out of 7 components, the forestry management and rehabilitation plan will require the longest period of 14 years. However, major works will be implemented after the community empowerment pilot project. The agriculture and agroforestry

improvement plan consisting of strengthening of extension services for the first 4 years and improvement of cultural practice will be realized in the next 5 years (after the completion of community empowerment pilot project). The erosion control facilities development plan including survey, detailed design and construction will be implemented for 2 years after the detail analysis of the data collected by the monitoring system. The institutional development plan will start for implementation immediately and be fulfilled using 5 years. The community empowerment will be completed for the first 4 years since it is important for sustainable watershed conservation. As for the monitoring and evaluation system development plan, its engineering items monitoring will be started immediately and completed for 10 years in this plan. The socio-economic items monitoring will be executed in parallel to the community empowerment activity for 4 years. More detailed information on implementation for respective components are given below:

3.2.2 Physical Watershed Conservation Measures

(1) Forestry Management and Rehabilitation

Forestry management and rehabilitation plan by the Project comprises eight activities. These are:

- Boundary survey for six protection forests,
- Community forestry,
- Reforestation in protection forests,
- Forest patrol for six protection forests and surroundings,
- Research for promoting no-wood forest products in and around protection forests,
- Fuel wood plantation,
- Timber tree planting, and
- Extension services.

In the project implementation period, above-mentioned activities will be implemented according to the Figure J.3.2 (See Appendix-F for the detail implementation schedule).

(2) Agriculture/Agroforestry Improvement

Agriculture/Agroforestry improvement program by the Project has three activities such as:

- Extension worker training,
- Procurement of equipment for extension improvement, and

- Administration services of the government staffs.

The implementation schedule of the each activity is presented in Figure J.3.3 (See Appendix-G for the detail plan).

(3) Erosion Control Facility Development

In the erosion control facility development plan, construction of following facilities are proposed:

- Check dam,
- River bed protection works,
- River bank protection works,
- Slope protection works for hillside, and
- Slope protection works for road.

The implementation schedule of the each structure is presented in Figure J.3.3 (See Appendix-H for the detail plan).

3.2.3 Institutional Development

Institutional development plan consists of six activities. There are:

- Community Institutional Development,
- Technical Institutional Development,
- Institutional Development of Forestry Offices,
- Accurate Village Boundary Mapping,
- Institutional Integration and Legal and Regulatory Frame Work, and
- University of Manado Development.

The implementation schedule of the each structure is presented in Figure J.3.3 (See Appendix-I for the detail plan).

3.2.4 Community Empowerment

Community empowerment consists of five activities. These are:

- Micro planning for suitable land use,
- Awareness raising and environmental education,
- Organizing of local people and reorientation of officials,
- Strengthening of social safety net, and
- Gender and conservation.

The implementation schedule of the each activity is presented in Figure J.3.4 (See Appendix-D for the detail).

3.2.5 Monitoring and Evaluation System Development

(1) Engineering Items

In the program of engineering items monitoring, following data will be observed.

These are:

- Erosion and sedimentation,
- Water quality,
- Water balance, and
- Torrent and slope erosion.

The implementation plan of the engineering monitoring is shown in Figure J.3.4 (See Appendix-H for the detail).

(2) Socio-Economic Items

The implementation plan of that is displayed in Figure J.3.4 (See Appendix-D for the detail).

CHAPTER 4 COST ESTIMATE

4.1 General

The cost was estimated separately for the capital cost and project running cost. The capital cost is the cost, which is provided by the Project. The Government of Indonesia itself prepares the project running cost meanwhile.

4.2 Capital Cost

4.2.1 Physical Watershed Conservation Measures

(1) Forestry Management and Rehabilitation

1) Capital Cost without Price Contingency

The capital cost for the forestry management and rehabilitation was estimated in the eight sub-components basis, as shown in Table J.4.1. The unit price for the plan was mainly taken from the '*Standard of Cost and Activity (Standar Biaya Dan Kegiatan)*', which is published by Ministry of Forestry.

2) Annual Disbursement Schedule

Annual disbursement schedule for the forestry management and rehabilitation is presented in Table J.4.2.

(2) Agriculture/Agroforestry Improvement

1) Capital Cost without Price Contingency

The Capital cost of the agriculture/agroforestry improvement plan is presented in Table J.4.3. The unit price for the plan was mainly taken from the two sources. The one is '*Standard of Cost and Activity (Standar Biaya Dan Kegiatan)*', which is published by Ministry of Forestry. The other one is '*Standard Unit Price for Material and Services for Fiscal Year 2000 (Standardisasi Harga Satuan Barang Dan Jasa Tahun Anggaran 2000)*', which is given by Minahasa Government Administration.

2) Annual Disbursement Schedule

Annual disbursement schedule for the forestry management and rehabilitation is presented in Table J.4.4.

(3) Erosion Control Facility Development

1) Direct Construction Cost

Direct construction cost can be obtained by multiplying construction unit rate and work quantity. Construction unit rates for the major works were calculated based on the local production rate of the works as much as possible. The data of local production rate of the works were collected from Regional Irrigation Office and District Forest Service. Work quantities were preliminary estimated with feasibility study level accuracy (See Table J.4.5 to J.4.9).

2) Indirect Construction Cost

Indirect construction cost was assumed as a 20 % of the direct construction cost.

3) Maintenance Equipment Cost

One pick-up truck and one jeep will be procured by the project for the operation and maintenance (See Table J.4.10).

4) Land Acquisition Cost

The land acquisition cost required for the erosion control facilities is estimate based on the present land use. The unit cost is referred to the data obtained from District Forest Service.

5) Engineering Services Cost

Local consultant team will organize the detail design and construction supervision with the cooperation of Ministry of Forestry (See Table J.4.11).

6) Capital Cost without Physical and Price Contingency

Total capital cost without physical and price contingency for the erosion control facility development is shown in Table J.4.12.

7) Annual Disbursement Schedule

Annual disbursement schedule for the forestry management and rehabilitation is tabulated in Table J.4.13.

4.2.2 Institutional Development

1) Capital Cost without Price Contingency

The capital cost for the institutional development was estimated mainly based on the unit price taken from the two sources. The one is '*Standard of Cost and Activity (Standar Biaya Dan Kegiatan)*', which is published by Ministry of Forestry. The other one is '*Standard Unit Price for Material and Services for Fiscal Year 2000 (Standardisasi Harga Satuan Barang Dan Jasa Tahun Anggaran 2000)*', which is given by Minahasa Government Administration. The result of estimation is shown in Table J.4.14.

2) Annual Disbursement Schedule

Annual disbursement schedule for the forestry management and rehabilitation is presented in Table J.4.15.

4.2.3 Community Empowerment

(1) Capital Cost without Price Contingency

Capital cost for the community empowerment is presented in Table J.4.16.

(2) Annual Disbursement Schedule

Annual disbursement schedule for the community empowerment is presented in Table J.4.17.

4.2.4 Monitoring and Evaluation System Development

(1) Engineering Items

1) Capital Cost without Price Contingency

For the civil works of the monitoring system, same cost estimation procedure with erosion control facility was applied. For the procurement of the monitoring apparatus, the price in Japan was used considering its non-availability in Indonesia. The total capital cost without price contingency for the engineering monitoring system development is shown in Table J.4.18 to J.4.26.

2) Annual Disbursement Schedule

Annual disbursement schedule for the engineering monitoring system is shown in Table J.4.27.

(2) Socio-Economic Items

1) Capital Cost

Cost for the required experts and material for socio-economic monitoring, which are provided by the Project is shown in Table J.4.28.

2) Annual Disbursement Schedule

Annual disbursement schedule for the socio-economic monitoring system is shown in Table J.4.29.

4.2.5 Administration of the Project Office

Administration cost will be used for the salary of the employees in the Project office, lighting expenses, etc. The administration cost of the Project office is estimated at 2.5% of the total cost of section 4.2.2 to 4.2.5.

4.2.6 Physical Contingency

The physical contingency is estimated at 10% of the direct construction cost of erosion control facility development.

4.2.7 Price Contingency

The price contingency was estimated at 2.0% for the foreign currency and 10.0% for the local currency (See Chapter 2).

4.2.8 Project Cost

Total project cost was estimated at 77,330 million rupiahs as given in Table J.4.30.

Summary of Project Cost

		Unit: Rp. Million		
Component		F.C.	L.C.	Total
1	Physical Watershed Conservation Measures			
1.1	Forestry Management and Rehabilitation	425	9,284	9,710
1.2	Agriculture/Agroforestry Improvement	1,990	2,604	4,594
1.3	Erosion Control Facility Development	4,962	2,980	7,942
2	Institutional Development	9,762	2,101	11,863
3	Community Empowerment	8,503	1,248	9,752
4	Monitoring and Evaluation System Development			
4.1	Engineering Items	985	1,992	2,977
4.2	Socio-Economic Items	773	110	883
5	Administration of the Project	685	508	1,193
6	Physical Contingency*	383	213	597
7	Price Contingency	2,510	24,642	27,152
GRAND TOTAL		30,978	445,683	76,661

Note : * 10% of direct construction cost of 1.3

4.2.9 Annual Disbursement Schedule

Annual disbursement schedule of the Project was prepared according to the implementation schedule of the each plan. Table shown below and Table J.4.31 show the annual disbursement schedule of the project.

Annual Disbursement Schedule

Unit: Rp. Million

Component	Fiscal Year													
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
1 Physical Watershed Conservation Measures														
1.1 Forestry Management and Rehabilitation	109	156	117	111	1,051	1,110	1,016	99.3	993	872	872	770	770	770
1.2 Agriculture / Agroforestry Improvement	0	0	0	0	2,093	597	597	597	597	0	0	0	0	0
1.3 Erosion Control Facility Development	0	0	0	2,867	5,075	0	0	0	0	0	0	0	0	0
2 Institutional Development	5,177	1,821	1,641	1,611	1,611	0	0	0	0	0	0	0	0	0
3 Community Empowerment	2,534	2,417	2,406	2,394	0	0	0	0	0	0	0	0	0	0
4 Monitoring and Evaluation System Development														
4.1 Engineering Items	1,182	179	179	179	179	364	179	179	179	179	0	0	0	0
4.2 Socio-Economic Items	219	219	219	225	0	0	0	0	0	0	0	0	0	0
5 Administration of the Project	126	126	126	126	126	63	63	63	63	63	63	63	63	63
6 Physical Contingency*	0	0	0	185	411	0	0	0	0	0	0	0	0	0
7 Price Contingency	727	563	722	1,805	3,814	1,792	1,983	2,334	2,737	1,988	1,930	1,967	2,243	2,546
TOTAL	10,141	5,441	5,376	9,463	14,320	3,948	3,860	4,188	4,591	3,124	2,887	2,823	3,099	3,402

Note : * 10% of direct construction cost of I.3

4.3 Running Cost

Running cost is the cost to operate and maintain the project after the completion of project activities. Consequently, running cost was estimated separately from the project cost and used for the project evaluation. The running cost is mainly composed of two items, such as i) operation and maintenance cost, and ii) replacement cost.

4.3.1 Operation and Maintenance Cost

The facilities and hardware provided by the Project must be operated and maintained properly throughout the life time of project activities. The cost for the operation and maintenance activities was estimated based on the handing-over schedule of the Project.

Following table shows the operation and maintenance cost of the project.

Operation and Maintenance Cost (without price contingency)

Unit: Rp. Million

Year	2002-2005	2006	2007-2010	2011-2013	2014-2015	2016-2031	2032-2061
O&M Cost	2.4	1,785	1,854	1,933	151	478	468

4.3.2 Replacement Cost

Some of the equipment and facilities such as vehicles have a shorter life than the Project and have to be replaced periodically. The replacement cost of such kind of equipment was estimated considering the useful life of the equipment. Total replacement cost of the project was estimated at 22,560 million rupiahs without considering price contingency.

4.3.3 Estimated Running Cost

Estimated running cost of each component is shown in Table J.4.32 to J.4.43.

Tables

Table J.4.1 Capital Cost of the Forestry Management and Rehabilitation

Unit: Rp.

Items	Unit	Quantity	Total Cost		
			F.C.	L.C.	Total
1 Forest Boundary Management					
1.1 Forest Survey					
Surveyer	m-day	100	0	9,000,000	9,000,000
Survey Assistant	m-day	200	0	18,000,000	18,000,000
Common Labor	m-day	400	0	8,000,000	8,000,000
Equipment (Rental)	day	100	4,000,000	0	4,000,000
1.2 Boundary Mapping					
Surveyer	m-day	50	0	4,500,000	4,500,000
Mapping Assistant	m-day	100	0	9,000,000	9,000,000
Equipment (1 unit)	L.S.	1	10,000,000	0	10,000,000
1.3 Construction of Monuments					
Surveyer	m-day	100	0	2,250,000	2,250,000
Common Labor	m-day	600	0	12,000,000	12,000,000
Material	L.S.	1	30,000,000	30,000,000	60,000,000
Sub-Total 1.1 - 1.3			44,000,000	92,750,000	136,750,000
2 Community Forestry					
2.1 Management	m-month	120	0	984,000,000	984,000,000
2.2 Survey and Planning					
Survey-Planner	m-day	100	0	9,000,000	9,000,000
Common Labor	m-day	100	0	2,000,000	2,000,000
2.3 Nursery Construction					
Common Labor	m-day	50	0	1,000,000	1,000,000
Material	unit	1	3,000,000	2,000,000	5,000,000
2.4 Nursery Operation					
Operation	unit-year	9	9,000,000	9,000,000	18,000,000
2.5 Planting Trees					
Equipment	unit-year	9	6,300,000	2,700,000	9,000,000
Sub-Total 2.1 - 2.4			18,300,000	1,009,700,000	1,028,000,000
3 Reforestation					
3.1 Management	m-month	120	0	984,000,000	984,000,000
3.2 Survey and Planning					
Survey-Planner	m-day	200	0	18,000,000	18,000,000
Common Labor	m-day	200	0	4,000,000	4,000,000
3.3 Nursery Construction					
Common Labor	m-day	250	0	5,000,000	5,000,000
Material	unit	5	15,000,000	10,000,000	25,000,000
3.4 Nursery Operation					
Common Labor	m-month	720	0	360,000,000	360,000,000
Operation	unit-year	20	20,000,000	20,000,000	40,000,000
3.5 Planting					
Common Labor	m-day	4,000	0	80,000,000	80,000,000
Equipment	unit	5	3,500,000	1,500,000	5,000,000
3.6 Treating of Planted Areas					
Common Labor	m-day	4,000	0	80,000,000	80,000,000
Sub-Total 3.1 - 3.6			38,500,000	1,562,500,000	1,601,000,000
4 Forest Patrol					
4.1 Patrolling					
Forest Guards	m-month	1,440	0	1,080,000,000	1,080,000,000
Equipment	unit	12	4,200,000	1,800,000	6,000,000
Motor Cycles	no.	6	120,000,000	0	120,000,000
4.2 Forest Patrol Station Construction					
Labor and Material	unit	6	60,000,000	60,000,000	120,000,000
4.3 Forest Patrol Station Operation					
Operation	unit-year	60	24,000,000	24,000,000	48,000,000
Sub-Total 4.1 - 4.3			208,200,000	1,165,800,000	1,374,000,000
5 Non-wood Forest Products					
5.1 Non-wood Forest Products Reserch	m-month	18	0	147,600,000	147,600,000
Sub-Total 5.1			0	147,600,000	147,600,000
6 Fuel Wood Plantation					
6.1 Delivery Station Construction	unit	7	3,500,000	3,500,000	7,000,000
6.2 Delivery Station Operation	unit-year	70	1,400,000	1,400,000	2,800,000
Sub-Total 6.1 - 6.2			4,900,000	4,900,000	9,800,000
7 Timber Plantation					
7.1 Management	m-month	120	0	984,000,000	984,000,000
7.2 Extension Services	m-month	3,600	0	2,700,000,000	2,700,000,000
7.3 Nursery Construction					
Common Labor	m-day	900	0	18,000,000	18,000,000
Material	unit	9	27,000,000	18,000,000	45,000,000
7.4 Nursery Operation					
Common Labor	m-month	2,916	0	1,458,000,000	1,458,000,000
Opeation	unit-year	81	81,000,000	81,000,000	162,000,000
Sub-Total 7.1 - 7.4			108,000,000	5,259,000,000	5,367,000,000
8 Extension Surrices					
8.1 Training Program	m-month	5	0	41,000,000	41,000,000
Lecturer	unit	5	3,500,000	1,500,000	5,000,000
Material			3,500,000	42,500,000	46,000,000
Sub-Total 8.1					
GRAND TOTAL			425,400,000	9,284,750,000	9,710,150,000

Note: F.C.=Foreign Currency, L.C.=Local Currency, L.S.=Lump Sum

Table J.4.2 Annual Disbursement Schedule of Forestry Management and Rehabilitation

Unit: Rp. Million

Items	Total	Unit: Kp./million																											
		Year 2002		Year 2003		Year 2004		Year 2005		Year 2006		Year 2007		Year 2008		Year 2009		Year 2010		Year 2011		Year 2012		Year 2013		Year 2014		Year 2015	
		F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.
1 Forest Boundary Management	44 93	29	71	15	22	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 Community Forestry	18 1,010	0	0	0	109	5	103	2	100	2	100	2	100	2	100	2	100	2	100	2	100	2	100	0	0	0	0	0	0
3 Reforestation	39 1,562	0	0	0	0	0	0	0	0	0	120	21	229	6	224	6	224	6	223	0	108	0	108	0	108	0	108	0	108
4 Forest Patrol	208 1,166	0	0	0	0	0	0	0	0	0	183	171	3	111	3	111	3	111	3	111	3	111	3	111	3	111	3	111	3
5 Non-wood Forest Products	0 148	0	0	0	0	0	0	0	0	0	0	74	0	74	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
6 Fuel Wood Plantation	5 5	0	0	0	0	0	0	0	0	0	2	2	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	
7 Timber Plantation	108 5,259	0	0	0	0	0	0	0	0	9	380	18	551	18	551	9	539	9	539	9	539	9	539	9	539	9	539	9	539
8 Extension Services	1 9	1	9	1	9	1	9	1	9	1	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
TOTAL	425 9,284	30	79	16	140	5	111	2	108	196	855	45	1,065	30	987	20	974	20	973	14	858	14	858	12	759	12	759	12	759

Note: F.C.=Foreign Currency, L.C.=Local Currency

Tabel J.4.3 Capital Cost of the Agriculture/Agroforestry Improvement

Unit:Rp.

Items	Unit	Quantity	Total Cost		
			F.C.	L.C.	Total
1 Extension Worker Training					
1.1 Lecture Fee					
Lecturer for Specialist Training Course (5 days)	m-day	75	0	15,000,000	15,000,000
Lecturer for PPL Training Course (5 days)	m-day	250	0	15,000,000	15,000,000
Lecturer for Farmers' Leaders Training Course (5 days)	m-day	250	0	10,000,000	10,000,000
1.2 Meeting Cost					
Specialist Training Course	day	15	0	1,755,000	1,755,000
PPL Training Course	day	25	0	35,250,000	35,250,000
Farmers' Leaders Training Course	day	25	0	109,500,000	109,500,000
Sub-Total 1.1 - 1.2			0	186,505,000	186,505,000
2 Equipment for Extension Services					
2.1 Pick up Truck	no.	1	180,000,000	0	180,000,000
2.2 Motor Cycle*	no.	60	1,200,000,000	0	1,200,000,000
2.3 Bicycle*	no.	100	100,000,000	0	100,000,000
2.4 Slide Projector	no.	3	9,000,000	0	9,000,000
2.5 Tape Recorder	no.	10	10,000,000	0	10,000,000
2.6 Computer	no.	3	90,000,000	0	90,000,000
2.7 Printer	no.	1	3,000,000	0	3,000,000
Sub-Total 2.1 - 2.7			1,592,000,000	0	1,592,000,000
3 O&M of Equipment for Extension Service Improvement					
3.1 Operation and Maintenance (5.0% of original price per year)	L.S.	1	398,000,000	0	398,000,000
Sub-Total 3.1			398,000,000	0	398,000,000
4 Administration Cost					
4.1 Specialist	m-month	180	0	138,600,000	138,600,000
4.2 PPL	m-month	3,600	0	2,278,800,000	2,278,800,000
Sub-Total 4.1 - 4.2			0	2,417,400,000	2,417,400,000
GRAND TOTAL			1,990,000,000	2,603,905,000	4,593,905,000

*: Half of the equipment will be used for agriculture extension and the other half for agroforestry extension.

Table J.4.4 Annual Disbursement Schedule of Agriculture/Agroforestry Improvement

Unit:Rp. Million

Items	Total	Year 2002		Year 2003		Year 2004		Year 2005		Year 2006		Year 2007		Year 2008		Year 2009		Year 2010	
		F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.
1. Extension Worker Training																			
Training for Specialist	0 17	0	6	0	0	0	6	0	0	0	6	0	0	0	0	0	0	0	0
Training for PPL	0 50	0	0	0	0	0	0	0	0	0	10	0	10	0	10	0	10	0	10
Training for Farmers' Leaders	0 120	0	0	0	0	0	0	0	0	0	24	0	24	0	24	0	24	0	24
2. Procurement of Equipment	1,592 0	102	0	0	0	0	0	0	0	1,490	0	0	0	0	0	0	0	0	0
3. O&M of Equipment	398 0	0	0	0	0	0	0	0	0	80	0	80	0	80	0	80	0	80	0
4. Administration	0 2,417	0	0	0	0	0	0	0	0	483	0	483	0	483	0	483	0	483	0
TOTAL	1,990 2,604	102	6	0	0	0	6	0	0	1,570	523	80	517	80	517	80	517	80	517

Note: F.C.=Foreign Currency, L.C.=Local Currency

**Table J.4.5 List of Labor Cost for Erosion Control Facility
Development**

Unit:Rp.

Item	Unit	F.C.	L.C.	Total
Foreman	m-day	0	32,500	32,500
Supervisor	m-day	0	22,500	22,500
Semi-skilled labor	m-day	0	25,000	25,000
Skilled Labor	m-day	0	30,000	30,000
Common Labor	m-day	0	20,000	20,000
Steel Fixer	m-day	0	25,000	25,000
Carpenter	m-day	0	27,500	27,500

**Table J.4.6 List of Material Cost for Erosion Control Facility
Development**

Unit:Rp.

Item	Unit	F.C.	L.C.	Total
Portland Cement	kg	471	52	523
Cobble	m3	41,525	33,975	75,500
Pebble	m3	14,625	7,875	22,500
Fine Aggregate	m3	55,900	30,100	86,000
Coarse Aggregate	m3	47,175	8,325	55,500
Tree	no.	0	300	300
Bench Mark	no.	120,000	80,000	200,000
Sand	m3	73,100	12,900	86,000
Wooden Frame	m3	408,000	72,000	480,000
PVC Pipe 4"	m	48,900	0	48,900
Wire for Rainfall Gauge	unit	67,500	0	67,500
Nail	kg	13,500	0	13,500
Reinforcing Bar	kg	12,800	0	12,800
Hoop Tie	kg	8,800	0	8,800
Palm Fiber, t=10cm	m2	0	29,250	29,250
Plastic Tape	kg	5,000	0	5,000
Wooden Pile	no.	0	1,000	1,000
Brick	no.	309	166	475
Bamboo (big)	no.	0	6,000	6,000
Bamboo (small)	no.	0	4,000	4,000
Palm Roof	m3	0	1,250	1,250
Sod	m2	0	48,750	48,750
Galvanized Iron Wire 2mm	kg	9,475	0	9,475
Galvanized Iron Wire 4mm	kg	9,475	0	9,475
Manufactured Gabion, (W=1.0m, L=2.0m, H=0.5m)	no.	365,000	0	365,000

Note: L.C.=Local Currency, F.C.=Foreign Currency

Table J.4.7 List of Equipment Cost for Erosion Control Facility Development

Unit:Rp.

No.	Item	Unit	F.C.	L.C.	Total
1	Cement mixer	unit/hr	83,838	4,413	88,250
2	Miscellaneous	L.S.	400	100	500
3	Concrete Vibrator	unit/hr	67,450	3,550	71,000
4	Concrete Bucket	no.	7,363	388	7,750
5	Concrete Mixer	no.	56,525	2,975	59,500
6	Hand Compactor	no.	32,850	3,650	36,500
7	Hammer	no.	43,200	4,800	48,000
8	Saw	no.	40,613	4,513	45,125
9	Bar Cutter	unit/hr	48,000	0	48,000
10	Bar Bender	unit/hr	36,500	0	36,500
11	Hoe	no.	79,425	8,825	88,250
12	Shovel	no.	53,550	5,950	59,500
13	Handcart	no.	726,300	80,700	807,000
14	Chopping Knife	no.	22,500	2,500	25,000
15	Cutting Knife	no.	27,675	3,075	30,750
16	Scaffolding	L.S.	4,500	500	5,000

Table J.4.8 List of Construction Unit Price for Erosion Control Facility Development

Unit:Rp.

Work Items	Unit	F.C.	L.C.	Total
1 Earth Works				
1.1 Clearing	m2	0	1,268	1,268
1.2 Excavation (manpower), common soil	m3	400	15,663	16,063
1.3 Excavation (manpower), weatherd rock	m3	400	31,225	31,625
1.4 Backfilling (manpower)	m3	3,285	10,390	13,675
1.5 Embankment (manpower)	m3	3,285	24,315	27,600
1.6 Sod Facing	m2	42,630	88,010	130,640
1.7 Grading (manpower), common soil	m3	400	11,225	11,625
2 Concrete Works				
2.1 Plain Concrete	m3	276,705	200,865	477,570
2.2 Concrete for Reinforced Concrete 175kg/cm2	m3	276,705	157,065	433,770
2.3 Form Works for Reinforced Concrete 175kg/cm2 including Demolition	m3	22,558	29,623	52,181
2.4 Reinforcing Bar Arrangement for Concrete 175kg/cm2	m3	1,438,100	353,000	1,791,100
2.5 Reinforced Concrete 175kg/cm2	m3	1,731,448	399,338	2,130,786
3 Stone Works				
3.1 Wet Masonry	m3	166,921	156,021	322,942
3.2 Plastering (all surface)	m2	6,037	15,129	21,166
3.3 Plastering (without masonry stone surface)	m2	4,019	11,816	15,835
3.4 Gabion Box (manpower)	m3	227,213	77,748	304,961
3.5 Manufactured Gabion Box 1.0 x 2.0 x 0.5 m	m3	392,101	36,230	428,331
3.6 Palm Fiber Filter, t=10cm	m2	28,508	32,577	61,085
3.7 Riprap	m3	41,525	41,575	83,100
4 Hillside Works				
4.1 Bamboo Terrace	10m	0	52,145	52,145
5 Building Works				
5.1 Brick Works	m3	280,174	234,967	515,141
5.2 Plastering (all surface)	m2	6,037	15,129	21,166
5.3 Rainfall Gauge Installation	unit	67,500	40,000	107,500
6 Other Works				
6.1 Re-vegetation	nos.	0	888	888

Note: L.C.=Local Currency, F.C.=Foreign Currency

Table J.4.9 Breakdown of Direct Construction Cost of Erosion Control Facility Development

Unit: Rp.

Work Item	Unit	Design Quantity	Quantity	Total Cost		
				F.C.	L.C.	Total
1 Check Dam						
1.1 Rehabilitation Works						
1.1.1 Check Dam Leleko						
- Embankment (manpower)	m3	30	30	98,550	729,450	828,000
- Sod Facing	m2	600	600	25,578,000	52,806,000	78,384,000
1.1.2 Check Dam Kasuratan						
- Riprap	m3	10	10	415,250	415,750	831,000
1.1.3 Check Dam Tontimomor						
- Gabion Box (manpower)	m3	20	20	4,544,260	1,554,960	6,099,220
1.2 Proposed Check Dam Construction						
1.2.1 Wet Masonry Check Dam (4 locations)						
- Clearing	m2	17,450	17,450	0	22,126,600	22,126,600
- Excavation (manpower), common soil	m3	8,264	8,264	3,305,520	129,435,899	132,741,419
- Excavation (manpower), weatherd rock	m3	918	918	367,280	28,670,795	29,038,075
- Backfilling (manpower)	m3	7,520	7,520	24,703,693	78,134,359	102,838,051
- Manufactured Gabion Box 1.0 x 2.0 x 0.5 m	m3	1,740	1,740	682,255,740	63,040,200	745,295,940
- Palm Fiber Filter, t=10cm	m2	6,480	6,480	184,731,840	211,098,960	395,830,800
- Wet masonry	m3	4,940	4,940	824,589,740	770,743,740	1,595,333,480
- Plastering (without masonry stone surface)	m2	1,980	1,980	7,957,620	23,395,680	31,353,300
- Reinforced Concrete 175kg/cm2	m3	8	8	13,851,584	3,194,704	17,046,288
- Plain Concrete	m3	19	19	5,257,395	3,816,435	9,073,830
- Re-vegetation	nos.	200	200	0	177,600	177,600
Sub-Total of 1				1,777,656,472	1,389,341,132	3,166,997,604
2 Groundsill						
2.1 The River Panasen (6 locations)						
- Manufactured Gabion Box 1.0 x 2.0 x 0.5 m	m3	1,260	1,260	494,047,260	45,649,800	539,697,060
- Excavation (manpower), common soil	m3	3,000	3,000	1,200,000	46,989,000	48,189,000
- Backfilling (manpower)	m3	1,200	1,200	3,942,000	12,468,000	16,410,000
- Palm Fiber Filter, t=10cm	m2	1,890	1,890	53,880,120	61,570,530	115,450,650
Sub-Total of 2				553,069,380	166,677,330	719,746,710
3 River Revetment Works						
3.1 The River Panasen						
- Manufactured Gabion Box 1.0 x 2.0 x 0.5 m	m3	3,150	3,150	1,235,118,150	114,124,500	1,349,242,650
- Excavation (manpower), common soil	m3	8,550	8,550	3,420,000	133,918,650	137,338,650
- Backfilling (manpower)	m3	5,589	5,589	18,359,865	58,069,710	76,429,575
- Palm Fiber Filter, t=10cm	m2	7,200	7,200	205,257,600	234,554,400	439,812,000
Sub-Total of 3				1,462,155,615	540,667,260	2,002,822,875
4 Hillside Works						
4.1 Hillside Slope Failure HSF-1						
- Bamboo Terrace	10m	15	15	0	782,175	782,175
- Grading (manpower), common soil	m3	150	150	60,000	1,683,750	1,743,750
- Gabion Box (manpower)	m3	120	120	27,265,560	9,329,760	36,595,320
- Backfilling (manpower)	m3	250	250	821,250	2,597,500	3,418,750
Sub-Total of 4				28,146,810	14,393,185	42,539,995
5 Slope Protection Works for Road						
5.1 Slope Protection Works at Paleloan						
- Gabion Box (manpower)	m3	26	26	5,907,538	2,021,448	7,928,986
- Backfilling (manpower)	m3	20	20	65,700	207,800	273,500
5.2 Slope Protection Works at Eris(3)						
- Grading (manpower), common soil	m3	180	180	72,000	2,020,500	2,092,500
- Clearing	m2	195	195	0	247,260	247,260
- Sod Facing	m2	180	180	7,673,400	15,841,800	23,515,200
Sub-Total of 5				13,718,638	20,338,808	34,057,446
GRAND TOTAL				3,834,746,915	2,131,417,715	5,966,164,630

Table J.4.10 List of Maintenance Equipment Cost for Erosion Control Facility Development

Unit:Rp.

No.	Item	Unit	Quantity	F.C.	L.C.	Total
1	Vehicle and Equipment					
1.1	Pick-up Truck	no.	2	360,000,000	0	360,000,000
GRAND TOTAL				360,000,000	0	360,000,000

Table J.4.11 Engineering Services Cost for Erosion Control Facility Development

Unit:Rp.

No.	Item	Unit	Quantity	F.C.	L.C.	Total Cost
1	Detailed Design Stage					
1.1	Remuneration	M/M	18.0	0	8,200,000	147,600,000
1.2	Direct Cost, Equipment Cost, Additional Survey & Investigation (50% of above)	L.S.	1.0	0	73,800,000	73,800,000
SUB-TOTAL 1.1 - 1.2						221,400,000
2	Supervision Stage					
2.1	Remuneration	M/M	18.0	0	8,200,000	147,600,000
2.2	Direct Cost & Equipment Cost (30% of above)	L.S.	1.0	0	44,280,000	44,280,000
SUB-TOTAL 2.1 - 2.2						191,880,000
GRAND TOTAL						413,280,000

Table J.4.12 Capital Cost of Erosion Control Facility Development

Unit: Rp. Million

No.	Work Description	F.C.	L.C.	Total	Remarks
1	Direct Construction Cost				
1.1	Check Dam	1,778	1,389	3,167	
1.2	River Bed Protection Works	553	167	720	
1.3	River Bank Protection Works	1,462	541	2,003	
1.4	Slope Protection Works for Hillside	28	14	43	
1.5	Slope Protection Works for Road	14	20	34	
Sub-Total 1.1 - 1.5		3,835	2,131	5,966	
2	Indirect Construction Cost	767	426	1,193	20% of Direct Construction Cost
3	Maintenance Equipment Cost	360	0	360	
4	Land Acquisition	0	9	9	
5	Engineering Services Cost	0	413	413	
TOTAL without Physical Contingency		4,962	2,980	7,942	
6	Physical Contingency	383	213	597	10% of Direct Construction Cost
TOTAL with Physical Contingency		5,345	3,193	8,539	

Table J.4.13 Annual Disbursement Schedule of Erosion Control Facility Development

Unit: Rp. Million

Items	Year 2005	Year 2006	Total
1 Direct Constrction			
1.1 Check Dam	1,056	2,111	3,167
1.2 River Bed Protection Works	720	0	720
1.3 River Bank Protection Works	0	2,003	2,003
1.4 Slope Protection Works for Hillside	43	0	43
1.5 Slope Protection Works for Road	34	0	34
2 Indirect Construction	370	823	1,193
3 Maintenance Equipment	360	0	360
4 Land Acquisition	9	0	9
5 Engineering Services	276	138	413
Total	2,867	5,075	7,942

Note: F.C.=Foreign Currency, L.C.=Local Currency, M/M=Man Month, L.S.=Lump Sum

Table J.4.14 Capital Cost of the Institutional Development

Unit:Rp.

Items	Unit	Quantity	Total Cost		
			F.C.	L.C.	Total
1 International Specialist for the Institutional Development					
1.1 Institutional Development and Information System	m-month	36.00	5,310,000,000	0	5,310,000,000
1.2 Environmental-Geographer	m-month	6.00	885,000,000	0	885,000,000
1.3 Agroforestry	m-month	3.75	553,125,000	0	553,125,000
Sub-Total 1.1 - 1.4			6,748,125,000	0	6,748,125,000
2 Local Specialist for the Institutional Development					
2.1 Agroforestry	m-month	36.0	0	270,000,000	270,000,000
2.2 Project Management	m-month	12.0	0	90,000,000	90,000,000
2.3 Civil Engineer	m-month	24.0	0	180,000,000	180,000,000
2.4 Mapping and GIS	m-month	12.0	0	90,000,000	90,000,000
2.5 Mapping Assistant	m-month	8.0	0	60,000,000	60,000,000
2.6 Legal Specialist (organizational development)	m-month	12.0	0	90,000,000	90,000,000
2.7 Social/Environmental Geography Researchers	m-month	56.0	0	420,000,000	420,000,000
2.8 Database & Computer Communication	m-month	12.0	0	90,000,000	90,000,000
2.9 Financial Management	m-month	12.0	0	90,000,000	90,000,000
2.10 Office Administration/Human Resource Management Specialist	m-month	12.0	0	90,000,000	90,000,000
Sub-Total 2.1 - 2.11			0	1,470,000,000	1,470,000,000
3 NGO					
3.1 Material for NGO Activity	L.S.	1.0	0	244,310,000	244,310,000
Sub-Total 3.1			0	244,310,000	244,310,000
4 Equipment for Institutional Development					
4.1 Equipment for Province Forestry Office					
Computer for Document	no.	7.0	84,000,000	0	84,000,000
Computer for GIS/CAD	no.	1.0	47,000,000	0	47,000,000
Local Area Network Development	L.S.	1.0	8,000,000	0	8,000,000
Server	no.	1.0	60,000,000	0	60,000,000
Laser Printer	no.	1.0	24,000,000	0	24,000,000
Color Deskjet Printer for Document	no.	1.0	6,315,000	0	6,315,000
A3 Color Deskjet Printer	no.	1.0	3,000,000	0	3,000,000
Business Package Software	no.	7.0	31,850,000	0	31,850,000
Statistic Software	no.	1.0	5,460,000	0	5,460,000
GIS Software	no.	1.0	27,000,000	0	27,000,000
CAD Software	no.	1.0	25,000,000	0	25,000,000
Publishing Software	no.	1.0	910,000	0	910,000
Vehicle	no.	2.0	400,000,000	0	400,000,000
Motorcycle	no.	1.0	20,000,000	0	20,000,000
4.2 Equipment for District Forestry Office					
Computer for Document	no.	2.0	24,000,000	0	24,000,000
Computer for GIS/CAD	no.	1.0	47,000,000	0	47,000,000
Color Deskjet Printer	no.	1.0	6,315,000	0	6,315,000
Business Package Software	no.	2.0	9,100,000	0	9,100,000
GIS Software	no.	1.0	27,000,000	0	27,000,000
CAD Software	no.	1.0	25,000,000	0	25,000,000
Vehicle	no.	1.0	200,000,000	0	200,000,000
Motorcycle	no.	2.0	40,000,000	0	40,000,000
Desk & Chair	L.S.	1.0	400,000	1,600,000	2,000,000
Library Development	L.S.	1.0	0	1,000,000	1,000,000
Book Rack	no.	1.0	200,000	800,000	1,000,000
Map Cupboard	no.	1.0	200,000	800,000	1,000,000
4.3 Equipment for Branch Forestry Office					
Typewriter	no.	3.0	3,900,000	0	3,900,000
Telephone Installation	L.S.	3.0	2,700,000	6,300,000	9,000,000
Motorcycle	no.	3.0	60,000,000	0	60,000,000
Accurate Maps	set	10.0	25,000,000	5,000,000	30,000,000
Office Furniture	L.S.	3.0	1,800,000	4,200,000	6,000,000
Filing Cabinet	no.	3.0	600,000	2,400,000	3,000,000
Equipment	set	7.0	10,500,000	0	10,500,000
Uniforms	no.	7.0	3,150,000	7,350,000	10,500,000
4.4 Equipment for University of Manado					
Computer for GIS/CAD	no.	2.0	94,000,000	0	94,000,000
GIS Software	no.	1.0	27,000,000	0	27,000,000
GPS Base Station and Roving Unit	no.	1.0	130,000,000	0	130,000,000
Map Cupboard	no.	1.0	200,000	800,000	1,000,000
Accurate Maps	set	1.0	2,500,000	500,000	3,000,000
Library Development	L.S.	1.0	50,000,000	0	50,000,000
Sub-Total 4.1 - 4.4			1,533,100,000	30,750,000	1,563,850,000
5 Material for Institutional Development					
5.1 Village Cadre Training	L.S.	1.0	969,014,400	242,253,600	1,211,268,000
5.2 IT Training	L.S.	1.0	240,000,000	60,000,000	300,000,000
5.3 Publication	L.S.	1.0	80,000,000	20,000,000	100,000,000
5.4 Planning and Coordination Meeting	no.	20.0	0	30,000,000	30,000,000
Sub-Total 5.1 - 5.4			1,289,014,400	352,253,600	1,641,268,000
6 O&M of Equipment (2.5% of Sub-total 4.1 - 4.4 per year)	L.S.		191,637,500	3,843,750	195,481,250
GRAND TOTAL			9,761,876,900	2,101,157,350	11,863,034,250

Table J.4.15 Annual Disbursement Schedule of Institutional Development

Unit:Rp. Million

Items	Total		Year 2002		Year 2003		Year 2004		Year 2005		Year 2006	
			F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.
1 International Specialist for the Institutional Development	6,748	0	2,058	0	1,173	0	1,173	0	1,173	0	1,173	0
2 Local Specialist for the Institutional Development	0	1,470	0	684	0	234	0	204	0	174	0	174
3 NGO	0	244	0	222	0	6	0	6	0	6	0	6
4 Equipment for Institutional Development	1,533	31	1,533	31	0	0	0	0	0	0	0	0
5 Material for Institutional Development	1,289	352	484	127	291	79	171	49	171	49	171	49
6 O&M of Equipment	192	4	38	1	38	1	38	1	38	1	38	1
TOTAL	9,762	2,101	4,113	1,065	1,502	319	1,382	259	1,382	229	1,382	229

Note: L.S.=Lump Sum, F.C.=Foreign Currency, L.C.=Local Currency

Table J.4.16 Capital Cost of the Community Empowerment

Unit:Rp.

Items	Unit	Quantity	Total Cost		
			F.C.	L.C.	Total
1 Consulting Services Cost					
1.1 Community Empowerment Specialist	m-month	44.0	6,963,484,000	0	6,963,484,000
1.2 Community Organizer	m-month	44.0	0	242,000,000	242,000,000
1.3 Gender Specialist	m-month	15.0	0	82,500,000	82,500,000
1.4 Participatory Planning Specialist	m-month	3.0	0	16,500,000	16,500,000
1.5 TOT Specialist	m-month	2.0	0	11,000,000	11,000,000
1.6 Micro Credit Specialist	m-month	4.0	0	22,000,000	22,000,000
Sub-Total 1.1 - 1.6			6,963,484,000	374,000,000	7,337,484,000
2 Direct Cost					
2.1 Operation Cost	month	44.0	1,540,000,000	660,000,000	2,200,000,000
2.2 Micro Realization Cost (Material)	set	8.0	0	96,000,000	96,000,000
2.3 Seed Money	set	1.0	0	100,000,000	100,000,000
Sub-Total 2.1 - 2.3			1,540,000,000	856,000,000	2,396,000,000
3 Administration Cost					
3.1 Forestry Specialist	m-month	6.0	0	3,798,000	3,798,000
3.2 Agriculture Specialist	m-month	6.0	0	3,798,000	3,798,000
3.3 Environmental Education Specialist	m-month	8.0	0	5,064,000	5,064,000
3.4 Community Forestry Specialist	m-month	9.0	0	5,697,000	5,697,000
Sub-Total 3.1 - 3.4			0	18,357,000	18,357,000
GRAND TOTAL			8,503,484,000	1,248,357,000	9,751,841,000

Table J.4.17 Annual Disbursement Schedule of Community Empowerment

Unit:Rp. Million

Items	Total		Year 2002		Year 2003		Year 2004		Year 2005	
			F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.
1 Consulting Services										
1.1 Community Empowerment Specialist	6,963	0	1,741	0	1,741	0	1,741	0	1,741	0
1.2 Community Organizer	0	242	0	61	0	61	0	61	0	61
1.3 Gender Specialist	0	83	0	33	0	17	0	17	0	17
1.4 Participatory Planning Specialist	0	17	0	17	0	0	0	0	0	0
1.5 TOT Specialist	0	11	0	11	0	0	0	0	0	0
1.6 Micro Credit Specialist	0	22	0	11	0	11	0	0	0	0
Sub-Total 1.1 - 1.6	6,963	374	1,741	132	1,741	88	1,741	77	1,741	77
2 Direct Cost										
2.1 Operation Cost	1,540	660	385	165	385	165	385	165	385	165
2.2 Micro Realization Cost (Material)	0	96	0	0	0	36	0	36	0	24
2.3 Seed Money	0	100	0	100	0	0	0	0	0	0
Sub-Total 2.1 - 2.3	1,540	856	385	265	385	201	385	201	385	189
3 Administration Cost										
3.1 Forestry Specialist	0	4	0	4	0	0	0	0	0	0
3.2 Agriculture Specialist	0	4	0	4	0	0	0	0	0	0
3.3 Environmental Education Specialist	0	5	0	1	0	1	0	1	0	1
3.4 Community Forestry Specialist	0	6	0	2	0	1	0	1	0	1
Sub-Total 3.1 - 3.4	0	18	0	11	0	3	0	3	0	3
GRAND TOTAL	8,503	1,248	2,126	408	2,126	292	2,126	281	2,126	269

Note: F.C.=Foreign Currency, L.C.=Local Currency

**Table J.4.18 List of Labor Cost for Construction Works of
Monitoring System Development (Engineering Items)**

Unit:Rp.

Item	Unit	F.C.	L.C.	Total
Foreman	m-day	0	32,500	32,500
Supervisor	m-day	0	22,500	22,500
Skilled Labor	m-day	0	30,000	30,000
Common Labor	m-day	0	20,000	20,000
Carpenter	m-day	0	27,500	27,500

**Table J.4.19 List of Material Cost for Construction Works of
Monitoring System Development (Engineering Items)**

Unit:Rp.

Item	Unit	F.C.	L.C.	Total
Portland Cement	kg	471	52	523
Cobble	m3	41,525	33,975	75,500
Pebble	m3	14,625	7,875	22,500
Fine Aggregate	m3	55,900	30,100	86,000
Bench Mark	no.	120,000	80,000	200,000
Sand	m3	73,100	12,900	86,000
PVC Pipe 4"	m	48,900	0	48,900
Wire for Rainfall Gauge	unit	67,500	0	67,500
Brick	no.	309	166	475

**Table J.4.20 List of Equipment Cost for Construction Works of
Monitoring System Development (Engineering Items)**

Unit:Rp.

Item	Unit	F.C.	L.C.	Total
Cement mixer	unit/hr	83,838	4,412	88,250
Miscellaneous	L.S.	400	100	500
Hand Compactor	no.	32,850	3,650	36,500

Note: F.C.=Foreign Currency, L.C.=Local Currency

Table J.4.21 List of Construction Unit Price for Monitoring System Development (Engineering Items)

Unit:Rp.

Work Item	Unit	F.C.	L.C.	Total
1 Earth Works				
1.1 Excavation (manpower), common soil	m3	400	15,663	16,063
1.2 Backfilling (manpower)	m3	3,285	10,390	13,675
2 Stone Works				
2.1 Wet Masonry	m3	166,921	156,021	322,942
3 Survey Works				
3.1 Bench Mark Construction	no.	120,000	107,150	227,150
4 Building Works				
4.1 Brick Works	m3	280,174	234,967	515,141
4.2 Plastering (all surface)	m2	6,037	15,129	21,166
4.3 Rainfall Gauge Installation	unit	67,500	40,000	107,500

Note: L.C.=Local Currency, F.C.=Foreign Currency

Table J.4.22 Breakdown of Direct Construction Cost of Monitoring System Development (Engineering Items)

Unit:Rp.

Work Item	Unit	Quantity	Total Cost		
			F.C.	L.C.	Total
1 Erosion and Sedimentation Monitoring					
1.1 Building and Measuring Well (3 locations)					
- Brick Works	m3	18	5,043,132	4,229,406	9,272,538
- Plastering (all surface)	m2	192	1,159,104	2,904,768	4,063,872
1.2 Measuring Flume (3 locations)					
- Excavation (manpower), common soil	m3	300	120,000	4,698,900	4,818,900
- Backfilling (manpower)	m3	60	197,100	623,400	820,500
- Wet Masonry	m3	189	31,548,069	29,487,969	61,036,038
1.3 Rainfall Gauge Installation (3 locations)					
- Rainfall Gauge Installation	unit	3	202,500	120,000	322,500
1.4 Bench Mark Construction (18 locations)					
- Bench Mark Construction	no.	18	2,160,000	1,928,700	4,088,700
Sub-Total 1.1 - 1.4			40,429,905	43,993,143	84,423,048
2 Water Balance Monitoring					
2.1 Rainfall Measurement (21 locations)					
- Rainfall Gauge Installation	unit	21	1,417,500	840,000	2,257,500
2.2 Flow Rate Measurement (12 new stations)					
Building and Measuring Well					
- Brick Works	m3	72	20,172,528	16,917,624	37,090,152
- Plastering (all surface)	m2	768	4,636,416	11,619,072	16,255,488
Measuring Flume					
- Excavation (manpower), common soil	m3	1,200	480,000	18,795,600	19,275,600
- Backfilling (manpower)	m3	240	788,400	2,493,600	3,282,000
- Wet Masonry	m3	756	126,192,276	117,951,876	244,144,152
Sub-Total 2.1 - 2.2			153,687,120	168,617,772	322,304,892
GRAND TOTAL			194,117,025	212,610,915	406,727,940

Table J.4.23 List of Monitoring Apparatus Cost

Unit:Rp.

No.	Item	Unit	Quantity	F.C.	L.C.	Total
1	Rainfall gauge	no.	24	161,424,000	0	161,424,000
2	Balance	no.	1	15,826,000	0	15,826,000
3	Drier	no.	1	15,826,000	0	15,826,000
4	Motorboat	no.	1	133,730,000	0	133,730,000
5	Soil sampler for bottom materials	no.	1	23,739,000	0	23,739,000
6	DO meter	no.	1	9,891,000	0	9,891,000
7	pH meter	no.	1	6,884,000	0	6,884,000
8	EC meter	no.	1	6,568,000	0	6,568,000
9	Secchii disc for water clearness	no.	1	2,374,000	0	2,374,000
10	Water sampler	no.	1	15,826,000	0	15,826,000
11	Water level gauge (12 new gauges and 2 replacement)	no.	14	88,620,000	0	88,620,000
12	Current meter	no.	1	34,817,000	0	34,817,000
TOTAL				515,525,000	0	515,525,000

Note: F.C.=Foreign Currency, L.C.=Local Currency

Table J.4.24 Engineering Services Cost of Monitoring System Development (Engineering Items)

Table 6.12.1 Engineering Services Cost of Monitoring System Development (Engineering Rp.)						Unit.Rp.
No.	Item	Unit	Quantity	F.C.	L.C.	Total Cost
1	Erosion and Sedimentation Monitoring					
1.1	Monitoring of Erosion (weekly)					
	Specialist for Monitoring	m-day	975.0	0	405,600,000	405,600,000
	Helper for Monitoring	m-day	8892.0	0	177,840,000	177,840,000
1.2	Monitoring of Sediment Delivery Ratio (weekly)					
	Specialist for Monitoring	m-day	520.0	0	216,320,000	216,320,000
	Helper for Monitoring	m-day	3900.0	0	78,000,000	78,000,000
1.3	Monitoring of Sedimentation (in 6th year)					
	Bathymetry Survey	km2	46.0	83,229,410	35,252,054	118,481,464
	SUB-TOTAL 1.1 - 1.2			83,229,410	913,012,054	996,241,464
2	Water Quality Monitoring					
2.1	Monitoring of Water Quality (4 times/year)					
	Specialist for Monitoring	m-day	48.0	0	19,968,000	19,968,000
	Helper for Monitoring	m-day	320.0	0	6,400,000	6,400,000
2.2	Sediment Sampling & Analysis (in 6th year)	set	1.0	49,700,700	16,566,900	66,267,600
	SUB-TOTAL 2.1			49,700,700	42,934,900	92,635,600
3	Water Balance Monitoring					
3.1	Hydrological Analysis for 1 Month Data (monthly)					
	Specialist for Monitoring	m-day	54.0	0	22,464,000	22,464,000
	SUB-TOTAL 3.1			0	22,464,000	22,464,000
	GRAND TOTAL			132,930,110	978,410,954	1,111,341,064

Table J.4.25 Administration Cost of Monitoring System Development (Engineering Items)

Table 3.4.23 – Administration Cost of Monitoring System Development (Engineering Items)						Unit:Rp.
No.	Item	Unit	Quantity	F.C.	L.C.	Total Cost
1	Erosion and Sedimentation Monitoring					
1.1	Monitoring of Erosion (weekly)					
	Assistant for Monitoring	m-day	7098.0	0	124,215,000	124,215,000
1.2	Monitoring of Sediment Delivery Ratio (weekly)					
	Assistant for Monitoring	m-day	2496.0	0	43,680,000	43,680,000
SUB-TOTAL 1.1 - 1.2				0	167,895,000	167,895,000
2	Water Quality Monitoring					
2.1	Monitoring of Water Quality (4 times/year)					
	Assistant for Monitoring	m-day	226.0	0	3,955,000	3,955,000
SUB-TOTAL 2.1				0	3,955,000	3,955,000
3	Water Balance Monitoring					
3.1	Rain Gauge & Water Gauge Data Collection for 35 sites (weekly)					
	Assistant for Monitoring	m-day	3224.0	0	56,420,000	56,420,000
3.2	Hydrological Analysis for 1 Month Data (monthly)					
	Assistant for Monitoring	m-day	852.0	0	14,910,000	14,910,000
SUB-TOTAL 3.1 - 3.2				0	71,330,000	71,330,000
GRAND TOTAL				0	243,180,000	243,180,000

Table J.4.26 Capital Cost of Monitoring System Development (Engineering Items)

Table 9.4.20 Capital Cost of Monitoring System Development (Engineering Items)					Unit: Rp. Million
No.	Work Description	F.C.	L.C.	Total	Remarks
1	Direct Construction Cost				
1.1	Erosion and Sedimentation Monitoring	40	44	84	
1.2	Water Quality Monitoring	0	0	0	
1.3	Water Balance Monitoring	154	169	322	
1.4	Information System Development	0	0	0	
	Sub-Total 1.1 - 1.4	194	213	407	
2	Indirect Construction Cost	39	43	81	20% of Direct Construction Cost
3	Monitoring Apparatus Cost	516	0	516	
4	Engineering Services Cost	133	978	1,111	
5	Administration Cost	0	243	243	
6	O&M Cost of Monitoring Appratus (12% of original price per year)	103	516	619	
GRAND TOTAL		985	1,992	2,977	

Note: Price contingency is not included in here.

Table J.4.27 Annual Disbursement Schedule of Monitoring System Development (Engineering Items)

Unit: Rp. Million																						
Components	Total		Year 2002		Year 2003		Year 2004		Year 2005		Year 2006		Year 2007		Year 2008		Year 2009		Year 2010		Year 2011	
	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.
1 Civil Works	233	255	233	255	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2 Purchase of Monitoring Apparatus	516	0	516	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3 Engineering Services	133	978	0	93	0	93	0	93	0	93	0	93	133	144	0	93	0	0	0	0	0	0
4 Administration Cost	0	243	0	24	0	24	0	24	0	24	0	24	0	24	0	24	0	24	0	24	0	24
5 O&M of Monitoring Appratus	103	516	10	52	10	52	10	52	10	52	10	52	10	52	10	52	98	199	98	199	98	199
TOTAL	985	1,992	759	424	10	169	10	169	10	169	10	169	143	220	10	169	98	224	98	224	98	224

Table J.4.28 Capital Cost of the Monitoring System Development (Socio-Economic Items)

Unit:Rp.

Items	Unit	Quantity	Total Cost		
			F.C.	L.C.	Total
1 Consulting Services Cost					
1.1 Community Empowerment Specialist	m-month	4.0	633,044,000	0	633,044,000
1.2 Community Organizer	m-month	4.0	0	22,000,000	22,000,000
1.3 Gender Specialist	m-month	1.0	0	5,500,000	5,500,000
1.4 Monitoring and Evaluation Specialist	m-month	4.0	0	22,000,000	22,000,000
Sub-Total 1.1 - 1.4			633,044,000	49,500,000	682,544,000
2 Direct Cost					
2.1 Operation Cost	month	4.0	140,000,000	60,000,000	200,000,000
Sub-Total 2.1			140,000,000	60,000,000	200,000,000
GRAND TOTAL			773,044,000	109,500,000	882,544,000

Table J.4.29 Annual Disbursement Schedule of Monitoring System Development (Socio-Economic Items)

Unit:Rp. Million

Items	Total		Year 2002		Year 2003		Year 2004		Year 2005	
			F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.
1 Consulting Services										
1.1 Community Empowerment Specialist	633	0	158	0	158	0	158	0	158	0
1.2 Community Organizer	0	22	0	6	0	6	0	6	0	6
1.3 Gender Specialist	0	6	0	0	0	0	0	0	0	6
1.4 M&E Specialist	0	22	0	6	0	6	0	6	0	6
Sub-Total 1.1 - 1.4	633	50	158	11	158	11	158	11	158	17
2 Direct Cost										
2.1 Operation Cost	140	60	35	15	35	15	35	15	35	15
Sub-Total 2.1	140	60	35	15	35	15	35	15	35	15
GRAND TOTAL	773	110	193	26	193	26	193	26	193	32

Note: F.C.=Foreign Currency, L.C.=Local Currency

Table J.4.30 Project Cost

Unit: Rp. Million

Items	F.C.	L.C.	Total	Remarks
1 Physical Watershed Conservation Measures				
1.1 Forestry Management and Rehabilitation	425	9,284	9,710	
1.2 Agriculture/Agroforestry Improvement	1,990	2,604	4,594	
1.3 Erosion Control Facility Development	4,962	2,980	7,942	
2 Institutional Development	9,762	2,101	11,863	
3 Community Empowerment	8,503	1,248	9,752	
4 Monitoring and Evaluation System Development				
4.1 Engineering Items	985	1,992	2,977	
4.2 Socio-Economic Items	773	110	883	
Sub-total of 1-4	27,400	20,320	47,720	
5 Administration of the Project Office	685	508	1,193	2.5% of Sub-total 1-4
6 Physical Contingency	383	213	597	10.0% of Direct Construction Cost for 1.3
7 Price Contingency	2,510	24,642	27,152	2.0% per annum for foreign currency 10.0% per annum for local currency
GRAND TOTAL	30,978	45,683	76,661	

Table J.4.31 Annual Disbursement Schedule of the Project

Unit: Rp. Million

Items	TOTAL		Year 2002		Year 2003		Year 2004		Year 2005		Year 2006		Year 2007		Year 2008		Year 2009		Year 2010		Year 2011		Year 2012		Year 2013		Year 2014		Year 2015		
	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	
1 Physical Watershed Conservation Measures																															
1.1 Forestry Management and Rehabilitation	425	9,284	30	79	16	140	5	111	2	108	196	855	45	1,065	30	987	20	974	20	973	14	858	14	858	12	759	12	759	12	759	
1.2 Agriculture/Agroforestry Improvement	1,990	2,604	102	6	0	0	0	6	0	0	1,570	523	80	517	80	517	80	517	80	517	0	0	0	0	0	0	0	0	0	0	
1.3 Erosion Control Facility Development	4,962	2,980	0	0	0	0	0	0	1,785	1,082	3,177	1,898	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2 Institutional Development	9,762	2,101	4,113	1,065	1,502	319	1,382	259	1,382	229	1,382	229	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3 Community Empowerment	8,503	1,248	2,126	408	2,126	292	2,126	281	2,126	269	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4 Monitoring and Evaluation System Development																															
4.1 Engineering Items	985	1,992	759	424	10	169	10	169	10	169	10	169	143	220	10	169	10	169	10	169	10	169	0	0	0	0	0	0	0	0	0
4.2 Socio-Economic Items	773	110	193	26	193	26	193	26	193	32	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Sub-Total 1-4	27,400	20,320	7,322	2,007	3,847	945	3,717	851	5,499	1,888	6,335	3,674	267	1,803	119	1,673	109	1,660	109	1,659	24	1,027	14	858	12	759	12	759	12	759	
5 Administration	685	508	49	36	49	36	49	36	49	36	49	36	49	36	49	36	49	36	49	36	49	36	49	36	49	36	49	36	49	36	
6 Physical Contingency	383	213	0	0	0	0	0	0	119	66	265	147	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Sub-Total 1-6	28,468	21,041	7,371	2,043	3,896	982	3,766	887	5,667	1,991	6,648	3,857	316	1,839	168	1,709	158	1,696	158	1,695	73	1,063	63	895	61	795	61	795	61	795	
7 Price Contingency	2,510	24,642	298	429	238	325	310	412	590	1,215	839	2,976	47	1,745	29	1,954	31	2,303	35	2,702	18	1,970	17	1,913	18	1,949	19	2,223	21	2,525	
2.0% per annum for foreign currency 10.0% per annum for local currency																															
GRAND TOTAL	30,978	45,683	7,669	2,472	4,135	1,306	4,076	1,299	6,257	3,206	7,487	6,832	363	3,585	197	3,663	189	3,999	193	4,398	91	3,033	79	2,807	79	2,744	80	3,018	82	3,320	

Table J.4.32 Annual Operation and Maintenance Cost of Forestry Management and Rehabilitation

Unit: Rp.

Items	Maintenance Period	Unit	Quantity	Total Cost
1 Reforestation				
1.1 Treating of Planted Areas Common Labor	Year 2016 - 2031	m-day	500	10,000,000
2 Forest Patrol				
2.1 Forest Guards	Year 2016 - 2061	m-month	72	54,000,000
2.2 Forest Patrol Station Operation	Year 2016 - 2061	unit	6	4,800,000
2.3 Maintenance of Patrol Station	Year 2002 - 2061	unit	6	2,400,000
3 Fuel Wood Plantation				
3.1 Delivery Station Operation	Year 2016 - 2061	unit	7	280,000
3.2 Maintenance of Delivery Station	Year 2006 - 2015	unit	7	140,000
4 Timber Plantation				
4.1 Extension Workers	Year 2016 - 2061	m-month	180	135,000,000
4.2 Nursery Operation Common Labor	Year 2016 - 2061	m-month	108	54,000,000

Table J.4.33 Replacement Cost for the Forestry Management and Rehabilitation

Unit: Rp.

Items	Usable Years	Unit	Quantity	Total Cost
1 Equipment				
1.1 Forest Boundary Monument	10	L.S.	1	74,250,000
1.2 Motor Cycle	10	no.	6	120,000,000
2 Forest Patrol Station				
2.1 Forest Patrol Station	30	unit	6	120,000,000
3 Delivery Station				
3.1 Delivery Station	30	unit	7	7,000,000

Table J.4.34 Annual Operation and Maintenance Cost for the Agriculture/Agroforestry Improvement

Unit:Rp.

Items	Percentage of Original Price (%)	Unit	Qunantity	Total Cost			Applied Year
				F.C.	L.C.	Total	
1 Equipment for Extention Services							
1.1 Equipment	5.0%	L.S.	1	79,600,000	0	79,600,000	Year 2011 - 2061
TOTAL				79,600,000	0	79,600,000	

Table J.4.35 Replacement Cost of the Equipment for Agriculture/Agroforestry Improvement

Unit:Rp.

Items	Usable Years	Unit	Qunantity	Total Cost		
				F.C.	L.C.	Total
1 Equipment for Extention Services						
1.1 Pick up Track	10	no.	1	180,000,000	0	180,000,000
1.2 Motor Cycle*	10	no.	60	1,200,000,000	0	1,200,000,000
1.3 Bycycle*	10	no.	100	100,000,000	0	100,000,000
1.4 Slide Projector	10	no.	3	9,000,000	0	9,000,000
1.5 Tape Recorder	10	no.	10	10,000,000	0	10,000,000
1.6 Computer	10	no.	3	90,000,000	0	90,000,000
1.7 Printer	10	no.	1	3,000,000	0	3,000,000

*: Half of the equipment will be used for agriculture extension and the other half for agroforestry extension.

Table J.4.36 Annual Maintenance Cost of Erosion Control Facility

Unit:Rp.

No.	Item	Unit	Quantity	Total Cost	Applied Year
1	Annual Maintenance Cost	L.S.	1	29,830,823	Year 2007 - 2061
GRAND TOTAL				29,830,823	

(0.5% of Direct Construction Cost)

Table J.4.37 Replacement Cost of Erosion Control Facility

Unit:Rp.

No.	Item	Usefule Years	Unit	Quantity	Total Cost
1	Vehicle and Equipment				
1.1	Pick-up Truck	10	no.	2	360,000,000
GRAND TOTAL					360,000,000

Note: F.C.=Foreign Currency, L.C.=Local Currency, M/M=Man Month, L.S.=Lump Sum

Table J.4.38 Annual Operation and Maintenance Cost of the Equipment for Institutional Development

Unit:Rp.

Items	Percentage of Original Price (%)	Unit	Qunantity	Total Cost		
				F.C.	L.C.	Total
1 Operation and Maintenance of Equipment	2.5%	L.S.	1	38,327,500	768,750	39,096,250
TOTAL				38,327,500	768,750	39,096,250

Year 2007 - 2061

Table J.4.39 Replacement Cost of the Equipment for Institutional Development

Unit:Rp.

Items	Usable Years	Unit	Qunantity	Total Cost		
				F.C.	L.C.	Total
1 Equipment						
1.1 Equipment for Province Forestry Office						
Computer for Document	10	no.	7	84,000,000	0	84,000,000
Computer for GIS/CAD	10	no.	1	47,000,000	0	47,000,000
Local Area Network Development	10	L.S.	1	8,000,000	0	8,000,000
Server	10	no.	1	60,000,000	0	60,000,000
Laser Printer	10	no.	1	24,000,000	0	24,000,000
Color Deskjet Printer for Document	10	no.	1	6,315,000	0	6,315,000
A3 Color Deskjet Printer	10	no.	1	3,000,000	0	3,000,000
Business Package Software	10	no.	7	31,850,000	0	31,850,000
Statistic Software	10	no.	1	5,460,000	0	5,460,000
GIS Software	10	no.	1	27,000,000	0	27,000,000
CAD Software	10	no.	1	25,000,000	0	25,000,000
Publishing Software	10	no.	1	910,000	0	910,000
Vehicle	10	no.	2	400,000,000	0	400,000,000
Motorcycle	10	no.	1	20,000,000	0	20,000,000
1.2 Equipment for District Forestry Office						
Computer for Document	10	no.	2	24,000,000	0	24,000,000
Computer for GIS/CAD	10	no.	1	47,000,000	0	47,000,000
Color Deskjet Printer	10	no.	1	6,315,000	0	6,315,000
Business Package Software	10	no.	2	9,100,000	0	9,100,000
GIS Software	10	no.	1	27,000,000	0	27,000,000
CAD Software	10	no.	1	25,000,000	0	25,000,000
Vehicle	10	no.	1	200,000,000	0	200,000,000
Motorcycle	10	no.	2	40,000,000	0	40,000,000
Desk & Chair	10	L.S.	1	400,000	1,600,000	2,000,000
Library Development	10	L.S.	1	0	1,000,000	1,000,000
Book Rack	10	no.	1	200,000	800,000	1,000,000
Map Cupboard	10	no.	1	200,000	800,000	1,000,000
1.3 Equipment for Branch Forestry Office						
Typewriter	10	no.	3	3,900,000	0	3,900,000
Telephone Installation	10	L.S.	3	2,700,000	6,300,000	9,000,000
Motorcycle	10	no.	3	60,000,000	0	60,000,000
Accurate Maps	10	set	10	25,000,000	5,000,000	30,000,000
Office Furniture	10	L.S.	3	1,800,000	4,200,000	6,000,000
Filing Cabinet	10	no.	3	600,000	2,400,000	3,000,000
Equipment	10	set	7	10,500,000	0	10,500,000
Uniforms	10	no.	7	3,150,000	7,350,000	10,500,000
1.4 Equipment for Reearch Center						
Computer for GIS/CAD	10	no.	2	94,000,000	0	94,000,000
GIS Software	10	no.	1	27,000,000	0	27,000,000
GPS Base Station and Roving Unit	10	no.	1	130,000,000	0	130,000,000
Map Cupboard	10	no.	1	200,000	800,000	1,000,000
Accurate Maps	10	set	1	2,500,000	500,000	3,000,000
Library Development	10	L.S.	1	50,000,000	0	50,000,000
TOTAL				1,533,100,000	30,750,000	1,563,850,000

Table J.4.40 Annual Maintenance Cost of Community Empowerment

Unit:Rp.

Items	Unit	Quantity	Total Cost		
			F.C.	L.C.	Total
1 Administration Cost					
1.1 Community Empowerment Specialist	m-month	96.0	0	60,768,000	60,768,000
1.2 Commnity Organizer	m-month	96.0	0	60,768,000	60,768,000
1.3 Gender Specialist	m-month	96.0	0	60,768,000	60,768,000
Sub-Total 1.1 - 1.4			0	182,304,000	182,304,000
2 Direct Cost					
2.1 Operation Cost	month	96.0	0	1,600,000,000	1,600,000,000
Sub-Total 2.1			0	1,600,000,000	1,600,000,000
GRAND TOTAL			0	1,782,304,000	1,782,304,000

Year 2006 - 2013

Table J.4.41 Annual Administration Cost of Monitoring System (Engineering Items)

Unit:Rp.

No.	Item	Unit	Quantity	F.C.	L.C.	Total Cost
1	Water Quality Monitoring					
1.1	Monitoring of Water Quality (4 times/year)					
	Assistant for Monitoring	m-day	22.6	0	395,500	395,500
	SUB-TOTAL 1.1			0	395,500	395,500
2	Water Balance Monitoring					
2.1	Rain Gauge & Water Gauge Data Collection for 35 sites (weekly)					
	Assistant for Monitoring	m-day	322.4	0	5,642,000	5,642,000
2.2	Hydrological Analysis for 1 Month Data (monthly)					
	Assistant for Monitoring	m-day	85.2	0	1,491,000	1,491,000
	SUB-TOTAL 2.1 - 2.2			0	7,133,000	7,133,000
GRAND TOTAL				0	7,528,500	7,528,500

Year 2012 - 2061

Table J.4.42 Engineering Monitoring Survey Cost in Project Running Period

Unit:Rp.

No.	Item	Frequency	Unit	Quantity	F.C.	L.C.	Total Cost
1	Erosion and Sedimentation Monitoring						
1.1	Monitoring of Sedimentation						
	Bathymetry	once in five years	km2	46.0	83,229,410	35,252,054	118,481,464
2	Water Quality Monitoring						
2.1	Sediment Sampling & Analysis	once in five years	set	1.0	49,700,700	16,566,900	66,267,600
GRAND TOTAL					132,930,110	51,818,954	184,749,064

Year 2012 - 2061

Table J.4.43 Annual Operation and Maintenance Cost of Monitoring Apparatus

Unit:Rp.

No.	Item	% of original price	Unit	Quantity	F.C.	L.C.	Total
1	Operation of Monitoring Apparatus	2.0%	L.S.	1	10,310,500	0	10,310,500
2	Maintenance Cost of Monitoring Apparatus	10.0%	L.S.	1	0	51,552,500	51,552,500
GRAND TOTAL					10,310,500	51,552,500	61,863,000

Year 2012 - 2061

Table J.4.44 Replacement Cost of Monitoring System (Engineering Items)

Unit:Rp.

No.	Item	Useful Years	Unit	Quantity	F.C.	L.C.	Total Cost
1	Rainfall gauge	10	no.	21	161,424,000	0	161,424,000
2	Drier	5	no.	1	15,826,000	0	15,826,000
3	Motorboat	20	no.	1	133,730,000	0	133,730,000
4	Soil sampler for bottom materials	15	no.	1	23,739,000	0	23,739,000
5	DO meter	5	no.	1	9,891,000	0	9,891,000
6	pH meter	5	no.	1	6,884,000	0	6,884,000
7	EC meter	5	no.	1	6,568,000	0	6,568,000
8	Secchii disc for water clearness	5	no.	1	2,374,000	0	2,374,000
9	Water sampler	15	no.	1	15,826,000	0	15,826,000
10	Water level gauge (12 new gauges and 2 replacement)	10	no.	14	88,620,000	0	88,620,000
11	Current meter	10	no.	1	34,817,000	0	34,817,000
12	Computer with Monitor	10	no.	1	47,000,000	0	47,000,000
13	CD-ROM writer	10	no.	1	3,170,000	0	3,170,000
14	Color Printer for Documents	10	no.	1	6,315,000	0	6,315,000
15	Color Plotter for Map	10	no.	1	71,059,000	0	71,059,000
16	GIS Software	10	no.	1	27,000,000	0	27,000,000
TOTAL					654,243,000	0	654,243,000

Note: L.S.=Lump Sum, F.C.=Foreign Currency, L.C.=Local Currency