

Table XI.2.2 MONTHLY WORKABLE DAYS FOR CONSTRUCTION WORKS

Unit: day

Item	Month												Total
	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	
(1) Rainy Day & Suspended Day													
Calender Day	31	28	31	30	31	30	31	31	30	31	30	31	365
5<R<10 mm : Rainy Day	3.3	2.1	1.5	2.7	1.1	1.1	0.6	0.7	1.4	0.9	2.5	3.5	21.4
: Suspended Day (Rainy day x 0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10<R<15 mm : Rainy Day	1.5	1.9	1.5	0.9	1.2	0.7	0.7	0.7	0.7	0.8	1.7	2.3	14.6
: Suspended Day (Rainy day x 0.0)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
15<R<30 mm : Rainy Day	4.4	2.5	3.2	2.3	1.8	1.0	1.3	0.5	1.2	1.5	2.7	3.1	25.5
: Suspended Day (Rainy day x 1.0)	4.4	2.5	3.2	2.3	1.8	1.0	1.3	0.5	1.2	1.5	2.7	3.1	25.5
30 mm < : Rainy Day	4.8	3.8	1.8	1.8	2.1	1.0	0.7	0.9	1.1	1.5	1.9	2.8	24.2
: Suspended Day (Rainy day x 3.0)	14.4	11.4	5.4	5.4	6.3	3.0	2.1	2.7	3.3	4.5	5.7	8.4	72.6
(2) Total of Rainy Day	14.0	10.3	8.0	7.7	6.2	3.8	3.3	2.8	4.4	4.7	8.8	11.7	85.7
(3) Total of Suspended day	18.8	13.9	8.6	7.7	8.1	4.0	3.4	3.2	4.5	6.0	8.4	11.5	98.1
(4) Suspended Rate : (3)/(1)%	60.6	49.6	27.7	25.7	26.1	13.3	11.0	10.3	15.0	19.4	28.0	37.1	26.9
(5) Sunday & National Holiday	5.0	5.0	6.0	7.0	7.0	5.0	5.0	6.0	5.0	4.0	5.0	5.0	65.0
(6) Rainy Day in Sunday & National Holiday (5)x(4)	3.0	2.5	1.7	1.8	1.8	0.7	0.5	0.6	0.8	0.8	1.4	1.9	17.5
(7) Non Workable day : (3)+(5)-(6)	20.8	16.4	12.9	12.9	13.3	8.3	7.9	8.6	8.8	9.2	12.0	14.6	145.6
(8) Workable Day : (1)-(7)	10.2	11.6	18.1	17.1	17.7	21.7	23.1	22.4	21.3	21.8	18.0	16.4	219.4
(9) Workable Rate : (8)/(1)%	33.0	41.4	58.3	57.0	57.2	72.2	74.7	72.3	70.8	70.2	60.0	52.8	60.1
(10) Applied Workable Day	0	0	0	18	18	22	23	22	21	22	18	16	180

Note : Data of average rainy day is given from 1979 to 1991 at Semarang Meteorological Station (BMG)

Table XI.3.1 WORK ITEM AND QUANTITIES FOR URGENT PROJECT

Item	Quantity	Unit
1. Preparatory Works	1	L.S.
2. West Floodway Improvement Works		
(1) Excavation; Common 1-F	339,000	m3
Common 2-F	226,000	m3
River Mouth	98,000	m3
(2) Retaining Wall; Type B	3,000	m
(3) Revetment; Type A	6,580	m2
Type B	3,020	m2
3. Garang River Improvement Works		
(1) Excavation; Common 1-G	276,800	m3
Common 1-EM	10,200	m3
Common 2-G	72,000	m3
(2) Embankment	10,200	m3
(3) Revetment; Type A	2,110	m2
Type B	32,200	m2
(4) Sodding	3,880	m2
(5) Ground Sill; Type A	1,040	m3
Type B	110	m3
Type C	30	m3
Type D	390	m3
4. Reconstruction of Simongan Weir		
(1) Diversion Works & Dewatering	1	LS
(2) Demolition	12,000	m3
(3) Excavation; Common 2-G	6,710	m3
(4) Revetment; Type C	1,110	m2
(5) Sodding	570	m2
(6) Reinforced Concrete	6,790	m3
(7) PC Foundation Pile; D=500mm,L=12m	216	pc
D=400mm,L=12m	135	pc
D=350mm,L=12m	480	pc
(8) Sheet Pile; t=0.2m	1,380	m2
(9) Main Gate 1	236	m2
(10) Main Gate 2	54	m2
(11) Retaining Wall; Type C	80	m
(12) Concrete Block; t=0.5m	2,830	m2
(13) Gabion Mattress; t=0.5m	2,020	m2
(14) Bridge	1,040	m2
(15) Control House & Gate House	1	LS
(16) Steel Stop Log	1	LS
5. Intake Structure		
(1) Demolition	350	m3
(2) Excavation; Common 2	150	m3
(3) Reinforced Concrete	510	m3
(4) PC Foundation Pile; D=350mm,L=12m	60	pc
(5) Sheet Pile; t=0.2m	240	m2
(6) Gate	30	m2
(7) Retaining Wall; Type C	55	m
Type D	80	m
6. Others		
(1) Railroad Bridge	1	L.S.
(2) Retaining Wall for PDAM; Type E	200	m
(3) Flap Gate; 1.0m x 1.0m	2	pc
1.5m x 1.5m	0	pc
2.0m x 2.0m	14	pc
7. Miscellaneous Works	1	L.S.

Table XI.4.1 WORK ITEM AND QUANTITIES OF FLOOD CONTROL PLAN FOR MASTER PLAN

Item	Unit	Biorong River	Bringin River	Silandak River	West floodway / Garang River		East Floodway	Babon River
					West	Garang		
<b>I. River Improvement Portion</b>								
1. Preparatory Works	L.S.	1	1	1	1	1	1	1
2. Excavation; Common 1	m3	74,400	97,000	213,400	428,500	474,600	593,400	1,016,700
3. Excavation; Common 2	m3	94,600	18,300	30,500	204,800	0	452,100	114,200
4. Embankment	m3	91,200	1,216,000	1,100	0	6,900	108,000	152,600
5. Revetment; Type B	m2	51,000	15,200	21,300	9,400	34,600	77,200	124,000
6. Sodding	m2	22,300	17,900	3,000	0	4,300	19,500	26,700
7. Railway Bridge	m	0	241	61	98	0	79	62
8. Road Bridge	m2	48	2,487	1,102	0	0	2,624	4,691
9. Retaining Wall	L.S.	0	0	0	1	1	1	0
10. Ground Sill	L.S.	0	0	0	0	1	0	0
11. Relocation Road	L.S.	0	0	0	1	1	0	0
12. Reconstruction of Simongan Weir	L.S.	0	0	0	0	1	0	0
13. Intake Structure	L.S.	0	0	0	0	1	0	0
14. Drainage Outlet	L.S.	0	0	0	0	1	0	0
15. Reconstruction of Pucanggading Weir	L.S.	0	0	0	1	0	0	0
16. River Side Channel	L.S.	0	0	0	0	0	0	1
17. Miscellaneous Works	L.S.	1	1	1	1	1	1	1
<b>II. Flood Control Dam portion</b>								
1. Name of Dam						Jatibarang		
2. Dam Type						Concrete		
3. Dam Volume						170,000 m3		

Table XI.4.2 WORK ITEM AND QUANTITIES OF URBAN DRAINAGE PLAN FOR MASTER PLAN

Item	Unit	Eastern Semarang Area			Central Semarang Area			Western Semarang Area		
		Siringin	Tenggang	Semarang	Banger	Bulu	Ronggo lawe	Karangayu	Tawang	Silandak
<b>1. Preparatory Works</b>	L.S.	1	1	1	1	1	1	1	1	1
<b>2. Primary Channel Improvement</b>										
1) Open Channel (Type A)	m	6,120	4,350	0	2,090	0	0	0	0	0
2) Open Channel (Type B)	m	0	0	2,360	0	0	0	0	0	0
3) Open Channel (Type C)	m	3,100	7,900	2,150	3,460	1,750	2,250	1,100	1,200	850
4) Open Channel (Type D)	m	0	1,450	0	0	0	0	0	0	0
5) Open Channel (Type E)	m	0	0	0	1,130	0	1,000	1,580	0	0
6) Open Channel (Type F)	m	0	0	5,770	0	0	0	0	0	0
7) Covered Channel (Type G)	m	0	0	0	0	0	0	0	0	0
<b>3. Related Structure</b>										
1) Pump Station	L.S.	0	0	1	0	0	0	0	0	0
2) Gate Structure	m2	0	0	8	0	0	0	0	0	0
3) Railway Bridge	m	0	22	20	50	0	5	3	0	8
4) Road Bridge	m2	414	2,678	1,503	1,263	9	0	83	0	0
5) Box Culvert	m3	0	0	726	1,148	607	394	909	810	0
6) Inspection Road	m2	55,320	73,500	14,160	33,300	10,500	13,500	6,600	0	5,100
<b>4. Miscellaneous Works</b>	L.S.	1	1	1	1	1	1	1	1	1

Table XI.5.1 (1/2) WORK ITEM AND QUANTITIES OF JATIBARANG DAM FOR FEASIBILITY STUDY

Item	Quantity	Unit
<b>I. Construction Base Cost (Dam)</b>		
1. Preparatory Works	1	L.S.
2. Main dam		
- Excavation (Ripping & Blasting)	115,000	m3
- Dam Concrete	206,000	m3
- Spillway Concrete (Reinforced)	13,000	m3
- Foundation Treatment (Grouting)	15,000	m
- Intake Facility	1	L.S.
- Maintenance Bridge	350	m2
3. Left Side Ridge Treatment		
- Excavation (Ripping)	12,000	m3
- Embankment	0	m3
- Water Leakage Treatment (Grouting)	6,000	m
4. Auxiliary Spillway		
- Excavation (Ripping)	26,000	m3
- Embankment	0	m3
- Invert Concrete	2,300	m3
- Water Leakage Treatment (Grouting)	2,300	m
5. Diversion Tunnel	350	m
6. Relocation Road	17,500	m2
7. Relocation of Electrical Tower	10	pc
8. Protection Works for Gore Caves	0	L.S.
9. Miscellaneous Works	1	L.S.
<b>II. Construction Base Cost (Exclusive to Hydro)</b>		
1. Preparatory Works	1	L.S.
2. Powerhouse		
- Excavation (Ripping & Blasting)	11,000	m3
- Reinforced Concrete	900	m3
- Powerhouse Building	1	L.S.
3. Tailrace		
- Excavation (Ripping & Blasting)	2,000	m3
- Common Concrete	150	m3
- Reinforced Concrete	400	m3
4. Electrical & Mechanical Equipment		
- Turbine ; 1,500 kw	1	set
- Generator ; 1,700 kVA	1	set
- Transformer ; 6.6/20 kVA	1	set
- Inlet Valve	1	set
- Control & Switchyard Equipment	1	set
- Draft Gate	2	set
- Outlet Gate	1	set
5. Distribution Line; 20 kV	1	L.S.
6. Miscellaneous Works	1	L.S.

Table XI.5.1 (2/2) WORK ITEM AND QUANTITIES OF URBAN DRAINAGE PLAN FOR FEASIBILITY STUDY

Item	Quantity	Unit	Remarks
1. Preparatory Works	1	L.S.	
2. Bandarharjo West			
1) Pumping Station	1	place	0.78 m <sup>3</sup> /s
2) Gate Structure	1	place	
3) Retarding Basin	1	place	0.84 ha
4) Channel Improvement			
- Open Channel; Type D	800	m	
5) Related Structure			
- Inspection Road	3,250	m <sup>2</sup>	
3. Asin River Basin			
1) Pumping Station	1	place	5.70 m <sup>3</sup> /s
2) Gate Structure	1	place	
3) Retarding Basin	1	place	2.67 ha
4) Channel Improvement			
- Open Channel; Type D	1,300	m	
5) Related Structure			
- Bridge	1	pc	
- Inspection Road	20,050	m <sup>2</sup>	
4. Bandarharjo East			
1) Pumping Station	1	place	2.00 m <sup>3</sup> /s
2) Gate Structure	1	place	
3) Retarding Basin	1	place	0.93 ha
4) Channel Improvement			
- Open Channel; Type D	700	m	
5) Related Structure			
- Inspection Road	5,600	m <sup>2</sup>	
5. Semarang River			
1) Channel Improvement			
- Open Channel; Type A	2,350	m	
- Open Channel; Type D	500	m	
- Open Channel; Type F	4,020	m	
2) Related Structure			
- Revetment; Type D	9,530	m <sup>2</sup>	
- Revetment; Type E	2,840	m <sup>2</sup>	
- Inspection Road	25,500	m <sup>2</sup>	
6. Baru River			
1) Gate Structure	1	place	
2) Channel Improvement			
- Open Channel (Type D)	300	m	
- Open Channel (Type G)	500	m	
2) Related Structure			
- Inspection Road	6,400	m <sup>2</sup>	
7. Miscellaneous Works	1	L.S.	

## FIGURES

Item	1992	1993	1994	1995	1996	1997	1998	1999	2000
Feasibility Study	■								
Application for Loan		■							
Detailed Design			■	■					
P/Q and Tendering					■				
Construction						■	■	■	■

MASTER PLAN ON WATER RESOURCES DEVELOPMENT AND  
 FEASIBILITY STUDY FOR URGENT FLOOD CONTROL AND  
 URBAN DRAINAGE IN SEMARANG CITY AND SUBURBS  
 JAPAN INTERNATIONAL COOPERATION AGENCY

Fig. XI. 3.1 IMPLEMENTATION SCHEDULE  
 FOR URGENT PROJECT



Item	Quantity	1994	1995	1996	1997	1998	1999	2000
1. Preparatory Works								
2. W-Floodway Improvement Works								
(1) Excavation Common 1-F	339,000 m3							
Common 2-F	226,000 m3							
River Mouth	98,000 m3							
(2) Retaining Wall Type B	3,000 m							
(3) Revetment Type A	6,580 m2							
Type B	3,020 m2							
3. Garang R. Improvement Works								
(1) Excavation Common 1-G	276,800 m3							
Common 1-EM	10,200 m3							
Common 2-G	72,000 m3							
(2) Embankment	10,200 m3							
(3) Revetment Type A	2,110 m2							
Type B	32,200 m2							
(4) Sodding	3,880 m2							
(5) Groundsill Type A	1 LS							
Type B	1 LS							
Type C	1 LS							
Type D	1 LS							
4. Reconstruction of Simongan Weir								
(1) Diversion Works & Dewatering	1 LS							
(2) Demolition	12,000 m3							
(3) Excavation Common 2-G	6,710 m3							
(4) Revetment Type C	1,110 m2							
(5) Sodding	570 m2							
(6) Reinforced Concrete	6,790 m3							
(7) Foundation Pile D=500mm,L=12m	216 pc							
D=400mm,L=12m	135 pc							
D=350mm,L=12m	480 pc							
(8) Sheet Pile t=0.2m	1,380 m2							
(9) Main Gate 1	236 m2							
(10) Main Gate 2	54 m2							
(11) Retaining Wall Type C	80 m							
(12) Concrete Block t=0.5m	2,830 m2							
(13) Gabion Mattress t=0.5m	2,020 m2							
(14) Bridge	1,040 m2							
(15) Control House & Gate House	1 LS							
5. Intake Structure								
(1) Demolition	350 m3							
(2) Excavation Common 2-G	150 m3							
(3) Reinforced Concrete	510 m3							
(4) Foundation Pile D=350mm,L=12m	60 pc							
(5) Sheet Pile t=0.2m	240 m2							
(6) Gate	30 m2							
(7) Retaining Wall Type C	55 m							
Type D	80 m							
6. Others								
(1) Railroad Bridge	1 LS							
(2) Retaining Wall for PDAM	200 m							
(3) Flap Gate 1.0m x 1.0m	2 pc.							
1.5m x 1.5m	0 pc							
2.0m x 2.0m	14 pc							
7. Miscellaneous Works								

### FLOOD CONTROL PLAN

Description	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	
1. Babon River																						
Babon River Improvement																						
Babon Floodway																						
2. East Floodway																						
East Floodway Improvement																						
3. Garang River/West Floodway																						
Garang River Improvement																						
West Floodway Improvement																						
Jatibarang dam																						
4. Silandak River																						
Silandak River Improvement																						
5. Bringln River																						
Bringln River Improvement																						
6. Blorong River																						
Blorong River Improvement																						
Kedung Suren Dam																						

On-going Project  
 Implemented by Master Plan

### URBAN DRAINAGE PLAN

Description	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	
1. Eastern Semarang																						
Stringln River																						
Tenggang River																						
2. Central Semarang																						
Semarang River																						
Banger River																						
Bulu River																						
3. Western Semarang																						
Ronggolawe River																						
Karangayu River																						
Tawang River																						
Silandak Channel																						

On-going Project  
 Implemented by Master Plan

### WATER RESOURCES DEVELOPMENT PLAN

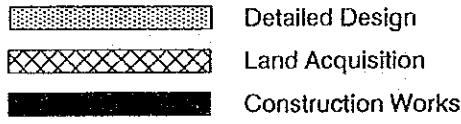
Description	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	
1. Babon Dam																						
2. Jatibarang Dam																						
3. Mundingan Dam																						
4. Interbasin Transfer																						
5. Kedung Suren Dam																						
Kedung Suren Dam																						
Conveyance Channel																						

Implemented by Master Plan

MASTER PLAN ON WATER RESOURCES DEVELOPMENT AND  
FEASIBILITY STUDY FOR URGENT FLOOD CONTROL AND  
URBAN DRAINAGE IN SEMARANG CITY AND SUBURBS  
JAPAN INTERNATIONAL COOPERATION AGENCY

Fig.XI 4.1 IMPLEMENTATION SCHEDULE  
FOR MASTER PLAN

Description		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Flood Control Plan	River Improvement Works for West Floodway/ Garang River		■			■						
	Jatibarang Dam Construction Works		■	■	■	■						
Water Resources Development Plan	Hydropower Station Construction Works		■			■						
	Urban Drainage Plan		■		■			■				



Item	Quantity	1998	1999	2000	2001	2002	2003	2004
1. Preparatory Works	1 LS	[Gantt bar spanning 1998-2004]						
2. Bandarharjo West								
1) Pumping Station	0.78 m3/s						[Gantt bar]	[Gantt bar]
2) Gate Structure	1 place						[Gantt bar]	[Gantt bar]
3) Retarding Basin	0.84 ha						[Gantt bar]	[Gantt bar]
4) Channel Improvement								
- Open Channel ; Type D	800 m						[Gantt bar]	[Gantt bar]
5) Related structure								
- Inspection Road	3,250 m2						[Gantt bar]	[Gantt bar]
3. Asin River basin								
1) Pumping Station	5.70 m3/s		[Gantt bar]	[Gantt bar]	[Gantt bar]			
2) Gate Structure	1 place		[Gantt bar]	[Gantt bar]	[Gantt bar]			
3) Retarding Basin	2.67 ha		[Gantt bar]	[Gantt bar]	[Gantt bar]			
4) Channel Improvement								
- Open Channel ; Type D	1,300 m			[Gantt bar]	[Gantt bar]			
5) Related structure								
- Bridge	1 pc			[Gantt bar]	[Gantt bar]			
- Inspection Road	20,050 m2			[Gantt bar]	[Gantt bar]			
4. Bandarharjo East								
1) Pumping Station	2.00 m3/s					[Gantt bar]	[Gantt bar]	
2) Gate Structure	1 place					[Gantt bar]	[Gantt bar]	
3) Retarding Basin	0.93 ha					[Gantt bar]	[Gantt bar]	
4) Channel Improvement								
- Open Channel ; Type D	700 m					[Gantt bar]	[Gantt bar]	
5) Related structure								
- Inspection Road	5,600 m2					[Gantt bar]	[Gantt bar]	
5. Semarang River								
1) Channel Improvement								
- Open Channel ; Type A	2,350 m	[Gantt bar]	[Gantt bar]					
- Open Channel ; Type D	500 m	[Gantt bar]	[Gantt bar]					
- Open Channel ; Type F	4,020 m	[Gantt bar]	[Gantt bar]					
2) Related Structure								
- Revetment ; Type D	9,530 m2	[Gantt bar]	[Gantt bar]					
- Revetment ; Type E	2,840 m2	[Gantt bar]	[Gantt bar]					
- Inspection Road	25,500 m2	[Gantt bar]	[Gantt bar]					
6. Baru River								
1) Gate Structure	1 place	[Gantt bar]	[Gantt bar]					
2) Channel Improvement								
- Open Channel ; Type D	300 m	[Gantt bar]	[Gantt bar]					
- Open Channel ; Type G	500 m	[Gantt bar]	[Gantt bar]					
3) Related Structure								
- Inspection Road	6,400 m2	[Gantt bar]	[Gantt bar]					
7. Miscellaneous Works	1 LS	[Gantt bar spanning 1998-2004]						

Item	Quantity	1994	1995	1996	1997	1998	1999	2000
<b>I. Jatibarang Dam</b>								
1. Preparatory Works								
2. Main Dam								
- Excavation (Ripping & Blasting)	115,000 m <sup>3</sup>							
- Dam Concrete	206,000 m <sup>3</sup>							
- Spillway Concrete (Reinforced)	13,000 m <sup>3</sup>							
- Foundation Treatment (Grouting)	15,000 m <sup>3</sup>							
- Intake Facility	1 LS							
- Maintenance Bridge	350 m <sup>2</sup>							
3. Left Side Ridge Treatment								
- Excavation (Ripping)	12,000 m <sup>3</sup>							
- Embankment	0 m <sup>3</sup>							
- Water Leakage Treatment (Grouting)	6,000 m							
4. Auxiliary Spillway								
- Excavation	26,000 m <sup>3</sup>							
- Embankment								
- Invert Concrete	2,300 m <sup>3</sup>							
- Water Leakage Treatment (Grouting)	2,300 m							
5. Diversion Tunnel	350 m							
6. Relocation Road	17,500 m <sup>2</sup>							
7. Relocation of Electrical Tower	10 pc							
8. Miscellaneous Works	1 LS							
<b>II. Hydropower Generation</b>								
1. Preparatory Works								
2. Power House								
- Excavation (Ripping & Blasting)	11,000 m <sup>3</sup>							
- Reinforced Concrete	900 m <sup>3</sup>							
- Powerhouse Building	1 LS							
3. Tailrace								
- Excavation (Ripping & Blasting)	2,000 m <sup>3</sup>							
- Common Concrete	150 m <sup>3</sup>							
- Reinforced Concrete	400 m <sup>3</sup>							
4. Electrical & Mechanical Equipment								
- Turbin ; 1,500 kw	1 set							
- Generator ; 1,700 kw	1 set							
- Transformer	1 set							
- Inlet Valve	1 set							
- Control & Switchyard Equipment	1 set							
- Draft Gate	2 set							
- Outlet Gate	1 set							
5. Distribution Line	1 LS							
6. Miscellaneous Works	1 LS							

## **XII PROJECT COST ESTIMATE**



XII PROJECT COST ESTIMATE

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## CHAPTER 1 GENERAL

This sector of the supporting report presents the estimate of project cost based on the design and the construction plan. Labour wages, unit prices of construction materials and unit prices of heavy equipment were estimated and canvassed in Semarang City. Annual disbursement schedules were made according to the Implementation Schedule.

## CHAPTER 2 BASIS OF COST ESTIMATE

### 2.1 Planning Criteria

Project cost is estimated on the basis of the design, the construction plan and the following basic conditions.

(1) Price Level

All unit costs are expressed based on the price level in July 1992.

(2) Currency Conversion Rate

Currency conversion rates are assumed at US\$1.00 = Rp. 2,033 and ¥1.00 = Rp. 16.20.

(3) Constitution of Project Cost

Project cost is composed of construction base cost, compensation cost, administration cost, engineering service cost, price contingency, physical contingency and value added tax. Calculation is carried out based on the following:

(a) Construction Base Cost = Work Volume x Unit Cost

(b) Compensation Cost = Area of Land to be Acquired and Number of Houses to be Evacuated x Unit Cost

(c) Administration Cost = 7% of [(a) + (b)].

(d) Engineering Service Cost

(e) Price Contingency (Financial Cost only) = Annual Escalation Rate (Foreign Currency, 3% and Local Currency, 8% of each cost).

(f) Physical Contingency = 10% of [(a) + (b) + (d) + (e)].

(g) Value Added Tax (Financial Cost only) = 10% of [(a) + (b) + (c) + (d) + (e) + (f)].

(4) Financial Cost and Economic Cost

Financial cost is estimated as real expenses of the project owner. On the other hand, project cost in economic evaluation is reckoned in terms of usage of real sources. Therefore, contractor's profit, price contingency and value added tax are not considered in the economic cost. In addition, market prices are converted to economic prices in the economic evaluation. Economic prices are described in SECTOR XIV, ECONOMIC EVALUATION.

(5) Foreign Currency and Local Currency Portion

Project cost consists of the foreign currency portion (F.C.) and the local currency portion (L.C.). The components of each item are given as follows:



Particulars	F.C. (%)	L.C. (%)
1. Labour Wage	0	100
2. Owning Cost of Heavy Equipment	100	0
3. Material Unit Cost		
- Cement	50	50
- Aggregate	0	100
- PC and RC Pile	50	50
- RC Sheet Pile	50	50
- Fuel	50	50
- Oil	50	50
- Reinforced Bar	80	20
- Flap Gate	100	0
- Structural Steel	80	20
4. Contractor's Profit	0	100
5. Compensation Cost	0	100
6. Administration Cost	0	100

## 2.2 Unit Price and Compensation Cost

### Unit Price

#### (1) Labour Wage

Basic labour wages of foreman, operator, mechanic, mason, driver, common labour, etc., were determined as shown in Table XII.2.1.

#### (2) Unit Prices of Materials

Unit prices of construction materials available in the local market were canvassed in Semarang and unit prices of materials to be imported were modified in consideration of the prevailing market prices in Japan. The unit costs of materials are shown in Table XII.2.2.

(3) Work Unit Cost of Heavy Equipment

Unit prices of heavy equipment were canvassed in Semarang City (refer to Table XII.2.3). The work unit costs of heavy equipment are composed of owning cost, operation cost and maintenance cost. Owning cost is calculated in consideration of unit price, economic life, depreciation value and interest. Operation cost includes fuel, oil, grease and operator cost. The work unit costs of heavy equipment are shown in Table XII.2.4.

Compensation Cost

The unit costs of compensation items consisting of land acquisition and house evacuation are estimated as follows:

<u>Compensation Item</u>	<u>Unit Cost</u>
1. Land Acquisition	
- Residential Area	
(Grade A)	50,000 Rp./m <sup>2</sup>
(Grade B)	20,000 Rp./m <sup>2</sup>
(Grade C)	5,000 Rp./m <sup>2</sup>
- Commercial Area	
(Grade A)	80,000 Rp./m <sup>2</sup>
(Grade B)	40,000 Rp./m <sup>2</sup>
- Paddy Land	
(Urban)	15,000 Rp./m <sup>2</sup>
(Rural)	10,000 Rp./m <sup>2</sup>
- Upland Cultivation	3,000 Rp./m <sup>2</sup>
- Plantation (Teak Wood)	8,000 Rp./m <sup>2</sup>
- Fishpond	3,000 Rp./m <sup>2</sup>
2. House Evacuation	
- Class A (Permanent)	15,000,000 Rp./unit
- Class B (Semi-permanent)	7,000,000 Rp./unit
- Class C (Temporary)	3,000,000 Rp./unit
- Class D (Marginal)	1,000,000 Rp./unit

### 2.3 Method of Cost Allocation

Since a multiple-purpose project serves some groups of beneficiaries, it is necessary to allocate the cost between flood control purpose, water supply purpose and so on. This is generally calculated by the alternative justifiable - expenditure method, and the allocation is done based on the following costs:

- (1) Multiple-purpose project cost
- (2) Separable costs
- (3) Alternate single-purpose cost
- (4) Joint costs

Separable costs are clearly chargeable to a single-purpose function. These costs are estimated as the multiple-purpose project cost less the estimated cost with that function omitted. Joint costs are estimated as the multiple-purpose cost less the sum of the separable costs. These costs are distributed in proportion to the differences between the separable costs and a single-purpose cost. The total allocated costs are obtained to add the joint costs to the separable costs.

## CHAPTER 3 URGENT PROJECT STUDY

### 3.1 Objective Project

River improvement works for West Floodway/Garang River is formulated as the Urgent Project for the stretch of 9.54 km starting from the river mouth up to the confluence of Garang River and Kreo River.

### 3.2 Unit Cost of Construction Works

Construction base cost is estimated by multiplying the unit cost and the corresponding work quantities. Preparatory and miscellaneous works are estimated on lump sum basis as 10% of main works, respectively. The unit cost for each work item consists of the costs of materials, labour and equipment. Contractor's indirect cost is incorporated in the unit costs of work items.

The unit costs of construction works for the Urgent Project are given in Table XII.3.1.

### 3.3 Cost for Alternative Study

The construction cost of the alternative plan for Simongan Weir is estimated as shown in Table XII.3.2, while those of West Floodway and Garang River are estimated as shown in Table XII.3.3 and Table XII.3.4, respectively.

### 3.4 Project Cost

#### Financial Project Cost and Annual Disbursement Schedule

Based on the implementation schedule, the financial project cost and the annual disbursement schedule are estimated as shown in Table XII.3.5 and Table XII.3.6, respectively. The breakdown of financial construction base cost also is shown in Table XII.3.7.

The financial project cost for the Urgent Project is estimated as follows:

Cost Items	Total (mill. Rp.)
1. Construction Base Cost	45,049
2. Compensation Cost	0
3. Administration Cost	3,154
4. Engineering Service Cost	8,969
5. Price Contingency	17,996
6. Physical Contingency	7,025
7. Value Added Tax	8,219
Total	90,412

#### Economic Annual Disbursement Schedule

The annual disbursement schedule for the economic evaluation is given in Table XII.3.8.

#### Operation, Maintenance and Replacement Cost

The annual operation, maintenance and replacement (OMR) cost for the proposed Urgent Project is estimated as shown in Table XII.3.9.

## CHAPTER 4 MASTER PLAN STUDY

### 4.1 Unit Cost of Construction Works

The calculation method for construction base cost applied to the Urgent Project described in CHAPTER 3 is employed for the Master Plan. The financial unit costs for the Master Plan are given in Table XII.4.1.

The channel improvement cost per meter of the urban drainage plan were estimated based on the unit cost mentioned above (refer to Table XII.4.2).

### 4.2 Flood Control Plan

#### Objective Rivers

The flood control master plan is formulated for six (6) major rivers; namely, Blorong River, Bringin River, Silandak River, West Floodway/Garang River, East Floodway, and Babon River.

#### Project Cost of Alternative Plan

To determine the optimum flood control plan, the relationships between the downstream design discharge and the project cost are estimated based on the corresponding work volume. The project cost of river improvement and flood control dam are given in Tables XII.4.3 and XII.4.4, respectively.

Details of the alternative study are described in SECTOR V, FLOOD CONTROL PLAN. Project cost of the flood control dam is allocated by means of the alternative justifiable - expenditure method based on the relationship between the project cost and dam height (refer to Table XII.4.5).

### Project Cost

The project costs of the optimum flood plans are estimated as follows:

#### Project Cost

(Unit: Mill. Rp.)

Name of River	Cost*
1. Babon River	
- River Improvement	52,854
- Babon Floodway	46,022
2. East Floodway	
- Floodway Improvement	30,642
3. West Floodway/Garang River	
- River Improvement	47,634
- Floodway Improvement	14,006
- Jatibarang Dam	23,413**
4. Silandak River	
- River Improvement	11,329
5. Bringin River	
- River Improvement	25,988
6. Blorong River	
- River Improvement	7,742
- Kedung Suren Dam	86,305**

\* Price Contingency and Value Added Tax are excluded.

\*\* Cost allocated for the Flood Control Project.

### Annual Disbursement Schedule

The annual disbursement schedule for economic evaluation to study higher priority river systems is shown in Table XII.4.6 in accordance with the implementation schedule.

### OMR Cost

The annual operation, maintenance and replacement (OMR) cost is estimated as shown in Table XII.4.7. The cost of dredging river channel siltation is considered in the OMR cost based on the sediment balance described in SECTOR VIII, SEDIMENT CONTROL PLAN. In case of a multiple-purpose dam, OMR cost is distributed in proportion to the allocated project cost.

## 4.3 Urban Drainage Plan

### Objective Areas

The urban drainage plan is formulated for three (3) drainage areas; namely, Eastern Semarang Area, Central Semarang Area and Western Semarang Area.

### Project Cost

The project costs of the proposed urban drainage works, which consists of surveyed primary channel improvement, are estimated as shown in Table XII.4.8 and summarized as follows.



## Project Cost

(Unit: Mill. Rp.)

Name of Drainage	Cost
1. Eastern Semarang	
- Siringin River	18,571
- Tenggang River	40,029
2. Central Semarang	
- Semarang River	60,671
- Banger River	21,449
- Bulu River	3,480
3. Western Semarang	
- Ronggolawe River	8,771
- Karangayu River	8,449
- Tawang River	2,116
- Silandak Channel	1,876

Note: Improvement cost of surveyed primary channels are considered. Price Contingency and Value Added Tax are excluded.

### Project Cost for Economic Evaluation

For the economic evaluation, project costs including those for surveyed and other primary and secondary channels are estimated as shown in Table XII.4.9.

### Annual Disbursement Schedule

The annual disbursement schedule is shown in Table XII.4.10 and the annual disbursement schedule for the economic evaluation is also shown in Table XII.4.11.

### OMR Cost

Operation, maintenance and replacement (OMR) cost will mainly comprise administration cost, repairing cost of civil works and equipment of the pump

station, and dredging works. Annual OMR cost is estimated as shown in Table XII.4.12.

#### 4.4 Water Resources Development Plan

##### Objective Facilities

The water resources development plan proposes five (5) facilities; namely, Babon Dam, Jatibarang Dam, Mundingan Dam, Interbasin Transfer, and Kedung Suren Dam.

##### Allocated Project Cost

The cost allocation for a multipurpose dam is executed under the alternative justifiable - expenditure method. The total allocated costs are shown in Table XII.4.13. Project costs of the interbasin transfer and the conveyance channel are estimated as shown in Tables XII.4.14 and XII.4.15, respectively. These are summarized in the following table.

##### Project Cost

(Unit: Mill. Rp.)

Name of Dam	Flood Control	Water Supply
Babon	-	291,391
Jatibarang	23,413	40,064
Mundingan	-	115,560
Interbasin Transfer	-	7,772
Kedung Suren	86,305	175,380
Conveyance Channel	-	8,854

Note: Price Contingency and Value Added Tax are excluded.

### Annual Disbursement Schedule

In accordance with the implementation schedule, the annual disbursement schedule for the Water Resources Development Master Plan is prepared as shown in Table XII.4.16.

### OMR Cost

The annual operation and maintenance cost (OMR) for the Master Plan is estimated as shown in Table XII.4.17, taking the design scale of the dam into account. In case of a multiple-purpose dam, OMR cost is also distributed in proportion to the allocated project cost.

## CHAPTER 5 FEASIBILITY STUDY

### 5.1 Objective Plans

The following projects have been identified as the priority projects with appropriate measures proposed in the master plan:

- (1) Flood Control Plan for Garang River Basin
  - (a) River Improvement Works for West Floodway/Garang River; and
  - (b) Construction of Jatibarang Dam.
- (2) Urban Drainage Plan for Semarang River Basin
  - (a) Construction of three (3) pumping stations;
  - (b) Channel improvement works in the Semarang river basin; and
  - (c) Construction of gate structure in Baru River.
- (3) Water Resources Development Plan
  - (a) Construction of Jatibarang Dam; and
  - (b) Construction of Hydropower Station.

### 5.2 Unit Cost of Construction Works

The calculation method of construction base cost and unit costs are applied to the Urgent Project described in CHAPTER 3. The other financial and

economic unit costs are given in Table XII.5.1 and Table XII.5.2, respectively.

### 5.3 Cost for Alternative Study

#### Alternative Study for Dam Crest Level

To determine the optimum dam crest level, the construction base cost and the compensation cost for alternatives are estimated as shown in Table XII.5.3. Details of the alternative study are given in SECTOR IX, DAM ENGINEERING.

#### Alternative Study for Flood Control Plan

To determine the optimum flood control plan, the relationship between the downstream design discharge and the corresponding project cost of the river improvement is estimated as shown in Table XII.5.4, and the relationship between the downstream design discharge and the corresponding project cost of Jatibarang Dam is allocated for the flood control purpose as shown in Table XII.5.5. The cost allocation is executed under the alternative justifiable - expenditure method based on the relationship between the project cost and dam height (refer to Table XII.5.6). Details of the alternative study are given in SECTOR V, FLOOD CONTROL PLAN.

#### Alternative Study for Urban Drainage Plan

To determine the optimum pump drainage system, the construction base cost and the compensation cost of the alternatives for Asin River Basin and Bandarharjo Area are estimated as shown in Table XII.5.7. Details of the alternative study are given in SECTOR VI, URBAN DRAINAGE PLAN.

#### 5.4 Project Cost

##### Financial Project Cost and Annual Disbursement Schedule

Financial costs are given in Table XII.5.8 and summarized as follows:

(Unit: Mill. Rp.)

Cost Item	River Improvement for West Floodway/Garang River	Jatibarang Dam	Urban Drainage Plan
1. Construction Base Cost	45,049	59,793	27,844
2. Compensation Cost	0	5,582	1,429
3. Administration Cost	3,154	4,576	2,050
4. Engineering Service Cost	8,969	17,579	4,180
5. Price Contingency	17,996	29,399	17,855
6. Physical Contingency	7,025	10,989	4,931
7. Value Added Tax	8,219	12,793	5,829
<b>Total</b>	<b>90,412</b>	<b>140,711</b>	<b>64,118</b>

Financial project costs allocated for each purpose are summarized as follows:

(Unit: Mill. Rp.)

Purpose	Project Cost
1. Flood Control Plan	132,223
- River Improvement for West Floodway/Garang River	90,412
- Jatibarang Dam	41,811
2. Urban Drainage Plan	64,118
3. Water Resources Development Plan (Jatibarang Dam)	79,881
4. Hydropower Generation Plan	19,019
Total	295,241

The annual disbursement schedules are given in Table XII.5.9 and the breakdown of cost is in Table XII.5.10.

#### Economic Project Cost and Annual Disbursement Schedule

The annual disbursement schedule for the economic evaluation is given in Table XII.5.11. To study the simultaneous implementation of river improvement and the construction of Jatibarang Dam, the annual disbursement schedule for staged implementation is as given in Table XII.5.12. Details of the study are given in SECTOR V, FLOOD CONTROL PLAN.

#### OMR Cost

The annual operation and maintenance cost (OMR) for the Feasibility Study is estimated as given in Table XII.5.13. OMR cost is distributed in proportion to the allocated project cost.

## TABLES





Table XII.2.1 BASIC LABOUR WAGES

Item	Unit	Wages (Rp.)
1 Foreman	mdl	12,000
2 Dredger Operator	mdl	12,000
3 Welder	mdl	10,000
4 Operator	mdl	8,000
5 Electrician	mdl	8,000
6 Dredger Crew	mdl	8,000
7 Mechanic	mdl	8,000
8 Mason	mdl	7,000
9 Painter	mdl	7,000
10 Driver	mdl	7,000
11 Concrete Worker	mdl	7,000
12 Steel Worker	mdl	7,000
13 Asphalt Worker	mdl	7,000
14 Carpenter	mdl	7,000
15 Skilled Labour	mdl	6,000
16 As.Operator	mdl	6,000
17 As.Driver	mdl	5,000
18 Common Labour	mdl	4,000

Table XII.2.2 UNIT PRICES OF CONSTRUCTION MATERIALS

Item	Unit	F.C.(Rp.)	L.C.(Rp.)	Total (Rp.)
1 Portland Cement	ton	70,000	70,000	140,000
2 Conc.Aggregate; Coarse	m3	0	18,500	18,500
3 Conc.Aggregate; Fine	m3	0	17,500	17,500
4 River Stone	m3	0	9,000	9,000
5 Raw Crushed Stone	m3	0	12,000	12,000
6 Crushed Stone	m3	0	15,000	15,000
7 Formwork Timber	m3	0	200,000	200,000
8 Metal Form	m2	13,600	3,400	17,000
9 Log Pile (D=100mm,L=3m)	pc	0	4,000	4,000
10 RC Pile (D=350mm,L=12m)	pc	260,000	260,000	520,000
11 PC Pile (D=400mm,L=12m)	pc	320,000	320,000	640,000
12 PC Pile (D=500mm,L=12m)	pc	492,000	492,000	984,000
13 PC Pile (D=500mm,L=15m)	pc	615,000	615,000	1,230,000
14 RC Sheet Pile (80.5m*t0.2m,L=3m)	pc	100,000	100,000	200,000
15 PC Sheet Pile (80.5m*t0.3m,L=15m)	pc	750,000	750,000	1,500,000
16 Re-bar; Deformed	kg	720	180	900
17 Gabion Mattress Wire	kg	1,280	320	1,600
18 Fuel; Diesel Oil	ltr	150	150	300
19 Lubricant Oil	ltr	1,700	1,700	3,400
20 Hydraulic Oil	ltr	1,700	1,700	3,400
21 Grease	kg	2,000	2,000	4,000
22 Asphalt	kg	200	200	400
23 Drain Pipe; PVC(D50mm)	m	1,250	1,250	2,500
24 Water Stop; t=250mm	m	35,000	0	35,000
25 Flap Gate; 1.0m x 1.0m	pc	13,500,000	0	13,500,000
26 Flap Gate; 1.5m x 1.5m	pc	41,000,000	0	41,000,000
27 Flap Gate; 2.0m x 2.0m	pc	68,000,000	0	68,000,000
28 Slide Gate; 1.0m x 1.0m	pc	34,400,000	8,600,000	43,000,000
29 Slide Gate; 1.5m x 1.5m	pc	41,600,000	10,400,000	52,000,000
30 Slide Gate; 2.0m x 2.0m	pc	64,000,000	16,000,000	80,000,000

Table XII.2.3 UNIT PRICES OF HEAVY EQUIPMENT

No.	Kind of Equipment	Power (HP)	Total Weight of Equipment (ton)	Economic Life (year)	Annual Working Hour (hr/year)	Hourly Fuel Consumption (ltr/hr)	Price (1,000 Rp.)
1	Bulldozer; 11 ton	104.0	10.95	5	2,000	13.00	201,000
2	Bulldozer; 15 ton	145.0	15.05	5	2,000	18.00	249,000
3	Bulldozer; 21 ton	211.0	22.85	5	2,000	26.00	400,000
4	Bulldozer; 21 ton; with Ripper	224.0	26.00	5	2,000	31.00	436,000
5	Bulldozer; 32 ton; with Ripper	315.0	39.00	5	2,000	43.00	619,000
6	Swamp Bulldozer; 16 ton	141.0	16.05	5	2,000	17.00	259,000
7	Backhoe; 0.35 m3	70.0	10.75	5	2,000	9.00	136,000
8	Backhoe; 0.60 m3	120.0	18.25	5	2,000	15.00	237,000
9	Backhoe; 0.70 m3	127.0	19.05	5	2,000	16.00	292,000
10	Truck Mixer; 3.0 m3	220.0	7.40	5	2,000	8.60	101,000
11	Truck; 4.5 ton	183.0	3.40	5	2,000	6.60	52,000
12	Dumptruck; 8 ton	253.0	7.10	5	2,000	9.90	99,000
13	Dumptruck; 11 ton	334.0	9.55	8	2,000	13.00	140,000
14	Crawler Crane; 16 ton	96.0	22.40	5	2,000	6.30	287,000
15	Crawler Crane; 27 ton	115.0	27.75	5	2,000	7.60	363,000
16	Crawler Crane; 37 ton	117.0	37.35	5	2,000	7.70	509,000
17	Truck Crane; 16 ton	230.0	19.80	5	2,000	7.80	322,000
18	Tire Roller; 8 ton	99.0	10.10	5	2,000	7.10	127,000
19	Diesel Hammer; 2.5 ton	102.0	59.50	5	2,000	13.00	710,000
20	Portable Concrete Mixer; 0.5 m3	7.4	7.40	2	2,000	-	149,000
21	Concrete Plant; 1.0 m3	49.0	50.00	15	2,000	-	810,000
22	Compressor; 5.0 m3/min	50.0	0.95	5	2,000	7.00	36,000
23	Compressor; 7.6 m3/min	81.0	1.50	5	2,000	11.00	52,000
24	Generator; 10 kVA	15.4	0.57	5	2,000	1.80	15,000
25	Generator; 20 kVA	27.0	0.77	5	2,000	3.20	30,000
26	Generator; 45 kVA	54.4	1.20	5	2,000	6.40	37,000
27	Generator; 150 kVA	187.5	2.80	5	2,000	22.00	87,000
28	Wheel Loader; 0.6 m3	47.0	3.85	5	2,000	4.90	62,000
29	Wheel Loader; 0.8 m3	54.0	4.65	5	2,000	5.60	78,000
30	Pontoon Barge; 200 ton	-	-	15	2,000	-	377,000
31	Scow; 150 m3	-	-	15	2,000	-	131,000
32	Backhoe with Breaker; 600 kg	120.0	18.97	5	2,000	15.00	299,000

Table XII.2.4 WORK UNIT COSTS OF HEAVY EQUIPMENT

No.	Kind of Equipment	Owning Cost *1		Operation Cost *2		Maintenance Cost		Total		
		F.C. (Rp./hr)	L.C. (Rp./hr)	F.C. (Rp./hr)	L.C. (Rp./hr)	F.C. (Rp./hr)	L.C. (Rp./hr)	F.C. (Rp./hr)	L.C. (Rp./hr)	Total (Rp./hr)
1	Bulldozer; 15 ton	37,350	0	4,639	9,159	4,980	2,490	46,969	11,649	58,618
2	Backhoe; 0.60 m3	35,550	0	3,796	8,316	4,740	2,370	44,086	10,686	54,772
3	Dumptruck; 11 ton	15,284	0	5,858	5,454	2,651	1,325	23,793	6,779	30,572
4	Tire Roller; 8 ton	19,050	0	1,703	6,723	2,540	1,270	23,293	7,993	31,286
5	Diesel Hammer; 2.5 ton	106,500	0	3,374	7,894	14,200	7,100	124,074	14,994	139,068
6	Wheel Loader; 0.8 m3	11,700	0	1,395	5,915	1,560	780	14,655	6,695	21,350
7	Concrete Plant; 1.0 m3	67,500	0	500	15,260	16,200	8,100	84,200	23,360	107,560
8	Generator; 150 kVA	13,050	0	5,483	9,683	1,740	870	20,273	10,553	30,826
9	Crawler Crane; 37 ton	76,350	0	2,043	7,063	10,180	5,090	88,573	12,153	100,726
10	Truck Mixer; 3.0 m3	15,150	0	2,239	4,474	2,020	1,010	19,409	5,484	24,893
11	Truck Crane; 16 ton	48,300	0	2,077	6,017	6,440	3,220	56,817	9,237	66,054
12	Pontoon Barge; 200 ton	21,363	0	0	0	3,770	1,885	25,133	1,885	27,018
13	Scow; 150 m3	7,423	0	0	0	1,310	655	8,733	655	9,388
14	Backhoe with Breaker; 600 kg	44,850	0	3,796	8,316	5,980	2,990	54,626	11,306	65,932
15	Truck; 4.5 ton	7,800	0	1,607	3,687	1,040	520	10,447	4,207	14,654

Notes : \*1 Owning cost is composed of Depreciation value, interest, etc.

\*2 Operation cost includes fuel, oil, grease and operator cost.

Table XII.3.1 (1/2) UNIT COSTS OF CONSTRUCTION WORKS FOR URGENT PROJECT  
(FINANCIAL)

Description	Unit	Unit Cost		
		F.C. (Rp.)	L.C. (Rp.)	Total (Rp.)
1 Excavation; Common 1 in West Floodway	m3	4,600	1,200	5,800
2 Excavation; Common 1 in Garang River	m3	6,700	1,800	8,500
3 Excavation; Common 1 for Embankment	m3	3,800	1,000	4,800
4 Excavation; Common 2 in West Floodway	m3	5,300	1,400	6,700
5 Excavation; Common 2 in Garang River	m3	7,400	2,000	9,400
6 Excavation; River Mouth	m3	6,400	1,900	8,300
7 Embankment	m3	2,000	600	2,600
8 Reinforced Concrete for Weir	m3	254,000	254,000	508,000
9 Reinforced Concrete for Pier	m3	163,000	176,000	339,000
10 Reinforced Concrete for Fixed Weir	m3	189,000	213,000	402,000
11 Retaining Wall; Type A	m	154,000	210,000	364,000
12 Retaining Wall; Type B	m	87,000	144,000	231,000
13 Retaining Wall; Type C (H=9.0 m)	m	3,800,000	2,970,000	6,770,000
14 Retaining Wall; Type D (H=6.0 m)	m	2,270,000	1,890,000	4,160,000
15 Retaining Wall; Type E	m	3,230,000	3,020,000	6,250,000
16 Ground Sill; Type A	m3	335,000	344,000	679,000
17 Ground Sill; Type B	m3	352,000	388,000	740,000
18 Ground Sill; Type C	m3	352,000	388,000	740,000
19 Ground Sill; Type D	m3	352,000	388,000	740,000
20 Revetment; Type A	m2	26,400	35,900	62,300
21 Revetment; Type B	m2	28,000	36,400	64,400
22 Revetment; Type C	m2	41,300	58,800	100,100
23 Pile Driving (D=350mm,L=12m)	pc	466,000	376,000	842,000
24 Pile Driving (D=400mm,L=12m)	pc	565,000	465,000	1,030,000
25 Pile Driving (D=500mm,L=12m)	pc	810,000	700,000	1,510,000
26 Pile Driving (D=500mm,L=15m)	pc	1,000,000	870,000	1,870,000
27 Sheet Pile Driving (t=0.2m,L=3m)	m2	109,000	92,000	201,000
28 Sheet Pile Driving (t=0.3m,L=15m)	m2	146,000	135,000	281,000
29 Log Pile (D=100mm,L=3m)	pc	2,900	6,400	9,300
30 Demolition of Concrete	m3	19,500	7,100	26,600
31 Concrete Block; t=0.5m	m2	24,700	52,500	77,200
32 Gabion Mattress; t=0.5m	m2	12,800	17,800	30,600
33 Sodding	m2	100	1,000	1,100
34 Flap Gate; 1.0m x 1.0m	L.S.	24,300,000	7,000,000	31,300,000
35 Flap Gate; 1.5m x 1.5m	L.S.	64,600,000	8,900,000	73,500,000
36 Flap Gate; 2.0m x 2.0m	L.S.	110,800,000	17,800,000	128,600,000
37 Culvert with Slide Gate; 1.0m * 1.0m	L.S.	213,000,000	164,000,000	377,000,000
38 Culvert with Slide Gate; 1.5m * 1.5m	L.S.	261,000,000	202,000,000	463,000,000
39 Culvert with Slide Gate; 2.0m * 2.0m	L.S.	342,000,000	255,000,000	597,000,000
40 Main Gate 1	m2	25,200,000	10,800,000	36,000,000
41 Main Gate 2	m2	26,600,000	11,400,000	38,000,000
42 Small Roller Gate for Intake	m2	29,400,000	12,600,000	42,000,000
43 Bridge for Weir (Superstructure)	m2	210,000	210,000	420,000
44 Control House & Gate House	L.S.	28,000,000	112,000,000	140,000,000
45 Railway Bridge (Superstructure)	m	8,000,000	1,400,000	9,400,000
46 Concrete Bridge (Superstructure)	m2	260,000	260,000	520,000
47 Retaining Wall; Type A-2B	m	264,000	365,000	629,000
48 Retaining Wall; Type B-1B	m	131,000	219,000	350,000

Table XII.3.1 (2/2) UNIT COSTS OF CONSTRUCTION WORKS FOR URGENT PROJECT (ECONOMIC)

Description	Unit	Unit Cost		
		F.C. (Rp.)	L.C. (Rp.)	Total (Rp.)
1 Excavation; Common 1 in West Floodway	m3	4,200	1,100	5,300
2 Excavation; Common 1 in Garang River	m3	6,100	1,700	7,800
3 Excavation; Common 1 for Embankment	m3	3,500	900	4,400
4 Excavation; Common 2 in West Floodway	m3	4,800	1,300	6,100
5 Excavation; Common 2 in Garang River	m3	6,700	1,800	8,500
6 Excavation; River Mouth	m3	5,800	1,700	7,500
7 Embankment	m3	1,800	500	2,300
8 Reinforced Concrete for Weir	m3	230,000	225,000	455,000
9 Reinforced Concrete for Pier	m3	148,000	157,000	305,000
10 Reinforced Concrete for Fixed Weir	m3	171,000	190,000	361,000
11 Retaining Wall; Type A	m	140,000	189,000	329,000
12 Retaining Wall; Type B	m	79,000	130,000	209,000
13 Retaining Wall; Type C (H=9.0 m)	m	3,430,000	2,660,000	6,090,000
14 Retaining Wall; Type D (H=6.0 m)	m	2,050,000	1,700,000	3,750,000
15 Retaining Wall; Type E	m	2,920,000	2,740,000	5,660,000
16 Ground Sill; Type A	m3	304,000	306,000	610,000
17 Ground Sill; Type B	m3	319,000	338,000	657,000
18 Ground Sill; Type C	m3	319,000	338,000	657,000
19 Ground Sill; Type D	m3	319,000	338,000	657,000
20 Revetment; Type A	m2	23,900	32,200	56,100
21 Revetment; Type B	m2	25,500	32,500	58,000
22 Revetment; Type C	m2	37,500	53,000	90,500
23 Pile Driving (D=350mm,L=12m)	pc	423,000	340,000	763,000
24 Pile Driving (D=400mm,L=12m)	pc	511,000	420,000	931,000
25 Pile Driving (D=500mm,L=12m)	pc	740,000	640,000	1,380,000
26 Pile Driving (D=500mm,L=15m)	pc	900,000	790,000	1,690,000
27 Sheet Pile Driving (t=0.2m,L=3m)	m2	99,000	84,000	183,000
28 Sheet Pile Driving (t=0.3m,L=15m)	m2	132,000	123,000	255,000
29 Log Pile (D=100mm,L=3m)	pc	2,700	5,800	8,500
30 Demolition of Concrete	m3	17,800	6,300	24,100
31 Concrete Block; t=0.5m	m2	22,700	46,700	69,400
32 Gabion Mattress; t=0.5m	m2	11,600	15,200	26,800
33 Sodding	m2	100	800	900
34 Flap Gate; 1.0m x 1.0m	L.S.	22,100,000	6,200,000	28,300,000
35 Flap Gate; 1.5m x 1.5m	L.S.	58,700,000	8,000,000	66,700,000
36 Flap Gate; 2.0m x 2.0m	L.S.	101,200,000	16,200,000	117,400,000
37 Culvert with Slide Gate; 1.0m * 1.0m	L.S.	195,000,000	148,000,000	343,000,000
38 Culvert with Slide Gate; 1.5m * 1.5m	L.S.	238,000,000	182,000,000	420,000,000
39 Culvert with Slide Gate; 2.0m * 2.0m	L.S.	312,000,000	230,000,000	542,000,000
40 Main Gate 1	m2	22,900,000	9,800,000	32,700,000
41 Main Gate 2	m2	24,200,000	10,400,000	34,600,000
42 Small Roller Gate for Intake	m2	26,700,000	11,500,000	38,200,000
43 Bridge for Weir (Superstructure)	m2	190,000	190,000	380,000
44 Control House & Gate House	L.S.	25,500,000	101,800,000	127,300,000
45 Railway Bridge (Superstructure)	m	7,300,000	1,300,000	8,600,000
46 Concrete Bridge (Superstructure)	m2	236,000	236,000	472,000
47 Retaining Wall; Type A-2B	m	239,000	328,000	567,000
48 Retaining Wall; Type B-1B	m	119,000	196,000	315,000

Table XII.3.2 COST COMPARISON OF ALTERNATIVES FOR SIMONGAN WEIR

Item	CASE 1		CASE 2		CASE 3		CASE 4	
	Roller Gate		Radial Gate		Rubber Gate		Tilting Gate	
	Quantity	Total Cost (Mill.Rp.)	Quantity	Total Cost (Mill.Rp.)	Quantity	Total Cost (Mill.Rp.)	Quantity	Total Cost (Mill.Rp.)
1. Civil Works		6,813		6,598		6,211		6,406
(1) Diversion Works & Dewatering	1 LS	324	1 LS	314	1 LS	296	1 LS	305
(2) Demolition	12,000 m3	319	12,000 m3	319	12,000 m3	319	12,000 m3	319
(3) Excavation; Common 2-G	6,710 m3	63	6,780 m3	64	7,090 m3	66	7,090 m3	66
(4) Revetment; Type C	1,110 m2	111	1,110 m2	111	1,110 m2	111	1,110 m2	111
(5) Sodding	570 m2	1	570 m2	1	570 m2	1	570 m2	1
(6) Reinforced Concrete	6,790 m3	3,450	6,510 m3	3,308	5,830 m3	2,962	6,150 m3	3,124
(7) Foundation Pile; D=500mm, L=12m	216 pc	326	252 pc	380	170 pc	257	180 pc	272
D=400mm, L=12m	135 pc	139	108 pc	111	135 pc	139	144 pc	148
D=350mm, L=12m	480 pc	404	480 pc	404	480 pc	404	480 pc	404
(8) Sheet Pile; t=0.2m	1,380 m2	277	1,380 m2	277	1,380 m2	277	1,380 m2	277
(9) Retaining Wall; Type C	80 m	542	80 m	542	80 m	542	80 m	542
(10) Concrete Block; t=0.5m	2,830 m2	219	2,830 m2	219	2,830 m2	219	2,830 m2	219
(11) Gabion Mattress; t=0.5m	2,020 m2	62	2,020 m2	62	2,020 m2	62	2,020 m2	62
(12) Bridge	1,040 m2	436	1,040 m2	436	1,040 m2	436	1,040 m2	436
(13) Control House & Gate House	1 LS	140	1 LS	50	1 LS	120	1 LS	120
2. Steel Works		11,198		12,457		12,149		11,451
(1) Main Gate 1:								
Gate Leaf	236 m2	5,098	244 m2	5,234	253 m2	7,236 *	249 m2	4,656
Guide Frame	1 LS	1,274	1 LS	381	0 LS	0	1 LS	762
Hoisting Equipment	1 LS	2,124	1 LS	2,664	1 LS	1,948	1 LS	3,048
Anchorage	0 LS	0	1 LS	1,237	0 LS	0	0 LS	0
(2) Main Gate 2:								
Gate Leaf	54 m2	1,149	54 m2	1,215	53 m2	1,128	53 m2	1,128
Guide Frame	1 LS	369	1 LS	146	1 LS	363	1 LS	363
Hoisting Equipment	1 LS	534	1 LS	705	1 LS	524	1 LS	524
Anchorage	0 LS	0	1 LS	365	0 LS	0	0 LS	0
(3) Steel Stop Log	1 LS	650	1 LS	510	1 LS	950	1 LS	970
Total		18,011		19,055		18,360		17,857

Note : \* The cost of the rubber gate was made double, because its working life is the half of others.

Table XII.3.3 COST COMPARISON OF ALTERNATIVES FOR WEST FLOODWAY

Item	Alt.1A Excavation		Alt.1B Embankment	
	Quantity	Total Cost (Mill.Rp.)	Quantity	Total Cost (Mill.Rp.)
I. Construction Works		11,158		20,876
1. Preparatory Works		1,015		1,898
2. River Improvement Works		5,591		3,360
(1) Excavation;	Common 1-F	m3 339,000	0	0
	Common 2-F	m3 226,000	0	0
	River Mouth	m3 98,000	0	0
(2) Retaining Wall;	Type A	m 0	1,800	655
	Type B	m 3,000	5,520	1,932
(3) Revetment;	Type A	m2 6,580	9,280	578
	Type B	m2 3,020	3,020	195
3. Reconstruction of Railroad Bridge		1,767		1,783
(1) Demolition		m3 1,050	1,050	27
(2) Excavation;	Common 2-F	m3 11,600	11,600	77
(3) Back Filling		m3 10,700	10,700	27
(4) Reinforced Concrete		m3 960	1,000	339
(5) Foundation Pile; D=500mm, L=15m		pc 100	100	187
(6) Superstructure		m 98	98	921
(7) Approaches		LS 1	1	47
(8) Temporary Bridge		LS 1	1	158
4. Reconstruction of Road Bridge		0		3,195
(1) Demolition		m3 0	4,080	109
(2) Excavation;	Common 2-D	m3 0	33,300	223
(3) Back Filling		m3 0	30,900	81
(4) Reinforced Concrete		m3 0	2,450	830
(5) Foundation Pile; D=500mm, L=15m		pc 0	240	449
(6) Superstructure		LS 0	2,088	1,086
(7) Approaches		LS 0	1	139
(8) Temporary Bridge		LS 0	1	278
5. Others		1,863		8,915
(1) Flap Gate;	1.0m x 1.0m	pc 2	0	0
	1.5m x 1.5m	pc 0	0	0
	2.0m x 2.0m	pc 14	0	0
(2) Culvert with Gate;	1.0m x 1.0m	pc 0	5	1,885
	1.5m x 1.5m	pc 0	1	463
	2.0m x 2.0m	pc 0	11	6,567
6. Miscellaneous Works		922		1,725
II. Compensation Cost		0		0
1. Land Acquisition; Residential	Grade A	m2 0	0	0
	Grade B	m2 0	0	0
	Paddy Land	m2 0	0	0
2. House Evacuation;	Class A	pc 0	0	0
	Class B	pc 0	0	0
	Class C	pc 0	0	0
Total		11,158		20,876



Table XII.3.4 COST COMPARISON OF ALTERNATIVES FOR GARANG RIVER

Item	Unit	Alt.2A Excavation with Movable Weir		Alt.2B Embankment with Fixed Weir	
		Quantity	Total Cost (Mill.Rp.)	Quantity	Total Cost (Mill.Rp.)
I. Construction Works			33,891		30,619
1. Preparatory Works			3,081		2,784
2. River Improvement Works			6,414		4,796
(1) Excavation;	Common 1-G	m3	276,800	0	0
	Common 1-EM	m3	10,200	23,100	111
	Common 2-G	m3	72,000	0	0
(2) Embankment		m3	10,200	23,100	60
(3) Revetment;	Type A	m2	2,110	13,100	816
	Type B	m2	32,200	29,800	1,919
(4) Sodding		m2	3,880	6,940	8
(5) Retaining Wall;	Type A	m	0	2,150	1,353
(6) Ground Sill;	Type A	m3	1,040	0	0
	Type B	m3	110	110	82
	Type C	m3	30	30	23
	Type D	m3	390	390	288
(7) Maintenance Road		LS	0	1	136
3. Reconstruction of Simongan Weir			18,011		7,398
(1) Diversion Works & Dewatering		LS	1	1	313
(2) Demolition		m3	12,000	12,000	319
(3) Excavation;	Common 2-G	m3	6,710	7,950	75
(4) Revetment;	Type C	m2	1,110	1,110	111
(5) Sodding		m2	570	570	1
(6) Reinforced Concrete		m3	6,790	8,800	3,537
(7) Foundation Pile;	D=500mm, L=12m	pc	216	326	126
	D=400mm, L=12m	pc	135	139	180
	D=350mm, L=12m	pc	480	404	404
(8) Sheet Pile;	t=0.2m	m2	1,380	277	1,380
(9) Main Gate 1		m2	236	8,496	0
(10) Main Gate 2		m2	54	2,052	0
(11) Scouring Sluice		m2	0	0	18
(12) Retaining Wall;	Type C	m	80	542	20
(13) Retaining Wall;	Type D	m	0	0	60
(14) Concrete Block;	t=0.5m	m2	2,830	219	2,830
(15) Gabion Mattress;	t=0.5m	m2	2,020	62	2,020
(16) Bridge		m2	1,040	436	1,040
(17) Control House & Gate House		LS	1	140	1
(18) Steel Stop Log		LS	1	650	0
4. Intake Structure			2,334		1,817
(1) Demolition		m3	350	9	350
(2) Excavation;	Common 2-G	m3	150	1	0
(3) Reinforced Concrete		m3	510	260	440
(4) Foundation Pile;	D=350mm, L=12m	pc	60	51	60
(5) Sheet Pile;	t=0.2m	m2	240	48	240
(6) Gate		m2	30	1,260	22
(7) Retaining Wall;	Type C	m	55	372	0
	Type D	m	80	333	135
5. Others			1,250		11,293
(1) Retaining Wall for PDAM; Type E		m2	200	1,250	200
(2) Flap Gate;	1.0m x 1.0m	pc	0	0	9
(3) Culvert with Gate;	1.0m x 1.0m	pc	0	0	15
	1.5m x 1.5m	pc	0	0	5
	2.0m x 2.0m	pc	0	0	3
6. Miscellaneous Works			2,801		2,531
II. Compensation Cost			0		688
1. Land Acquisition; Residential	Grade A	m2	0	0	3,000
	Grade B	m2	0	0	0
	Paddy Land	m2	0	0	3,000
2. House Evacuation;	Class A	pc	0	0	0
	Class B	pc	0	0	25
	Class C	pc	0	0	106
Total			33,891		31,307

Table XII.3.5 SUMMARY OF URGENT PROJECT COST (FINANCIAL)

Description	Amount			Total (1,000 US\$)	Total (Mill.Yen)
	F.C. (Mill.Rp.)	L.C. (Mill.Rp.)	Total (Mill.Rp.)		
I. Construction Base Cost	34,700	24,646	59,346	29,191	3,663
1. Preparatory Works	2,659	1,436	4,095	2,014	253
2. West Floodway Improvement Works	3,904	1,687	5,591	2,750	345
3. Garang River Improvement Works	3,940	2,474	6,414	3,155	396
4. Reconstruction of Simongan Weir	11,330	6,681	18,011	8,859	1,112
5. Intake Structure	1,465	869	2,334	1,148	144
6. Others	3,536	1,344	4,880	2,400	301
7. Miscellaneous Works	2,418	1,306	3,724	1,832	230
Sub-total	29,252	15,797	45,049	22,159	2,781
8. Price Contingency ; F.C.3% & L.C.8%	5,448	8,849	14,297	7,032	883
II. Compensation Cost	0	0	0	0	0
III. Administration Cost	0	4,924	4,924	2,422	304
1. Administration	0	3,154	3,154	1,551	195
2. Price Contingency ; F.C.3% & L.C.8%	0	1,770	1,770	871	109
IV. Engineering Service	6,948	3,950	10,898	5,361	673
1. Detailed Design	2,958	1,385	4,343	2,136	268
2. Construction Supervision	3,172	1,454	4,626	2,275	286
3. Price Contingency ; F.C.3% & L.C.8%	818	1,111	1,929	949	119
V. Physical Contingency; 10% of I+II+IV	4,165	2,860	7,025	3,455	434
VI. Total (I+II+III+IV+V)	45,813	36,380	82,193	40,429	5,074
VII. Value Added Tax ; 10% of VI	0	8,219	8,219	4,043	507
VIII. Grand Total	45,813	44,599	90,412	44,472	5,581
Grand Total (1,000 US\$)	22,535	21,937	44,472		
Grand Total (Mill.Yen)	2,828	2,753	5,581		

Notes : \*1 Price Level in July,1992

\*2 Conversion Rate US\$ 1.00 = Rp.2,033, 1 Yen = Rp.16.20

Table XII.3.6 ANNUAL DISBURSEMENT SCHEDULE FOR URGENT PROJECT (FINANCIAL)

Unit: Million Rp.

Description	Amount		1994/1995		1995/1996		1996/1997		1997/1998		1998/1999		1999/2000		2000/2001	
	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.
I. Construction Base Cost	34,700	24,646	0	0	0	0	0	0	14,011	9,457	14,075	10,680	6,614	4,509	0	0
1. Preparatory Works	2,659	1,436	0	0	0	0	0	0	1,330	718	1,329	718	0	0	0	0
2. West Floodway Improvement Works	3,904	1,687	0	0	0	0	0	0	2,767	1,180	1,117	507	0	0	0	0
3. Garing River Improvement Works	3,940	2,474	0	0	0	0	0	0	797	359	2,689	1,784	454	331	0	0
4. Reconstruction of Simongan Weir	11,330	6,681	0	0	0	0	0	0	4,898	2,849	5,500	3,147	932	685	0	0
5. Intake Structure	1,465	869	0	0	0	0	0	0	0	0	41	39	1,424	830	0	0
6. Others	3,536	1,344	0	0	0	0	0	0	1,549	938	387	143	1,600	263	0	0
7. Miscellaneous Works	2,418	1,306	0	0	0	0	0	0	725	392	725	392	968	522	0	0
Sub-total	39,252	15,797	0	0	0	0	0	0	12,086	6,436	11,788	6,730	5,378	2,631	0	0
8. Price Contingency : F.C.3% & L.C.8%	5,448	8,849	0	0	0	0	0	0	1,925	3,021	2,287	3,950	1,236	1,878	0	0
II. Compensation Cost	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
III. Administration Cost	0	4,924	0	0	0	0	0	0	0	1,906	0	2,057	0	961	0	0
1. Administration	0	3,154	0	0	0	0	0	0	0	1,297	0	1,296	0	561	0	0
2. Price Contingency : F.C.3% & L.C.8%	0	1,770	0	0	0	0	0	0	0	609	0	761	0	400	0	0
IV. Engineering Service	5,948	3,950	1,569	807	1,616	873	0	0	1,512	879	1,557	949	694	442	0	0
1. Detailed Design	2,956	1,385	1,479	692	1,479	693	0	0	0	0	0	0	0	0	0	0
2. Construction Supervision	3,172	1,454	0	0	0	0	0	0	1,304	598	1,304	598	564	258	0	0
3. Price Contingency : F.C.3% & L.C.8%	818	1,111	90	115	137	180	0	0	208	281	253	351	130	184	0	0
V. Physical Contingency : 10% of I+II+IV	4,165	2,860	157	81	162	87	0	0	1,552	1,034	1,563	1,163	731	495	0	0
VI. Total (I+II+III+IV+V)	45,813	36,380	1,726	888	1,778	960	0	0	17,075	13,276	17,195	14,849	8,039	6,407	0	0
VII. Value Added Tax : 10% of VI	0	8,219	0	261	0	274	0	0	0	3,035	0	3,204	0	1,445	0	0
VIII. Grand Total	45,813	44,599	1,726	1,149	1,778	1,234	0	0	17,075	16,311	17,195	18,053	8,039	7,852	0	0

Notes : \*1 Price Level in July, 1992  
 \*2 Conversion Rate US\$ 1.00 = Rp.2,033, 1 Yen = Rp.16.20

Table XII.3.7 COST BREAKDOWN FOR URGENT PROJECT (FINANCIAL)

Item	Quantity	Unit Price		Amount		
		F.C. (1,000Rp.)	L.C. (1,000Rp.)	F.C. (Mill.Rp.)	L.C. (Mill.Rp.)	Total (Mill.Rp.)
1.Preparatory Works				2,659	1,436	4,095
2.West Floodway Improvement Works				3,904	1,687	5,591
(1) Excavation; Common 1-F	339,000 m3	4.6	1.2	1,559	407	1,966
Common 2-F	226,000 m3	5.3	1.4	1,198	316	1,514
River Mouth	98,000 m3	6.4	1.9	627	186	813
(2) Retaining Wall; Type B	3,000 m	87.0	144.0	261	432	693
(3) Revetment; Type A	6,580 m2	26.4	35.9	174	236	410
Type B	3,020 m2	28.0	36.4	85	110	195
3.Garang River Improvement Works				3,940	2,474	6,414
(1) Excavation; Common 1-G	276,800 m3	6.7	1.8	1,855	498	2,353
Common 1-EH	10,200 m3	3.8	1.0	39	10	49
Common 2-G	72,000 m3	7.4	2.0	533	144	677
(2) Embankment	10,200 m3	2.0	0.6	20	6	26
(3) Revetment; Type A	2,110 m2	26.4	35.9	56	76	132
Type B	32,200 m2	28.0	36.4	902	1,172	2,074
(4) Sodding	3,880 m2	0.1	1.0	0	4	4
(5) Groundsill; Type A	1,040 m3	335.0	344.0	348	358	706
Type B	110 m3	352.0	388.0	39	43	82
Type C	30 m3	352.0	388.0	11	12	23
Type D	390 m3	352.0	388.0	137	151	288
4.Reconstruction of Simongan Weir				11,330	6,681	18,011
(1) Diversion Works & Dewatering	1 LS	166,000.0	158,000.0	166	158	324
(2) Demolition	12,000 m3	19.5	7.1	234	85	319
(3) Excavation; Common 2-G	6,710 m3	7.4	2.0	50	13	63
(4) Revetment; Type C	1,110 m2	41.3	58.8	46	65	111
(5) Sodding	570 m2	0.1	1.0	0	1	1
(6) Reinforced Concrete	6,790 m3	254.0	254.0	1,725	1,725	3,450
(7) Foundation Pile; D=500mm,L=12m	216 pc	810.0	700.0	175	151	326
D=400mm,L=12m	135 pc	565.0	465.0	76	63	139
D=350mm,L=12m	480 pc	466.0	376.0	224	180	404
(8) Sheet Pile; t=0.2m	1,380 m2	109.0	92.0	150	127	277
(9) Main Gate 1	236 m2	25,200.0	10,800.0	5,947	2,549	8,496
(10) Main Gate 2	54 m2	26,600.0	11,400.0	1,436	616	2,052
(11) Retaining Wall; Type C	80 m	3,800.0	2,970.0	304	238	542
(12) Concrete Block; t=0.5m	2,830 m2	24.7	52.5	70	149	219
(13) Gabion Mattress; t=0.5m	2,020 m2	12.8	17.8	26	36	62
(14) Bridge	1,040 m2	210.0	210.0	218	218	436
(15) Control House & Gate House	1 LS	28,000.0	112,000.0	28	112	140
(16) Steel Stop Log	1 LS	455,000.0	195,000.0	455	195	650
5.Intake Structure				1,465	869	2,334
(1) Demolition	350 m3	19.5	7.1	7	2	9
(2) Excavation; Common 2	150 m3	7.4	2.0	1	0	1
(3) Reinforced Concrete	510 m3	254.0	254.0	130	130	260
(4) Foundation Pile; D=350mm,L=12m	60 pc	466.0	376.0	28	23	51
(5) Sheet Pile; t=0.2m	240 m2	109.0	92.0	26	22	48
(6) Gate	30 m2	29,400.0	12,600.0	882	378	1,260
(7) Retaining Wall; Type C	55 m	3,800.0	2,970.0	209	163	372
Type D	80 m	2,270.0	1,890.0	182	151	333
6.Others				3,536	1,344	4,880
(1) Railway Bridge	1 LS	1,290,000.0	477,000.0	1,290	477	1,767
(2) Retaining Wall for PDAM; Type E	200 m	3,230.0	3,020.0	646	604	1,250
(3) Flap Gate; 1.0m x 1.0m	2 pc	24,300.0	7,000.0	49	14	63
1.5m x 1.5m	0 pc	64,600.0	8,900.0	0	0	0
2.0m x 2.0m	14 pc	110,800.0	17,800.0	1,551	249	1,800
7.Miscellaneous Works				2,418	1,306	3,724
<b>Total</b>				<b>29,252</b>	<b>15,797</b>	<b>45,049</b>

Table XII.3.8 ANNUAL DISBURSEMENT SCHEDULE FOR URGENT PROJECT (ECONOMIC)

Unit: Million Rp.

Description	Amount		1994/1995		1995/1996		1996/1997		1997/1998		1998/1999		1999/2000		2000/2001		
	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.	
I. Construction Base Cost	26,583	14,263	40,846														
1. Preparatory Works	2,417	1,297	3,714														
2. West Floodway Improvement Works	3,548	1,534	5,082														
3. Garang River Improvement Works	3,580	2,230	5,810														
4. Reconstruction of Simongan Weir	10,293	6,018	16,311														
5. Intake Structure	1,327	784	2,111														
6. Others	3,221	1,221	4,442														
7. Miscellaneous Works	2,197	1,179	3,376														
Sub-total	26,583	14,263	40,846														
8. Price Contingency : F.C.0% & L.C.0%	0	0	0														
II. Compensation Cost	0	0	0														
III. Administration Cost	0	3,154	3,154														
1. Administration	0	3,154	3,154														
2. Price Contingency : F.C.0% & L.C.0%	0	0	0														
IV. Engineering Service	6,130	2,839	8,969														
1. Detailed Design	2,958	1,385	4,343														
2. Construction Supervision	3,172	1,454	4,626														
3. Price Contingency : F.C.0% & L.C.0%	0	0	0														
V. Physical Contingency : 10% of I+II+IV	3,274	1,709	4,983														
VI. Total (I+II+III+IV+V)	35,987	21,965	57,952														
VII. Value Added Tax : 0% of VI	0	0	0														
VIII. Grand Total	35,987	21,965	57,952														

Notes : \*1 Price Level in July, 1992  
 \*2 Conversion Rate US\$ 1.00 = Rp. 2,033, 1 Yen = Rp. 16.20

Table XII.3.9 ANNUAL OMR COST FOR URGENT PROJECT (ECONOMIC)

Item	Quantity	Unit Price		Amount			
		F.C.	L.C.	F.C.	L.C.	Total	
		(1,000Rp.)	(1,000Rp.)	(Mill.Rp.)	(Mill.Rp.)	(Mill.Rp.)	
<b>I. Civil Works</b>				103.1	61.5	164.6	
<b>1. West Floodway</b>				18.1	8.5	26.6	
(1) Excavation;	Common 1-F	1,700 m3	4.2	1.1	7.1	1.9	9.0
	Common 2-F	1,100 m3	4.8	1.3	5.3	1.4	6.7
	River Mouth	500 m3	5.8	1.7	2.9	0.9	3.8
(2) Retaining Wall;	Type B	20 m	79.0	130.0	1.6	2.6	4.2
(3) Revetment;	Type A	30 m2	23.9	32.2	0.7	1.0	1.7
	Type B	20 m2	25.5	32.5	0.5	0.7	1.2
<b>2. Garang River</b>				19.2	12.3	31.5	
(1) Excavation;	Common 1-G	1,400 m3	6.1	1.7	8.5	2.4	10.9
	Common 1-EM	50 m3	3.5	0.9	0.2	0.0	0.2
	Common 2-G	400 m3	6.7	1.8	2.7	0.7	3.4
(2) Embankment		50 m3	1.8	0.5	0.1	0.0	0.1
(3) Revetment;	Type A	10 m2	23.9	32.2	0.2	0.3	0.5
	Type B	200 m2	25.5	32.5	5.1	6.5	11.6
(4) Ground Sill		1 LS	2,390.0	2,400.0	2.4	2.4	4.8
<b>3. Simongan Weir</b>				31.8	22.7	54.5	
(1) Excavation;	Common 2-G	30 m3	6.7	1.8	0.2	0.1	0.3
(2) Revetment;	Type C	10 m2	37.5	53.0	0.4	0.5	0.9
(3) Sodding		10 m2	0.1	0.8	0.0	0.0	0.0
(4) Reinforced Concrete		30 m3	230.0	225.0	6.9	6.8	13.7
(5) Main Gate 1 (Painting)		1 LS	13,200.0	6,600.0	13.2	6.6	19.8
(6) Main Gate 2 (Painting)		1 LS	3,020.0	1,510.0	3.0	1.5	4.5
(7) Retaining Wall; Type C		1 LS	3,430.0	2,660.0	3.4	2.7	6.1
(8) Concrete Block; t=0.5m		20 m2	22.7	46.7	0.5	0.9	1.4
(9) Gabion Mattress; t=0.5m		10 m2	11.6	15.2	0.1	0.2	0.3
(10) Bridge		1 LS	990.0	990.0	1.0	1.0	2.0
(11) Control House & Gate House		1 LS	255.0	1,018.0	0.3	1.0	1.3
(12) Steel Stop Log (Painting)		1 LS	2,800.0	1,400.0	2.8	1.4	4.2
<b>4. Intake Structure</b>				8.5	6.3	14.8	
(2) Excavation;	Common 2-G	10 m3	6.7	1.8	0.1	0.0	0.1
(3) Reinforced Concrete		5 m3	230.0	225.0	1.2	1.1	2.3
(6) Gate (Painting)		1 LS	1,680.0	840.0	1.7	0.8	2.5
(7) Retaining Wall; Type C		1 LS	3,430.0	2,660.0	3.4	2.7	6.1
	Type D	1 LS	2,050.0	1,700.0	2.1	1.7	3.8
<b>5. Others</b>				16.1	6.1	22.2	
(1) Railway Bridge		1 LS	5,880.0	2,170.0	5.9	2.2	8.1
(2) Retaining Wall for PDAM; Type E		1 LS	2,920.0	2,740.0	2.9	2.7	5.6
(3) Flap Gate;	1.0m x 1.0m	2 pc	111.0	31.0	0.2	0.1	0.3
	1.5m x 1.5m	0 pc	294.0	40.0	0.0	0.0	0.0
	2.0m x 2.0m	14 pc	506.0	81.0	7.1	1.1	8.2
<b>6. Miscellaneous Works</b>				9.4	5.6	15.0	
<b>II. Administration Cost</b>				0.0	55.4	55.4	
<b>1. Electrical Charge</b>				0.0	24.0	24.0	
<b>2. Administration Cost</b>				0.0	31.4	31.4	
<b>Total</b>				103.1	116.9	220.0	

Table XII.4.1 UNIT COSTS OF CONSTRUCTION WORKS FOR MASTER PLAN

Description	Unit	Unit Cost		
		F.C. (Rp.)	L.C. (Rp.)	Total (Rp.)
1 Excavation; Common 1	m3	5,100	1,400	6,500
2 Excavation; Common 1 for Embankment	m3	3,800	1,000	4,800
3 Excavation; Common 2	m3	5,800	1,500	7,300
4 Embankment	m3	2,000	600	2,600
5 Retaining Wall; Type A	m	154,000	210,000	364,000
6 Retaining Wall; Type B	m	87,000	144,000	231,000
7 Retaining Wall; Type C (H=9.0 m)	m	3,800,000	2,970,000	6,770,000
8 Retaining Wall; Type D (H=6.0 m)	m	2,270,000	1,890,000	4,160,000
9 Retaining Wall; Type E	m	3,230,000	3,020,000	6,250,000
10 Ground Sill	m3	352,000	388,000	740,000
11 Revetment	m2	28,000	36,400	64,400
12 Demolition of Concrete	m3	19,500	7,100	26,600
13 Concrete Block; t=0.5m	m2	24,700	52,500	77,200
14 Gabion Mattress; t=0.5m	m2	12,800	17,800	30,600
15 Sodding	m2	100	1,000	1,100
16 Railway Bridge	m	13,000,000	5,000,000	18,000,000
17 Concrete Bridge	m2	830,000	700,000	1,530,000
18 Relocation Road	m2	20,000	30,000	50,000

Table XII.4.2 UNIT COSTS OF CHANNEL IMPROVEMENT WORKS FOR MASTER PLAN

for 1m

Item	Unit Cost 1 *1			Unit Cost 2 *2		
	F.C. (1,000Rp.)	L.C. (1,000Rp.)	Total (1,000Rp.)	F.C. (1,000Rp.)	L.C. (1,000Rp.)	Total (1,000Rp.)
I. Open Channel (Type A)						
1. Siringin	327	101	428	327	101	428
2. Tenggang	458	140	598	458	140	598
3. Banger	371	113	484	371	113	484
II. Open Channel (Type B)						
1. Semarang	451	448	899	451	448	899
III. Open Channel (Type C)						
1. Siringin	490	689	1,179	426	653	1,079
2. Tenggang	449	683	1,132	426	682	1,108
3. Semarang	410	591	1,001	410	591	1,001
4. Banger	543	695	1,238	543	695	1,238
5. Bulu	249	443	692	248	443	691
6. Ronggolawe	381	588	969	381	588	969
7. Karangayu	364	579	943	364	579	943
8. Tawang	359	593	952	359	593	952
9. Silandak	316	479	795	316	479	795
IV. Open Channel (Type D)						
1. Tenggang	690	988	1,678	690	988	1,678
2. Banger	0	0	0	461	844	1,305
V. Open Channel (Type E)						
1. Banger	1,183	944	2,127	1,183	944	2,127
2. Ronggolawe	1,148	935	2,083	1,148	935	2,083
3. Karangayu	1,110	925	2,035	1,110	925	2,035
VI. Open Channel (Type F)						
1. Semarang	1,144	934	2,078	1,144	934	2,078
VII. Covered Channel (Type G)						
1. Banger	0	0	0	620	605	1,225
2. Bulu	0	0	0	431	428	859
VIII.Box Culvert for 1m <sup>3</sup>	104	103	207	104	103	207

Notes : \*1 The improvement costs of the surveyed primary channels.

: \*2 The improvement costs of the surveyed and other primary channels.



Table XII.4.3 (1/8) COST BREAKDOWN FOR BLORONG RIVER IMPROVEMENT

Unit : Million Rp.

Item	Design Discharge (Q=60m <sup>3</sup> /s)		Design Discharge (Q=100m <sup>3</sup> /s)		Design Discharge (Q=300m <sup>3</sup> /s)		Design Discharge (Q=400m <sup>3</sup> /s)		Design Discharge (Q=500m <sup>3</sup> /s)		Design Discharge (Q=630m <sup>3</sup> /s)	
	Quantity	Unit Cost	Quantity	Unit Cost	Quantity	Unit Cost	Quantity	Unit Cost	Quantity	Unit Cost	Quantity	Unit Cost
I. Construction Base Cost		5,352		5,799		25,037		31,389		39,697		60,852
1. Preparatory Works		487		527		2,276		2,854		3,609		5,532
2. Excavation; Common 1	34,500	m <sup>3</sup>	74,400	m <sup>3</sup>	1,544,800	m <sup>3</sup>	2,019,500	m <sup>3</sup>	2,615,100	m <sup>3</sup>	4,415,900	m <sup>3</sup>
3. Excavation; Common 2	46,300	m <sup>3</sup>	94,600	m <sup>3</sup>	455,100	m <sup>3</sup>	647,800	m <sup>3</sup>	887,400	m <sup>3</sup>	1,334,700	m <sup>3</sup>
4. Embankment	128,300	m <sup>3</sup>	91,200	m <sup>3</sup>	175,500	m <sup>3</sup>	169,300	m <sup>3</sup>	176,600	m <sup>3</sup>	172,900	m <sup>3</sup>
5. Revetment; Type B	53,300	m <sup>2</sup>	3,432	m <sup>2</sup>	50,200	m <sup>2</sup>	52,900	m <sup>2</sup>	58,300	m <sup>2</sup>	67,900	m <sup>2</sup>
6. Sodding	24,300	m <sup>2</sup>	22,300	m <sup>2</sup>	25,000	m <sup>2</sup>	24,700	m <sup>2</sup>	26,300	m <sup>2</sup>	29,600	m <sup>2</sup>
7. Railway Bridge	0	m	0	m	80	m	88	m	102	m	160	m
8. Road Bridge	45	m <sup>2</sup>	48	m <sup>2</sup>	1,419	m <sup>2</sup>	1,717	m <sup>2</sup>	2,125	m <sup>2</sup>	2,686	m <sup>2</sup>
9. Miscellaneous Works		442		479		2,069		2,594		3,281		5,029
II. Compensation Cost		0		0		3,533		6,220		8,885		16,074
I. Land Acquisition												
Residential Area; Grade A	0.00	ha	0.00	ha	0.00	ha	0.00	ha	0.00	ha	0.00	ha
Residential Area; Grade B	0.00	ha	0.00	ha	0.00	ha	0.00	ha	0.00	ha	0.00	ha
Residential Area; Grade C	0.00	ha	0.00	ha	3.00	ha	150	ha	265	ha	375	ha
Paddy Land; Urban	0.00	ha	0.00	ha	0.00	ha	0.00	ha	0.00	ha	0.00	ha
Paddy Land; Rural	0.00	ha	0.00	ha	26.50	ha	47.30	ha	67.60	ha	122.30	ha
2. House Evacuation												
Class A	0	pc	0	pc	0	pc	0	pc	0	pc	0	pc
Class B	0	pc	0	pc	99	pc	693	pc	1,225	pc	1,750	pc
Class C	0	pc	0	pc	0	pc	0	pc	0	pc	0	pc
III. Administration Cost		375		406		2,000		2,633		3,401		5,385
IV. Engineering Cost		803		870		3,756		4,708		5,955		9,128
V. Physical Contingency		616		667		3,233		4,232		5,454		8,605
VI. Total		7,146		7,742		37,559		49,182		63,392		100,044

Remarks : The design discharge of 100 m<sup>3</sup>/s is selected as the optimum plan.

Table XII.4.3 (2/8) COST BREAKDOWN FOR BRINGIN RIVER IMPROVEMENT

Unit : Million Rp.

Item	Design Discharge (Q=120m <sup>3</sup> /s)		Design Discharge (Q=270m <sup>3</sup> /s)		Design Discharge (Q=320m <sup>3</sup> /s)	
	Quantity	Unit Cost	Quantity	Unit Cost	Quantity	Unit Cost
I. Construction Base Cost	5,214	7,974	11,320	15,813		
1. Preparatory Works	474	725	1,029	1,438		
2. Excavation; Common 1	76,600 m <sup>3</sup>	498	89,100 m <sup>3</sup>	579	97,000 m <sup>3</sup>	631
3. Excavation; Common 2	18,300 m <sup>3</sup>	133	18,300 m <sup>3</sup>	133	18,300 m <sup>3</sup>	133
4. Embankment	113,800 m <sup>3</sup>	296	238,800 m <sup>3</sup>	621	1,216,000 m <sup>3</sup>	3,162
5. Revetment; Type B	9,300 m <sup>2</sup>	599	12,800 m <sup>2</sup>	824	15,200 m <sup>2</sup>	979
6. Sodding	12,200 m <sup>2</sup>	13	15,500 m <sup>2</sup>	18	17,900 m <sup>2</sup>	20
7. Railway Bridge	73 m	1,314	123 m	2,214	241 m	4,338
8. Road Bridge	952 m <sup>2</sup>	1,456	1,471 m <sup>2</sup>	2,251	2,487 m <sup>2</sup>	3,805
9. Miscellaneous Works	431	659	936	1,307		
II. Compensation Cost	2,287	4,169	4,169	4,169		
I. Land Acquisition						
Residential Area; Grade A	0.00 ha	0	0.00 ha	0	0.00 ha	0
Residential Area; Grade B	1.80 ha	360	3.30 ha	660	3.30 ha	660
Residential Area; Grade C	0.00 ha	0	0.00 ha	0	0.00 ha	0
Paddy Land; Urban	0.00 ha	0	0.00 ha	0	0.00 ha	0
Paddy Land; Rural	16.50 ha	1,650	29.90 ha	2,990	29.90 ha	2,990
2. House Evacuation						
Class A	13 pc	195	25 pc	375	25 pc	375
Class B	7 pc	49	12 pc	84	12 pc	84
Class C	11 pc	33	20 pc	60	20 pc	60
III. Administration Cost	525	850	1,084	1,399		
IV. Engineering Cost	782	1,196	1,698	2,372		
V. Physical Contingency	828	1,334	1,719	2,235		
VI. Total	9,636	15,523	19,990	25,988		

Remarks : The design discharge of 320 m<sup>3</sup>/s is selected as the optimum plan.

Table XII.4.3 (3/8) COST BREAKDOWN FOR BRINGIN FLOODWAY

Unit : Million Rp.

Item	Design Discharge (Q=50m <sup>3</sup> /s)		Design Discharge (Q=100m <sup>3</sup> /s)		Design Discharge (Q=200m <sup>3</sup> /s)	
	Quantity	Unit Cost	Quantity	Unit Cost	Quantity	Unit Cost
I. Construction Base Cost		15,439		18,501		25,457
1. Preparatory Works		1,404		1,682		2,314
2. Excavation; Common 1	0	m <sup>3</sup>	0	m <sup>3</sup>	0	m <sup>3</sup>
3. Excavation; Common 2	108,300	m <sup>3</sup>	216,700	m <sup>3</sup>	366,700	m <sup>3</sup>
4. Embankment	54,000	m <sup>3</sup>	54,000	m <sup>3</sup>	54,000	m <sup>3</sup>
5. Revetment; Type B	6,400	m <sup>2</sup>	6,400	m <sup>2</sup>	9,900	m <sup>2</sup>
6. Sodding	20,000	m <sup>2</sup>	20,000	m <sup>2</sup>	20,000	m <sup>2</sup>
7. Railway Bridge	12	m	21	m	37	m
8. Road Bridge	121	m <sup>2</sup>	203	m <sup>2</sup>	366	m <sup>2</sup>
9. Fixed Weir	1	L.S.	1	L.S.	1	L.S.
10. Diversion Gate	1	L.S.	1	L.S.	1	L.S.
11. Ground Sill	1	L.S.	1	L.S.	1	L.S.
12. Miscellaneous Works		3,657		6,178		11,204
		1,276		1,529		2,104
II. Compensation Cost		976		1,673		2,531
I. Land Acquisition						
Residential Area; Grade A	0.00	ha	0.00	ha	0.00	ha
Residential Area; Grade B	0.77	ha	1.33	ha	2.02	ha
Residential Area; Grade C	0.00	ha	0.00	ha	0.00	ha
Paddy Land; Urban	0.00	ha	0.00	ha	0.00	ha
Paddy Land; Rural	6.96	ha	11.98	ha	18.17	ha
2. House Evacuation						
Class A	6	pc	10	pc	15	pc
Class B	3	pc	5	pc	7	pc
Class C	5	pc	8	pc	12	pc
III. Administration Cost		1,149		1,412		1,959
IV. Engineering Cost		2,316		2,775		3,819
V. Physical Contingency		1,873		2,295		3,181
VI. Total		21,753		26,556		36,947

Remarks : This floodway is not applied as the optimum plan.

Table XII.4.3 (4/8) COST BREAKDOWN FOR SILANDAK RIVER IMPROVEMENT

Unit : Million Rp.

Item	Design Discharge (Q=120m <sup>3</sup> /s)		Remarks
	Quantity	Unit Cost	
I. Construction Base Cost		6,983	
1. Preparatory Works		635	
2. Excavation; Common 1	213,400	m <sup>3</sup>	
3. Excavation; Common 2	30,500	m <sup>3</sup>	
4. Embankment	1,100	m <sup>3</sup>	
5. Revetment; Type B	21,300	m <sup>2</sup>	
6. Sodding	3,000	m <sup>2</sup>	
7. Railway Bridge	61	m	
8. Road Bridge	1,102	m <sup>2</sup>	
9. Miscellaneous Works		577	
II. Compensation Cost		1,715	
I. Land Acquisition			
Residential Area; Grade A	0.00	ha	0
Residential Area; Grade B	4.90	ha	980
Residential Area; Grade C	0.00	ha	0
Paddy Land; Urban	4.90	ha	735
Paddy Land; Rural	0.00	ha	0
2. House Evacuation			
Class A	0	pc	0
Class B	0	pc	0
Class C	0	pc	0
III. Administration Cost		609	
IV. Engineering Cost		1,047	
V. Physical Contingency		975	
VI. Total		11,329	

Table XII.4.3 (5/8) COST BREAKDOWN FOR GARANG RIVER IMPROVEMENT

Unit : Million Rp.

Item	Design Discharge (Q=740m <sup>3</sup> /s)		Design Discharge (Q=770m <sup>3</sup> /s)		Design Discharge (Q=850m <sup>3</sup> /s)		Design Discharge (Q=900m <sup>3</sup> /s)		Design Discharge (Q=980m <sup>3</sup> /s)	
	Quantity	Unit Cost	Quantity	Unit Cost	Quantity	Unit Cost	Quantity	Unit Cost	Quantity	Unit Cost
I. Construction Base Cost	31,138		33,901		37,619		40,113		43,858	
1. Preparatory Works		2,831		3,082		3,420		3,647		3,987
2. Excavation; Common 1	432,000	m <sup>3</sup>	474,600	m <sup>3</sup>	557,900	m <sup>3</sup>	676,200	m <sup>3</sup>	866,100	m <sup>3</sup>
3. Excavation; Common 2	0	m <sup>3</sup>	0	m <sup>3</sup>	0	m <sup>3</sup>	0	m <sup>3</sup>	0	m <sup>3</sup>
4. Embankment	8,900	m <sup>3</sup>	6,900	m <sup>3</sup>	12,900	m <sup>3</sup>	14,600	m <sup>3</sup>	12,800	m <sup>3</sup>
5. Revetment; Type B	34,100	m <sup>2</sup>	34,600	m <sup>2</sup>	35,800	m <sup>2</sup>	36,200	m <sup>2</sup>	37,200	m <sup>2</sup>
6. Sodding	4,200	m <sup>2</sup>	4,300	m <sup>2</sup>	4,600	m <sup>2</sup>	4,700	m <sup>2</sup>	5,000	m <sup>2</sup>
7. Railway Bridge	0	m	0	m	0	m	0	m	0	m
8. Road Bridge	0	m <sup>2</sup>	0	m <sup>2</sup>	0	m <sup>2</sup>	0	m <sup>2</sup>	0	m <sup>2</sup>
10. Retaining Wall	1	L.S.	1	L.S.	1	L.S.	1	L.S.	1	L.S.
11. Ground Sill	1	L.S.	1	L.S.	1	L.S.	1	L.S.	1	L.S.
12. Relocation Road	1	L.S.	1	L.S.	1	L.S.	1	L.S.	1	L.S.
13. Reconstruction of Simongan Weir	17,270		18,000		19,800		21,060		22,860	
14. Intake Structure	2,334		2,334		2,334		2,334		2,334	
15. Miscellaneous Works	2,573		2,802		3,109		3,315		3,625	
II. Compensation Cost	0		0		197		3,599		9,660	
1. Land Acquisition										
Residential Area; Grade A	0.00	ha	0.00	ha	0.30	ha	5.60	ha	15.05	ha
Residential Area; Grade B	0.00	ha	0.00	ha	0.00	ha	0.00	ha	0.00	ha
Residential Area; Grade C	0.00	ha	0.00	ha	0.00	ha	0.00	ha	0.00	ha
Paddy Land; Urban	0.00	ha	0.00	ha	0.00	ha	0.00	ha	0.00	ha
Paddy Land; Rural	0.00	ha	0.00	ha	0.00	ha	0.00	ha	0.00	ha
2. House Evacuation										
Class A	0	pc	0	pc	2	pc	37	pc	98	pc
Class B	0	pc	0	pc	2	pc	25	pc	68	pc
Class C	0	pc	0	pc	1	pc	23	pc	63	pc
III. Administration Cost	2,180		2,373		2,647		3,060		3,746	
IV. Engineering Cost	6,743		7,245		8,019		8,544		9,322	
V. Physical Contingency	3,788		4,115		4,584		5,226		6,284	
VI. Total	43,849		47,634		53,066		60,542		72,870	

Remarks : The design discharge of 770 m<sup>3</sup>/s is selected as the optimum plan.

Table XII.4.3 (6/8) COST BREAKDOWN FOR WEST FLOODWAY IMPROVEMENT

Unit : Million Rp.

Item	Design Discharge (Q=740m <sup>3</sup> /s)		Design Discharge (Q=770m <sup>3</sup> /s)		Design Discharge (Q=850m <sup>3</sup> /s)		Design Discharge (Q=900m <sup>3</sup> /s)		Design Discharge (Q=980m <sup>3</sup> /s)	
	Quantity	Unit Cost	Quantity	Unit Cost	Quantity	Unit Cost	Quantity	Unit Cost	Quantity	Unit Cost
<b>I. Construction Base Cost</b>		10,140		10,491		22,243		23,973		26,739
1. Preparatory Works		922		954		2,022		2,179		2,431
2. Excavation; Common 1	397,900	m <sup>3</sup>	428,500	m <sup>3</sup>	519,100	m <sup>3</sup>	600,100	m <sup>3</sup>	732,700	m <sup>3</sup>
3. Excavation; Common 2	200,500	m <sup>3</sup>	204,800	m <sup>3</sup>	229,700	m <sup>3</sup>	244,800	m <sup>3</sup>	268,900	m <sup>3</sup>
4. Embankment	0	m <sup>3</sup>	0	m <sup>3</sup>	0	m <sup>3</sup>	0	m <sup>3</sup>	0	m <sup>3</sup>
5. Revetment; Type B	9,300	m <sup>2</sup>	9,400	m <sup>2</sup>	9,500	m <sup>2</sup>	9,600	m <sup>2</sup>	9,600	m <sup>2</sup>
6. Sodding	0	m <sup>2</sup>	0	m <sup>2</sup>	0	m <sup>2</sup>	0	m <sup>2</sup>	0	m <sup>2</sup>
7. Railway Bridge	95	m	1,710	m	1,764	m	1,872	m	2,034	m
8. Road Bridge	0	m <sup>2</sup>	0	m <sup>2</sup>	0	m <sup>2</sup>	0	m <sup>2</sup>	0	m <sup>2</sup>
9. Retaining Wall	1 L.S.		693	L.S.	693	L.S.	693	L.S.	693	L.S.
10. Drainage Outlet	1 L.S.		1,328	L.S.	1,328	L.S.	1,328	L.S.	1,328	L.S.
11. Relocation Road	1 L.S.		0	L.S.	0	L.S.	0	L.S.	0	L.S.
12. Miscellaneous Works	838		867		1,838		1,981		2,210	
<b>II. Compensation Cost</b>		0		0		5,446		9,950		17,198
<b>1.Land Acquisition</b>										
Residential Area; Grade A	0.00	ha	0.00	ha	8.50	ha	15.50	ha	25.80	ha
Residential Area; Grade B	0.00	ha	0.00	ha	0.00	ha	0.00	ha	0.00	ha
Residential Area; Grade C	0.00	ha	0.00	ha	0.00	ha	0.00	ha	0.00	ha
Paddy Land; Urban	0.00	ha	0.00	ha	0.00	ha	0.00	ha	0.00	ha
Paddy Land; Rural	0.00	ha	0.00	ha	0.00	ha	0.00	ha	0.00	ha
2.House Evacuation										
Class A	0	pc	0	pc	55	pc	101	pc	175	pc
Class B	0	pc	0	pc	38	pc	70	pc	120	pc
Class C	0	pc	0	pc	35	pc	65	pc	111	pc
<b>III. Administration Cost</b>		710		734		1,938		2,375		3,076
<b>IV. Engineering Cost</b>		1,521		1,574		3,336		3,596		4,011
<b>V. Physical Contingency</b>		1,166		1,207		3,103		3,752		4,795
<b>VI. Total</b>		13,537		14,006		36,066		43,646		55,819

Remarks : The design discharge of 770 m<sup>3</sup>/s is selected as the optimum plan.

Table XII.4.3 (7/8) COST BREAKDOWN FOR EAST FLOODWAY IMPROVEMENT

Unit : Million Rp.

Item	Design Discharge (Q=350m <sup>3</sup> /s)		Remarks
	Quantity	Unit Cost	
<b>I. Construction Base Cost</b>			22,418
1. Preparatory Works			2,038
2. Excavation; Common 1	593,400	m <sup>3</sup>	3,857
3. Excavation; Common 2	452,100	m <sup>3</sup>	3,300
4. Embankment	108,000	m <sup>3</sup>	281
5. Revetment; Type B	77,200	m <sup>2</sup>	4,972
6. Sodding	19,500	m <sup>2</sup>	22
7. Railway Bridge	79	m	1,422
8. Road Bridge	2,624	m <sup>2</sup>	4,015
9. Retaining Wall	1	L.S.	658
10. Miscellaneous Works			1,853
<b>II. Compensation Cost</b>			610
<b>1. Land Acquisition</b>			
Residential Area; Grade A	1.14	ha	570
Residential Area; Grade B	0.00	ha	0
Residential Area; Grade C	0.00	ha	0
Paddy Land; Urban	0.00	ha	0
Paddy Land; Rural	0.00	ha	0
<b>2. House Evacuation</b>			
Class A	2	pc	30
Class B	1	pc	7
Class C	1	pc	3
<b>III. Administration Cost</b>			1,612
<b>IV. Engineering Cost</b>			3,363
<b>V. Physical Contingency</b>			2,639
<b>VI. Total</b>			30,642

Table XII.4.3 (8/8) COST BREAKDOWN FOR BABON RIVER IMPROVEMENT

Unit : Million Rp.

Item	Design Discharge (Q=150m <sup>3</sup> /s)		Design Discharge (Q=200m <sup>3</sup> /s)		Design Discharge (Q=300m <sup>3</sup> /s)		Design Discharge (Q=420m <sup>3</sup> /s)	
	Quantity	Unit Cost	Quantity	Unit Cost	Quantity	Unit Cost	Quantity	Unit Cost
I. Construction Base Cost		17,235	19,803	25,200	31,533			
1. Preparatory Works		1,567	1,800	2,291	2,867			
2. Excavation; Common 1	296,200	m <sup>3</sup>	404,900	m <sup>3</sup>	561,200	m <sup>3</sup>	1,016,700	m <sup>3</sup>
3. Excavation; Common 2	22,900	m <sup>3</sup>	39,300	m <sup>3</sup>	73,300	m <sup>3</sup>	114,200	m <sup>3</sup>
4. Embankment	132,600	m <sup>3</sup>	131,000	m <sup>3</sup>	134,600	m <sup>3</sup>	152,600	m <sup>3</sup>
5. Revetment; Type B	91,200	m <sup>2</sup>	100,700	m <sup>2</sup>	112,200	m <sup>2</sup>	124,000	m <sup>2</sup>
6. Sodding	23,600	m <sup>2</sup>	24,000	m <sup>2</sup>	24,700	m <sup>2</sup>	26,700	m <sup>2</sup>
7. Railway Bridge	43	m	45	m	53	m	62	m
8. Road Bridge	2,540	m <sup>2</sup>	2,883	m <sup>2</sup>	3,699	m <sup>2</sup>	4,691	m <sup>2</sup>
9. Reconstruction of Pucanggading	1	L.S.	1	L.S.	1	L.S.	1	L.S.
10. River Side Channel	1	L.S.	1	L.S.	1	L.S.	1	L.S.
11. Miscellaneous Works		836	836	836	836	836	836	836
		1,424	1,637	2,083	2,606			
II. Compensation Cost		1,358	2,501	5,392	9,194			
I. Land Acquisition								
Residential Area; Grade A	0.00	ha	0	ha	0	ha	0	ha
Residential Area; Grade B	0.00	ha	0	ha	0	ha	0	ha
Residential Area; Grade C	0.49	ha	45	ha	1.94	ha	3.30	ha
Paddy Land; Urban	0.00	ha	0	ha	0	ha	0	ha
Paddy Land; Rural	9.20	ha	17.10	ha	36.80	ha	62.70	ha
2. House Evacuation								
Class A	20	pc	36	pc	78	pc	133	pc
Class B	11	pc	140	pc	43	pc	74	pc
Class C	12	pc	66	pc	48	pc	82	pc
III. Administration Cost		1,302	1,561	2,141	2,851			
IV. Engineering Cost		2,585	2,970	3,780	4,730			
V. Physical Contingency		2,118	2,527	3,437	4,546			
VI. Total		24,598	29,362	39,950	52,854			

Remarks : The design discharge of 420 m<sup>3</sup>/s is selected as the optimum plan.



Table XII.4.4 (1/4) COST ALLOCATION FOR KEDUNG SUREN DAM

Item	Qmax=592m <sup>3</sup> /s		Qmax=402m <sup>3</sup> /s		Qmax=293m <sup>3</sup> /s		Qmax=206m <sup>3</sup> /s		Qmax=100m <sup>3</sup> /s		Qmax=60m <sup>3</sup> /s		
	Flood Control Dam	Water Supply Dam	Flood Control Dam	Water Supply Dam	Flood Control Dam	Water Supply Dam	Flood Control Dam	Water Supply Dam	Flood Control Dam	Water Supply Dam	Flood Control Dam	Water Supply Dam	
Reference Point Qmax Required Capacity	592 (MCM)	2,441	402	3,934	293	5,833	206	7,733	100	10,726	60	13,426	
Multiple-Purpose Cost	Sediment Capacity (MCM)	19,700	19,700	19,700	19,700	19,700	19,700	19,700	19,700	19,700	19,700	19,700	
	Required Capacity (MCM)	54,807	54,807	56,300	58,199	58,199	60,099	60,099	63,092	63,092	65,792	65,792	
	Total Capacity (MCM)	74,507	74,507	76,000	77,899	77,899	79,799	79,799	82,792	82,792	85,492	85,492	
	Dam Crest (EL.m)	75.04	75.04	75.20	75.40	75.40	75.60	75.60	76.00	76.00	76.20	76.20	
Construction Cost (Mill.Rp.)	249,496	249,496	251,527	251,527	254,067	254,067	256,606	256,606	261,685	261,685	264,224	264,224	
Alternate Single-Purpose Cost	Sediment Capacity (MCM)	3,940	19,700	3,940	19,700	3,940	19,700	3,940	19,700	3,940	19,700	3,940	
	Required Capacity (MCM)	2,441	52,366	3,934	52,366	5,833	52,366	7,733	52,366	10,726	52,366	13,426	
	Total Capacity (MCM)	6,381	72,066	7,874	72,066	9,773	72,066	11,673	72,066	14,666	72,066	17,366	
	Dam Crest (EL.m)	59.22	74.70	60.35	74.70	61.19	74.70	62.03	74.70	63.35	74.70	64.54	
Construction Cost (Mill.Rp.)	115,280	246,306	122,058	246,306	127,096	246,306	132,134	246,306	140,051	246,306	147,189	246,306	
Separable Cost	Sediment Capacity (MCM)	19,700	19,700	19,700	19,700	19,700	19,700	19,700	19,700	19,700	19,700	19,700	
	Other Purpose Capacity (MCM)	52,366	2,441	52,366	3,934	52,366	5,833	52,366	7,733	52,366	10,726	52,366	
	Total Capacity (MCM)	72,066	22,141	72,066	23,634	72,066	25,533	72,066	27,433	72,066	30,426	72,066	
	Dam Crest (EL.m)	74.70	65.86	74.70	66.20	74.70	66.64	74.70	67.07	74.70	67.50	74.70	
Construction Cost (Mill.Rp.)	246,306	159,294	246,306	162,989	246,306	167,770	246,306	172,443	246,306	179,941	246,306	186,679	
Separable Cost (Mill.Rp.)	3,190	90,202	5,221	88,538	7,761	86,297	10,300	84,163	15,379	81,744	17,918	77,545	
Alternate Cost less Separable Cost Allocated Joint Cost	(Mill.Rp.)	112,090	156,104	116,837	157,768	119,335	160,009	121,834	162,143	124,672	164,562	129,271	168,761
	(Mill.Rp.)	65,251	90,853	67,051	90,717	68,324	91,685	69,559	92,584	70,926	93,636	73,242	95,519
Total Allocated Cost (Mill.Rp.)	68,441	181,055	72,272	179,255	76,085	177,982	79,859	176,747	86,305	175,380	91,160	173,064	

Table XII.4.4 (2/4) COST ALLOCATION FOR JATIBARANG DAM

Item	Qmax=968m <sup>3</sup> /s		Qmax=845m <sup>3</sup> /s		Qmax=802m <sup>3</sup> /s		Qmax=770m <sup>3</sup> /s		Qmax=749m <sup>3</sup> /s		Qmax=736m <sup>3</sup> /s	
	Flood Control Dam	Water Supply Dam	Flood Control Dam	Water Supply Dam	Flood Control Dam	Water Supply Dam	Flood Control Dam	Water Supply Dam	Flood Control Dam	Water Supply Dam	Flood Control Dam	Water Supply Dam
Reference Point Qmax Required Capacity	(m <sup>3</sup> /s) (MCM)	968 1.140	845 2.280	14.600	802 3.260	13.620	770 4.330	12.550	749 5.220	11.660	736 6.200	10.680
Multiple-Purpose Cost	Sediment Capacity (MCM)	6.800	6.800	6.800	6.800	6.800	6.800	6.800	6.800	6.800	6.800	6.800
	Required Capacity (MCM)	16.880	16.880	16.880	16.880	16.880	16.880	16.880	16.880	16.880	16.880	16.880
	Total Capacity (MCM)	23.680	23.680	23.680	23.680	23.680	23.680	23.680	23.680	23.680	23.680	23.680
	Dam Crest (EL.m)	162.00	162.00	162.00	162.00	162.00	162.00	162.00	162.00	162.00	162.00	162.00
Constructor Cost (Mill.Rp.)	63,477	63,477	63,477	63,477	63,477	63,477	63,477	63,477	63,477	63,477	63,477	63,477
Alternate Single-Purpose Cost	Sediment Capacity (MCM)	1.360	1.360	1.360	1.360	1.360	1.360	1.360	1.360	1.360	1.360	1.360
	Required Capacity (MCM)	1.140	15.740	2.280	14.600	3.260	13.620	4.330	5.220	11.660	6.200	10.680
	Total Capacity (MCM)	2.500	22.540	3.640	21.400	4.620	20.420	5.690	6.580	18.460	7.560	17.480
	Dam Crest (EL.m)	134.62	161.00	137.36	160.00	139.59	159.00	141.39	142.78	157.00	144.31	156.00
Constructor Cost (Mill.Rp.)	31,283	61,659	33,204	59,840	34,768	58,485	36,617	57,009	38,179	55,776	39,899	54,421
Separable Cost	Sediment Capacity (MCM)	6.800	6.800	6.800	6.800	6.800	6.800	6.800	6.800	6.800	6.800	6.800
	Other Purpose Capacity (MCM)	15.740	1.140	14.600	2.280	13.620	3.260	12.550	4.330	11.660	5.220	10.680
	Total Capacity (MCM)	22.540	7.940	21.400	9.080	20.420	10.060	19.350	11.130	18.460	12.020	13.000
	Dam Crest (EL.m)	161.00	144.91	160.00	146.35	159.00	147.58	157.91	148.91	157.00	150.02	151.11
Constructor Cost (Mill.Rp.)	61,659	40,573	59,840	42,191	58,485	43,573	57,009	45,068	55,776	46,320	54,421	47,797
Separable Cost (Mill.Rp.)	1,818	22,904	3,637	21,286	4,992	19,904	6,468	18,409	7,701	17,157	9,056	15,680
Alternate Cost less Separable Cost Allocated Joint Cost	(Mill.Rp.)	29,465	38,755	29,567	38,554	29,776	38,581	30,149	38,600	30,478	38,619	30,843
	(Mill.Rp.)	16,742	22,013	16,732	21,822	16,821	21,760	16,945	21,655	17,031	21,588	17,162
Total Allocated Cost (Mill.Rp.)		18,560	44,917	20,369	43,108	21,813	41,664	23,413	40,064	24,732	38,745	26,218
												37,259

Table XII.4.4 (3/4) COST ALLOCATION FOR MUNDINGAN DAM

Item	Qmax=875m3/s			Qmax=831m3/s			Qmax=811m3/s			Qmax=780m3/s			Qmax=770m3/s			Qmax=766m3/s			
	Flood	Water		Flood	Water		Flood	Water		Flood	Water		Flood	Water		Flood	Water		
	Control	Supply	Dam	Control	Supply	Dam	Control	Supply	Dam	Control	Supply	Dam	Control	Supply	Dam	Control	Supply	Dam	
Reference Point Qmax Required Capacity	875 (MCM)	-	27,588	831 1,484	-	27,588	811 2,055	-	27,588	780 3,198	-	27,588	770 4,086	-	27,588	766 4,896	-	27,588	
Sediment Capacity	7,400	7,400	7,400	7,400	7,400	7,400	7,400	7,400	7,400	7,400	7,400	7,400	7,400	7,400	7,400	7,400	7,400	7,400	7,400
Multiple-Purpose Capacity	28,500	28,500	29,072	29,072	29,072	29,643	29,643	30,786	30,786	31,674	31,674	31,674	31,674	31,674	31,674	32,484	32,484	32,484	32,484
Total Capacity	35,900	35,900	36,472	36,472	36,472	37,043	37,043	38,186	38,186	39,074	39,074	39,074	39,074	39,074	39,074	39,884	39,884	39,884	39,884
Dam Crest	230.00	230.00	230.20	230.20	230.20	230.40	230.40	230.80	230.80	231.11	231.11	231.11	231.11	231.11	231.11	231.39	231.39	231.39	231.39
Construction Cost	115,560	115,560	116,792	116,792	116,792	118,024	118,024	120,488	120,488	122,398	122,398	122,398	122,398	122,398	122,398	124,122	124,122	124,122	124,122
Alternate Single-Purpose Capacity	1,480	7,400	7,400	1,480	7,400	7,400	1,480	7,400	7,400	1,480	7,400	7,400	1,480	7,400	7,400	1,480	7,400	7,400	7,400
Total Capacity	0,912	27,588	1,484	27,588	1,484	27,588	2,055	27,588	3,198	27,588	4,086	27,588	5,566	34,988	6,376	34,988	7,400	27,588	8,896
Dam Crest	204.97	229.60	206.13	229.60	206.13	229.60	207.27	229.60	209.56	229.60	210.77	229.60	210.77	229.60	211.72	229.60	211.72	229.60	229.60
Construction Cost	28,395	113,553	30,044	113,553	30,044	113,553	31,665	113,553	34,921	113,553	37,845	113,553	37,845	113,553	40,679	113,553	40,679	113,553	113,553
Sediment Capacity	7,400	7,400	7,400	7,400	7,400	7,400	7,400	7,400	7,400	7,400	7,400	7,400	7,400	7,400	7,400	7,400	7,400	7,400	7,400
Other Purpose Capacity	27,588	0,912	27,588	1,484	27,588	2,055	27,588	3,198	27,588	4,086	27,588	4,086	27,588	4,086	27,588	4,896	27,588	4,896	4,896
Total Capacity	34,988	8,312	34,988	8,884	34,988	9,455	34,988	10,598	34,988	11,486	34,988	11,486	34,988	11,486	34,988	34,988	34,988	34,988	34,988
Dam Crest	229.60	213.97	229.60	214.63	229.60	215.20	229.60	216.08	229.60	216.76	229.60	216.76	229.60	216.76	229.60	217.38	229.60	217.38	217.38
Construction Cost	113,553	47,393	113,553	49,362	113,553	51,063	113,553	53,689	113,553	55,718	113,553	55,718	113,553	55,718	113,553	57,568	113,553	57,568	57,568
Separable Cost	2,007	68,157	3,239	67,430	4,471	66,961	6,935	66,799	8,845	66,680	10,569	66,680	10,569	66,680	10,569	66,680	10,569	66,680	66,680
Alternate Cost less Separable Cost	26,386	45,386	26,805	46,123	27,194	46,592	27,986	46,754	29,000	46,873	30,110	46,999	30,110	46,999	30,110	46,999	30,110	46,999	46,999
Allocated Joint Cost	16,702	28,684	16,973	29,150	17,192	29,400	17,486	29,268	17,905	28,968	18,330	28,659	18,330	28,659	18,330	28,659	18,330	28,659	28,659
Total Allocated Cost	18,709	96,851	20,212	96,580	21,663	96,361	24,421	96,067	26,750	95,648	28,899	95,223	28,899	95,223	28,899	95,223	28,899	95,223	95,223

Table XII.4.4 (4/4) COST ALLOCATION FOR BABON DAM

Item	Reference Point Qmax (m <sup>3</sup> /s) (MCM)	Qmax=184m <sup>3</sup> /s		Qmax=132m <sup>3</sup> /s		Qmax=86m <sup>3</sup> /s		Qmax=81m <sup>3</sup> /s				
		Flood Control Dam	Water Supply Dam	Flood Control Dam	Water Supply Dam	Flood Control Dam	Water Supply Dam	Flood Control Dam	Water Supply Dam			
Required Capacity	184 (MCM)	2,076	35,924	132 (MCM)	2,951	35,924	86 (MCM)	3,827	35,924	81 (MCM)	4,703	35,924
Sediment Capacity	(MCM)	10,200	10,200	10,200	10,200	10,200	10,200	10,200	10,200	10,200	10,200	10,200
Required Capacity	(MCM)	38,000	38,000	38,875	38,875	39,751	39,751	40,627	40,627	40,627	40,627	40,627
Total Capacity	(MCM)	48,200	48,200	49,075	49,075	49,951	49,951	50,827	50,827	50,827	50,827	50,827
Dam Crest	(EL.m)	75.00	75.00	75.20	75.20	75.40	75.40	75.60	75.60	75.60	75.60	75.60
Construction Cost	(Mill.Rp.)	291,391	291,391	293,139	293,139	294,887	294,887	296,635	296,635	296,635	296,635	296,635
Alternate Single Purpose Cost	(MCM)	2,040	10,200	2,040	10,200	2,040	10,200	2,040	10,200	2,040	10,200	10,200
Required Capacity	(MCM)	2,076	35,924	2,951	35,924	3,827	35,924	4,703	35,924	4,703	35,924	35,924
Total Capacity	(MCM)	4,116	46,124	4,991	46,124	5,867	46,124	6,743	46,124	6,743	46,124	46,124
Dam Crest	(EL.m)	55.51	74.40	56.32	74.40	57.13	74.40	57.94	74.40	57.94	74.40	74.40
Construction Cost	(Mill.Rp.)	119,255	286,018	125,483	286,018	131,711	286,018	137,939	286,018	137,939	286,018	286,018
Sediment Capacity	(MCM)	10,200	10,200	10,200	10,200	10,200	10,200	10,200	10,200	10,200	10,200	10,200
Other Purpose Capacity	(MCM)	35,924	2,076	35,924	2,951	35,924	3,827	35,924	4,703	35,924	4,703	4,703
Total Capacity	(MCM)	46,124	12,276	46,124	13,151	46,124	14,027	46,124	14,903	46,124	14,903	14,903
Dam Crest	(EL.m)	74.40	61.85	74.40	62.34	74.40	62.83	74.40	63.32	74.40	63.32	63.32
Construction Cost	(Mill.Rp.)	286,018	171,151	286,018	175,753	286,018	180,355	286,018	184,956	286,018	184,956	184,956
Separable Cost	(Mill.Rp.)	5,373	120,240	7,121	117,386	8,869	114,532	10,617	111,679	10,617	111,679	111,679
Alternate Cost less Separable Cost	(Mill.Rp.)	113,882	165,778	118,362	168,632	122,842	171,486	127,322	174,339	127,322	174,339	174,339
Allocated Joint Cost	(Mill.Rp.)	67,472	98,306	69,476	99,156	71,510	99,976	73,571	100,768	73,571	100,768	100,768
Total Allocated Cost	(Mill.Rp.)	72,845	218,546	76,597	215,542	80,379	214,508	84,188	212,447	84,188	212,447	212,447

Table XII.4.5 (1/4) RELATIONSHIP BETWEEN PROJECT COST AND DAM HEIGHT OF KEDUNG SUREN DAM

Item	Height=45m (EL.76.0m)		Height=40m (EL.70.0m)		Height=35m (EL.65.0m)	
	Quantity	Unit Total (Mill.Rp.)	Quantity	Unit Total (Mill.Rp.)	Quantity	Unit Total (Mill.Rp.)
<b>I. Construction Base Cost</b>		145,301		139,075		117,880
Embankment Volume	4,120,000	m3 143,376	3,920,000	m3 137,200	2,220,000	m3 86,580
Relocation Road	38,500	m2 1,925	37,500	m2 1,875	26,500	m2 1,325
Relocation of Electrical Tower	0	L.S. 0	0	L.S. 0	0	L.S. 0
<b>II. Compensation Cost</b>		54,990		52,161		37,886
<b>1. Land Acquisition</b>						
Residential Area; Grade C	68.6	ha 3,430	64.8	ha 3,240	41.0	ha 2,050
Paddy Land; Rural	330.5	ha 33,050	312.0	ha 31,200	234.2	ha 23,420
Upland Cultivation	98.1	ha 2,943	92.6	ha 2,778	57.4	ha 1,722
Plantation	64.7	ha 5,176	61.1	ha 4,888	45.4	ha 3,632
Forest	598.1	ha 5,981	564.5	ha 5,645	427.2	ha 4,272
2. House Evacuation; Class C	1,470	unit 4,410	1,470	unit 4,410	930	unit 2,790
<b>III. Administration Cost</b>		14,020		13,387		10,904
<b>IV. Engineering Services</b>		24,859		22,947		20,034
<b>V. Physical Contingency</b>		22,515		21,418		17,580
<b>Total</b>		261,685		248,988		204,284
						149,948

Table XII.4.5 (2/4) RELATIONSHIP BETWEEN PROJECT COST AND DAM HEIGHT OF JATIBARANG DAM

Item	Height=77m (EL.162.0m)		Height=75m (EL.160.0m)		Height=65m (EL.150.0m)		Height=55m (EL.140.0m)	
	Quantity	Unit Total (Mill.Rp.)	Quantity	Unit Total (Mill.Rp.)	Quantity	Unit Total (Mill.Rp.)	Quantity	Unit Total (Mill.Rp.)
I. Construction Base Cost		38,025		35,995		26,995		19,465
Concrete Volume	170,000	m3	158,000	m3	107,000	m3	71,000	m3
Relocation Road	16,000	m2	15,500	m2	12,500	m2	9,500	m2
Relocation of Electrical Tower	10	L.S.	10	L.S.	10	L.S.	10	L.S.
II. Compensation Cost		6,040		5,505		4,577		3,634
1. Land Acquisition								
Residential Area; Grade C	0.0	ha	0.0	ha	0.0	ha	0.0	ha
Paddy Land; Rural	28.0	ha	25.5	ha	25.1	ha	20.2	ha
Upland Cultivation	108.0	ha	98.5	ha	68.9	ha	53.8	ha
Plantation	0.0	ha	0.0	ha	0.0	ha	0.0	ha
Forest	0.0	ha	0.0	ha	0.0	ha	0.0	ha
2. House Evacuation; Class C	0	unit	0	unit	0	unit	0	unit
III. Administration Cost		3,085		2,905		2,210		1,617
IV. Engineering Services		10,837		10,259		8,503		7,299
V. Physical Contingency		5,490		5,176		4,008		3,040
Total		63,477		59,840		46,293		35,055

Table XII.4.5 (3/4) RELATIONSHIP BETWEEN PROJECT COST AND DAM HEIGHT OF MUNDINGAN DAM

Item	Height=50m (EL.230.0m)		Height=40m (EL.220.0m)		Height=30m (EL.210.0m)	
	Quantity	Unit Total (Mill.Rp.)	Quantity	Unit Total (Mill.Rp.)	Quantity	Unit Total (Mill.Rp.)
I. Construction Base Cost		54,240		28,200		14,300
Concrete Volume	188,000	m3 50,760	95,000	m3 26,600	45,000	m3 13,500
Relocation Road	48,000	m2 2,400	32,000	m2 1,600	16,000	m2 800
Relocation of Electrical Tower	10	L.S. 1,080	0	L.S. 0	0	L.S. 0
II. Compensation Cost		29,996		18,936		10,032
1. Land Acquisition						
Residential Area; Grade C	23.0	ha 1,150	13.8	ha 690	7.3	ha 365
Paddy Land; Rural	266.8	ha 26,680	171.0	ha 17,100	90.7	ha 9,070
Upland Cultivation	25.2	ha 756	16.7	ha 501	8.5	ha 255
Plantation	0.0	ha 0	0.0	ha 0	0.0	ha 0
Forest	0.0	ha 0	0.0	ha 0	0.0	ha 0
2. House Evacuation; Class C	470	unit 1,410	215	unit 645	114	unit 342
III. Administration Cost		5,897		3,300		1,703
IV. Engineering Services		15,458		9,306		6,435
V. Physical Contingency		9,969		5,644		3,077
Total		115,560		65,386		35,547

Table XII.4.5 (4/4) RELATIONSHIP BETWEEN PROJECT COST AND DAM HEIGHT OF BABON DAM

Item	Height=45m (EL.75.0m)		Height=40m (EL.70.0m)		Height=35m (EL.65.0m)		Height=30m (EL.60.0m)	
	Quantity	Unit Total (Mill.Rp.)	Quantity	Unit Total (Mill.Rp.)	Quantity	Unit Total (Mill.Rp.)	Quantity	Unit Total (Mill.Rp.)
I. Construction Base Cost		185,090		157,580		128,440		97,930
Embankment Volume	5,890,000	m3	4,570,000	m3	3,420,000	m3	2,470,000	m3
Relocation Road	50,000	m2	44,000	m2	38,000	m2	32,000	m2
Relocation of Electrical Tower	0	L.S.	0	L.S.	0	L.S.	0	L.S.
II. Compensation Cost		35,249		28,754		22,605		16,793
1. Land Acquisition								
Residential Area; Grade C	74.2	ha	60.9	ha	48.2	ha	36.3	ha
Paddy Land; Rural	217.5	ha	179.0	ha	142.7	ha	108.2	ha
Upland Cultivation	193.3	ha	151.1	ha	111.1	ha	73.5	ha
Plantation	0.0	ha	0.0	ha	0.0	ha	0.0	ha
Forest	0.0	ha	0.0	ha	0.0	ha	0.0	ha
2. House Evacuation; Class C	1,330	unit	1,092	unit	864	unit	651	unit
III. Administration Cost		15,424		13,043		10,573		8,031
IV. Engineering Services		30,540		26,001		21,828		17,774
V. Physical Contingency		25,088		21,234		17,287		13,250
Total		291,391		246,612		200,733		153,778



Table XII.4.6 ANNUAL DISBURSEMENT SCHEDULE OF FLOOD CONTROL PLAN FOR MASTER PLAN

		Unit: Million Rp.																				
(Financial Cost)	Description	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
	<b>Total</b>																					
1.	Babon River																					
	Babon River Improvement	58,139	0	0	0	0	0	0	0	0	0	1,431	1,431	7,099	22,111	17,378	8,689	0	0	0	0	0
	Babon Floodway	50,824	0	6,028	14,356	14,289	13,330	2,621	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.	East Floodway																					
	East Floodway Improvement	33,706	0	0	0	0	0	0	1,018	1,018	472	12,669	12,355	6,174	0	0	0	0	0	0	0	0
3.	Garang River																					
	Garang River Improvement	52,397	2,104	2,191	0	19,729	19,729	8,644	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	West Floodway Improvement	15,407	458	476	0	5,936	5,936	2,601	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Jatibarang Dam	25,754	0	2,594	6,736	7,189	7,189	2,046	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.	Silandak River																					
	Silandak River Improvement	12,462	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	634	1,324	6,655	3,849	0
5.	Bringin River																					
	Bringin River Improvement	28,587	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,436	3,219	15,220	8,712
6.	Blorong River																					
	Blorong River Improvement	8,516	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	527	0	7,989	0	0
	Kedungsuren Dam	94,936	0	0	0	0	2,382	2,382	9,336	10,384	11,331	22,325	16,709	3,378	0	0	0	0	0	0	0	0
	<b>Total</b>	<b>380,528</b>	<b>2,562</b>	<b>11,289</b>	<b>21,092</b>	<b>47,143</b>	<b>48,566</b>	<b>18,294</b>	<b>9,336</b>	<b>11,402</b>	<b>12,349</b>	<b>30,809</b>	<b>30,495</b>	<b>16,651</b>	<b>22,111</b>	<b>17,378</b>	<b>9,323</b>	<b>1,851</b>	<b>8,091</b>	<b>15,057</b>	<b>15,220</b>	<b>8,712</b>
Note : Value added tax is included, but Price contingency is excluded.																						
(Economic Cost)																						
		Unit: Million Rp.																				
	Description	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
	<b>Total</b>																					
1.	Babon River																					
	Babon River Improvement	48,375	0	0	0	0	0	0	0	0	0	1,301	1,301	5,848	18,309	14,411	7,205	0	0	0	0	0
	Babon Floodway	38,777	0	4,651	11,039	10,950	10,175	1,961	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.	East Floodway																					
	East Floodway Improvement	28,107	0	0	0	0	0	0	925	925	388	10,504	10,245	5,120	0	0	0	0	0	0	0	0
3.	Garang River																					
	Garang River Improvement	43,906	1,913	1,992	0	16,407	16,407	7,187	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	West Floodway Improvement	12,851	416	433	0	4,923	4,923	2,156	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Jatibarang Dam	21,627	0	2,236	5,694	5,995	5,995	1,707	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4.	Silandak River																					
	Silandak River Improvement	10,372	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	576	1,091	5,514	3,191	0
5.	Bringin River																					
	Bringin River Improvement	23,791	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,305	2,651	12,608	7,227
6.	Blorong River																					
	Blorong River Improvement	7,104	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	479	0	6,625	0	0
	Kedungsuren Dam	79,039	0	0	0	0	2,165	2,165	7,690	8,578	9,375	18,514	13,872	2,808	0	0	0	0	0	0	0	0
	<b>Total</b>	<b>313,949</b>	<b>2,329</b>	<b>9,312</b>	<b>16,733</b>	<b>38,275</b>	<b>39,666</b>	<b>15,176</b>	<b>7,690</b>	<b>9,503</b>	<b>10,300</b>	<b>18,902</b>	<b>25,677</b>	<b>25,418</b>	<b>13,776</b>	<b>18,309</b>	<b>14,411</b>	<b>7,761</b>	<b>1,570</b>	<b>6,819</b>	<b>12,467</b>	<b>12,608</b>

Table XII.4.7 ANNUAL OMR COST OF FLOOD CONTROL PLAN FOR MASTER PLAN

(Economic Cost)

Unit : Milliin Rp.

Description	Operation & Administration	Maintenance & Replacement	Dredging	Total
1. Babon River				
Babon River Improvement	14	144	62	220
Babon Floodway	14	158	31	203
2. East Floodway				
East Floodway Improvement	12	102	66	180
3. West Floodway / Garang River				
Garang River Improvement	34	129	6	169
West Floodway Improvement	4	47	6	57
Jatibarang Dam	20	25	-	45
4. Silandak River				
Silandak River Improvement	8	32	80	120
5. Bringin River				
Bringin River Improvement	10	41	106	157
6. Blorong River				
Blorong River Improvement	4	27	22	53
Kedungsuren Dam	29	86	-	115
Total	149	791	379	1,319

Table XII.4.8 (1/3) COST BREAKDOWN FOR URBAN DRAINAGE PLAN OF EASTERN AND CENTRAL SEMARANG

Item	Eastern Semarang Area			Central Semarang Area		
	Siringin	Tenggang	Semarang #2	Banger	Bulu	
	Quantity Unit (Mill.Rp.)	Quantity Unit (Mill.Rp.)	Quantity Unit (Mill.Rp.)	Quantity Unit (Mill.Rp.)	Quantity Unit (Mill.Rp.)	Quantity Unit (Mill.Rp.)
<b>I. Construction Base Cost</b>	8,713	22,822	44,149	13,242	1,701	
1. Preparatory Works	792	2,075	4,014	1,204	155	
2. Primary Channel Improvement *1						
1) Open Channel (Type A)	6,120 m	4,350 m	0 m	2,090 m	0 m	0
2) Open Channel (Type B)	0 m	0 m	2,360 m	0 m	0 m	0
3) Open Channel (Type C)	3,100 m	7,900 m	2,153 m	3,460 m	1,750 m	1,211
4) Open Channel (Type D)	0 m	1,450 m	0 m	0 m	0 m	0
5) Open Channel (Type E)	0 m	0 m	0	1,130 m	0 m	0
6) Open Channel (Type F)	0 m	0 m	5,770 m	0 m	0 m	0
7) Covered Channel (Type G)	0 m	0 m	0	0 m	0 m	0
3. Related Structure						
Pump Station	0 L.S.	0 L.S.	16,841	0 L.S.	0 L.S.	0
Gate Structure	0 m <sup>2</sup>	0 m <sup>2</sup>	496	0 m <sup>2</sup>	0 m <sup>2</sup>	0
Railway Bridge	0 m	22 m	360	50 m	0 m	0
Road Bridge	414 m <sup>2</sup>	2,678 m <sup>2</sup>	2,299	1,263 m <sup>2</sup>	9 m <sup>2</sup>	13
Box Culvert	0 m <sup>3</sup>	0 m <sup>3</sup>	151	1,148 m <sup>3</sup>	607 m <sup>3</sup>	126
Inspection Road	55,320 m <sup>2</sup>	73,500 m <sup>2</sup>	389	33,300 m <sup>2</sup>	10,500 m <sup>2</sup>	55
Miscellaneous Works	720	1,886	3,649	176	141	
<b>II. Compensation Cost</b>	5,931	8,172	1,481	3,223	1,034	
1. Land Acquisition						
Residential Area; Grade B	26.82 ha	35.33 ha	88	7.75 ha	2.02 ha	404
Residential Area; Grade C	0.00 ha	0.00 ha	206	0.00 ha	0.00 ha	0
Fish Pond	0.00 ha	0.00 ha	32	0.00 ha	0.00 ha	0
2. House Evacuation						
Class B	81 pc	158 pc	1,155	239 pc	90 pc	630
<b>III. Administration Cost</b>	1,025	2,170	3,194	1,153	191	
<b>IV. Engineering Cost</b>	1,307	3,423	6,622	1,986	255	
<b>V. Physical Contingency</b>	1,595	3,442	5,225	1,845	299	
<b>VI. Total</b>	18,571	40,029	60,671	21,449	3,480	

Notes : \*1 The improvement costs of the surveyed primary channels are considered.  
: \*2 The improvement cost of Asin River is included.

Table XII.4.8 (2/3) COST BREAKDOWN FOR URBAN DRAINAGE PLAN OF WESTERN SEMARANG

Item	Western Semarang Area							
	Ronggojawe		Karangayu		Tawang		Silandak	
	Quantity	Unit Cost (Mill.Rp.)	Quantity	Unit Cost (Mill.Rp.)	Quantity	Unit Cost (Mill.Rp.)	Quantity	Unit Cost (Mill.Rp.)
I. Construction Base Cost		5,453		5,636		1,585		1,025
1. Preparatory Works		496		512		144		93
2. Primary Channel Improvement *1								
1) Open Channel (Type A)	0	m	0	m	0	m	0	m
2) Open Channel (Type B)	0	m	0	m	0	m	0	m
3) Open Channel (Type C)	2,250	m	2,180	m	1,200	m	850	m
4) Open Channel (Type D)	0	m	0	m	0	m	0	m
5) Open Channel (Type E)	1,000	m	2,083	m	1,580	m	0	m
6) Open Channel (Type F)	0	m	0	m	0	m	0	m
7) Covered Channel (Type G)	0	m	0	m	0	m	0	m
3. Related Structure								
Pump Station	0	L.S.	0	L.S.	0	L.S.	0	L.S.
Gate Structure	0	m2	0	m2	0	m2	0	m2
Railway Bridge	5	m	90	m	54	m	8	m
Road Bridge	0	m2	0	m2	127	m2	0	m2
Box Culvert	394	m3	82	m3	189	m3	810	m3
Inspection Road	13,500	m2	71	m2	35	m2	0	m2
4. Miscellaneous Works		451		466		131		85
II. Compensation Cost		1,274		791		0		434
1. Land Acquisition								
Residential Area; Grade B	2.87	ha	574	ha	308	ha	0.00	ha
Residential Area; Grade C	0.00	ha	0	ha	0	ha	0.00	ha
Fish Pond	0.00	ha	0	ha	0	ha	0.00	ha
2. House Evacuation								
Class B	100	pc	700	pc	483	pc	0	pc
III. Administration Cost		471		450		111		102
IV. Engineering Cost		818		845		238		154
V. Physical Contingency		755		727		182		161
VI. Total		8,771		8,449		2,116		1,876

Note : \*1 The improvement costs of the surveyed primary channels are considered.

Table XII.4.8 (3/3) COST BREAKDOWN FOR PUMP STATION

Unit : Million Rp.

Item	P1 (Q=0.8m3/s)		P2 (Q=5.7m3/s)		P3 (Q=1.5m3/s)		Total
	Quantity	Unit Cost	Quantity	Unit Cost	Quantity	Unit Cost	
<b>1. Civil Work</b>							
1) Excavation; Common	40,800	m3	298	1,482	62,000	m3	453
2) Embankment	1,800	m3	5	8	2,000	m3	5
3) Revetment; Type A	1,000	m3	62	62	1,000	m3	62
4) PC Pile; D=400mm, L=20m	100	pc	163	286	120	pc	196
5) Sheet Pile; L=3m	130	m3	26	59	150	m3	30
6) Reinforced Concrete	800	m3	264	462	1,000	m3	330
7) Building Works	1	L.S.	245	708	1	L.S.	323
Sub-Total			1,053	3,067			1,399
<b>2. Mechanical &amp; Electrical Works</b>							
1) Pump	1	L.S.	341	2,112	1	L.S.	638
2) Main Motor	1	L.S.	97	624	1	L.S.	182
3) Pipe & Valve	1	L.S.	74	526	1	L.S.	139
4) Electrical Facilities	1	L.S.	780	2,033	1	L.S.	1,463
5) Crane & Spare Parts	1	L.S.	55	210	1	L.S.	103
6) Gate Leaf	1	L.S.	11	55	1	L.S.	21
7) Hoist Machine	1	L.S.	7	37	1	L.S.	14
8) Installation	1	L.S.	137	560	1	L.S.	256
9) Miscellaneous Works	1	L.S.	120	492	1	L.S.	225
Sub-Total			1,622	6,649			3,041
Total			2,685	9,716			4,440
Total							11,312
Total							16,841



Table XII.4.10 ANNUAL DISBURSEMENT SCHEDULE OF URBAN DRAINAGE PLAN FOR MASTER PLAN

(Financial Cost)

Unit: Million Rp.

Description	Total	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	
<b>1. Eastern Semarang</b>																							
Sirringin	20,428	0	1,660	1,660	2,241	0	0	0	0	0	0	0	0	0	0	0	287	287	2,771	5,385	3,486	2,611	
Tenggang	44,032	2,189	2,189	2,189	2,180	0	0	0	0	0	0	0	0	763	796	2,527	5,983	5,983	5,983	5,141	4,300	3,799	
<b>2. Central Semarang</b>																							
Semarang	66,738	0	2,004	2,004	382	6,464	6,464	7,679	7,680	7,300	7,300	7,300	6,083	6,078	0	0	0	0	0	0	0	0	0
Bangret	23,584	2,292	2,292	2,294	2,294	0	0	0	367	367	1,268	7,959	4,461	0	0	0	0	0	0	0	0	0	0
Bulu	3,828	508	508	677	0	0	0	0	0	0	86	743	1,306	0	0	0	0	0	0	0	0	0	0
<b>3. Western Semarang</b>																							
Rongglawe	9,648	0	330	0	0	0	0	0	0	0	0	0	479	1,583	7,256	0	0	0	0	0	0	0	0
Karangayu	9,294	0	0	0	0	0	0	0	0	0	0	0	512	1,018	7,764	0	0	0	0	0	0	0	0
Tawang	2,328	0	0	0	0	0	0	0	0	0	0	0	144	0	2,184	0	0	0	0	0	0	0	0
Silandak	2,064	0	0	0	0	0	0	0	0	0	0	0	94	558	1,412	0	0	0	0	0	0	0	0
<b>Total</b>	<b>181,954</b>	<b>4,989</b>	<b>9,003</b>	<b>8,844</b>	<b>7,107</b>	<b>6,464</b>	<b>6,464</b>	<b>7,679</b>	<b>8,047</b>	<b>7,667</b>	<b>8,654</b>	<b>16,002</b>	<b>13,079</b>	<b>10,000</b>	<b>19,412</b>	<b>2,527</b>	<b>6,270</b>	<b>6,270</b>	<b>8,754</b>	<b>10,526</b>	<b>7,786</b>	<b>6,410</b>	

Notes : This financial cost is made under the implementation schedule considering the priority sequence and the on-going projects.  
Value added tax is included, but Price contingency is excluded.  
The improvement costs of the surveyed primary channels are considered.

Table XII.4.11 ANNUAL DISBURSEMENT SCHEDULE OF URBAN DRAINAGE PLAN FOR MASTER PLAN (INCLUDING SECONDARY CHANNEL)

(Economic Cost)

Unit: Million Rp.

Description	Total	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014			
<b>1. Eastern Semarang</b>																									
Siringin	50,512	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,332	5,477	16,546	14,757	11,068				
Tenggang	123,302	0	0	0	0	0	0	0	0	0	0	0	3,146	3,282	6,527	20,520	20,520	18,344	16,168	14,275					
<b>2. Central Semarang</b>																									
Semarang	55,651	0	0	0	0	0	0	0	0	0	1,822	1,822	315	5,358	5,358	6,367	6,053	6,053	6,053	5,043	5,043	5,040			
Banger	30,710	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	833	833	2,987	16,828	9,229				
Bulu	3,431	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	157	1,096	2,178			
<b>3. Western Semarang</b>																									
Ronggolawe	8,032	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	450	1,351	6,231		
Karangayu	7,741	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	465	838	6,438		
Tawang	1,943	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	131	0	1,812		
Silandak	1,717	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	85	460	1,172		
<b>Total</b>	<b>283,039</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1,822</b>	<b>1,822</b>	<b>315</b>	<b>8,504</b>	<b>8,640</b>	<b>12,894</b>	<b>28,219</b>	<b>28,738</b>	<b>32,883</b>	<b>45,218</b>	<b>56,541</b>	<b>57,443</b>			

Notes : This economic cost will be used to identify the priority sequence of drainage area.  
The improvement costs of the surveyed and other primary, and secondary channels are considered.

(Economic Cost)

Unit: Million Rp.

Description	Total	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014			
<b>1. Eastern Semarang</b>																									
Siringin	50,512	0	1,396	1,395	1,867	0	0	0	0	0	0	0	0	0	0	0	1,209	4,971	15,020	13,396	10,049				
Tenggang	123,302	1,823	1,823	1,823	1,823	0	0	0	0	0	0	0	2,960	3,089	6,141	19,306	19,306	17,259	15,213	13,430					
<b>2. Central Semarang</b>																									
Semarang	55,651	0	1,822	1,822	315	5,358	5,358	6,367	6,053	6,053	6,053	5,043	5,043	0	0	0	0	0	0	0	0	0	0	0	0
Banger	30,710	1,909	1,908	1,908	1,908	0	0	626	626	626	2,245	12,645	6,935	0	0	0	0	0	0	0	0	0	0	0	0
Bulu	3,431	422	421	562	0	0	0	0	0	0	94	647	1,285	0	0	0	0	0	0	0	0	0	0	0	0
<b>3. Western Semarang</b>																									
Ronggolawe	8,032	0	275	0	0	0	0	0	0	0	0	0	435	1,304	6,018	0	0	0	0	0	0	0	0	0	0
Karangayu	7,741	0	0	0	0	0	0	0	0	0	0	0	465	838	6,438	0	0	0	0	0	0	0	0	0	0
Tawang	1,943	0	0	0	0	0	0	0	0	0	0	0	131	0	1,812	0	0	0	0	0	0	0	0	0	0
Silandak	1,717	0	0	0	0	0	0	0	0	0	0	0	85	460	1,172	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>283,039</b>	<b>4,154</b>	<b>7,645</b>	<b>7,510</b>	<b>5,913</b>	<b>5,358</b>	<b>5,358</b>	<b>6,367</b>	<b>6,993</b>	<b>6,679</b>	<b>8,392</b>	<b>19,345</b>	<b>14,379</b>	<b>10,602</b>	<b>18,529</b>	<b>6,141</b>	<b>20,515</b>	<b>20,515</b>	<b>24,277</b>	<b>32,279</b>	<b>28,609</b>	<b>23,479</b>			

Notes : This economic cost is made under the implementation schedule considering the priority sequence and the on-going projects.  
The improvement costs of the surveyed and other primary, and secondary channels are considered.



Table XII.4.12 ANNUAL OMR COST OF URBAN DRAINAGE PLAN FOR MASTER PLAN

(Economic Cost)

Unit : Milliin Rp.

Description	Operation & Administration	Maintenance & Replacement	Dredging	Total
1. Eastern Semarang				
Siringin	12	116	29	157
Tenggang	27	299	63	389
2. Central Semarang				
Semarang	85	267	19	371
Banger	8	73	20	101
Bulu	3	7	4	14
3. Western Semarang				
Ronggolawe	4	20	6	30
Karangayu	4	21	5	30
Tawang	3	5	2	10
Silandak	2	4	2	8
Total	148	812	150	1,110

Table XII.4.13 COST ALLOCATION FOR MULTIPLE-PURPOSE DAM

Description	Jatibarang Dam				Kedung Suren Dam			
	Flood Control Purpose	Water Supply Purpose	Total		Flood Control Purpose	Water Supply Purpose	Total	
Reference Point Qmax Required Capacity	770 (MCM)	-	-	100	-	-	-	52,366
	4,330	12,550	-	10,726	-	-	-	-
<hr/>								
Multiple-Purpose Cost	(MCM)	(MCM)	(MCM)	(MCM)	(MCM)	(MCM)	(MCM)	(MCM)
Sediment Capacity	-	-	6,800	-	-	-	-	19,700
Required Capacity	-	-	16,880	-	-	-	-	63,092
Total Capacity	-	-	23,680	-	-	-	-	82,792
Dam Crest (EL.m)	-	-	162.00	-	-	-	-	76.00
Construction Cost (Mill.Rp.)	-	-	63,477	-	-	-	-	261,685
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Alternate Single-Purpose Cost	(MCM)	(MCM)	(MCM)	(MCM)	(MCM)	(MCM)	(MCM)	(MCM)
Sediment Capacity	1,360	6,800	-	3,940	19,700	-	-	-
Required Capacity	4,330	12,550	-	10,726	52,366	-	-	-
Total Capacity	5,690	19,350	-	14,666	72,066	-	-	-
Dam Crest (EL.m)	141.39	157.91	-	63.35	74.70	-	-	-
Construction Cost (Mill.Rp.)	36,517	57,009	93,626	140,051	246,306	386,357	-	-
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Separable Cost	(MCM)	(MCM)	(MCM)	(MCM)	(MCM)	(MCM)	(MCM)	(MCM)
Sediment Capacity	6,800	6,800	-	19,700	19,700	-	-	-
Other Purpose Capacity	12,550	4,330	-	52,366	10,726	-	-	-
Total Capacity	19,350	11,130	-	72,066	30,426	-	-	-
Dam Crest (EL.m)	157.91	148.91	-	74.70	67.76	-	-	-
Construction Cost (Mill.Rp.)	57,009	45,068	-	246,306	179,941	-	-	-
Separable Cost (Mill.Rp.)	6,468	18,409	24,877	15,379	81,744	97,123	-	-
<hr/>								
Alternate Cost less Separable Cost (Mill.Rp.)	30,149	38,600	68,749	124,672	164,562	289,234	-	-
Allocated Joint Cost (Mill.Rp.)	16,945	21,655	38,600	70,926	93,636	164,562	-	-
<hr/>								
Total Allocated Cost (Mill.Rp.)	23,413	40,064	63,477	86,305	175,380	261,685	-	-

Table XII.4.14 COST BREAKDOWN FOR INTERBASIN TRANSFER

Item	Quantity	Unit	Cost (Mill.Rp.)
I. Construction Base Cost			5,574
1. Preparatory Works			507
2. Tunnel	1,600	m	4,320
3. Intake Weir			
1) Concrete	300	m3	150
2) Gate	1	L.S.	42
3) Revetment	200	m2	12
4) Maintenance Bridge	120	m2	50
4. Open Channel	100	m	32
5. Miscellaneous Works			461
II. Compensation Cost			20
1. Land Acquisition			
Paddy Land; Rural	2.00	ha	20
2. House Evacuation			
Class B	0	pc	0
III. Administration Cost			392
IV. Engineering Cost			1,115
V. Physical Contingency			671
VI. Total			7,772

Table XII.4.15 COST BREAKDOWN FOR CONVEYANCE CHANNEL

Item	Quantity	Unit	Cost (Mill.Rp.)
I. Construction Base Cost			6,446
1. Preparatory Works			586
2. Conveyance Channel	19,000	m	5,130
3. Related Structure	1	L.S.	62
4. Tunnel	1	L.S.	135
5. Miscellaneous Works			533
II. Compensation Cost			212
1. Land Acquisition			
Residential Area; Grade C	2.90	ha	145
Paddy Land; Rural	6.70	ha	67
2. House Evacuation			
Class B	0	pc	0
III. Administration Cost			466
IV. Engineering Cost			967
V. Physical Contingency			763
VI. Total			8,854

Table XII.4.16 ANNUAL DISBURSEMENT SCHEDULE OF WATER RESOURCES DEVELOPMENT PLAN FOR MASTER PLAN

Unit: Million Rp.

Description	Year																						
	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014		
<b>Total</b>	0	4,439	16,016	36,278	44,551	43,865	46,771	29,693	23,051	57,958	47,804	55,650	38,831	34,742	81,543	64,357	64,357	13,016	0	0	0	0	
1. Babon Dam	0	0	0	0	0	0	0	0	0	8,869	8,869	18,147	26,630	34,742	81,543	64,357	64,357	13,016	0	0	0	0	
2. Jatibarang Dam	0	4,439	11,527	12,299	12,299	3,506	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3. Mundingan Dam	0	0	4,489	23,979	27,413	35,520	27,799	7,916	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4. Interbasin Transfer	8,549	0	0	0	0	0	0	675	25	3,139	4,710	0	0	0	0	0	0	0	0	0	0	0	0
5. Kedungsuren Dam Kedungsuren Dam Conveyance Channel	192,918 9,739	0 0	0 0	0 0	4,839 0	4,839 0	18,972 0	21,102 0	23,026 0	45,365 585	33,952 273	33,952 3,551	5,871 5,330	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
<b>Total</b>	702,922	4,439	16,016	36,278	44,551	43,865	46,771	29,693	23,051	57,958	47,804	55,650	38,831	34,742	81,543	64,357	64,357	13,016	0	0	0	0	0

Note : Value added tax is included, but Price contingency is excluded.

Unit: Million Rp.

Description	Year																						
	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014		
<b>Total</b>	0	3,826	9,743	10,257	10,257	2,925	0	0	0	8,063	8,063	14,946	22,026	28,772	67,634	53,416	53,416	10,818	0	0	0	0	
1. Babon Dam	0	0	0	0	0	0	0	0	0	8,063	8,063	14,946	22,026	28,772	67,634	53,416	53,416	10,818	0	0	0	0	
2. Jatibarang Dam	0	3,826	9,743	10,257	10,257	2,925	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3. Mundingan Dam	0	0	4,081	20,149	22,738	29,543	23,184	6,601	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4. Interbasin Transfer	7,157	0	0	0	0	0	0	614	21	2,609	3,913	0	0	0	0	0	0	0	0	0	0	0	0
5. Kedungsuren Dam Kedungsuren Dam Conveyance Channel	160,611 8,120	0 0	0 0	0 0	4,399 0	4,399 0	15,627 0	17,430 0	19,051 0	37,622 532	28,188 225	28,188 2,944	5,707 4,419	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
<b>Total</b>	586,346	3,826	13,824	30,406	37,394	36,867	38,811	24,645	19,072	48,826	40,389	46,078	32,152	28,772	67,634	53,416	53,416	10,818	0	0	0	0	0

Table XII.4.17 ANNUAL OMR COST OF WATER RESOURCES DEVELOPMENT PLAN FOR MASTER PLAN

(Economic Cost)

Unit : Milliin Rp.

Description	Operation & Administration	Maintenance & Replacement	Dredging	Total
1. Babon Dam	113	333	-	446
2. Jatibarang Dam	34	43	-	77
3. Mundingan Dam	59	97	-	156
4. Interbasin Transfer	2	25	-	27
5. Kedungsuren Dam				
Kedungsuren Dam	58	176	-	234
Conveyance Channel	3	29	13	45
<b>Total</b>	<b>269</b>	<b>703</b>	<b>13</b>	<b>985</b>

Table XII.5.1 UNIT COSTS OF DAM CONSTRUCTION WORKS FOR FEASIBILITY STUDY  
(FINANCIAL)

Description	Unit	Unit Cost		
		F.C. (Rp.)	L.C. (Rp.)	Total (Rp.)
1 Excavation (Ripping & Blasting)	m3	7,500	5,500	13,000
2 Excavation (Ripping)	m3	5,600	1,500	7,100
3 Embankment	m3	12,000	8,000	20,000
4 Dam Concrete	m3	60,000	60,000	120,000
5 Spillway Concrete (Reinforced)	m3	125,000	155,000	280,000
6 Invert Concrete	m3	100,000	110,000	210,000
7 Foundation Treatment (Grouting)	m	130,000	80,000	210,000
8 Intake Facility	L.S.	760,000,000	430,000,000	1,190,000,000
9 Maintenance Bridge	m2	260,000	260,000	520,000
10 Diversion Tunnel	m	4,800,000	3,200,000	8,000,000
11 Relocation Road	m2	20,000	30,000	50,000
12 Relocation of Electrical Tower	pc	50,400,000	21,600,000	72,000,000

(ECONOMIC)

Description	Unit	Unit Cost		
		F.C. (Rp.)	L.C. (Rp.)	Total (Rp.)
1 Excavation (Ripping & Blasting)	m3	6,800	5,000	11,800
2 Excavation (Ripping)	m3	5,100	1,400	6,500
3 Embankment	m3	10,900	7,300	18,200
4 Dam Concrete	m3	54,500	54,500	109,000
5 Spillway Concrete (Reinforced)	m3	114,000	141,000	255,000
6 Invert Concrete	m3	90,900	100,000	190,900
7 Foundation Treatment (Grouting)	m	118,000	73,000	191,000
8 Intake Facility	L.S.	691,000,000	391,000,000	1,082,000,000
9 Maintenance Bridge	m2	236,000	236,000	472,000
10 Diversion Tunnel	m	4,360,000	2,910,000	7,270,000
11 Relocation Road	m2	18,200	27,300	45,500
12 Relocation of Electrical Tower	pc	45,800,000	19,600,000	65,400,000

Table XII.5.2 UNIT COSTS OF URBAN DRAINAGE WORKS FOR FEASIBILITY STUDY

Item	Unit Cost (Financial)			Unit Cost (Economic)		
	F.C. (1000Rp.)	L.C. (1000Rp.)	Total (1000Rp.)	F.C. (1000Rp.)	L.C. (1000Rp.)	Total (1000Rp.)
I. Open Channel (Type A)						
1. Semarang	195	53	248	178	49	227
II. Open Channel (Type D)						
1. Bandarharjo West	309	494	803	281	449	730
2. Asin	407	663	1,070	371	603	974
3. Bandarharjo East	325	521	846	296	474	770
4. Semarang	572	814	1,386	521	742	1,263
5. Balu	343	634	977	312	577	889
III. Open Channel (Type F)						
1. Semarang	49	13	62	45	12	57
IV. Open Channel (Type G)						
1. Baru	1,255	1,417	2,672	1,142	1,290	2,432
V. Revetment						
1. Revetment; Type D	12	27	39	11	25	36
2. Revetment; Type E	66	73	139	60	66	126
3. Revetment; Type F	93	103	196	85	94	179
VI. Drain Ditch						
1. Drain Ditch	23	37	60	21	33	54
VII. Retaining Wall						
1. Retaining Wall	641	739	1,380	583	674	1,257
VIII. Road Bridge						
1. Road Bridge	129,966	119,284	249,250	117,894	108,417	226,311
IX. Operation Bridge						
1. Bandarharjo West	7,823	4,932	12,755	7,119	4,483	11,602
2. Asin	33,692	20,323	54,015	30,656	18,468	49,124
3. Bandarharjo East	29,023	35,387	64,410	26,454	32,167	58,621
X. Overflow Section						
1. Bandarharjo West	32,817	30,337	63,154	29,847	27,143	56,990
2. Asin	147,570	135,588	283,158	134,239	122,317	256,556
3. Bandarharjo East	34,474	32,814	67,288	31,392	29,827	61,219
XI. Retarding Pond						
1. Bandarharjo West	219,723	107,334	327,057	200,577	97,558	298,135
2. Asin	827,339	383,274	1,210,613	755,164	350,153	1,105,317
3. Bandarharjo East	518,990	488,130	1,007,120	472,649	445,233	917,882



Table XII.5.3 COST COMPARISON OF ALTERNATIVES FOR JATIBARANG DAM CREST LEVEL

Item	Unit	Alt.1 Crest EL.160.5m		Alt.2 Crest EL.164.0m		Alt.3 Crest EL.167.0m		Alt.4 Crest EL.170.0m	
		Quantity	Total (Mill.Rp.)	Quantity	Total (Mill.Rp.)	Quantity	Total (Mill.Rp.)	Quantity	Total (Mill.Rp.)
<b>I. Construction Base Cost</b>			42,878	49,936	63,784	78,559			
1. Preparatory Works	L.S.	1	3,898	1	4,540	1	5,799	1	7,142
2. Main dam									
- Excavation (Ripping & Blasting)	m3	94,000	1,222	115,000	1,496	146,000	1,898	184,000	2,392
- Dam Concrete	m3	168,000	20,160	206,000	24,720	249,000	29,880	296,000	35,520
- Spillway Concrete (Reinforced)	m3	12,000	3,360	13,000	3,640	14,000	3,920	15,000	4,200
- Foundation Treatment (Grouting)	m	14,000	2,940	15,000	3,150	17,000	3,570	19,000	3,990
- Intake Facility	L.S.	1	1,071	1	1,190	1	1,309	1	1,428
- Maintenance Bridge	m2	350	182	350	182	350	182	350	182
3. Left Side Ridge Treatment									
- Excavation (Ripping)	m3	7,500	53	12,000	85	101,000	718	123,000	874
- Embankment	m3	0	0	0	0	27,000	540	53,000	1,060
- Water Leakage Treatment (Grouting)	m	4,400	924	6,000	1,260	9,000	1,890	11,000	2,310
4. Auxiliary Spillway									
- Excavation (Ripping)	m3	69,000	490	26,000	185	26,000	185	26,000	185
- Embankment	m3	0	0	0	0	500	10	3,200	64
- Invert Concrete	m3	2,300	483	2,300	483	7,200	1,512	15,100	3,171
- Water Leakage Treatment (Grouting)	m	1,100	231	2,300	483	4,000	840	6,800	1,428
5. Diversion Tunnel	m	350	2,800	350	2,800	350	2,800	350	2,800
6. Relocation Road	m2	16,000	800	17,500	875	18,800	940	20,000	1,000
7. Relocation of Electrical Tower	pc	10	720	10	720	10	720	10	720
8. Protection Works for Goa Cave	L.S.	0	0	0	0	1	1,800	1	3,600
9. Miscellaneous Works	L.S.	1	3,544	1	4,127	1	5,271	1	6,493
<b>II. Compensation Cost</b>			5,214	5,582	5,901	6,217			
1. Land Acquisition									
- Paddy Land; Rural	ha	24.0	2,400	24.8	2,480	25.5	2,550	26.2	2,620
- Upland Cultivation	ha	93.8	2,814	103.4	3,102	111.7	3,351	119.9	3,597
2. House Evacuation	unit	0.0	0	0.0	0	0.0	0	0.0	0
<b>Total</b>			48,092	55,518	69,685	84,776			

Table XII.5.4 (1/2) COST BREAKDOWN FOR FEASIBILITY STUDY OF GARANG RIVER IMPROVEMENT

Item	Design Discharge (Q=740m <sup>3</sup> /s)		Design Discharge (Q=770m <sup>3</sup> /s)		Design Discharge (Q=850m <sup>3</sup> /s)		Design Discharge (Q=900m <sup>3</sup> /s)		Design Discharge (Q=980m <sup>3</sup> /s)	
	Quantity	Unit Cost	Quantity	Unit Cost	Quantity	Unit Cost	Quantity	Unit Cost	Quantity	Unit Cost
<b>I. Construction Base Cost</b>		31,138		33,891		37,619		40,113		43,858
1. Preparatory Works		2,831		3,081		3,420		3,647		3,987
2. Excavation; Common 1	257,600	2,190	276,800	2,353	332,800	2,829	403,400	3,429	516,200	4,388
3. Excavation; Common 2	66,000	620	72,000	677	85,000	799	103,000	968	132,000	1,241
4. Embankment	8,900	66	10,200	75	12,900	96	14,600	108	12,800	94
5. Revetment; Type A & B	33,400	2,151	34,310	2,206	34,800	2,241	35,100	2,261	36,300	2,337
6. Sodding	4,200	4	4,300	4	4,600	5	4,700	5	5,000	6
7. Railway Bridge	0	0	0	0	0	0	0	0	0	0
8. Road Bridge	0	0	0	0	0	0	0	0	0	0
10. Retaining Wall	1	0	1	1,250	1	1,250	1	1,250	1	1,250
11. Ground Sill	1	1,099	1	1,099	1	1,099	1	1,099	1	1,099
12. Relocation Road	1	0	1	0	1	637	1	637	1	637
13. Reconstruction of Simongan Weir	1	17,270	1	18,011	1	19,800	1	21,060	1	22,860
14. Intake Structure	1	2,334	1	2,334	1	2,334	1	2,334	1	2,334
15. Miscellaneous Works		2,573		2,801		3,109		3,315		3,625
<b>II. Compensation Cost</b>		0		0		197		3,599		9,660
<b>1. Land Acquisition</b>										
Residential Area; Grade A	0.00	0	0.00	0	0.30	150	5.60	2,800	15.05	7,525
Residential Area; Grade B	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0
Residential Area; Grade C	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0
Paddy Land; Urban	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0
Paddy Land; Rural	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0
<b>2. House Evacuation</b>										
Class A	0	0	0	0	2	30	37	555	98	1,470
Class B	0	0	0	0	2	14	25	175	68	476
Class C	0	0	0	0	1	3	23	69	63	189
<b>III. Administration Cost</b>		2,180		2,372		2,647		3,060		3,746
<b>IV. Engineering Cost</b>		6,743		7,245		8,019		8,544		9,322
<b>V. Physical Contingency</b>		3,788		4,114		4,584		5,226		6,284
<b>VI. Total</b>		43,849		47,622		53,066		60,542		72,870

Remarks : The design discharge of 770 m<sup>3</sup>/s is selected as the optimum plan.

Table XII.5.4 (2/2) COST BREAKDOWN FOR FEASIBILITY STUDY OF WEST FLOODWAY IMPROVEMENT

Item	Design Discharge (Q=740m <sup>3</sup> /s)		Design Discharge (Q=770m <sup>3</sup> /s)		Design Discharge (Q=850m <sup>3</sup> /s)		Design Discharge (Q=900m <sup>3</sup> /s)		Design Discharge (Q=980m <sup>3</sup> /s)	
	Quantity	Unit Cost	Quantity	Unit Cost	Quantity	Unit Cost	Quantity	Unit Cost	Quantity	Unit Cost
<b>I. Construction Base Cost</b>		10,370		11,158		22,492		24,232		27,008
1. Preparatory Works		943		1,015		2,045		2,203		2,455
2. Excavation; Common 1	277,800	m <sup>3</sup>	339,000	m <sup>3</sup>	416,800	m <sup>3</sup>	509,100	m <sup>3</sup>	660,200	m <sup>3</sup>
3. Excavation; Common 2	293,500	m <sup>3</sup>	324,000	m <sup>3</sup>	322,700	m <sup>3</sup>	337,800	m <sup>3</sup>	361,900	m <sup>3</sup>
4. Embankment	0	m <sup>3</sup>	0	m <sup>3</sup>	0	m <sup>3</sup>	0	m <sup>3</sup>	0	m <sup>3</sup>
5. Revetment; Type A & B	9,300	m <sup>2</sup>	586	m <sup>2</sup>	9,500	m <sup>2</sup>	9,600	m <sup>2</sup>	9,600	m <sup>2</sup>
6. Sodding	0	m <sup>2</sup>	0	m <sup>2</sup>	0	m <sup>2</sup>	0	m <sup>2</sup>	0	m <sup>2</sup>
7. Railway Bridge	95	m	1,710	m	104	m	1,872	m	127	m
8. Road Bridge	0	m <sup>2</sup>	0	m <sup>2</sup>	4,733	m <sup>2</sup>	7,241	m <sup>2</sup>	5,792	m <sup>2</sup>
9. Retaining Wall	1	L.S.	693	L.S.	1	L.S.	693	L.S.	1	L.S.
10. Drainage Outlet	1	L.S.	1,863	L.S.	1	L.S.	1,863	L.S.	1	L.S.
11. Relocation Road	1	L.S.	0	L.S.	1	L.S.	1,586	L.S.	1	L.S.
12. Miscellaneous Works	857		922		1,859		2,003		2,232	
<b>II. Compensation Cost</b>		0		0		5,446		9,950		17,198
<b>1. Land Acquisition</b>										
Residential Area; Grade A	0.00	ha	0.00	ha	8.50	ha	4,250	ha	15.50	ha
Residential Area; Grade B	0.00	ha	0.00	ha	0.00	ha	0	ha	0.00	ha
Residential Area; Grade C	0.00	ha	0.00	ha	0.00	ha	0	ha	0.00	ha
Paddy Land; Urban	0.00	ha	0.00	ha	0.00	ha	0	ha	0.00	ha
Paddy Land; Rural	0.00	ha	0.00	ha	0.00	ha	0	ha	0.00	ha
<b>2. House Evacuation</b>										
Class A	0	pc	0	pc	55	pc	825	pc	101	pc
Class B	0	pc	0	pc	38	pc	266	pc	70	pc
Class C	0	pc	0	pc	35	pc	105	pc	65	pc
<b>III. Administration Cost</b>		726		781		1,956		2,393		3,094
<b>IV. Engineering Cost</b>		1,556		1,674		3,374		3,635		4,051
<b>V. Physical Contingency</b>		1,193		1,283		3,131		3,782		4,826
<b>VI. Total</b>		13,845		14,896		36,399		43,992		56,177

Remarks : The design discharge of 770 m<sup>3</sup>/s is selected as the optimum plan.



Table XII.5.6 RELATIONSHIP BETWEEN PROJECT COST AND DAM HEIGHT OF JATIBARANG DAM FOR FEASIBILITY STUDY

Item	Unit	Crest EL.145.0m		Crest EL.150.0m		Crest EL.160.5m		Crest EL.164.0m	
		Quantity	Total (Mill.Rp.)	Quantity	Total (Mill.Rp.)	Quantity	Total (Mill.Rp.)	Quantity	Total (Mill.Rp.)
I. Construction Base Cost			25,175		29,524		42,878		49,936
1. Preparatory Works									
2. Main dam	L.S.		2,289	1	2,684	1	3,898	1	4,540
- Excavation (Ripping & Blasting)	m3	55,000	716	69,000	898	94,000	1,222	115,000	1,496
- Dam Concrete	m3	86,000	10,320	108,000	12,960	168,000	20,160	206,000	24,720
- Spillway Concrete (Reinforced)	m3	9,500	2,661	10,000	2,800	12,000	3,360	13,000	3,640
- Foundation Treatment (Grouting)	m	9,500	1,995	11,000	2,310	14,000	2,940	15,000	3,150
3. Diversion Tunnel	m	330	2,640	335	2,680	350	2,800	350	2,800
4. Relocation Road	m2	11,000	550	12,500	625	16,000	800	17,500	875
5. Relocation of Electrical Tower	pc	10	720	10	720	10	720	10	720
6. Other Works	L.S.	1	1,204	1	1,407	1	3,434	1	3,868
7. Miscellaneous Works	L.S.	1	2,080	1	2,440	1	3,544	1	4,127
II. Compensation Cost			3,642		4,282		5,214		5,582
1. Land Acquisition									
- Paddy Land; Rural	ha	20.1	2,010	23.5	2,350	24.0	2,400	24.8	2,480
- Upland Cultivation	ha	54.4	1,632	64.4	1,932	93.8	2,814	103.4	3,102
2. House Evacuation	unit	0.0	0	0.0	0	0.0	0	0.0	0
III. Administration Cost			2,017		2,366		3,366		3,886
IV. Engineering Services			9,384		10,240		13,825		16,101
V. Physical Contingency			3,820		4,405		6,192		7,162
Total			44,038		50,817		71,475		82,567

Table XII.5.7 (1/2) COST COMPARISON OF ALTERNATIVES FOR PUMP DRAINAGE SYSTEM IN ASIN RIVER BASIN AREA

Item	Alt.1			Alt.2			Alt.3		
	Quantity	Unit	Cost (Mill.Rp.)	Quantity	Unit	Cost (Mill.Rp.)	Quantity	Unit	Cost (Mill.Rp.)
I. Construction Base Cost			2,193			4,384			2,632
1. Preparatory Works			199			399			239
2. Pump Station	0 L.S.		0	1 L.S.		1,500	0 L.S.		0
3. Retarding Pond			1,444			1,754			1,337
1) Excavation; Common	91,200	m3	666	91,400	m3	667	74,960	m3	547
2) Revetment; Type F	3,650	m2	715	5,160	m2	1,011	3,710	m2	727
3) Drain Ditch	1,050	m	63	1,270	m	76	1,060	m	63
4. Channel Improvement			369			369			838
1) Excavation; Common	12,000	m3	88	12,000	m3	88	36,300	m3	265
2) Embankment	2,500	m3	7	2,500	m3	7	6,300	m3	17
3) Revetment; Type D	2,080	m2	81	2,080	m2	81	5,510	m2	215
4) Revetment; Type E	1,390	m2	193	1,390	m2	193	2,450	m2	341
5. Miscellaneous Works			181			362			218
II. Compensation Cost			1,687			1,212			751
1. Land Acquisition			1,405			930			699
Residential Area; Grade B	0.00	ha	0	0.00	ha	0	3.17	ha	634
Residential Area; Grade A	2.81	ha	1,405	1.43	ha	715	0.13	ha	65
Paddy Land; Urban	0.00	ha	0	1.43	ha	215	0.00	ha	0
2. House Evacuation			282			282			52
Class C	94	pc	282	94	pc	282	0	pc	0
Class D	0	pc	0	0	pc	0	52	pc	52
<b>Total</b>			<b>3,880</b>			<b>5,596</b>			<b>3,383</b>

Table XII.5.7 (2/2) COST COMPARISON OF ALTERNATIVES  
FOR PUMP DRAINAGE SYSTEM IN BANDARHARJO AREA

Item	Alt.1		Alt.2		Remarks
	Quantity	Unit Cost (Mill.Rp.)	Quantity	Unit Cost (Mill.Rp.)	
I. Construction Base Cost		2,943		1,587	
1. Preparatory Works		268		144	
2. Pump Station	0 L.S.	0	0 L.S.	0	
3. Retarding Pond		802		531	
1) Excavation; Common	15,200	m3 111	31,750	m3 232	
2) Revetment; Type F	0	m2 0	1,527	m2 299	
3) Retaining Wall	500	m 691	0	m 0	
4. Channel Improvement		1,630		781	
1) Open Channel; Type D	300	m 293	800	m 781	
2) Open Channel; Type G	500	m 1,337	0	m 0	
5. Miscellaneous Works		243		131	
II. Compensation Cost		84		1,156	
1. Land Acquisition					
Commercial Area; Grade B	0.21	ha 84	1.39	ha 556	
2. House Evacuation					
Warehouse	0	pc 0	4	pc 600 (11,800 m2)	
<b>Total</b>		<b>3,027</b>		<b>2,743</b>	

Table XII.5.8 (1/3) SUMMARY OF RIVER IMPROVEMENT PROJECT COST FOR FEASIBILITY STUDY (FINANCIAL)

Description	Amount			Total (1,000 US\$)	Total (Mill.Yen)
	F.C. (Mill.Rp.)	L.C. (Mill.Rp.)	Total (Mill.Rp.)		
I. Construction Base Cost	34,700	24,646	59,346	29,191	3,663
1. Preparatory Works	2,659	1,436	4,095	2,014	253
2. West Floodway Improvement Works	3,904	1,687	5,591	2,750	345
3. Garang River Improvement Works	3,940	2,474	6,414	3,155	396
4. Reconstruction of Simongan Weir	11,330	6,681	18,011	8,859	1,112
5. Intake Structure	1,465	869	2,334	1,148	144
6. Others	3,536	1,344	4,880	2,400	301
7. Miscellaneous Works	2,418	1,306	3,724	1,832	230
Sub-total	29,252	15,797	45,049	22,159	2,781
8. Price Contingency ; F.C.3% & L.C.8%	5,448	8,849	14,297	7,032	883
II. Compensation Cost	0	0	0	0	0
III. Administration Cost	0	4,924	4,924	2,422	304
1. Administration	0	3,154	3,154	1,551	195
2. Price Contingency ; F.C.3% & L.C.8%	0	1,770	1,770	871	109
IV. Engineering Service	6,948	3,950	10,898	5,361	673
1. Detailed Design	2,958	1,385	4,343	2,136	268
2. Construction Supervision	3,172	1,454	4,626	2,275	286
3. Price Contingency ; F.C.3% & L.C.8%	818	1,111	1,929	949	119
V. Physical Contingency; 10% of I+II+IV	4,165	2,860	7,025	3,455	434
VI. Total (I+II+III+IV+V)	45,813	36,380	82,193	40,429	5,074
VII. Value Added Tax ; 10% of VI	0	8,219	8,219	4,043	507
VIII. Grand Total	45,813	44,599	90,412	44,472	5,581
Grand Total (1,000 US\$)	22,535	21,938	44,473		
Grand Total (Mill.Yen)	2,828	2,753	5,581		

Notes : \*1 Price Level in July,1992

\*2 Conversion Rate US\$ 1.00 = Rp.2,033, 1 Yen = Rp.16.20



Table XII.5.8 (2/3) SUMMARY OF JATIBARANG DAM PROJECT COST FOR FEASIBILITY STUDY (FINANCIAL)

Description	Amount			Total (1,000 US\$)	Total (Mill.Yen)
	F.C. (Mill.Rp.)	L.C. (Mill.Rp.)	Total (Mill.Rp.)		
I. Construction Base Cost	40,258	39,972	80,230	39,464	4,952
1. Preparatory Works	2,388	2,152	4,540	2,233	280
2. Main dam	17,649	16,729	34,378	16,910	2,122
3. Left Side Ridge Treatment	847	498	1,345	662	83
4. Auxiliary Spillway	675	476	1,151	566	71
5. Diversion Tunnel	1,680	1,120	2,800	1,377	173
6. Relocation Road	350	525	875	430	54
7. Relocation of Electrical Tower	504	216	720	354	44
8. Miscellaneous Works	2,171	1,956	4,127	2,030	255
9. Hydropower	7,741	2,116	9,857	4,848	608
Sub-total	34,005	25,788	59,793	29,411	3,691
10. Price Contingency ; F.C.3% & L.C.8%	6,253	14,184	20,437	10,053	1,262
II. Compensation Cost	0	7,898	7,898	3,885	488
1. Compensation	0	5,582	5,582	2,746	345
2. Price Contingency ; F.C.3% & L.C.8%	0	2,316	2,316	1,139	143
III. Administration Cost	0	7,051	7,051	3,468	435
1. Administration	0	4,576	4,576	2,251	282
2. Price Contingency ; F.C.3% & L.C.8%	0	2,475	2,475	1,217	153
IV. Engineering Service	14,268	7,482	21,750	10,698	1,343
1. Detailed Design	5,197	2,488	7,685	3,780	474
2. Construction Supervision	7,182	2,712	9,894	4,867	611
3. Price Contingency ; F.C.3% & L.C.8%	1,889	2,282	4,171	2,052	257
V. Physical Contingency; 10% of I+II+IV	5,453	5,536	10,989	5,405	678
VI. Total (I+II+III+IV+V)	59,979	67,939	127,918	62,921	7,896
VII .Value Added Tax ; 10% of VI	0	12,793	12,793	6,293	790
VIII.Grand Total	59,979	80,732	140,711	69,213	8,686
Grand Total (1,000 US\$)	29,503	39,711	69,214		
Grand Total (Mill.Yen)	3,702	4,983	8,685		

Notes : \*1 Price Level in July,1992

\*2 Conversion Rate US\$ 1.00 = Rp.2,033, 1 Yen = Rp.16.20

Table XII.5.8 (3/3) SUMMARY OF URBAN DRAINAGE PROJECT COST FOR FEASIBILITY STUDY (FINANCIAL)

Description	Amount			Total (1,000 US\$)	Total (Mill.Yen)
	F.C. (Mill.Rp.)	L.C. (Mill.Rp.)	Total (Mill.Rp.)		
I. Construction Base Cost	25,880	15,701	41,581	20,453	2,567
1. Preparatory Works	1,802	730	2,532	1,245	156
2. Bandarharjo West	2,735	839	3,574	1,758	221
3. Asin River Basin	7,544	2,288	9,832	4,836	607
4. Bandarharjo East	3,954	1,349	5,313	2,613	328
5. Semarang River	1,252	1,173	2,425	1,193	150
6. Baru River	884	983	1,867	918	115
7. Secondary Channel Improvement	0	0	0	0	0
8. Miscellaneous Works	1,638	663	2,301	1,132	142
Sub-total	19,819	8,025	27,844	13,696	1,719
9. Price Contingency ; F.C.3% & L.C.8%	6,061	7,676	13,737	6,757	848
II. Compensation Cost	0	2,184	2,184	1,074	135
1. Compensation	0	1,429	1,429	703	88
2. Price Contingency ; F.C.3% & L.C.8%	0	755	755	371	47
III. Administration Cost	0	4,050	4,050	1,992	250
1. Administration	0	2,050	2,050	1,008	127
2. Price Contingency ; F.C.3% & L.C.8%	0	2,000	2,000	984	123
IV. Engineering Service	3,221	2,322	5,543	2,727	342
1. Detailed Design	1,629	877	2,506	1,233	155
2. Construction Supervision	1,087	587	1,674	823	103
3. Price Contingency ; F.C.3% & L.C.8%	505	858	1,363	670	84
V. Physical Contingency; 10% of I+II+IV	2,910	2,021	4,931	2,425	304
VI. Total (I+II+III+IV+V)	32,011	26,278	58,289	28,671	3,598
VII. Value Added Tax ; 10% of VI	0	5,829	5,829	2,867	360
VIII. Grand Total	32,011	32,107	64,118	31,540	3,958
Grand Total (1,000 US\$)	15,746	15,793	31,539		
Grand Total (Mill.Yen)	1,976	1,982	3,958		

Notes : \*1 Price Level in July,1992

\*2 Conversion Rate US\$ 1.00 = Rp.2,033, 1 Yen = Rp.16.20

Table XII.5.9 (1/3) ANNUAL DISBURSEMENT SCHEDULE OF RIVER IMPROVEMENT WORKS FOR FEASIBILITY STUDY (FINANCIAL)

Unit: Million Rp.

Description	Amount		1994/1995		1995/1996		1996/1997		1997/1998		1998/1999		1999/2000		2000/2001		2001/2002		2002/2003		2003/2004		2004/2005	
	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.
I. Construction Base Cost	34,700	24,646	59,346																					
1. Preparatory Works	2,659	1,436	4,095																					
2. West Floodway Improvement Works	3,904	1,687	5,591																					
3. Garang River Improvement Works	3,940	2,474	6,414																					
4. Reconstruction of S/mongan Weir	11,330	6,681	18,011																					
5. Intake Structure	1,465	869	2,334																					
6. Others	3,536	1,304	4,880																					
7. Miscellaneous Works	2,418	1,306	3,724																					
Sub-total	29,252	15,797	45,049																					
8. Price Contingency	5,448	8,849	14,297																					
II. Compensation Cost	0	0	0																					
III. Administration Cost	0	4,924	4,924																					
1. Administration	0	3,154	3,154																					
2. Price Contingency	0	1,770	1,770																					
IV. Engineering Service	6,948	3,950	10,898																					
1. Detailed Design	2,958	1,385	4,343																					
2. Construction Supervision	3,172	1,454	4,626																					
3. Price Contingency	818	1,111	1,929																					
V. Physical Contingency	4,165	2,860	7,025																					
VI. Total (I+II+III+IV+V)	45,813	36,380	82,193																					
VII. Value Added Tax	0	8,219	8,219																					
VIII. Grand Total	45,813	44,599	90,412																					

Notes : \*1 Price Level In July 1992  
 \*2 Conversion Rate US\$ 1.00 = Rp.2,033, 1 Yen = Rp.16.20

Table XII.5.9 (2/3) ANNUAL DISBURSEMENT SCHEDULE OF JATIBARANG DAM CONSTRUCTION WORKS FOR FEASIBILITY STUDY (FINANCIAL)

Unit: Million Rp.

Description	1994/1995		1995/1996		1996/1997		1997/1998		1998/1999		1999/2000		2000/2001		2001/2002		2002/2003		2003/2004		2004/2005	
	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.
I. Construction Base Cost	40,258	39,972	80,230	0	0	0	5,049	4,788	11,374	10,971	13,451	14,444	10,384	9,769	0	0	0	0	0	0	0	0
1. Preparatory Works	2,388	2,152	4,540	0	0	1,672	1,506	716	646	0	0	0	0	0	0	0	0	0	0	0	0	0
2. Main dam	17,649	16,729	34,378	0	0	525	385	5,100	5,024	7,844	7,432	4,180	3,888	0	0	0	0	0	0	0	0	0
3. Left Side Ridge Treatment	847	498	1,345	0	0	67	18	780	480	0	0	0	0	0	0	0	0	0	0	0	0	0
4. Auxiliary Spillway	675	476	1,151	0	0	0	0	146	39	230	253	299	184	0	0	0	0	0	0	0	0	0
5. Diversion Tunnel	1,680	1,120	2,800	0	0	1,680	1,120	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6. Relocation Road	350	525	875	0	0	240	360	110	165	0	0	0	0	0	0	0	0	0	0	0	0	0
7. Relocation of Electrical Tower	504	216	720	0	0	302	130	202	86	0	0	0	0	0	0	0	0	0	0	0	0	0
8. Miscellaneous Works	2,171	1,956	4,127	0	0	0	0	435	392	868	782	868	782	0	0	0	0	0	0	0	0	0
9. Hydropower	7,741	2,116	9,857	0	0	0	0	2,322	635	2,323	635	3,096	846	0	0	0	0	0	0	0	0	0
Sub-total	34,005	25,788	59,793	0	0	4,486	3,519	9,811	7,467	11,255	9,102	8,443	5,700	0	0	0	0	0	0	0	0	0
10. Price Contingency	6,253	14,184	20,437	0	0	563	1,269	1,563	3,504	2,186	5,342	1,941	4,069	0	0	0	0	0	0	0	0	0
II. Compensation Cost	0	7,898	7,898	0	0	0	3,797	0	4,101	0	0	0	0	0	0	0	0	0	0	0	0	0
1. Compensation	0	5,582	5,582	0	0	0	2,791	0	2,791	0	0	0	0	0	0	0	0	0	0	0	0	0
2. Price Contingency	0	2,316	2,316	0	0	0	1,006	0	1,310	0	0	0	0	0	0	0	0	0	0	0	0	0
III. Administration Cost	0	7,051	7,051	0	0	0	1,027	0	2,064	0	2,263	0	1,697	0	0	0	0	0	0	0	0	0
1. Administration	0	4,576	4,576	0	0	0	755	0	1,405	0	1,426	0	990	0	0	0	0	0	0	0	0	0
2. Price Contingency	0	2,475	2,475	0	0	0	272	0	659	0	837	0	707	0	0	0	0	0	0	0	0	0
IV. Engineering Service	14,268	7,482	21,750	0	0	2,839	1,567	3,939	2,143	2,412	1,155	2,899	1,450	2,179	1,167	0	0	0	0	0	0	0
1. Detailed Design	5,197	2,488	7,685	0	0	2,598	1,244	2,599	1,244	0	0	0	0	0	0	0	0	0	0	0	0	0
2. Construction Supervision	7,182	2,712	9,894	0	0	901	331	2,081	786	2,428	914	1,772	681	0	0	0	0	0	0	0	0	0
3. Price Contingency	1,889	2,282	4,171	0	0	241	323	439	568	331	369	471	536	407	486	0	0	0	0	0	0	0
V. Physical Contingency	5,453	5,536	10,989	0	0	284	157	899	1,073	1,379	1,623	1,535	1,589	1,256	1,094	0	0	0	0	0	0	0
VI. Total (I+II+III+IV+V)	59,979	67,939	127,918	0	0	3,123	1,724	9,887	12,928	15,165	19,914	17,985	19,746	13,819	13,727	0	0	0	0	0	0	0
VII. Value Added Tax	0	12,793	12,793	0	0	0	485	0	2,272	0	3,508	0	3,773	0	2,755	0	0	0	0	0	0	0
VIII. Grand Total	59,979	80,732	140,711	0	0	3,123	2,209	9,887	15,100	15,165	23,422	17,985	23,519	13,819	16,482	0	0	0	0	0	0	0

Notes : \*1 Price Level in July,1992  
\*2 Conversion Rate US\$ 1.00 = Rp.2,033, 1 Yen = Rp.16.20

Table XII.5.9 (3/3) ANNUAL DISBURSEMENT SCHEDULE OF URBAN DRAINAGE WORKS FOR FEASIBILITY STUDY (FINANCIAL)

Unit: Million Rp.

Description	Amount		1994/1995		1995/1996		1996/1997		1997/1998		1998/1999		1999/2000		2000/2001		2001/2002		2002/2003		2003/2004		2004/2005			
	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.		
I. Construction Base Cost	25,880	15,701	41,581	0	0	0	0	0	0	0	0	2,282	2,802	3,702	1,919	4,787	1,869	4,013	2,791	4,372	2,373	3,509	2,084	3,215	1,863	
1. Preparatory Works	1,802	730	2,532	0	0	0	0	0	0	0	0	360	146	542	219	360	145	190	73	180	73	180	73	0	0	
2. Bandarharjo West	2,735	839	3,574	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	808	232	1,927	607	
3. Asin River Basin	7,544	2,288	9,832	0	0	0	0	0	0	0	0	0	0	1,719	299	3,257	799	2,568	1,190	0	0	0	0	0	0	
4. Bandarharjo East	3,964	1,349	5,313	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2,745	893	1,219	456	0	0	
5. Sewarang River	1,252	1,173	2,425	0	0	0	0	0	0	0	0	713	565	539	508	0	0	0	0	0	0	0	0	0	0	
6. Baru River	884	983	1,867	0	0	0	0	0	0	0	0	838	955	46	28	0	0	0	0	0	0	0	0	0	0	
7. Secondary Channel Improvement	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
8. Miscellaneous Works	1,638	663	2,301	0	0	0	0	0	0	0	0	0	0	164	-66	162	65	328	133	328	133	328	133	328	133	
Sub-total	19,819	8,025	27,844	0	0	0	0	0	0	0	0	1,911	1,766	3,010	1,120	3,779	1,010	3,075	1,396	3,253	1,099	2,535	884	2,255	740	
9. Price Contingency	6,061	7,676	13,737	0	0	0	0	0	0	0	0	371	1,036	692	799	1,008	859	937	1,395	1,119	1,274	974	1,190	960	1,123	
II. Compensation Cost	0	2,184	2,184	0	0	0	0	0	0	1,049	0	1,135	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1. Compensation	0	1,429	1,429	0	0	0	0	0	0	714	0	715	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2. Price Contingency	0	755	755	0	0	0	0	0	0	335	0	420	0	0	0	0	0	0	0	0	0	0	0	0	0	0
III. Administration Cost	0	4,050	4,050	0	0	0	0	0	0	73	0	487	0	495	0	620	0	626	0	658	0	658	0	560	0	531
1. Administration	0	2,050	2,050	0	0	0	0	0	0	50	0	307	0	289	0	335	0	313	0	305	0	305	0	240	0	211
2. Price Contingency	0	2,000	2,000	0	0	0	0	0	0	23	0	180	0	206	0	285	0	313	0	353	0	353	0	320	0	320
IV. Engineering Service	3,221	2,302	5,543	0	0	0	0	0	0	171	122	198	149	238	191	227	188	228	196	185	185	185	188	167	159	
1. Detailed Design	1,629	877	2,506	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2. Construction Supervision	1,087	587	1,674	0	0	0	0	0	0	143	77	161	87	188	103	174	94	170	91	134	72	117	72	117	63	
3. Price Contingency	505	858	1,363	0	0	0	0	0	0	28	45	37	62	50	88	53	94	58	105	51	96	51	96	50	96	
V. Physical Contingency	2,910	2,021	4,931	0	0	0	0	0	0	105	245	406	390	207	503	206	424	298	460	257	369	225	338	202		
VI. Total (I+II+III+IV+V)	32,011	26,278	58,289	0	0	0	0	0	0	1,227	2,698	4,952	4,290	2,770	5,328	2,886	4,664	3,903	5,060	3,484	4,063	3,037	3,720	2,755		
VII. Value Added Tax	0	5,829	5,829	0	0	0	0	0	0	123	0	765	0	706	0	841	0	857	0	854	0	710	0	648		
VIII. Grand Total	32,011	32,107	64,118	0	0	0	0	0	0	1,350	2,698	5,717	4,290	3,476	5,528	3,727	4,664	4,760	5,060	4,338	4,063	3,747	3,720	3,403		

Notes : \*1 Price Level in July, 1992  
 \*2 Conversion Rate US\$ 1.00 = Rp.2,033, 1 Yen = Rp.16.20

Table XII.5.10 (1/5) COST BREAKDOWN FOR FEASIBILITY STUDY  
OF RIVER IMPROVEMENT WORKS (FINANCIAL)

Item	Quantity	Unit Price		Amount					
		F.C. (1,000Rp.)	L.C. (1,000Rp.)	F.C. (Mill.Rp.)	L.C. (Mill.Rp.)	Total (Mill.Rp.)			
1. Preparatory Works							2,659	1,436	4,095
2. West Floodway Improvement Works							3,904	1,687	5,591
(1) Excavation;	Common 1-F	339,000 m3	4.6	1.2	1,559	407	1,559	407	1,966
	Common 2-F	226,000 m3	5.3	1.4	1,198	316	1,198	316	1,514
	River Mouth	98,000 m3	6.4	1.9	627	186	627	186	813
(2) Retaining Wall;	Type B	3,000 m	87.0	144.0	261	432	261	432	693
(3) Revetment;	Type A	6,580 m2	26.4	35.9	174	236	174	236	410
	Type B	3,020 m2	28.0	36.4	85	110	85	110	195
3. Garang River Improvement Works							3,940	2,474	6,414
(1) Excavation;	Common 1-G	276,800 m3	6.7	1.8	1,855	498	1,855	498	2,353
	Common 1-EM	10,200 m3	3.8	1.0	39	10	39	10	49
	Common 2-G	72,000 m3	7.4	2.0	533	144	533	144	677
(2) Embankment		10,200 m3	2.0	0.6	20	6	20	6	26
(3) Revetment;	Type A	2,110 m2	26.4	35.9	56	76	56	76	132
	Type B	32,200 m2	28.0	36.4	902	1,172	902	1,172	2,074
(4) Sodding		3,880 m2	0.1	1.0	0	4	0	4	4
(5) Groundsill;	Type A	1,040 m3	335.0	344.0	348	358	348	358	706
	Type B	110 m3	352.0	388.0	39	43	39	43	82
	Type C	30 m3	352.0	388.0	11	12	11	12	23
	Type D	390 m3	352.0	388.0	137	151	137	151	288
4. Reconstruction of Simongan Weir							11,330	6,681	18,011
(1) Diversion Works & Dewatering		1 LS	166,000.0	158,000.0	166	158	166	158	324
(2) Demolition		12,000 m3	19.5	7.1	234	85	234	85	319
(3) Excavation;	Common 2-G	6,710 m3	7.4	2.0	50	13	50	13	63
(4) Revetment;	Type C	1,110 m2	41.3	58.8	46	65	46	65	111
(5) Sodding		570 m2	0.1	1.0	0	1	0	1	1
(6) Reinforced Concrete		6,790 m3	254.0	254.0	1,725	1,725	1,725	1,725	3,450
(7) Foundation Pile;	D=500mm,L=12m	216 pc	810.0	700.0	175	151	175	151	326
	D=400mm,L=12m	135 pc	565.0	465.0	76	63	76	63	139
	D=350mm,L=12m	480 pc	466.0	376.0	224	180	224	180	404
(8) Sheet Pile;	t=0.2m	1,380 m2	109.0	92.0	150	127	150	127	277
(9) Main Gate 1		236 m2	25,200.0	10,800.0	5,947	2,549	5,947	2,549	8,496
(10) Main Gate 2		54 m2	26,600.0	11,400.0	1,436	616	1,436	616	2,052
(11) Retaining Wall;	Type C	80 m	3,800.0	2,970.0	304	238	304	238	542
(12) Concrete Block;	t=0.5m	2,830 m2	24.7	52.5	70	149	70	149	219
(13) Gabion Mattress;	t=0.5m	2,020 m2	12.8	17.8	26	36	26	36	62
(14) Bridge		1,040 m2	210.0	210.0	218	218	218	218	436
(15) Control House & Gate House		1 LS	28,000.0	112,000.0	28	112	28	112	140
(16) Steel Stop Log		1 LS	455,000.0	195,000.0	455	195	455	195	650
5. Intake Structure							1,465	869	2,334
(1) Demolition		350 m3	19.5	7.1	7	2	7	2	9
(2) Excavation;	Common 2	150 m3	7.4	2.0	1	0	1	0	1
(3) Reinforced Concrete		510 m3	254.0	254.0	130	130	130	130	260
(4) Foundation Pile;	D=350mm,L=12m	60 pc	466.0	376.0	28	23	28	23	51
(5) Sheet Pile;	t=0.2m	240 m2	109.0	92.0	26	22	26	22	48
(6) Gate		30 m2	29,400.0	12,600.0	882	378	882	378	1,260
(7) Retaining Wall;	Type C	55 m	3,800.0	2,970.0	209	163	209	163	372
	Type D	80 m	2,270.0	1,890.0	182	151	182	151	333
6. Others							3,536	1,344	4,880
(1) Railway Bridge		1 LS	1,290,000.0	477,000.0	1,290	477	1,290	477	1,767
(2) Retaining Wall for PDAM;	Type E	200 m	3,230.0	3,020.0	646	604	646	604	1,250
(3) Flap Gate;	1.0m x 1.0m	2 pc	24,300.0	7,000.0	49	14	49	14	63
	1.5m x 1.5m	0 pc	64,600.0	8,900.0	0	0	0	0	0
	2.0m x 2.0m	14 pc	110,800.0	17,800.0	1,551	249	1,551	249	1,800
7. Miscellaneous Works							2,418	1,306	3,724
<b>Total</b>							<b>29,252</b>	<b>15,797</b>	<b>45,049</b>

Table XII.5.10 (2/5) COST BREAKDOWN FOR FEASIBILITY STUDY  
OF JATIBARANG DAM CONSTRUCTION WORKS (FINANCIAL)

Item	Quantity	Unit Price (1,000 Rp.)		Amount (Mill.Rp.)		Total (Mill.Rp.)
		F.C.	L.C.	F.C.	L.C.	
I. Construction Base Cost (Dam)-----				26,264	23,672	49,936
1. Preparatory Works -----	1 L.S.			2,388	2,152	4,540
2. Main dam -----				17,649	16,729	34,378
- Excavation (Ripping & Blasting)	115,000 m3	7.5	5.5	863	633	1,496
- Dam Concrete	206,000 m3	60.0	60.0	12,360	12,360	24,720
- Spillway Concrete (Reinforced)	13,000 m3	125.0	155.0	1,625	2,015	3,640
- Foundation Treatment (Grouting)	15,000 m	130.0	80.0	1,950	1,200	3,150
- Intake Facility	1 L.S.	760,000.0	430,000.0	760	430	1,190
- Maintenance Bridge	350 m2	260.0	260.0	91	91	182
3. Left Side Ridge Treatment -----				847	498	1,345
- Excavation (Ripping)	12,000 m3	5.6	1.5	67	18	85
- Embankment	0 m3	12.0	8.0	0	0	0
- Water Leakage Treatment (Grouting)	6,000 m	130.0	80.0	780	480	1,260
4. Auxiliary Spillway -----				675	476	1,151
- Excavation (Ripping)	26,000 m3	5.6	1.5	146	39	185
- Embankment	0 m3	12.0	8.0	0	0	0
- Invert Concrete	2,300 m3	100.0	110.0	230	253	483
- Water Leakage Treatment (Grouting)	2,300 m	130.0	80.0	299	184	483
5. Diversion Tunnel -----	350 m	4,800.0	3,200.0	1,680	1,120	2,800
6. Relocation Road -----	17,500 m2	20.0	30.0	350	525	875
7. Relocation of Electrical Tower ----	10 pc	50,400.0	21,600.0	504	216	720
8. Protection Works for Goa Cave ----	0 L.S.	0.0	0.0	0	0	0
9. Miscellaneous Works -----	1 L.S.			2,171	1,956	4,127
II. Construction Base Cost (Exclusive to Hydro) -----				7,741	2,116	9,857
1. Preparatory Works -----	1 L.S.			704	192	896
2. Powerhouse -----				1096	1083	2,179
- Excavation (Ripping & Blasting)	11,000 m3	7.5	5.5	83	61	144
- Reinforced Concrete	900 m3	125.0	135.0	113	122	235
- Powerhouse Building	1 L.S.	900,000.0	900,000.0	900	900	1,800
3. Tailrace -----				73	74	147
- Excavation (Ripping & Blasting)	2,000 m3	7.5	5.5	15	11	26
- Common Concrete	150 m3	52.0	63.0	8	9	17
- Reinforced Concrete	400 m3	125.0	135.0	50	54	104
4. Electrical & Mechanical Equipment -----				5,193	577	5,770
- Turbine ; 1,500 kw	1 set	1,620,000.0	180,000.0	1,620	180	1,800
- Generator ; 1,700 kVA	1 set	765,000.0	85,000.0	765	85	850
- Transformer ; 6.6/20 kVA	1 set	180,000.0	20,000.0	180	20	200
- Inlet Valve	1 set	180,000.0	20,000.0	180	20	200
- Control & Switchyard Equipment	1 set	2,070,000.0	230,000.0	2,070	230	2,300
- Draft Gate	2 set	108,000.0	12,000.0	216	24	240
- Outlet Gate	1 set	162,000.0	18,000.0	162	18	180
5. Distribution Line; 20 kV -----	1 L.S.	35,000.0	15,000.0	35	15	50
6. Miscellaneous Works -----	1 L.S.			640	175	815
Construction Base Cost Total				34,005	25,788	59,793
III. Compensation Cost -----				0	5,582	5,582
1. Land Acquisition -----				0	5,582	5,582
- Residential Area; Grade C	0.0 ha	0.0	50,000.0	0	0	0
- Paddy Land; Rural	24.8 ha	0.0	100,000.0	0	2,480	2,480
- Upland Cultivation	103.4 ha	0.0	30,000.0	0	3,102	3,102
- Plantation	0.0 ha	0.0	80,000.0	0	0	0
- Forest	0.0 ha	0.0	10,000.0	0	0	0
2. House Evacuation -----	0.0 unit	0.0	3,000.0	0	0	0

Table XII.5.10 (3/5) COST BREAKDOWN FOR FEASIBILITY STUDY OF URBAN DRAINAGE WORKS (FINANCIAL)

Item	Quantity	Unit Price (1,000 Rp.)		Amount (Mill.Rp.)		Total (Mill.Rp.)
		F.C.	L.C.	F.C.	L.C.	
<b>I. Construction Base Cost</b> -----				19,819	8,025	27,844
1. Preparatory Works -----				1,802	730	2,532
2. Bandarharjo West -----				2,735	839	3,574
1) Pumping Station	0.80 m3/s			2,061	252	2,313
2) Gate Structure	1 place			206	69	275
3) Retarding Basin	0.84 ha			220	107	327
4) Channel Improvement - Open Channel; Type D	800 m	309.0	494.0	247	395	642
5) Related Structure - Inspection Road	3,250 m2	0.4	4.9	1	16	17
3. Asin River Basin -----				7,544	2,288	9,832
1) Pumping Station	5.70 m3/s			5,338	639	5,977
2) Gate Structure	1 place			712	187	899
3) Retarding Basin	2.67 ha			827	383	1,210
4) Channel Improvement - Open Channel; Type D	1,300 m	407.0	663.0	529	862	1,391
5) Related Structure - Bridge	1 pc			130	119	249
- Inspection Road	20,050 m2	0.4	4.9	8	98	106
4. Bandarharjo East -----				3,964	1,349	5,313
1) Pumping Station	2.00 m3/s			3,037	405	3,442
2) Gate Structure	1 place			178	64	242
3) Retarding Basin	0.93 ha			519	488	1,007
4) Channel Improvement - Open Channel; Type D	700 m	325.0	521.0	228	365	593
5) Related Structure - Inspection Road	5,600 m2	0.4	4.9	2	27	29
5. Semarang River -----				1,252	1,173	2,425
1) Channel Improvement - Open Channel; Type A	2,350 m	195.0	53.0	458	125	583
- Open Channel; Type D	500 m	572.0	814.0	286	407	693
- Open Channel; Type F	4,020 m	49.0	13.0	197	52	249
2) Related Structure - Revetment; Type D	9,530 m2	12.0	27.0	114	257	371
- Revetment; Type E	2,840 m2	66.0	73.0	187	207	394
- Inspection Road	25,500 m2	0.4	4.9	10	125	135
6. Baru River -----				884	983	1,867
1) Gate Structure	1 place			150	53	203
2) Channel Improvement - Open Channel (Type D)	300 m	343.0	634.0	103	190	293
- Open Channel (Type G)	500 m	1,255.0	1,417.0	628	709	1,337
2) Related Structure - Inspection Road	6,400 m2	0.4	4.9	3	31	34
7. Secondary Channel Improvement -----				0	0	0
8. Miscellaneous Works -----				1,638	663	2,301
<b>II. Compensation Cost</b> -----				0	1,429	1,429
1. Land Acquisition -----				0	1,167	1,167
Residential Area; Grade A	0.35 ha	0.0	500,000.0	0	175	175
Residential Area; Grade B	4.54 ha	0.0	200,000.0	0	908	908
Commercial Area; Grade B	0.21 ha	0.0	400,000.0	0	84	84
2. House Evacuation -----				0	262	262
Class B	30 pc	0.0	7,000.0	0	210	210
Class C	0 pc	0.0	3,000.0	0	0	0
Class D	52 pc	0.0	1,000.0	0	52	52



Table XII.5.10 (4/5) COST BREAKDOWN OF PUMP STATION

Unit : 1,000 Rp.

Item	Unit	Bandarharjo West P1 (Q=0.80m <sup>3</sup> /s)			Asin River Basin P2 (Q=5.70m <sup>3</sup> /s)			Bandarharjo East P3 (Q=2.00m <sup>3</sup> /s)			Total
		Quantity	F.C.	L.C.	Quantity	F.C.	L.C.	Quantity	F.C.	L.C.	
<b>1. Civil Work</b>											
1) Excavation; Common	m <sup>3</sup>	972	5,638	1,458	2,690	15,602	4,035	1,400	8,120	2,100	36,953
2) Embankment	m <sup>3</sup>	55	110	33	542	1,084	325	559	1,118	335	3,005
3) Backfilling	m <sup>3</sup>	522	1,566	470	1,173	3,519	1,056	623	1,869	561	9,041
4) Foundation Pile; D=500mm, L=15m	pc	34	34,000	29,580	66	66,000	57,420	52	52,000	45,240	284,240
5) RC Sheet Pile; t=0.2m	m <sup>2</sup>	23	2,507	2,116	126	13,734	11,592	108	11,772	9,936	51,657
6) Reinforced Concrete	m <sup>3</sup>	414	55,890	68,310	1,027	138,545	169,455	680	91,800	112,200	636,300
7) Leveling Concrete	m <sup>3</sup>	20	1,160	1,400	57	3,306	3,990	36	2,088	2,520	14,464
8) Concrete Block; t=0.5m	m <sup>2</sup>	0	0	0	160	3,952	8,400	100	2,470	5,250	20,072
9) Building Works	L.S.	1	30,261	31,010	1	73,753	76,882	1	51,371	53,443	316,720
10) Others	L.S.	1	6,557	6,719	1	15,980	16,658	1	11,130	11,579	68,623
Sub-Total			137,689	141,096		335,575	349,813		233,738	243,164	1,441,075
<b>2. Mechanical &amp; Electrical Works</b>											
1) Pump & Motor	L.S.	1	709,000	0	1	2,083,000	0	1	968,000	0	3,760,000
2) Generator	L.S.	1	263,000	0	1	862,000	0	1	569,000	0	1,714,000
3) Valve	L.S.	1	113,000	0	1	302,000	0	1	152,000	0	567,000
4) Electrical Facilities	L.S.	1	386,000	0	1	485,000	0	1	451,000	0	1,322,000
5) Miscellaneous Works	L.S.	1	358,000	0	1	1,078,000	0	1	555,000	0	1,991,000
6) Installation	L.S.	1	74,000	111,000	1	192,000	289,000	1	108,000	162,000	936,000
Sub-Total			1,923,000	111,000		5,002,000	289,000		2,803,000	162,000	10,290,000
Total			2,060,689	252,096		5,337,575	638,813		3,036,738	405,164	11,731,075

Table XII.5.10 (5/5) COST BREAKDOWN OF GATE STRUCTURE

Unit : 1,000 Rp.

Item	Unit	Bandarharjo West		Asin River Basin		Bandarharjo East		Baru River		Total				
		Quantity	F.C.	L.C.	Quantity	F.C.	L.C.	Quantity	F.C.		L.C.			
<b>1. Civil Work</b>														
1) Excavation; Common	m3	389	2,256	584	776	4,501	1,164	544	3,155	816	212	1,230	318	14,024
2) Backfilling	m3	188	564	169	138	414	124	261	783	235	88	264	79	2,632
3) Foundation Pile; D=500mm, L=15m	pc	33	33,000	28,710	50	50,000	43,500	24	24,000	20,880	19	19,000	16,530	235,620
4) RC Sheet Pile; t=0.2m	m2	52	5,668	4,784	189	20,601	17,388	66	7,194	6,072	66	7,194	6,072	74,973
5) Reinforced Concrete	m3	104	14,040	17,160	367	49,545	60,555	122	16,470	20,130	108	14,580	17,820	210,300
6) Levelling Concrete	m3	15	870	1,050	43	2,494	3,010	18	1,044	1,260	15	870	1,050	11,648
7) Concrete Block; t=0.5m	m2	100	2,470	5,250	400	9,880	21,000	100	2,470	5,250	50	1,235	2,625	50,180
8) Others	L.S.	1	2,943	2,885	1	6,872	7,337	1	2,756	2,732	1	2,219	2,225	29,969
Sub-Total			61,811	60,592		144,307	154,078		57,872	57,375		46,592	46,719	629,346
<b>2. Mechanical &amp; Electrical Works</b>														
1) Gate Leaf	L.S.	1	56,900	0	1	213,800	0	1	55,100	0	1	47,000	0	372,800
2) Hoist Machine	L.S.	1	71,300	0	1	291,600	0	1	51,800	0	1	45,400	0	460,100
3) Miscellaneous Works	L.S.	1	10,300	0	1	40,400	0	1	8,600	0	1	7,400	0	66,700
4) Installation	L.S.	1	5,500	8,300	1	21,800	32,700	1	4,600	6,900	1	4,000	6,000	89,800
Sub-Total			144,000	8,300		567,600	32,700		120,100	6,900		103,800	6,000	989,400
Total			205,811	68,892		711,907	186,778		177,972	64,275		150,392	52,719	1,618,746

Table XII.5.11 (1/5) ANNUAL DISBURSEMENT SCHEDULE OF FLOOD CONTROL PLAN FOR FEASIBILITY STUDY (ECONOMIC)

Unit: Million Rp.

Description	Amount		1994/1995		1995/1996		1996/1997		1997/1998		1998/1999		1999/2000		2000/2001		2001/2002		2002/2003		2003/2004		2004/2005		
	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.	
I. Construction Base Cost	34,766	21,643	56,409	0	0	0	1,398	1,098	13,315	7,953	13,498	8,705	6,555	3,887	0	0	0	0	0	0	0	0	0	0	0
1. River Improvement Works	26,583	14,263	40,846	0	0	0	0	0	10,982	5,824	10,712	6,066	4,889	2,373	0	0	0	0	0	0	0	0	0	0	0
2. Jatibarang Dam	8,183	7,380	15,563	0	0	0	1,398	1,098	2,333	2,129	2,786	2,639	1,514	0	0	0	0	0	0	0	0	0	0	0	0
II. Compensation Cost	0	1,740	1,740	0	0	0	0	0	870	0	870	0	0	0	0	0	0	0	0	0	0	0	0	0	0
III. Administration Cost	0	4,487	4,487	0	0	0	0	259	0	1,708	0	1,714	0	806	0	0	0	0	0	0	0	0	0	0	0
IV. Engineering Service	10,044	4,445	14,489	1,479	692	2,282	1,112	493	1,971	843	2,090	887	1,110	458	0	0	0	0	0	0	0	0	0	0	0
1. Detailed Design	4,564	2,143	6,707	1,479	692	2,282	1,072	803	379	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2. Construction Supervision	5,480	2,302	7,782	0	0	0	309	114	1,971	843	2,090	887	1,110	458	0	0	0	0	0	0	0	0	0	0	0
V. Physical Contingency	4,482	2,763	7,265	148	69	228	107	251	246	1,529	967	1,559	767	435	0	0	0	0	0	0	0	0	0	0	0
VI. Total (I+II+III+IV+V)	49,292	35,098	84,390	1,627	761	2,510	1,179	2,761	2,966	16,815	12,341	17,147	12,265	8,432	5,566	0	0	0	0	0	0	0	0	0	0
VII. Value Added Tax	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
VIII. Grand Total	49,292	35,098	84,390	1,627	761	2,510	1,179	2,761	2,966	16,815	12,341	17,147	12,265	8,432	5,566	0	0	0	0	0	0	0	0	0	0

Notes : \*1 Price Level In July, 1992.  
 \*2 Conversion Rate US\$ 1.00 = Rp. 2,033, 1 Yen = Rp. 16.20

Table XII.5.11 (2/5) ANNUAL DISBURSEMENT SCHEDULE OF URBAN DRAINAGE WORKS FOR FEASIBILITY STUDY (ECONOMIC)

Unit: Million Rp.

Description	Amount		1994/1995		1995/1996		1996/1997		1997/1998		1998/1999		1999/2000		2000/2001		2001/2002		2002/2003		2003/2004		2004/2005	
	F.C.	L.C. Total	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.
I. Construction Base Cost	17,124	6,465 23,589	0	0	0	0	0	0	0	0	1,292	1,194	2,388	695	3,415	897	2,777	1,249	2,934	980	2,282	789	2,036	661
1. Preparatory Works	1,557	588 2,145	0	0	0	0	0	0	0	0	311	118	467	176	311	118	156	59	156	59	156	58	0	0
2. Bandarharjo West	2,487	764 3,251	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	734	210	1,753	554
3. Asti River Basin	6,864	2,081 8,945	0	0	0	0	0	0	0	0	0	0	1,563	272	2,963	726	2,338	1,083	0	0	0	0	0	0
4. Bandarharjo East	3,604	1,228 4,832	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2,495	814	1,109	414	0	0
5. Semarang River	392	375 767	0	0	0	0	0	0	0	0	218	206	174	169	0	0	0	0	0	0	0	0	0	0
6. Baru River	805	895 1,700	0	0	0	0	0	0	0	0	763	870	42	25	0	0	0	0	0	0	0	0	0	0
7. Secondary Channel Improvement	0	0 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8. Miscellaneous Works	1,415	534 1,949	0	0	0	0	0	0	0	0	0	0	142	53	141	53	283	107	283	107	283	107	283	107
Sub-total	17,124	6,465 23,589	0	0	0	0	0	0	0	0	1,292	1,194	2,388	695	3,415	897	2,777	1,249	2,934	980	2,282	789	2,036	661
9. Price Contingency	0	0 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
II. Compensation Cost	0	1,299 1,299	0	0	0	0	0	0	0	649	0	650	0	0	0	0	0	0	0	0	0	0	0	0
1. Compensation	0	1,299 1,299	0	0	0	0	0	0	0	649	0	650	0	0	0	0	0	0	0	0	0	0	0	0
2. Price Contingency	0	0 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
III. Administration Cost	0	2,050 2,050	0	0	0	0	0	0	0	50	0	307	0	289	0	335	0	313	0	305	0	240	0	211
1. Administration	0	2,050 2,050	0	0	0	0	0	0	0	50	0	307	0	289	0	335	0	313	0	305	0	240	0	211
2. Price Contingency	0	0 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IV. Engineering Service	2,716	1,464 4,180	0	0	815	439	814	438	0	0	143	77	161	87	188	103	174	94	170	91	134	72	117	63
1. Detailed Design	1,829	877 2,506	0	0	815	439	814	438	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2. Construction Supervision	1,087	587 1,674	0	0	0	0	0	0	0	0	143	77	161	87	188	103	174	94	170	91	134	72	117	63
3. Price Contingency	0	0 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
V. Physical Contingency	1,984	923 2,907	0	0	82	45	61	44	0	65	144	192	255	78	360	100	295	134	310	107	242	86	215	72
VI. Total (I+II+III+IV+V)	21,824	12,201 34,025	0	0	897	464	895	482	0	764	1,579	2,420	2,804	1,149	3,963	1,435	3,245	1,790	3,414	1,483	2,658	1,187	2,366	1,007
VII. Value Added Tax	0	0 0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
VIII. Grand Total	21,824	12,201 34,025	0	0	897	464	895	482	0	764	1,579	2,420	2,804	1,149	3,963	1,435	3,245	1,790	3,414	1,483	2,658	1,187	2,366	1,007

Notes : \*1 Price Level in July,1992  
\*2 Conversion Rate US\$ 1.00 = Rp.2,033, 1 Yen = Rp.16.20

Table XII.5.11 (3/5) ANNUAL DISBURSEMENT SCHEDULE OF WATER RESOURCES DEVELOPMENT PLAN FOR FEASIBILITY STUDY (ECONOMIC)

Unit: Million Rp.

Description	Amount		1994/1995		1995/1996		1996/1997		1997/1998		1998/1999		1999/2000		2000/2001		2001/2002		2002/2003		2003/2004		2004/2005		
	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.	
I. Construction Base Cost	15,633	14,101	29,734	0	0	0	2,670	2,099	4,457	4,068	5,323	5,042	3,183	2,892	0	0	0	0	0	0	0	0	0	0	0
1. Jatibarang Dam	15,633	14,101	29,734	0	0	0	2,670	2,099	4,457	4,068	5,323	5,042	3,183	2,892	0	0	0	0	0	0	0	0	0	0	0
II. Compensation Cost	0	3,324	3,324	0	0	0	0	1,662	0	1,662	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
III. Administration Cost	0	2,547	2,547	0	0	0	0	495	0	785	0	799	0	468	0	0	0	0	0	0	0	0	0	0	0
IV. Engineering Service	7,480	3,070	10,550	0	1,534	725	2,125	942	1,275	468	1,502	552	1,044	383	0	0	0	0	0	0	0	0	0	0	0
1. Detailed Design	3,069	1,450	4,519	0	1,534	725	1,535	725	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2. Construction Supervision	4,411	1,620	6,031	0	0	0	590	217	1,275	468	1,502	552	1,044	383	0	0	0	0	0	0	0	0	0	0	0
V. Physical Contingency	2,312	2,050	4,362	0	153	73	480	470	573	620	683	559	423	328	0	0	0	0	0	0	0	0	0	0	0
VI. Total (I+II+III+IV+V)	25,425	25,092	50,517	0	1,687	798	5,275	5,668	6,305	7,603	7,508	6,952	4,650	4,071	0	0	0	0	0	0	0	0	0	0	0
VII. Value Added Tax	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
VIII. Grand Total	25,425	25,092	50,517	0	1,687	798	5,275	5,668	6,305	7,603	7,508	6,952	4,650	4,071	0	0	0	0	0	0	0	0	0	0	0

Notes : \*1 Price Level in July, 1992  
\*2 Conversion Rate US\$ 1.00 = Rp.2,033, 1 Yen = Rp.16.20

Table XII.5.11 (4/5) ANNUAL DISBURSEMENT SCHEDULE OF JATIBARANG DAM CONSTRUCTION WORKS FOR FEASIBILITY STUDY (ECONOMIC)

Unit: Million Rp.

Description	Amount		1994/1995		1995/1996		1996/1997		1997/1998		1998/1999		1999/2000		2000/2001		2001/2002		2002/2003		2003/2004		2004/2005		
	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.	
I. Construction Base Cost	30,899	23,446	54,345	0	0	0	0	4,076	3,203	8,914	6,786	10,236	8,273	7,673	5,184	0	0	0	0	0	0	0	0	0	0
1. Preparatory Works	2,169	1,957	4,126	0	0	0	1,518	1,370	651	587	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2. Main dam	16,035	15,204	31,239	0	0	0	477	351	4,634	4,565	7,126	6,754	3,798	3,534	0	0	0	0	0	0	0	0	0	0	
3. Left Side Ridge Treatment	769	455	1,224	0	0	0	61	17	708	438	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4. Auxiliary Spillway	613	434	1,047	0	0	0	0	0	133	36	209	230	271	168	0	0	0	0	0	0	0	0	0	0	
5. Diversion Tunnel	1,526	1,019	2,545	0	0	0	1,526	1,019	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
6. Relocation Road	319	478	797	0	0	0	219	328	100	150	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
7. Relocation of Electrical Tower	458	196	654	0	0	0	275	118	183	78	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
8. Miscellaneous Works	1,972	1,779	3,751	0	0	0	0	0	394	355	789	712	789	712	0	0	0	0	0	0	0	0	0	0	
9. Hydropower	7,038	1,924	8,962	0	0	0	0	0	2,111	577	2,112	577	2,815	770	0	0	0	0	0	0	0	0	0	0	
Sub-tota1	30,899	23,446	54,345	0	0	0	4,076	3,203	8,914	6,786	10,236	8,273	7,673	5,184	0	0	0	0	0	0	0	0	0	0	
10. Price Contingency	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
11. Compensation Cost	0	5,074	5,074	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1. Compensation	0	5,074	5,074	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2. Price Contingency	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
III. Administration Cost	0	4,576	4,576	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1. Administration	0	4,576	4,576	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2. Price Contingency	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
IV. Engineering Service	12,379	5,200	17,579	0	0	0	2,598	1,244	3,500	1,575	2,081	786	2,428	914	1,772	681	0	0	0	0	0	0	0	0	
1. Detailed Design	5,197	2,488	7,685	0	0	0	2,598	1,244	2,599	1,244	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2. Construction Supervision	7,182	2,712	9,894	0	0	0	0	0	901	331	2,081	786	2,428	914	1,772	681	0	0	0	0	0	0	0	0	
3. Price Contingency	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
V. Physical Contingency	4,329	3,373	7,702	0	0	0	260	124	758	732	1,100	1,011	1,266	919	945	587	0	0	0	0	0	0	0	0	
VI. Total (I+II+III+IV)	47,607	41,669	89,276	0	0	0	2,858	1,368	8,334	8,802	12,095	12,525	13,930	11,532	10,390	7,442	0	0	0	0	0	0	0	0	
VII. Value Added Tax	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
VIII. Grand Total	47,607	41,669	89,276	0	0	0	2,858	1,368	8,334	8,802	12,095	12,525	13,930	11,532	10,390	7,442	0	0	0	0	0	0	0	0	

Notes : \*1 Price Level in July,1992  
\*2 Conversion Rate US\$ 1.00 = Rp.2.033, 1 Yen = Rp.16.20

Table XII.5.11 (5/5) ANNUAL DISBURSEMENT SCHEDULE OF HYDROPOWER GENERATION WORKS FOR FEASIBILITY STUDY (ECONOMIC)

Unit: Million Rp.

Description	Amount		1994/1995		1995/1996		1996/1997		1997/1998		1998/1999		1999/2000		2000/2001		2001/2002		2002/2003		2003/2004		2004/2005		
	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.	
I. Construction Base Cost	7,083	1,965	9,048	0	0	0	0	8	6	2,124	589	2,127	592	2,824	778	0	0	0	0	0	0	0	0	0	0
1. Jetbarang Dam	45	41	86	0	0	0	0	8	6	13	12	15	15	9	8	0	0	0	0	0	0	0	0	0	0
2. Exclusive to Hydro	7,038	1,924	8,962	0	0	0	0	0	0	2,111	577	2,112	577	2,815	770	0	0	0	0	0	0	0	0	0	0
II. Compensation Cost	0	10	10	0	0	0	0	0	5	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
III. Administration Cost	0	696	696	0	0	0	0	1	0	209	0	209	0	277	0	0	0	0	0	0	0	0	0	0	0
IV. Engineering Service	982	526	1,508	0	0	260	140	262	141	139	73	139	74	182	98	0	0	0	0	0	0	0	0	0	0
1. Detailed Design	520	260	800	0	0	260	140	260	140	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2. Construction Supervision	462	266	708	0	0	0	0	2	1	139	73	139	74	182	98	0	0	0	0	0	0	0	0	0	0
V. Physical Contingency	807	251	1,058	0	0	26	14	27	15	226	67	227	67	301	88	0	0	0	0	0	0	0	0	0	0
VI. Total (I+II+III+IV+V)	8,872	3,448	12,320	0	0	286	154	297	168	2,489	943	2,493	942	3,307	1,241	0	0	0	0	0	0	0	0	0	0
VII. Value Added Tax	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
VIII. Grand Total	8,872	3,448	12,320	0	0	286	154	297	168	2,489	943	2,493	942	3,307	1,241	0	0	0	0	0	0	0	0	0	0

Notes : \*1 Price Level in July,1992  
\*2 Conversion Rate US\$ 1.00 = Rp.2,033, 1 Yen = Rp.16.20

Table XII.5.12 (1/2) ANNUAL DISBURSEMENT SCHEDULE OF FLOOD CONTROL PLAN FORFEASIBILITY STUDY  
(ALTERNATIVE I, ECONOMIC)

Unit: Million Rp.

Description	Amount		1994/1995		1996/1996		1997/1997		1998/1998		1999/1999		2000/2000		2001/2001		2002/2002		2003/2003		2004/2004		2005/2005			
	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.		
I. Construction Base Cost	34,766	21,643	56,409	0	0	0	0	0	10,982	5,824	10,712	6,066	4,889	2,373	0	1,398	1,098	2,333	2,129	2,786	2,639	1,666	1,514	0	0	
1. River Improvement Works	26,583	14,263	40,846	0	0	0	0	10,982	5,824	10,712	6,066	4,889	2,373	0	0	0	0	0	0	0	0	0	0	0	0	0
2. Jettying Dam	8,183	7,380	15,563	0	0	0	0	0	0	0	0	0	0	0	0	1,398	1,098	2,333	2,129	2,786	2,639	1,666	1,514	0	0	
II. Compensation Cost	0	1,740	1,740	0	0	0	0	0	0	0	0	0	0	0	0	0	0	870	0	870	0	0	0	0	0	
III. Administration Cost	0	4,487	4,487	0	0	0	0	1,297	0	1,297	0	1,296	0	561	0	0	259	0	411	0	418	0	245	0	0	
IV. Engineering Service	10,044	4,445	14,489	1,479	692	1,479	693	0	1,304	598	1,304	598	564	258	803	379	1,112	493	667	245	786	289	546	200	0	
1. Detailed Design	4,564	2,143	6,707	1,479	692	1,479	693	0	0	0	0	0	0	0	803	379	803	379	0	0	0	0	0	0	0	
2. Construction Supervision	5,480	2,302	7,782	0	0	0	0	1,304	598	1,304	598	564	258	0	0	309	114	667	245	786	289	546	200	0		
V. Physical Contingency	4,482	2,783	7,265	148	69	148	69	0	1,229	643	1,202	666	546	264	80	38	251	246	300	324	357	293	221	171	0	
VI. Total (I+II+III+IV)	49,292	35,098	84,390	1,627	761	1,627	762	0	13,515	8,362	13,218	8,626	5,999	3,456	883	417	2,761	2,966	3,300	3,979	3,639	2,433	2,130	0	0	
VII. Value Added Tax	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
VIII. Grand Total	49,292	35,098	84,390	1,627	761	1,627	762	0	13,515	8,362	13,218	8,626	5,999	3,456	883	417	2,761	2,966	3,300	3,979	3,639	2,433	2,130	0	0	

Notes : \*1 Price Level in July, 1992

\*2 Conversion Rate US\$ 1.00 = Rp.2.033, 1 Yen = Rp.16.20