

## **SUPPORTING REPORT**

**N: CONSTRUCTION PLAN AND COST ESTIMATE**

## Supporting Report N: Construction Plan and Cost Estimate

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**1. CONSTRUCTION PLAN**

**1.1 General**

The construction works for the Master Plan and Priority Project consist of mainly excavation, embankment, revetment, diversion weir, control gate, drainage sluice, ground sill, intake gate, bridge, rural road and telemeter system. Stretches to be improved are the Lower Reaches (River mouth - El Delirio), Middle Reaches (El Delirio ñ Urbina bridge) of the San Miguel River, and Olomega diversion channel and Olomega drainage.

**1.2 Basis of Construction Plan**

The construction plan for the execution of Master Plan and Priority Project was prepared on the basis of following assumption and consideration:

- 1) **Construction Period:** Construction period of the Master Plan was assumed to be 10 years in due consideration of quantity of works, funding and realization of flood control effects at early stage. Construction of the Priority Project will be carried out for 5 years at the initial stage of the Master Plan.
- 2) **Procurement of Works:** Construction works were assumed to be procured through a package contract system by international tendering, since the construction should be carried out during a limited period.
- 3) **Annual Workable Days:** Annual workable days were assumed to be 220 days based on the rainfall records and current national holidays as follows:
  - Total days in a year : 365 days
  - Sundays : 52 days
  - National holidays : 22 days
  - Suspended days due to rainfall : 71 days (Daily rainfall > 10 mm)
  - Workable days(1-2-3-4) : 220 days
- 4) Daily working hour is assumed to be eight (8) hours.
- 5) All the construction works except the excavation of rock layer are basically carried out by the conventional methods and equipment. This will facilitate equipment maintenance and supply of spare parts. Since the quantity of work is large, major works are planned to be carried out by mechanical power, however, in order to

enhance employment opportunity man power will be utilized to the maximum extent whenever possible.

### 1.3 Construction Plan

According to the preliminary facility design in SUPPORTING REPORTS- L(Floodwater Storage Plan) and M (River Improvement Plan), the major quantities of works are as presented bellow respectively for the Master Plan, Priority Project and rest of the Master Plan.

| Items                    | Master Plan               | Priority Projects        | Rest of MP               |
|--------------------------|---------------------------|--------------------------|--------------------------|
| Earth excavation         | 14,353,000 m <sup>3</sup> | 7,883,000 m <sup>3</sup> | 6,470,000 m <sup>3</sup> |
| Excavation of rock layer | 603,000 m <sup>3</sup>    | 152,000 m <sup>3</sup>   | 451,000 m <sup>3</sup>   |
| Embankment               | 1,843,000 m <sup>3</sup>  | 1,173,000 m <sup>3</sup> | 670,000 m <sup>3</sup>   |
| Revetment                | 6,000 m                   | 6,000 m                  | -                        |
| Ground sill              | 4 sites                   | 4 sites                  | 4 sites (renovation)     |
| Sluice                   | 15 sites                  | 1 site                   | 14 sites                 |
| Diversion weir           | 1 site                    | 1 site                   | 1 site(renovation)       |
| Control gate             | 1 site                    | 1 site                   | -                        |
| Bridge                   | 5 sites                   | 3 sites                  | 2 sites                  |

Major quantities of works for respective work divisions of the lower reaches, middle reaches, Olomega diversion/retarding facilities and reaches around San Miguel City are presented below respectively for the Priority Project and the rest of the Master Plan project.

#### Priority Project

##### 1) Lower Reach (River mouth ñ El Delirio): Construction from 2001 to 2004

- Earth excavation(1) : 575,000 m<sup>3</sup> (with hauling of 1 km long)
- Earth excavation(2) : 3,906,000 m<sup>3</sup> (Jocotal area: no hauling)
- Rock excavation : 69,000 m<sup>3</sup>
- Embankment : 506,000 m<sup>3</sup>
- Revetment : 3,700 m
- Ground sill : 2 sites

##### 2) Middle Reach (El Delirio ñ Aramuaca): Construction from 2003 to 2005

- Excavation(1) : 2,034,000 m<sup>3</sup> (with hauling of 1 km long)
- Rock excavation : 83,000 m<sup>3</sup>
- Embankment : 531,000 m<sup>3</sup>
- Revetment : 1,100 m

- Ground sill : 2 sites
  - Drainage sluice : 1 site
  - Intake gate : 1 site
  - Bridge : 1 site
- 3) Olomega Diversion / Retarding Facilities: Construction from 2001 to 2003
- Excavation(1) : 1,368,000 m<sup>3</sup> (with hauling of 1 km long)
  - Embankment : 136,000 m<sup>3</sup>
  - Revetment : 1,200 m
  - Control gate : 1 site
  - Diversion weir : 1 site
  - Bridge : 2 sites

#### Rest of Master Plan Project

- 1) Lower Reach (River mouth ñ El Delirio): Construction from 2006 to 2009
- Earth excavation(1) : 2,870,000 m<sup>3</sup> (with hauling of 1 km long)
  - Earth excavation(2) : 2,360,000 m<sup>3</sup> (Jocotal area: no hauling)
  - Rock excavation : 451,000 m<sup>3</sup>
  - Embankment : 670,000 m<sup>3</sup>
  - Ground sill : 2 sites (widening)
  - Drainage sluice : 14 sites
  - Bridge reconstruction : 2 sites
- 2) Middle Reach (El Delirio ñ Aramuaca) : Construction from 2009 to 2010
- Earth excavation(1) : 406,000 m<sup>3</sup> (with hauling of 1 km long)
  - Ground sill : 2 sites (widening)
- 3) Olomega Diversion / Retarding Facilities: Construction from 2009 to 2010
- Diversion weir : 1 site (heightening and widening)
- 4) Reaches around San Miguel City: Construction in 2010
- Excavation : 834,000 m<sup>3</sup> (with hauling of 1 km long)

Construction method was discussed so that work quantities mentioned above would distribute uniformly throughout the construction period. As a result, the following construction method and work period were proposed:

- 1) Earth excavation: Excavation is carried out by bulldozer (21 ton) and backhoe (0.7 m<sup>3</sup>).
- 2) Disposal of excavated materials: The excess excavated materials could be utilized effectively to reclaim the low-lying lands and swampy areas along the river except

the Jocotal area. The excavated materials are hauled to the final disposal areas by dump truck (11 ton). The hauling distance was assumed to be 1 km on an average. As the volume of excavation is large, it is recommended to utilize it for useful purpose like land reclamation in depressed area. It is possible to find such depressed land in the vicinity of the contraction area. The excavated materials in the Jocotal area are mounded up on the discontinuous alignment along the river.

- 3) **Rock excavation:** Excavation of rock layer is carried out by blasting in combination with ripper bulldozer (21 ton) and backhoe (0.7 m<sup>3</sup>) with ripper.
- 4) **Embankment:** Embankment works are carried out by bulldozer (21 ton) and backhoe (0.7 m<sup>3</sup>). A part of the excavated materials is used for the embankment.
- 5) **Revetment works:** Revetment works are planned for the low-water channel. The revetment works are executed principally by manpower. Stone pitching type with concrete frame is planned.
- 6) **Bridge:** Post pre-stressed concrete beam type is planned for bridge. The piers and abutments are built on the pile foundation.

## **2. BASIS OF COST ESTIMATE**

The project cost consists of costs for the following items:

- 1) Construction works
  - Channel works (earth and rock excavation, embankment and revetment)
  - Structure works (diversion weir, control gate, drainage sluice and ground sill)
  - Appurtenant works (intake gate, bridge, rural road and telemeter system)
- 2) Land acquisition and house compensation
- 3) Administration
- 4) Engineering service
- 5) Contingency
  - Physical contingency
  - Price contingency

The project cost was estimated based on the following conditions and assumptions:

- 1) The estimates are made on the assumption that all the construction works are executed by general contractors under the contract through international tendering.
- 2) All the base costs are expressed based on the fixed price as of December 1996.
- 3) The exchange rate: US\$1.00 = ₱ 8.75 is assumed according to the prevailing exchange rate during the study period.
- 4) The cost is classified into foreign and local currency portions.
- 5) Administration cost is assumed at 5% of the total costs of construction works and land acquisition and house compensation.
- 6) Engineering service cost is assumed at 15% of the total costs of construction works and land acquisition and house compensation.
- 7) A physical contingency is assumed to be 10% of the total costs of construction works, land acquisition and house compensation, administration and engineering service.
- 8) Annual price escalation rate is assumed to be 3 % for foreign currency portion and 6 % for local currency portion.



### 3. UNIT PRICE/COST

#### 3.1 Unit Price

The unit prices of labor wages, construction materials and equipment are shown in Tables N.3.1, N.3.2 and N.3.3 based on the actual similar projects in El Salvador.

#### 3.2 Unit Construction and Land Costs

##### 1) Unit Construction Cost

Standard unit construction costs applied to the cost estimate are as follows:

- Excavation(1):                   ¢ 45 / m<sup>3</sup> (hauling=1km) except for Jocotal area
- Excavation(2):                   ¢ 20 / m<sup>3</sup> (hauling=0km) for Jocotal area
- Rock excavation:               ¢ 173 / m<sup>3</sup>
- Embankment:                    ¢ 42 / m<sup>3</sup>
- Revetment:                      ¢ 5,700 /m(stone pitching type with concrete frame)
- Bridge:                          ¢ 13,400,000 (PC post tension type, span=35m x 3)  
   ¢ 12,600,000 (PC post tension type, span=30m x 3)  
   ¢ 7,000,000 (PC post tension type, span=40m x 1)
- Drainage sluice:                ¢ 426,000 for Type-A (1.25m x 1.25m)  
   ¢ 586,000 for Type-B (1.75m x 1.75m)  
   ¢ 754,000 for Type-C (2.5m x 2.5m)
- Diversion weir:                 ¢ 10,900,000 for Master Plan  
   ¢ 10,500,000 for Priority Project
- Control gate:                    ¢ 9,400,000
- Groundsill:                     ¢ 18,269 /m
- Rural road:                      ¢ 160 /m
- Telemeter system:              ¢ 8,100,000 (including control office)

Within the above unit construction costs, 22% of the indirect cost such as site expenses, contractor's overhead, profit and tax are included.

## 2) Land Acquisition Cost and Compensation Costs

The land acquisition and house compensation costs were estimated based on the following unit prices which were obtained from the offices concerned:

### Land acquisition

- River mouth - Limon River      ₡ 2.15 / m<sup>2</sup>
- Usulután area      ₡ 5.72 / m<sup>2</sup>
- Vado Marin area      ₡ 2.57 / m<sup>2</sup>
- Jocotal area      ₡ 0.72 / m<sup>2</sup>
- Olomega - Aramuaca area      ₡ 3.58 / m<sup>2</sup>
- San Miguel area      ₡ 7.15 / m<sup>2</sup>

### House compensation

- House      ₡ 12,000 / house

#### 4. PROJECT COST

The project cost is estimated for the Master Plan and Priority Project at the fixed price as of December 1996 as follows:

| Items                | Master Plan       | Priority Project |
|----------------------|-------------------|------------------|
| Construction works   | ¢ 807.5 million   | ¢ 433.7 million  |
| Land acquisition     | ¢ 23.8 million    | ¢ 19.2 million   |
| Administration       | ¢ 41.6 million    | ¢ 22.6 million   |
| Engineering service  | ¢ 124.7 million   | ¢ 67.9 million   |
| Physical contingency | ¢ 99.8 million    | ¢ 54.3 million   |
| Total                | ¢ 1,097.4 million | ¢ 597.7 million  |

Breakdown of cost estimate is shown in Table N.4.1 for the Master Plan and Priority Project.

Disbursement schedule for the Master Plan and Priority Project were estimated as shown in Tables N.4.2 and N.4.3 according to the implementation schedule presented in Chapter 5. Total funds required for the implementation of the project were also estimated in the table. The required funds including the price contingency during the construction period are as follows:

| Items                    | Master Plan       | Priority Project |
|--------------------------|-------------------|------------------|
| Total fund required      | ¢ 1,577.6 million | ¢ 775.9 million  |
| Foreign currency portion | ¢ 727.4 million   | ¢ 347.6 million  |
| Local currency portion   | ¢ 850.2 million   | ¢ 428.3 million  |

The operation and maintenance cost at full operation stage of facilities after the completion of construction works was assumed to be annually 0.5 % of the total construction cost as shown in Tables N.5.2 and N.5.3.

## **5. IMPLEMENTATION SCHEDULE**

Implementation schedule of the Priority Project and the rest of the Master Plan was prepared as shown in Fig.N.5.1 based on the following assumptions:

### **Priority Project:**

- 1) Loan agreement will be completed by the end of 1998.
- 2) Detailed design including topographical and geological survey will be carried out for one(1) year from the beginning of 1999.
- 3) Tendering procedures of the construction works will be started at the beginning of 2000 and completed for one(1) year.
- 4) Construction works will be carried out for five(5) years from the beginning of 2001 to the end of 2005.
- 5) Prior to the execution of the construction works, land acquisition and house compensation will be started at the beginning of 2000 and completed by the end of 2003.

### **Rest of Master Plan Project:**

- 1) Feasibility study for the rest of the Master Plan project by 2002.  
Loan agreement will be completed by the end of 2003.
- 2) Detailed design including topographical and geological survey will be carried out for one(1) year from the beginning of 2004.
- 3) Tendering procedures of the construction works will be started at the beginning of 2005 and completed for one(1) year.
- 4) Construction works will be carried out for five(5) years from the beginning of 2006 to the end of 2010.
- 5) Prior to the execution of the construction works, land acquisition and house compensation will be started at the beginning of 2005 and completed by the end of 2006.



Table N.3.2 MATERIAL UNIT PRICE

| Items   | Unit  | Price at site (¢) | Unit price |          | Component |          |
|---|-------|-------------------|------------|----------|-----------|----------|
|   |       |                   | F.C. (¢)   | L.C. (¢) | F.C. (%)  | L.C. (%) |
| Sand  | cu.m  | 67                | 0          | 67       | 0         | 100      |
| Gravel  | cu.m  | 142               | 0          | 142      | 0         | 100      |
| Cobble & rubble stone                         | cu.m  | 86                | 0          | 86       | 0         | 100      |
| Crushed stone                                 | cu.m  | 122               | 0          | 122      | 0         | 100      |
| Sand for concrete                             | cu.m  | 151               | 0          | 151      | 0         | 100      |
| Portland cement (40 kg)                       | sack  | 35                | 7          | 28       | 20        | 80       |
| Mortar  | cu.m  | 975               | 49         | 926      | 5         | 95       |
| Ready mixed concrete (210kg/cm <sup>2</sup> ) | cu.m  | 975               | 49         | 926      | 5         | 95       |
| Ready mixed concrete (280kg/cm <sup>2</sup> ) | cu.m  | 1,057             | 53         | 1,004    | 5         | 95       |
| Ready mixed concrete (350kg/cm <sup>2</sup> ) | cu.m  | 1,140             | 57         | 1,083    | 5         | 95       |
| Prestressed concrete pile D=400mm             | lin.m | 370               | 0          | 370      | 0         | 100      |
| Reinforcement bar                             | ton   | 3,370             | 34         | 3,336    | 1         | 99       |
| Steel plate                                   | ton   | 6,670             | 4,002      | 2,668    | 60        | 40       |
| Steel sheet pile U-2 (43kg/m)                 | lin.m | 1,000             | 600        | 400      | 60        | 40       |
| Steel slide gate                              | ton   | 10,000            | 4,000      | 6,000    | 40        | 60       |
| Guide frame                                   | ton   | 10,000            | 4,000      | 6,000    | 40        | 60       |
| Hoisting                                      | set   | 10,000            | 4,000      | 6,000    | 40        | 60       |
| wooden plate/beam                             | cu.m  | 2,270             | 2,270      | 0        | 100       | 0        |
| Plywood water/roof (1.2mx2.4mx12mm)           | sheet | 97                | 97         | 0        | 100       | 0        |
| Asphalt concrete                              | ton   | 650               | 97         | 553      | 15        | 85       |
| Bearing pad 406x280x46mm                      | pc    | 69,000            | 69,000     | 0        | 100       | 0        |
| PC cable                                      | t     | 27,891            | 20,918     | 6,973    | 75        | 25       |
| PC cable anchor                               | pc    | 263               | 171        | 92       | 65        | 35       |
| Diesel oil                                    | ltr   | 3                 | 0          | 3        | 0         | 100      |
| Gasoline                                      | ltr   | 5                 | 0          | 5        | 0         | 100      |
| Electricity                                   | kwh   | 1                 | 0          | 1        | 0         | 100      |

Table N.3.1 LABOUR WAGES

| Description              | Unit | Wage     |          |
|--------------------------|------|----------|----------|
|                          |      | F.C. (¢) | L.C. (¢) |
| Foreman                  | m. d | 0        | 125      |
| Heavy equipment operator | m. d | 0        | 123      |
| Assistant operator       | m. d | 0        | 96       |
| Dump truck driver        | m. d | 0        | 112      |
| Cargo truck driver       | m. d | 0        | 112      |
| Steel worker             | m. d | 0        | 114      |
| Carpenter                | m. d | 0        | 114      |
| Mason                    | m. d | 0        | 114      |
| Concrete worker          | m. d | 0        | 96       |
| Common labour            | m. d | 0        | 65       |

Table N.3.3 HOURLY COST OF MAIN EQUIPMENT

| Depreciation          | Capacity           | Basic price | Life (year) | Hour (hr/yr) | Depreciation Cost#1 (¢/hr) | Management Cost#2 (¢/hr) | Maintenance and repair cost |               |             |            | F.C (¢/hr) | L.C (¢/hr) | Total (¢/hr) |
|-----------------------|--------------------|-------------|-------------|--------------|----------------------------|--------------------------|-----------------------------|---------------|-------------|------------|------------|------------|--------------|
|                       |                    |             |             |              |                            |                          | Total Ratio#3 (%)           | Amount (¢/hr) | Component#4 |            |            |            |              |
|                       |                    |             |             |              |                            |                          |                             |               | F.C (¢/hr)  | L.C (¢/hr) |            |            |              |
| Bulldozer             | 21 ton             | 2110        | 5           | 2000         | 190                        | 74                       | 90                          | 190           | 190         | 0          | 380        | 74         | 454          |
| Swamp Bulldozer       | 18 ton             | 1550        | 5           | 2000         | 140                        | 54                       | 90                          | 140           | 140         | 0          | 280        | 54         | 334          |
| Bulldozer             | 11 ton             | 1090        | 5           | 2000         | 98                         | 38                       | 90                          | 98            | 98          | 0          | 196        | 38         | 234          |
| Bulldozer with Ripper | 21 ton             | 2338        | 5           | 2000         | 210                        | 82                       | 90                          | 210           | 210         | 0          | 420        | 82         | 502          |
| Bekhoe                | 0.4 m <sup>3</sup> | 970         | 5           | 2000         | 87                         | 34                       | 90                          | 87            | 87          | 0          | 174        | 34         | 208          |
| Bekhoe                | 0.7 m <sup>3</sup> | 1623        | 5           | 2000         | 146                        | 57                       | 90                          | 146           | 146         | 0          | 292        | 57         | 349          |
| Swamp Backhoe         | 0.4 m <sup>3</sup> | 1059        | 5           | 2000         | 95                         | 37                       | 90                          | 95            | 95          | 0          | 190        | 37         | 227          |
| Crawler loader        | 1.4 m <sup>3</sup> | 910         | 5           | 2000         | 82                         | 32                       | 90                          | 82            | 82          | 0          | 164        | 32         | 196          |
| Crawler loader        | 1.8 m <sup>3</sup> | 1437        | 5           | 2000         | 129                        | 50                       | 90                          | 129           | 129         | 0          | 258        | 50         | 308          |
| Dozer Shovel          | 2.2 m <sup>3</sup> | 1721        | 5           | 2000         | 155                        | 60                       | 90                          | 155           | 155         | 0          | 310        | 60         | 370          |
| Clamshell/Drumline    | 0.6 m <sup>3</sup> | 1987        | 5           | 2000         | 179                        | 70                       | 90                          | 179           | 179         | 0          | 358        | 70         | 428          |
| Dump Truck            | 11 ton             | 864         | 5           | 2000         | 78                         | 30                       | 90                          | 78            | 78          | 0          | 156        | 30         | 186          |
| Ordinary Truck        | 6 ton              | 329         | 5           | 2000         | 30                         | 12                       | 90                          | 30            | 30          | 0          | 60         | 12         | 72           |

#1 : Salvage value of 10% is applied.

#2 : Yearly management cost of 7% is applied by local currency component.

The management cost is composed of the insurance, tax, interest and other expenses for equipment management.

#3 : The ratio of maintenance and repair cost against the Basic price are decided referring to the values stipulated in the data book

for construction equipment, ministry of construction, Japan and other data in El Salvador.

#4 : F.C portion of 100% & L.C portion of 0% are applied based on the other Project's data in El Salvador.

$$(4) = (1) \times 0.9 / ((2) \times (3))$$

$$(7) = (1) \times (6) / ((2) \times (3))$$

$$(9) = (7) \times 0\%$$

$$(11) = (5) + (9)$$

$$(5) = (1) \times 7\% / (3)$$

$$(10) = (4) + (8)$$

$$(12) = (10) + (11)$$

**Table N.4.1 PROJECT COSTS**

| Items                     | Unit                           |            | Master Plan Project |                             |       |       | Priority Project |                             |       |       |
|---------------------------|--------------------------------|------------|---------------------|-----------------------------|-------|-------|------------------|-----------------------------|-------|-------|
|                           | Unit                           | Cost(Col.) | Quantity            | Amount( ₹ 10 <sup>6</sup> ) |       |       | Quantity         | Amount( ₹ 10 <sup>6</sup> ) |       |       |
|                           |                                |            |                     | Total                       | I.C.  | F.C.  |                  | Total                       | L.C.  | F.C.  |
| 1. Construction works     |                                |            |                     | 705.1                       | 306.2 | 398.9 |                  | 366.9                       | 167.5 | 199.4 |
| 1.1 Channel works         |                                |            |                     |                             |       |       |                  |                             |       |       |
| Earth excavation(1)       | m <sup>3</sup>                 | 45         | 8,087,000           | 363.9                       | 149.2 | 214.7 | 3,977,000        | 179.0                       | 73.4  | 105.6 |
| Earth excavation(2)       | m <sup>3</sup>                 | 20         | 6,266,000           | 125.3                       | 51.4  | 73.9  | 3,906,000        | 78.1                        | 32.0  | 46.1  |
| Rock excavation           | m <sup>3</sup>                 | 173        | 603,000             | 104.3                       | 42.8  | 61.5  | 152,000          | 26.3                        | 10.8  | 15.5  |
| Embankment                | m <sup>3</sup>                 | 42         | 1,843,000           | 77.4                        | 31.7  | 45.7  | 1,173,000        | 49.3                        | 20.2  | 29.1  |
| Revetment                 | m                              | 5,700      | 6,000               | 34.2                        | 31.1  | 3.1   | 6,000            | 34.2                        | 31.1  | 3.1   |
| 1.2 Structure works       |                                |            |                     | 34.7                        | 25.6  | 9.1   |                  | 24.7                        | 18.8  | 5.9   |
| Diversion weir            | Is.                            |            |                     | 10.9                        | 9.4   | 1.5   |                  | 10.5                        | 9.0   | 1.5   |
| Control gate              | Is.                            |            |                     | 9.4                         | 5.8   | 3.6   |                  | 9.4                         | 5.8   | 3.6   |
| Drainage sluice           |                                |            |                     | 8.0                         | 5.0   | 3.0   |                  | 0.6                         | 0.4   | 0.2   |
| Type-A                    | nos                            | 426,000    | 7                   | 3.0                         | 1.9   | 1.1   | 0                | 0.0                         | 0.0   | 0.0   |
| Type-B                    | nos                            | 586,000    | 6                   | 3.5                         | 2.2   | 1.3   | 1                | 0.6                         | 0.4   | 0.2   |
| Type-C                    | nos                            | 754,000    | 2                   | 1.5                         | 0.9   | 0.6   | 0                | 0.0                         | 0.0   | 0.0   |
| Ground sill               | m                              | 18,269     | 348                 | 6.4                         | 5.4   | 1.0   | 229              | 4.2                         | 3.6   | 0.6   |
| 1.3 Appurtenant works     |                                |            |                     | 67.7                        | 37.5  | 30.2  |                  | 42.1                        | 24.0  | 18.1  |
| Intake gate(Type-B)       | nos                            | 586,000    | 1                   | 0.6                         | 0.4   | 0.2   | 1                | 0.6                         | 0.4   | 0.2   |
| Bridge                    |                                |            |                     | 58.2                        | 30.3  | 27.9  |                  | 33.0                        | 17.2  | 15.8  |
| Bridge(105m)              | nos                            | 13,400,000 | 1                   | 13.4                        | 7.0   | 6.4   | 1                | 13.4                        | 7.0   | 6.4   |
| Bridge(90m)               | nos                            | 12,600,000 | 3                   | 37.8                        | 19.7  | 18.1  | 1                | 12.6                        | 6.6   | 6.0   |
| Bridge(40m)               | nos                            | 7,000,000  | 1                   | 7.0                         | 3.6   | 3.4   | 1                | 7.0                         | 3.6   | 3.4   |
| Rural road                | m                              | 160        | 5,140               | 0.8                         | 0.8   | 0.0   | 2,640            | 0.4                         | 0.4   | 0.0   |
| Telemetering system       | Is.                            |            |                     | 8.1                         | 6.1   | 2.0   |                  | 8.1                         | 6.1   | 2.0   |
| (Sub-total : 1.1+1.2+1.3) |                                |            |                     | 807.5                       | 369.3 | 438.2 |                  | 433.7                       | 210.3 | 223.4 |
| 2 Land and house          |                                |            |                     | 23.8                        | 23.8  | 0.0   |                  | 19.2                        | 19.2  | 0.0   |
| Land acquisit.(1)         | 10 <sup>3</sup> m <sup>2</sup> | 2,150      | 728                 | 1.6                         | 1.6   | 0.0   | 728              | 1.6                         | 1.6   | 0.0   |
| Land acquisit.(2)         | 10 <sup>3</sup> m <sup>2</sup> | 5,720      | 845                 | 4.8                         | 4.8   | 0.0   | 845              | 4.8                         | 4.8   | 0.0   |
| Land acquisit.(3)         | 10 <sup>3</sup> m <sup>2</sup> | 2,570      | 1,067               | 2.7                         | 2.7   | 0.0   | 1,067            | 2.7                         | 2.7   | 0.0   |
| Land acquisit.(4)         | 10 <sup>3</sup> m <sup>2</sup> | 720        | 1,695               | 1.2                         | 1.2   | 0.0   | 1,695            | 1.2                         | 1.2   | 0.0   |
| Land acquisit.(5)         | 10 <sup>3</sup> m <sup>2</sup> | 3,580      | 3,181               | 11.4                        | 11.4  | 0.0   | 2,424            | 8.7                         | 8.7   | 0.0   |
| Land acquisit.(6)         | 10 <sup>3</sup> m <sup>2</sup> | 7,150      | 270                 | 1.9                         | 1.9   | 0.0   | 0                | 0.0                         | 0.0   | 0.0   |
| House compensat.          | house                          | 12,000     | 20                  | 0.2                         | 0.2   | 0.0   | 20               | 0.2                         | 0.2   | 0.0   |
| 3. Administration         | Is.                            |            |                     | 41.6                        | 41.6  | 0.0   |                  | 22.6                        | 22.6  | 0.0   |
| 4. Engineering service    | Is.                            |            |                     | 124.7                       | 46.1  | 78.6  |                  | 67.9                        | 25.1  | 42.8  |
| 5. Physical contingency   | Is.                            |            |                     | 99.8                        | 48.1  | 51.7  |                  | 54.3                        | 27.7  | 26.6  |
| (Sub-total : 1+2+3+4+5)   |                                |            |                     | 1,697.4                     | 528.9 | 568.5 |                  | 597.7                       | 301.9 | 292.8 |
| 6. Price contingency      | Is.                            |            |                     | 480.2                       | 321.3 | 158.9 |                  | 178.2                       | 123.4 | 54.8  |
| Total                     |                                |            |                     | 1,577.6                     | 850.2 | 727.4 |                  | 775.9                       | 428.3 | 347.6 |



Table N.4.2 ANNUAL DISBURSEMENT SCHEDULE (MASTER PLAN)

|                               | Total cost | Annual Disbursement (million coitons) |       |        |        |        |        |        |        |        |        |        |        |       |
|-------------------------------|------------|---------------------------------------|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-------|
|                               |            | 1999                                  | 2000  | 2001   | 2002   | 2003   | 2004   | 2005   | 2006   | 2007   | 2008   | 2009   | 2010   | 2011  |
| 1. Construction Cost          |            |                                       |       |        |        |        |        |        |        |        |        |        |        |       |
| Total                         | 807.5      | 0.00                                  | 0.00  | 86.74  | 86.74  | 86.74  | 86.74  | 86.74  | 86.74  | 74.76  | 74.76  | 74.76  | 74.76  | 0.00  |
| L.C.                          | 369.3      | 0.00                                  | 0.00  | 42.06  | 42.06  | 42.06  | 42.06  | 42.06  | 42.06  | 31.80  | 31.80  | 31.80  | 31.80  | 0     |
| F.C.                          | 438.2      | 0.00                                  | 0.00  | 44.68  | 44.68  | 44.68  | 44.68  | 44.68  | 44.68  | 42.96  | 42.96  | 42.96  | 42.96  | 0     |
| 2. Land Acquisition           |            |                                       |       |        |        |        |        |        |        |        |        |        |        |       |
| Total                         | 23.8       | 0.00                                  | 4.80  | 4.80   | 4.80   | 4.80   | 4.80   | 4.80   | 4.80   | 0.00   | 0.00   | 0.00   | 0.00   | 0     |
| L.C.                          | 23.8       | 0.00                                  | 4.80  | 4.80   | 4.80   | 4.80   | 4.80   | 4.80   | 4.80   | 0.00   | 0.00   | 0.00   | 0.00   | 0     |
| F.C.                          | 0.0        | 0.00                                  | 0.00  | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0     |
| 3. Administration             |            |                                       |       |        |        |        |        |        |        |        |        |        |        |       |
| Total                         | 41.6       | 0.00                                  | 0.24  | 4.58   | 4.58   | 4.58   | 4.58   | 4.58   | 4.58   | 3.85   | 3.74   | 3.74   | 3.74   | 0     |
| L.C.                          | 41.6       | 0.00                                  | 0.24  | 4.58   | 4.58   | 4.58   | 4.58   | 4.58   | 4.58   | 3.85   | 3.74   | 3.74   | 3.74   | 0     |
| F.C.                          | 0.0        | 0.00                                  | 0.00  | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0     |
| 4. Engineering Cost           |            |                                       |       |        |        |        |        |        |        |        |        |        |        |       |
| Total                         | 124.7      | 20.37                                 | 5.43  | 8.42   | 8.42   | 25.55  | 12.99  | 7.02   | 7.02   | 7.02   | 7.02   | 7.02   | 7.02   | 0.00  |
| L.C.                          | 46.1       | 7.53                                  | 2.01  | 3.11   | 3.11   | 9.41   | 4.79   | 2.60   | 2.60   | 2.60   | 2.60   | 2.60   | 2.60   | 0     |
| F.C.                          | 78.6       | 12.84                                 | 3.42  | 5.31   | 5.31   | 16.14  | 8.20   | 4.42   | 4.42   | 4.42   | 4.42   | 4.42   | 4.42   | 0     |
| 5. Physical Contingency       |            |                                       |       |        |        |        |        |        |        |        |        |        |        |       |
| Total                         | 99.8       | 2.04                                  | 1.05  | 10.45  | 10.45  | 11.66  | 10.65  | 8.79   | 8.55   | 8.55   | 8.55   | 8.55   | 8.55   | 0     |
| L.C.                          | 48.1       | 0.75                                  | 0.71  | 5.46   | 5.46   | 5.58   | 5.36   | 4.06   | 3.81   | 3.81   | 3.81   | 3.81   | 3.81   | 0     |
| F.C.                          | 51.7       | 1.28                                  | 0.34  | 5.00   | 5.00   | 6.08   | 5.29   | 4.74   | 4.74   | 4.74   | 4.74   | 4.74   | 4.74   | 0     |
| 6. (Sub-total)<br>(1+2+3+4+5) |            |                                       |       |        |        |        |        |        |        |        |        |        |        |       |
| Total                         | 1,097.4    | 22.41                                 | 11.52 | 114.99 | 114.99 | 128.29 | 117.13 | 96.73  | 94.07  | 94.07  | 94.07  | 94.07  | 94.15  | 0     |
| L.C.                          | 528.9      | 8.28                                  | 7.75  | 60.00  | 60.00  | 61.39  | 58.97  | 44.61  | 41.96  | 41.96  | 41.96  | 41.96  | 42.01  | 0     |
| F.C.                          | 568.5      | 14.12                                 | 3.77  | 54.99  | 54.99  | 66.90  | 58.16  | 52.11  | 52.11  | 52.11  | 52.11  | 52.11  | 52.13  | 0     |
| 7. Price Contingency          |            |                                       |       |        |        |        |        |        |        |        |        |        |        |       |
| Total                         | 480.2      | 1.88                                  | 1.83  | 22.65  | 29.05  | 35.78  | 46.30  | 50.53  | 46.64  | 51.10  | 57.71  | 64.66  | 72.02  | 0     |
| L.C.                          | 321.3      | 1.02                                  | 1.48  | 15.75  | 20.30  | 25.11  | 30.92  | 35.02  | 30.76  | 33.18  | 37.69  | 42.47  | 47.60  | 0     |
| F.C.                          | 158.9      | 0.86                                  | 0.35  | 6.90   | 8.76   | 10.67  | 15.38  | 15.52  | 15.88  | 17.92  | 20.02  | 22.19  | 24.43  | 0     |
| 8. (Total)<br>(1+2+3+4+5+7)   |            |                                       |       |        |        |        |        |        |        |        |        |        |        |       |
| Total                         | 1,577.6    | 24.29                                 | 13.35 | 137.64 | 144.04 | 150.77 | 174.59 | 167.66 | 143.37 | 145.17 | 151.78 | 158.73 | 166.17 | 0     |
| L.C.                          | 850.2      | 9.31                                  | 9.23  | 75.75  | 80.30  | 85.12  | 92.31  | 93.98  | 75.37  | 75.14  | 79.65  | 84.42  | 89.61  | 0     |
| F.C.                          | 727.4      | 14.98                                 | 4.12  | 61.89  | 63.74  | 65.66  | 82.28  | 73.68  | 68.00  | 70.04  | 72.14  | 74.30  | 76.56  | 0     |
| O & M cost                    |            |                                       |       |        |        |        |        |        |        |        |        |        |        |       |
| L.C.                          |            | 0                                     | 0.00  | 0.00   | 0.48   | 0.95   | 1.43   | 1.91   | 2.39   | 2.80   | 3.21   | 3.62   | 4.03   | 4.44  |
| Price Contingency             |            | 0                                     | 0.00  | 0.00   | 0.16   | 0.40   | 0.72   | 1.13   | 1.64   | 2.21   | 2.88   | 3.66   | 4.57   | 5.60  |
| Total                         |            | 0                                     | 0.00  | 0.00   | 0.64   | 1.35   | 2.15   | 3.04   | 4.03   | 5.01   | 6.09   | 7.28   | 8.60   | 10.04 |

Table N.4.3 ANNUAL DISBURSEMENT SCHEDULE (PRIORITY PROJECT)

|                               | Total cost | Annual Disbursement (million colons) |       |        |        |        |        |        |        |        |        |        |      |
|-------------------------------|------------|--------------------------------------|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------|
|                               |            | 1999                                 | 2000  | 2001   | 2002   | 2003   | 2004   | 2005   | 2006   |        |        |        |      |
| 1. Construction Cost          |            |                                      |       |        |        |        |        |        |        |        |        |        |      |
| Total                         | 433.7      | 0                                    | 0.00  | 86.74  | 86.74  | 86.74  | 86.74  | 86.74  | 86.74  | 86.74  | 86.74  | 86.74  | 0    |
| L.C.                          | 210.3      | 0                                    | 0.00  | 42.06  | 42.06  | 42.06  | 42.06  | 42.06  | 42.06  | 42.06  | 42.06  | 42.06  | 0    |
| F.C.                          | 223.4      | 0                                    | 0.00  | 44.68  | 44.68  | 44.68  | 44.68  | 44.68  | 44.68  | 44.68  | 44.68  | 44.68  | 0    |
| 2. Land Acquisition           |            |                                      |       |        |        |        |        |        |        |        |        |        |      |
| Total                         | 19.2       | 0                                    | 4.80  | 4.80   | 4.80   | 4.80   | 4.80   | 4.80   | 4.80   | 4.80   | 4.80   | 4.80   | 0    |
| L.C.                          | 19.2       | 0                                    | 4.80  | 4.80   | 4.80   | 4.80   | 4.80   | 4.80   | 4.80   | 4.80   | 4.80   | 4.80   | 0    |
| F.C.                          | 0.0        | 0                                    | 0.00  | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0    |
| 3. Administration             |            |                                      |       |        |        |        |        |        |        |        |        |        |      |
| Total                         | 22.6       | 0                                    | 0.24  | 4.58   | 4.58   | 4.58   | 4.58   | 4.58   | 4.58   | 4.58   | 4.58   | 4.58   | 0    |
| L.C.                          | 22.6       | 0                                    | 0.24  | 4.58   | 4.58   | 4.58   | 4.58   | 4.58   | 4.58   | 4.58   | 4.58   | 4.58   | 0    |
| F.C.                          | 0.0        | 0                                    | 0.00  | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0    |
| 4. Engineering Cost           |            |                                      |       |        |        |        |        |        |        |        |        |        |      |
| Total                         | 67.9       | 20.37                                | 5.43  | 8.42   | 8.42   | 8.42   | 8.42   | 8.42   | 8.42   | 8.42   | 8.42   | 8.42   | 0    |
| L.C.                          | 25.1       | 7.53                                 | 2.01  | 3.11   | 3.11   | 3.11   | 3.11   | 3.11   | 3.11   | 3.11   | 3.11   | 3.11   | 0    |
| F.C.                          | 42.8       | 12.84                                | 3.42  | 5.31   | 5.31   | 5.31   | 5.31   | 5.31   | 5.31   | 5.31   | 5.31   | 5.31   | 0    |
| 5. Physical Contingency       |            |                                      |       |        |        |        |        |        |        |        |        |        |      |
| Total                         | 54.3       | 2.04                                 | 1.05  | 10.45  | 10.45  | 10.45  | 10.45  | 10.45  | 10.45  | 10.45  | 10.45  | 10.45  | 0    |
| L.C.                          | 27.7       | 0.75                                 | 0.71  | 5.46   | 5.46   | 5.46   | 5.46   | 5.46   | 5.46   | 5.46   | 5.46   | 5.46   | 0    |
| F.C.                          | 26.6       | 1.28                                 | 0.34  | 5.00   | 5.00   | 5.00   | 5.00   | 5.00   | 5.00   | 5.00   | 5.00   | 5.00   | 0    |
| 6. (Sub-total)<br>(1+2+3+4+5) |            |                                      |       |        |        |        |        |        |        |        |        |        |      |
| Total                         | 597.7      | 22.41                                | 11.52 | 114.99 | 114.99 | 114.99 | 114.99 | 114.99 | 114.99 | 114.99 | 114.99 | 114.99 | 0    |
| L.C.                          | 504.9      | 8.28                                 | 7.75  | 60.00  | 60.00  | 60.00  | 60.00  | 60.00  | 60.00  | 60.00  | 60.00  | 60.00  | 0    |
| F.C.                          | 292.8      | 14.12                                | 3.77  | 54.99  | 54.99  | 54.99  | 54.99  | 54.99  | 54.99  | 54.99  | 54.99  | 54.99  | 0    |
| 7. Price Contingency          |            |                                      |       |        |        |        |        |        |        |        |        |        |      |
| Total                         | 178.2      | 1.88                                 | 1.83  | 22.65  | 22.65  | 22.65  | 22.65  | 22.65  | 22.65  | 22.65  | 22.65  | 22.65  | 0    |
| L.C.                          | 123.4      | 1.02                                 | 1.48  | 15.75  | 15.75  | 15.75  | 15.75  | 15.75  | 15.75  | 15.75  | 15.75  | 15.75  | 0    |
| F.C.                          | 54.8       | 0.86                                 | 0.35  | 6.90   | 6.90   | 6.90   | 6.90   | 6.90   | 6.90   | 6.90   | 6.90   | 6.90   | 0    |
| 8. (Total)<br>(1+2+3+4+5+7)   |            |                                      |       |        |        |        |        |        |        |        |        |        |      |
| Total                         | 775.9      | 24.29                                | 13.35 | 137.64 | 144.04 | 150.77 | 149.51 | 156.32 | 156.32 | 156.32 | 156.32 | 156.32 | 0    |
| L.C.                          | 428.3      | 9.31                                 | 9.23  | 75.75  | 80.30  | 85.12  | 81.89  | 86.69  | 86.69  | 86.69  | 86.69  | 86.69  | 0    |
| F.C.                          | 347.6      | 14.98                                | 4.12  | 61.89  | 63.74  | 65.66  | 67.63  | 69.63  | 69.63  | 69.63  | 69.63  | 69.63  | 0    |
| O & M cost                    |            |                                      |       |        |        |        |        |        |        |        |        |        |      |
| L.C.                          |            | 0                                    | 0.00  | 0.00   | 0.48   | 0.95   | 1.43   | 1.91   | 1.91   | 1.43   | 1.91   | 2.39   | 2.39 |
| Price Contingency             |            | 0                                    | 0.00  | 0.00   | 0.16   | 0.40   | 0.72   | 1.13   | 1.13   | 0.72   | 1.13   | 1.64   | 1.64 |
| Total                         |            | 0                                    | 0.00  | 0.00   | 0.64   | 1.35   | 2.15   | 3.04   | 3.04   | 2.15   | 3.04   | 4.03   | 4.03 |

Table N.4.4 ANNUAL DISBURSEMENT SCHEDULE (REST OF MASTER PLAN PROJECT)

|                               | Total cost | Annual Disbursement (million colons) |      |      |      |      |       |       |        |        |        |        |        |        |        |        |        |        |      |
|-------------------------------|------------|--------------------------------------|------|------|------|------|-------|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------|
|                               |            | 1999                                 | 2000 | 2001 | 2002 | 2003 | 2004  | 2005  | 2006   | 2007   | 2008   | 2009   | 2010   | 2011   |        |        |        |        |      |
| 1. Construction Cost          |            |                                      |      |      |      |      |       |       |        |        |        |        |        |        |        |        |        |        |      |
| Total                         | 373.8      | 0                                    | 0.00 | 0.00 | 0.00 | 0.00 | 0.00  | 0.00  | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0      |      |
| L.C.                          | 159.0      | 0                                    | 0.00 | 0.00 | 0.00 | 0.00 | 0.00  | 0.00  | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0    |
| F.C.                          | 214.8      | 0                                    | 0.00 | 0.00 | 0.00 | 0.00 | 0.00  | 0.00  | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0    |
| 2. Land Acquisition           |            |                                      |      |      |      |      |       |       |        |        |        |        |        |        |        |        |        |        |      |
| Total                         | 4.6        | 0                                    | 0.00 | 0.00 | 0.00 | 0.00 | 0.00  | 0.00  | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0    |
| L.C.                          | 4.6        | 0                                    | 0.00 | 0.00 | 0.00 | 0.00 | 0.00  | 0.00  | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0    |
| F.C.                          | 0.0        | 0                                    | 0.00 | 0.00 | 0.00 | 0.00 | 0.00  | 0.00  | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0    |
| 3. Administration             |            |                                      |      |      |      |      |       |       |        |        |        |        |        |        |        |        |        |        |      |
| Total                         | 19.0       | 0                                    | 0.00 | 0.00 | 0.00 | 0.00 | 0.00  | 0.00  | 0.00   | 0.00   | 0.00   | 0.16   | 3.85   | 3.74   | 3.74   | 3.74   | 3.74   | 3.77   | 0    |
| L.C.                          | 19.0       | 0                                    | 0.00 | 0.00 | 0.00 | 0.00 | 0.00  | 0.00  | 0.00   | 0.00   | 0.00   | 0.16   | 3.85   | 3.74   | 3.74   | 3.74   | 3.74   | 3.77   | 0    |
| F.C.                          | 0.0        | 0                                    | 0.00 | 0.00 | 0.00 | 0.00 | 0.00  | 0.00  | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0.00   | 0    |
| 4. Engineering Cost           |            |                                      |      |      |      |      |       |       |        |        |        |        |        |        |        |        |        |        |      |
| Total                         | 56.8       | 0.00                                 | 0.00 | 0.00 | 0.00 | 0.00 | 17.13 | 4.57  | 7.02   | 7.02   | 7.02   | 7.02   | 7.02   | 7.02   | 7.02   | 7.02   | 7.02   | 7.02   | 0    |
| L.C.                          | 21.0       | 0.00                                 | 0.00 | 0.00 | 0.00 | 0.00 | 6.30  | 1.68  | 2.60   | 2.60   | 2.60   | 2.60   | 2.60   | 2.60   | 2.60   | 2.60   | 2.60   | 2.60   | 0    |
| F.C.                          | 35.8       | 0.00                                 | 0.00 | 0.00 | 0.00 | 0.00 | 10.83 | 2.89  | 4.42   | 4.42   | 4.42   | 4.42   | 4.42   | 4.42   | 4.42   | 4.42   | 4.42   | 4.42   | 0    |
| 5. Physical Contingency       |            |                                      |      |      |      |      |       |       |        |        |        |        |        |        |        |        |        |        |      |
| Total                         | 45.5       | 0.00                                 | 0.00 | 0.00 | 0.00 | 0.00 | 1.71  | 0.74  | 8.79   | 8.55   | 8.55   | 8.55   | 8.55   | 8.55   | 8.55   | 8.55   | 8.55   | 8.59   | 0    |
| L.C.                          | 20.4       | 0.00                                 | 0.00 | 0.00 | 0.00 | 0.00 | 0.63  | 0.44  | 4.06   | 3.81   | 3.81   | 3.81   | 3.81   | 3.81   | 3.81   | 3.81   | 3.81   | 3.84   | 0    |
| F.C.                          | 25.1       | 0.00                                 | 0.00 | 0.00 | 0.00 | 0.00 | 1.08  | 0.31  | 4.74   | 4.74   | 4.74   | 4.74   | 4.74   | 4.74   | 4.74   | 4.74   | 4.74   | 4.76   | 0    |
| 6. (Sub-total)<br>(1+2+3+4+5) |            |                                      |      |      |      |      |       |       |        |        |        |        |        |        |        |        |        |        |      |
| Total                         | 499.7      | 0.00                                 | 0.00 | 0.00 | 0.00 | 0.00 | 18.84 | 7.77  | 96.73  | 94.07  | 94.07  | 94.07  | 94.07  | 94.07  | 94.07  | 94.07  | 94.15  | 94.15  | 0    |
| L.C.                          | 224.0      | 0.00                                 | 0.00 | 0.00 | 0.00 | 0.00 | 6.93  | 4.58  | 44.61  | 41.96  | 41.96  | 41.96  | 41.96  | 41.96  | 41.96  | 41.96  | 42.01  | 42.01  | 0    |
| F.C.                          | 275.7      | 0.00                                 | 0.00 | 0.00 | 0.00 | 0.00 | 11.91 | 3.20  | 52.11  | 52.11  | 52.11  | 52.11  | 52.11  | 52.11  | 52.11  | 52.11  | 52.13  | 52.13  | 0    |
| 7. Price Contingency          |            |                                      |      |      |      |      |       |       |        |        |        |        |        |        |        |        |        |        |      |
| Total                         | 301.9      | 0.00                                 | 0.00 | 0.00 | 0.00 | 0.00 | 6.23  | 3.57  | 46.64  | 51.10  | 57.71  | 57.71  | 57.71  | 57.71  | 57.71  | 57.71  | 57.71  | 57.71  | 0    |
| L.C.                          | 197.9      | 0.00                                 | 0.00 | 0.00 | 0.00 | 0.00 | 3.49  | 2.72  | 30.76  | 33.18  | 37.69  | 37.69  | 37.69  | 37.69  | 37.69  | 37.69  | 37.69  | 37.69  | 0    |
| F.C.                          | 104.0      | 0.00                                 | 0.00 | 0.00 | 0.00 | 0.00 | 2.74  | 0.85  | 15.88  | 17.92  | 20.02  | 20.02  | 20.02  | 20.02  | 20.02  | 20.02  | 20.02  | 20.02  | 0    |
| 8. (Total)<br>(1+2+3+4+5+7)   |            |                                      |      |      |      |      |       |       |        |        |        |        |        |        |        |        |        |        |      |
| Total                         | 801.6      | 0.00                                 | 0.00 | 0.00 | 0.00 | 0.00 | 25.07 | 11.34 | 143.37 | 145.17 | 151.78 | 151.78 | 151.78 | 151.78 | 151.78 | 151.78 | 151.78 | 151.78 | 0    |
| L.C.                          | 421.9      | 0.00                                 | 0.00 | 0.00 | 0.00 | 0.00 | 10.42 | 7.29  | 75.37  | 75.14  | 79.65  | 79.65  | 79.65  | 79.65  | 79.65  | 79.65  | 79.65  | 79.65  | 0    |
| F.C.                          | 379.7      | 0.00                                 | 0.00 | 0.00 | 0.00 | 0.00 | 14.65 | 4.05  | 68.00  | 70.04  | 72.14  | 72.14  | 72.14  | 72.14  | 72.14  | 72.14  | 72.14  | 72.14  | 0    |
| O & M cost                    |            |                                      |      |      |      |      |       |       |        |        |        |        |        |        |        |        |        |        |      |
| L.C.                          |            | 0                                    | 0.00 | 0.00 | 0.00 | 0.00 | 0.00  | 0.00  | 0.00   | 0.41   | 0.82   | 1.23   | 1.65   | 2.06   | 2.48   | 2.90   | 3.31   | 3.73   | 4.15 |
| Price Contingency             |            | 0                                    | 0.00 | 0.00 | 0.00 | 0.00 | 0.00  | 0.00  | 0.00   | 0.33   | 0.74   | 1.25   | 1.86   | 2.59   | 3.31   | 4.04   | 4.77   | 5.50   | 6.23 |
| Total                         |            | 0                                    | 0.00 | 0.00 | 0.00 | 0.00 | 0.00  | 0.00  | 0.00   | 0.74   | 1.56   | 2.48   | 3.51   | 4.65   | 5.71   | 6.75   | 7.80   | 8.85   | 9.90 |

| Description                           | Year |      |      |      |      |      |      |      |      |      |      |      |      |
|---------------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|
|                                       | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
| <b>PRIORITY PROJECT</b>               |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 1. Loan Process                       |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 2. Land Acquisition                   |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 3. Construction                       |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Lower Reach (River mouth - El Dolino) |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Middle Reach (El Dolino - Aramuaca)   |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Omega Diversion / Retarding           |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Telemetry System                      |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 4. Engineering Services               |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Detailed Design                       |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Assistance in Tendering               |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Supervision                           |      |      |      |      |      |      |      |      |      |      |      |      |      |
| <b>REST OF MASTER PLAN PROJECT</b>    |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 1. Feasibility Study                  |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 2. Loan Process                       |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 3. Land Acquisition                   |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 4. Construction                       |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Lower Reach (River mouth - El Dolino) |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Middle Reach (El Dolino - Aramuaca)   |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Reach around San Miguel City          |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 5. Engineering Services               |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Detailed Design                       |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Assistance in Tendering               |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Supervision                           |      |      |      |      |      |      |      |      |      |      |      |      |      |

Figure N.5.1 CONSTRUCTION SCHEDULE

## **SUPPORTING REPORT**

### **O: PROJECT EVALUATION**

## Supporting Report O: Project Evaluation

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## **O: PROJECT EVALUATION**

### **1. CONDITION AND METHODOLOGY OF THE EVALUATION**

#### **1.1 General**

The Study Area covers 2,247 square km ranging the four Departments; Usulután, San Miguel, Morazan and La Unión in the Region IV. In the Study Area, the flood prone area, which is caused by river water of the Río Grande de San Miguel, is estimated at approximately 180 square km in the three Departments of San Miguel, Usulután and La Unión.

The present study would be aiming to formulate a project so as to reduce the flood damage by executing the project, and its effect is evaluated from the economic, financial and environmental points of view. Among them, the economic and financial evaluations would be made in the present Supporting Report-O. The environmental impact would be assessed based on an initial environmental examination as shown in the Supporting Report -F.

The economic evaluation would be made by comparing the two present values of economic benefit and economic cost of the project. The financial evaluation would be examined about raise and refund of the construction fund of the project, not to carry out a comparison between cost and revenue, because the project have no financial revenue.

The project evaluation is made in two stages; the master plan and the feasibility study. In the master plan (Chapter 2), the economic evaluation is carried out for the whole flood prone area, three alternatives of the priority project, and the remaining projects; where the priority project contains three areas of Olomega, Jocotal and Usulután, except San Miguel area, and it is prepared as the three alternatives of 2-, 5- and 10-year flood control plans. The remaining projects are defined as the difference between the master plan and the priority project (see the Supporting Report -M).

In addition to them, an economic evaluation would be made for a multipurpose dam, which includes irrigation and power generation projects together with the flood control project, with a view to comparing the economic effect between two flood control projects of dam construction and river improvement.

In the feasibility study, the economic evaluation of the priority project is made including two sub-projects of the priority project. Between the sub-projects, one includes the Jocotal and Usulután areas, except Olomega area, and the other is only the Usulután area. In addition, a sensitivity test would be carried out to confirm the economic feasibility of the priority project, and the financial aspects of the priority project also would be examined at the feasibility study stage (Chapter 3).

## **1.2 Condition of Economic Evaluation**

An economic investment effect of the project is evaluated by an economic difference between "with-project" and "without-project" situations, by means of Economic Internal Rate of Return (EIRR) together with Net Present Value (NPV) and Benefit-Cost Ratio (B/C). The economic cost and economic benefit of the project are estimated using the economic prices under the conditions and assumptions as shown below:

- (a) Transfer payments such as value added tax, income tax and corporation tax are excluded from cost and benefit of the project;
- (b) A standard conversion rate (SCR), which will be applied to equipment and materials procured locally, is assumed to be approximately 96 % (Table O1.1);
- (c) Opportunity cost of wages for unskilled laborers is assumed to be 90 % of the existing cost, taking unemployment situations in recent years into consideration;
- (d) Opportunity cost of land to be acquired for the project is assumed to be 90 % of the existing cost, taking into consideration the vacant condition of the land; and
- (e) Inflation factor is taken no account for the economic evaluation.

Further, the following conditions are added for estimating the cost and benefit of the project:

- (1) Economic life of the project (hereinafter referred to as the "project life") is taken as 30 years after completion of the construction work;

- (2) The benefit of the project and the OM cost (operating and maintenance cost) for construction facilities are expected to accrue every year during period of the project life after completion of the construction work; and
- (3) Partial benefit and OM cost for the construction period are assumed to accrue in proportional to progress of the construction work, i.e. the benefit and the OM cost are approximately estimated by a ratio of the invested construction cost to the total construction cost.

### **1.3 Methodology of Estimating the Flood Control Benefit**

#### **1.3.1 Objects of Flood Damage Estimated**

The major economic benefit of the flood control project could be presented as an expected reduction effect in flood damage by implementing the project. The major flood damage to be reduced is composed of the damage to assets and the damage to economic activities.

In the present study, the assets are represented by buildings, household effects, livestock, public facilities and agricultural field crops. The buildings and household effects are called the "general assets" herein. The general assets consist of residences (three kinds of medium, low and poor classes), stores and other houses. Each household in the residence keeps some livestock such as pigs and chickens.

The public facilities contain facilities of transport, agriculture, electricity, water supply, drainage, etc. The agricultural field crops are limited to major crops such as annual crops, sugar cane and pasture, where the annual crops are represented by maize.

#### **1.3.2 General Formula for Estimating Flood Damage**

The flood damages to the general assets and livestock could be estimated by using (a) number of the assets to be inundated by flood, (b) appraisal values of the assets, and (c) damage rate of the assets inundated. It can be expressed by an equation as follows:

$$D_i = N_i \cdot A_i \cdot R_i$$

where  $i$  : Kind of buildings,  
 $D_i$  : Flood damage to general asset and livestock for  $i$ -kind of building,  
 $N_i$  : Number of  $i$ -kind of buildings,  
 $A_i$  : Average appraisal values per general asset and livestock for  $i$ -kind of building,  
and  
 $R_i$  : Average damage rate of general assets and livestock for  $i$ -building.

On the other hand, the flood damage to the agricultural field crops could be estimated by using (a) inundation areas in the agricultural crop fields, (b) production of a unit area, and (c) the damage rate of the agricultural field crops inundated, and it can be expressed by the following equation:

$$D_j = A_j \cdot V_j \cdot R_j$$

where  $j$  : Kind of Agricultural field crops,  
 $D_j$  : Flood damage to  $j$ -crop,  
 $A_j$  : Planted area of  $j$ -crop,  
 $V_j$  : Average unit price of  $j$ -crop, and  
 $R_j$  : Average damage rate for  $j$ -crop.

The flood damage to pasture is represented by reduction in meat and milk produced in the pasture land, using the area of pasture land inundated, and production of meat and milk per unit area of pasture land, and damage rate of meat and milk caused by inundation.

### 1.3.3 Number of General Assets and Area of Agricultural Fields in Flood Prone Area

Number of buildings and area of agricultural fields to be inundated by floods are studied by return period of probable flood using land use maps and aerial photographs, on the basis of hydraulic and hydrological analyses.

These number and area are firstly counted by inundation depth for each situation of "with-project" and "without-project". Finally, those are given as a difference between "with-project" and "without-project" situations, i.e. the difference indicates number of assets and area of agricultural field crops which the flood damage will be reduced by implementing the project.

The number of buildings in the flood prone area is estimated under the following conditions and assumptions:

- (a) Out of the number of buildings, the number of residential houses is estimated using family size and population density, assuming that it will be nearly equal to the number of households.
- (b) The family size and population density would apply the projected values in 2010, as an average for the period from 2005 to 2015, when the construction works of various alternative projects will be completed.
- (c) These values would be estimated using the population projection in Municipalities related to the flood prone area, because there are not available data in Cantons. In 2010, these are projected to be 4.0 persons/hh for the family size and 405 persons/square kilometer for the population density (see Table C2.7, Supporting Report -C). Under the conditions above, the number of residential houses is estimated at 1.0125 houses/ha, and it would be adopted as a material for estimating the flood damage.
- (d) The total number of residential houses in the flooded land would be estimated by multiplying the above number per square kilometer with an area of flooded land.
- (e) The number of residential houses in the flooded area would be divided into three classes; medium, low and poor, at a ratio of 22.8, 53.1 and 24.1, according to a result of the flood damage survey in the flood prone area. In addition, the number of buildings of stores and others is assumed to be approximately 2.0 % of the total number of residential houses based on the said survey.
- (f) Under the condition and assumption above, the number of buildings to be saved from the flood damage could be calculated by alternative plan of flood control project, return period and water depth of inundation. The results are described in the succeeding Chapters 2 and 3.

#### 1.3.4 Appraisal Values of Assets

An interview survey was carried out to obtain the present appraisal values of buildings, household effects and livestock for residences, shops and other houses in the flood prone area, and available samples of 227 were collected. These average appraisal values are listed according to categories of buildings, as shown in Table O1.2.

With regard to the agricultural field crops, values such as production (tons/ha), prices (Cols./ton) and yield (Cols./ha) at the farm gate were estimated on the basis of agricultural production statistics and the result of questionnaire survey to the agencies and farmers concerned. Value of pasture was converted into production, price and yield of meat and milk of cattle raised in the pasture land. These data together with the appraisal values of the general assets are given in the said table.

### 1.3.5 Rate of Flood Damage to Assets

The rate of flood damage to assets in the flood prone area is estimated by water depth of inundation under the following conditions:

- (a) The flood damage rate of the general assets is based on data of similar condition in the tropical zone; Guatemala, Bolivia, Indonesia, etc., because it was difficult to estimate an available damage rate from the results of interview survey to people in the flood prone area. The damage rates of livestock and agricultural crops are estimated using the results of interview survey and data of the MAG (Table O1.3)
- (b) In the present study, the damage to the public facilities is assumed to be 34 % of the damage to general assets, in accordance with similar projects in the South-east Asian countries, because it was difficult to estimate the flood damage to these facilities using the past flood damage records in the flood prone area.
- (c) The economic losses in the business activities are caused by suspensions of business activities and road traffic in and around the inundation area. Actually, inhabitants and enterprises in and around the flooded area have been obliged to suspend all or a part of their business and productive activities during some periods in and after flooding. However, it is very difficult to grasp accurately these economic losses from records of the past flood damage. Therefore, in the present study, these losses are assumed to be approximately 6 % of the flood damage to general assets, in accordance with other similar projects.

## 2. ECONOMIC EVALUATION OF PROJECTS FOR MASTER PLAN

### 2.1 General

The flood prone area is divided into four zones of Usulután, Jocotal, Olomega and San Miguel. In the present chapter, an economic evaluation of the flood control project is made for a master plan which covers these all zones. The master plan has been formulated for a project with 10-year flood control plan, taking account of flood conditions in the past, the situation of land use and financial aspect of the project.

Following the master plan study, some alternative plans were evaluated economically, for the purpose of selecting a priority project; where the alternative plans have been prepared for three kinds of probability floods with 2-, 5- and 10-year.

### 2.2 Economic Benefit

Based on a difference of two inundation areas between without-project and with-project situations, number and area of assets to be saved from flood damage are given by category of assets, return period of flood and water depth, as listed in Tables O2.1, O2.2 and O2.3.

The damage reduced is estimated for each return period by using the tables above, under conditions and assumptions shown in Chapter 1. The following tables give reduction amount of damage expected by implementing the projects for the master plan (M/P), and the priority projects (P/P) with 10-year and 2-year flood control plans:

| Return Period<br>(Year) | M/P<br>(10-year) | P/P<br>(10-year) | P/P<br>(2-year) |
|-------------------------|------------------|------------------|-----------------|
| 1                       | 46.46            | 45.97            | 38.50           |
| 2                       | 112.45           | 112.22           | 76.14           |
| 5                       | 145.54           | 143.90           | 65.48           |
| 10                      | 170.72           | 168.62           | 88.25           |
| 20                      | 196.03           | 193.94           | 109.45          |
| 50                      | 173.95           | 171.84           | 107.83          |
| 100                     | 116.60           | 114.15           | 116.52          |



Using the reduction in flood damage above, an expected Average Annual Benefit would be estimated as follows:

|                         | M/P<br>(10-year) | P/P<br>(10-year) | P/P<br>(2-year) |
|-------------------------|------------------|------------------|-----------------|
| Average Annual Benefit: | 156.87           | 155.54           | 105.42          |
| (Cols. Million)         |                  |                  |                 |

The average annual benefit of an alternative priority project with 5-year flood control plan is estimated at approximately Cols. 124.21 Million by an interpolation using the two benefits of the alternative priority projects indicated above. Regarding the remaining Project, which is defined as a difference between M/P and P/P, its average annual benefit would become Cols. 51.45 Million. These benefits would be transferred to Tables O2.9 to O2.13 respectively, to make the economic analyses of the projects.

### 2.3 Economic Cost

The economic costs are obtained by converting from the project costs, under the conditions and assumptions described in Chapter 1 as well as the following conditions:

- (a) Commodity and unskilled labor costs included in the local currency portion ( L.C.) of the construction cost are assumed to be a ratio of approximately 40 : 60.
- (b) The foreign currency portion ( F.C.) in the project cost is regarded as a tax-free.

Tables O2.4 through O2.8 give the economic costs which were converted from the financial costs of the projects for alternative plans. The total amount of the economic and financial costs for the alternative plans are listed below:

| Alternative Projects      | <u>Construction Cost</u> |          | <u>Annual OM Cost</u> |          |
|---------------------------|--------------------------|----------|-----------------------|----------|
|                           | Financial                | Economic | Financial             | Economic |
| 1. M/P                    | 1,577.56                 | 998.29   | 10.04                 | 4.03     |
| 2. P/P (2-Year)           | 775.98                   | 540.15   | 4.03                  | 2.15     |
| 3. Alt.1 of P/P (5-Year)  | 1,033.62                 | 724.87   | 5.44                  | 2.92     |
| 4. Alt.2 of P/P (10-Year) | 1,355.63                 | 540.15   | 4.03                  | 2.15     |
| 5. Rest of M/P Project    | 801.56                   | 458.14   | 4.65                  | 1.88     |

The annual flows of the economic costs and the economic OM costs are transferred to Tables O2.9 to O2.13, for the purpose of the economic analyses of the projects.

## 2.4 Economic Evaluation

### 2.4.1 Economic Effects of the River Improvement Projects

The economic feasibility of each project is examined using cash flows of the economic cost and benefit shown in Tables O2.9 to O2.13. As a result, EIRR of the project for the master plan (M/P) indicates 14.6 %, supporting that the project is economically feasible, in view of the opportunity cost of capital (approximately 12 %) in El Salvador. In addition, NPV of Cols. 99.51 Million and B/C of 1.2 at a discount rate of 12 % support the economic feasibility of the project.

The priority project with 2-year flood control plan shows the EIRR of 18.1 %, which is higher rate than the M/P. Besides, the EIRR for two alternative plans were 15.9 % for the 5-year flood control plan and 15.2 % for the 10-year flood control plan. It shows that the projects for these alternative plans also are feasible economically, though somewhat lower percentage than the P/P on the EIRR. While, the remaining project indicates a relatively low EIRR of 10.1 %. This percentage is expected to have the economic feasibility, subject that the project will have a valuable intangible effects.

As a result of EIRR, it shows that the priority project with 2-year flood control plan will have the highest feasibility economically, among alternative projects. The results of evaluation indices are summarized as follows:

| Alternative Projects       | EIRR (%) | NPV (Cols. Million) | B/C  |
|----------------------------|----------|---------------------|------|
| 1. M/P                     | 14.56    | 99.51               | 1.20 |
| 2. P/P (2-Year)            | 18.11    | 161.31              | 1.49 |
| 3. Alt. 1 of P/P (5-Year)  | 15.93    | 136.42              | 1.31 |
| 4. Alt. 2 of P/P (10-Year) | 15.17    | 143.77              | 1.25 |
| 5. Rest of M/P Project     | 10.09    | 22.51               | 0.86 |

## 2.4.2 Economic Effect of the Multipurpose Dam Project

Economic effect of a dam multipurpose project, which has three purposes of flood control, irrigation and power generation, is evaluated herein, for the purpose of comparing with the effect of river improvement project on the flood control plan.

### (1) Economic Benefit

Economic benefit of the dam construction project would be given as the total of three benefits which accrue from flood control, irrigation and power generation. The average annual benefit of the flood control project is estimated at Cols. 156.87 Million by applying the benefit for the master plan shown in Table O2.9.

Regarding the irrigation project, the benefit of the San Miguel area in "Proyecto de Riego Usulután-San Miguel 1975" would be adopted, taking account of an average annual inflation rate of 15.26 % for the period 1975-1996 and the VAT of 13 %. As a result, the annual economic benefits at the 1996 price level, which will accrue after completion of the dam construction, are estimated as follows:

| <u>Year</u> | <u>Annual Benefits</u><br><u>(Cols. Million)</u> |
|-------------|--|
| 1           | 93.830   |
| 2           | 172.536  |
| 3           | 224.489  |
| 4           | 276.128  |
| 5           | 290.240  |
| 6           | 345.322  |
| 7           | 350.183  |
| 8 to 50     | 351.193  |

In the present study, an alternative facility cost method would be applied to estimate of the economic benefit of the hydropower project. The benefit is composed of costs of two sorts to

be saved; one is the construction cost of thermal power plant, and the other is the annual cost which contains the OM cost of thermal plant facilities and the energy cost of fuel spent for operating it..

As a result, the economic benefit of the power generation is estimated at Cols. 71.054 Million for the construction of plant and Cols. 22.565 Million for the annual cost. As is obvious from these values, the power generation benefit is very low compared with the benefits of flood control and irrigation sectors, because of the hydropower plant of a relatively small size.

## (2) Economic Cost

The project consists of construction of a dam body and its incidental facilities, a partial improvement of river facilities for flood control, and construction of irrigation facilities. The economic cost is estimated at Cols. 2,805.31 Million in total for the construction cost and Cols. 11.77 Million for the annual OM cost. Table O2.14 gives the annual disbursement of these costs together with annual flow of the economic benefits. The project life is taken as 50 years after completion of the dam construction.

## (3) Economic Evaluation

EIRR of the multipurpose dam construction project would be estimated at 10.3 % as shown in Table O2.14. This rate is low by 4.3 % compared with EIRR (14.6 %) for the master plan in the present study.

# 3. FEASIBILITY STUDY OF PRIORITY PROJECT

## 3.1 General

As a result of the master plan study, it has been recognized that the priority project with 2-year flood control plan, among alternative plans, had the highest feasibility economically. The economic evaluation of this priority project (Alt. I) was carried out for the whole zone of Olomega, Jocotal and Usulután.

So, an economic effect of the project for each zone would be examined herein, taking account that the project area may be divided by zone at the implementation stage, caused by limitation

on budget, regional conditions, etc. The evaluated areas would be limited to two areas of a combined zone of Jocotal and Usulután (Alt. II) and single zone of Usulután (Alt. III).

While, single zone of each Olomega and Jocotal, and a combined zone of Olomega and Jocotal would be omitted from the economic evaluation, because there is a danger of expanding the flood damage in the lower basin of river by improving the upper reaches.

Regarding the economic evaluation of the priority project, a sensitivity of EIRR would be tested, and further the indirect effect would be evaluated. The financial aspects of the project also would be discussed in this Chapter.

### 3.2 Economic Evaluation

#### 3.2.1 Economic Benefit

Based on a difference of two inundation areas between without-project and with-project situations, number and area of assets to be saved from flood damage are given for Alts. II and III of the priority project, together to the assets of the priority project (Tables O3.1, O3.2 and O3.3).

The damage reduced by implementing the project is estimated for each return period by using the tables above, under the same conditions and assumptions as shown in Chapter 2. The results are summarized as follows:

| Return Period<br>(Year) | P/P(Alt. I)<br>(O+J+U) | Alt. II<br>(J+U) | Alt. III<br>(U) |
|-------------------------|------------------------|------------------|-----------------|
| 1                       | 38.50                  | 21.68            | 2.04            |
| 2                       | 76.14                  | 40.34            | 12.27           |
| 5                       | 65.48                  | 49.09            | 12.22           |
| 10                      | 88.25                  | 54.20            | 13.21           |
| 20                      | 109.45                 | 59.41            | 14.04           |
| 50                      | 107.83                 | 64.39            | 16.71           |
| 100                     | 116.52                 | 68.94            | 19.61           |

Using the reduction in flood damage above, an expected Average Annual Benefit would be estimated as follows:

|                         | P/P     | Alt. II | Alt. III |
|-------------------------|---------|---------|----------|
|                         | (O+J+U) | (J+U)   | (U)      |
| Average Annual Benefit: | 105.42  | 61.13   | 11.89    |
| (Cols. Million)         |         |         |          |

These benefits would be transferred to Tables O3.7 to O3.9 respectively, for the purpose of the economic analyses of the projects.

### 3.2.2 Economic Cost

The economic costs are obtained by converting the project costs, under the same conditions and assumptions as described in Chapter 2 (see Tables O3.4 to O3.6). The annual flows of the economic costs are transferred to Tables O3.7 to O3.9, to make the economic analyses, and the total amount of the economic and financial costs together with their OM costs are summarized below:

| Alternative Projects | Construction Cost |          | Annual OM Cost |          |
|----------------------|-------------------|----------|----------------|----------|
|                      | Financial         | Economic | Financial      | Economic |
| 1. P/P (Alt. I)      | 775.98            | 540.15   | 4.03           | 2.15     |
| 2. Alt. II (J+U)     | 305.44            | 211.97   | 1.56           | 0.83     |
| 3. Alt. III (U)      | 89.75             | 62.16    | 0.43           | 0.23     |

### 3.2.3 Economic Evaluation

#### (1) Direct Effects

The economic feasibility of each project is examined using cash flows of the economic cost and benefit shown in Tables O3.7 to O3.9. As a result, EIRR of the projects is estimated at 18.1 % for the priority project (Alt. I), 26.3 % for the Alt. II and 17.5 % for the Alt. III.

These percentages show that all alternative projects are economically feasible, in view of the opportunity cost of capital (approximately 12 %) in El Salvador. NPV and B/C at a discount rate of 12 % are summarized below:

| Alternative Projects | EIRR (%) | NPV (Cols. Million) | B/C  |
|----------------------|----------|---------------------|------|
| 1. P/P (Alt. I)      | 18.11    | 161.31              | 1.49 |
| 2. Alt. II (J+U)     | 26.31    | 155.61              | 2.20 |
| 3. Alt. III (U)      | 17.52    | 17.09               | 1.45 |

Next, on the priority project, an EIRR sensitivity would be tested under the conditions of the increase in 5 % and 10 % of the economic cost and the decrease in 5 % and 10 % of the economic benefit. The result is summarized in the following table:

As is obvious from figures in table, the priority project would indicate a high feasibility economically, maintaining the EIRR of 14.6 %, even in the unfavorable case where the increase in cost and the decrease in benefit are both 10 %.

| EIRR Sensitivity Test (%) |                  |      |      |
|---------------------------|------------------|------|------|
| Decrease in               | Increase in Cost |      |      |
|                           | 0 %              | 5 %  | 10 % |
| Benefit                   |                  |      |      |
| 0 %                       | 18.1             | 17.5 | 17.0 |
| 5 %                       | 17.5             | 16.9 | 15.8 |
| 10 %                      | 16.8             | 15.7 | 14.6 |

## (2) Indirect Tangible Effects

After completion of the flood control project, the most expected indirect effect will be an utilization of an unused land. It is expected that an unused land caused by flood will be converted into an effective land such as agricultural land and residential area.

For example, in case used as an agricultural land, it is expected that the project will produce an agricultural land area of approximately 3,300 ha, consisting of 1,500 ha for the maize plantation and 1,800 ha for the sugar cane plantation, based on the land classification maps in the flood prone area.

Net economic benefit produced by these lands would be estimated at Cols. 6.5 Million per annum, i.e. it would be to rise by approximately 0.5 % as to the EIRR of the project.

### (3) Indirect Intangible Effects

The following indirect intangible effects could be expected by implementing the flood control project:

#### (a) Improvement of social environment

- i) Increase in a favorable communication in the region owing to reductions in traffic suspension caused by flood;
- ii) Decrease in malignant infectious diseases due to improvement of sanitary condition; and
- iii) Improvement of the fauna situation due to stabilization of water quality of the lake Jocotal.

#### (b) Activation of regional economy

- i) Increase in agricultural production due to increase of arable lands;
- ii) Promotion of regional economic development by investing a huge construction fund;
- iii) Increase in employment opportunity;
- iv) Stabilization of fishery at the lake Olomega, by keeping a preferable water level of the lake; and
- v) Acceleration of a sustainable economic development through soil erosion control in the river basin.

## 3.3 Consideration of Financial Aspects

### 3.3.1 Raising of the Project Fund

In the present section, a consideration would be given on raising of the construction fund, in order to examine a financial viability of the project.

According to estimates of the project cost described in "Supporting Report - N", the construction cost of the priority project is estimated at Cols. 775.9 Million (equivalent to US\$ 88.67 Million) in total, in accordance with the annual disbursement schedule shown in Table O3.10.



The construction fund is assumed to be raised from two sources of self-fund and external debt, under conditions as follows:

- (1) The external debt is assumed to be 75 % of the project cost, and the remaining 25 % would come to a self-fund;
- (2) A repayment schedule for the external debt is assumed to take the loan terms of 30 years including the grace period of 10 years, and the interest rate of 6 % per annum, based on the actual condition of the external debt of El Salvador.
- (3) During the grace period, only the interest is paid, and repayment of the debt with the interest is made after the grace period.

Under the conditions above, the total fund required, US\$ 88.67 Million, is composed of US\$ 66.50 Million for the external debt and US\$ 22.17 Million for the self-fund. In accordance with the construction schedule, the fund required every year during the period from 1999 to 2005 is estimated as follows:

|               | Total<br>Fund | <u>Annual Disbursement</u> |             |             |             |             |             |             |       |
|---------------|---------------|----------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------|
|               |               | <u>1999</u>                | <u>2000</u> | <u>2001</u> | <u>2002</u> | <u>2003</u> | <u>2004</u> | <u>2005</u> |       |
| Self-fund     | 22.17         | 0.70                       | 0.38        |             | 3.93        | 4.11        | 4.31        | 4.27        | 4.47  |
| External Debt | 66.50         | 2.08                       | 1.14        | 11.80       | 12.35       | 12.92       | 12.82       | 13.39       |       |
| Total         | 88.67         | 2.78                       | 1.52        |             | 15.73       | 16.46       | 17.23       | 17.09       | 17.86 |

Unit : US\$ Million

Of the annual disbursement, the maximum disbursement would come to US\$ 17.86 Million in total and US\$ 4.47 Million for the self-fund in 2005. The respective amounts correspond to 3.1 % and 0.8 % of the expected average annual public investment of the Central Government for the period from 1995 to 1999 (see Table C5.3, Supporting Report -C). These rates appear to be not so much share in the governmental finance.

### 3.3.2 Repayment of External Debt

Table O3.10 gives a tentative schedule of repayment for the external debt. The annual maximum repayment would amount to US\$ 7.32 Million in 2009 ( the eleventh year from the

commencement of the project). This repayment amount consists of US\$ 3.33 Million for the capital and US\$ 3.99 Million for the interest.

According to the repayment statistics of the external debt of El Salvador (Table C6.1, Supporting Report-C), the average annual repayment amounted to US\$ 263.7 Million for the period 1990-1995, and it was trending toward increase at an annual rate of 6.3 %. The annual maximum repayment amount of US\$ 7.32 Million in 2009 for the present project will be less than 3 % of the total annual repayment of El Salvador for the said period.

In conclusion, if the fund schedule is executed under the said conditions, raising of the construction fund and repayment of the external debt seem to be possible, judging that the maximum annual disbursement is nearly 3 % of the average annual disbursement of public investment expected for the period 1995-1999, and the maximum annual repayment of the external debt is less than 3 % of the annual debt service of the Government for the period 1990-1995.



**TABLE O1.1 ESTIMATE OF STANDARD CONVERSION RATE  
(SCR)**

| Items                         | 1991   | 1992   | 1993   | 1994   | 1995   | Average |
|-------------------------------|--------|--------|--------|--------|--------|---------|
| Imports (Colones Million)     | 12,133 | 15,522 | 18,670 | 22,522 | 29,334 | 19,636  |
| Import Duty (Colones Million) | 786    | 840    | 882    | 1,236  | 1,781  | 1,105   |
| Total                         | 12,919 | 16,362 | 19,552 | 23,758 | 31,115 | 20,741  |
| Rate of Import Duty (%)       | 6.5    | 5.4    | 4.7    | 5.5    | 6.1    | 5.6     |
| Exports (Colones Million)     | 5,774  | 6,660  | 8,979  | 10,932 | 14,537 | 6,469   |
| Export Duty (Colones Million) | 225    | 30     | 9      | 0      | 0      | 53      |
| Total                         | 5,549  | 6,630  | 8,970  | 10,932 | 14,537 | 6,416   |
| SCR (%)                       | 97.0   | 96.5   | 96.9   | 96.4   | 96.1   | 96.6    |

**Average SCR of El Salvador : 96 %**

**TABLE OI.2 AVERAGE APPRAISAL VALUES OF ASSETS IN FLOOD PRONE AREA  
(AT THE 1996 PRICES)**

| 1. Buildings, Household Effects & Livestock |           | 2. Agricultural Field Crops                               |               |                         |                            |                           |
|---|-----------|---|---------------|-------------------------|----------------------------|---------------------------|
| No. Kind of Buildings                       | Buildings | Unit : Colones/household<br>Household<br>hold<br>Effects* | No. Crops     | Production<br>(Tons/ha) | Unit<br>Price<br>(Col/ton) | Unit<br>Price<br>(Col/ha) |
| 1 Residence                                 |           |   | 1 Sugar cane  | 96.43                   | 193.54                     | 18,663                    |
| (1) Medium Class                            | 53,755    | 31,087  | 2 Minize      | 2.09                    | 2,577.65                   | 5,387                     |
| (2) Low Class                               | 27,405    | 12,338  | 3 Pasture**** |                         |                            |                           |
| (3) Poor Class                              | 9,905     | 3,845   | (1) Natural   | -                       | -                          | 6,790                     |
| 2 Store & Others***                         | 52,333    | 139,498   | (2) Improved  | -                       | -                          | 8,570                     |
|   |           |   | (3) Average   |                         |                            | 7,680                     |

Source : MAG data and interview survey in field.

Note : \* Household effects include equipment and materials.

\*\* Livestock is pig and chicken.

\*\*\* Store & others give an average price of store and other buildings and these equipment and materials.

\*\*\*\* Price of pasture is estimated based on production of meat and milk of cattle raised in pasture.

**TABLE 01.3 INUNDATION DAMAGE RATE OF ASSETS**

| No. Inundation<br>Depth<br>(cm.) | Damage Rate    |                      |           |                          |       |         |
|----------------------------------|----------------|----------------------|-----------|--------------------------|-------|---------|
|                                  | General Assets |                      | Livestock | Agricultural Field Crops |       |         |
|                                  | Buildings      | Household<br>Effects |           | Sugar cane               | Maize | Pasture |
| 1 0 - 25                         | 0.140          | 0.111                | 0.069     | 0.548                    | 0.214 | 0.181   |
| 2 25 - 50                        | 0.198          | 0.127                | 0.206     | 0.642                    | 0.457 | 0.280   |
| 3 50 - 100                       | 0.355          | 0.254                | 1.000     | 0.926                    | 0.696 | 0.561   |
| 4 100 - 150                      | 0.452          | 0.325                | 1.000     | 0.973                    | 0.910 | 0.841   |
| 5 150 - 200                      | 0.453          | 0.343                | 1.000     | 1.000                    | 1.000 | 1.000   |

Source : Results of interview survey in field.

**TABLE O2.1 REDUCTION IN NUMBER AND AREA OF INUNDATION ASSETS EXPECTED BY IMPLEMENTING THE PROJECT**

| <b>1. MP</b>                       |                 |                     |       |      |       |                 |       |                         |            |         |       |       |
|------------------------------------|-----------------|---------------------|-------|------|-------|-----------------|-------|-------------------------|------------|---------|-------|-------|
| <b>(1) 1.05-Year Return Period</b> |                 |                     |       |      |       |                 |       |                         |            |         |       |       |
| No.                                | Water Depth (m) | Number of Buildings |       |      |       | Stores & others | Total | Agricultural Crops (ha) |            |         |       | Total |
|                                    |                 | Residence           |       |      | Total |                 |       | Maize                   | Sugar cane | Pasture | Total |       |
|                                    |                 | Medium              | Low   | Poor |       |                 |       |                         |            |         |       |       |
| 1                                  | 0.0-0.25        | 113                 | 254   | 120  | 497   | 10              | 507   | 142                     | 200        | 882     | 1,224 |       |
| 2                                  | 0.25-0.5        | 131                 | 307   | 139  | 577   | 12              | 589   | 50                      | 59         | 303     | 412   |       |
| 3                                  | 0.5-1.0         | 173                 | 404   | 183  | 760   | 15              | 775   | 91                      | 159        | 692     | 942   |       |
| 4                                  | 1.0-1.5         | 49                  | 114   | 52   | 215   | 4               | 219   | 9                       | 71         | 288     | 368   |       |
| 5                                  | over 1.5        | 126                 | 294   | 133  | 553   | 11              | 564   | 13                      | 113        | 482     | 608   |       |
| Total                              |                 | 592                 | 1,383 | 627  | 2,602 | 52              | 2,654 | 305                     | 602        | 2,647   | 3,554 |       |

  

| <b>1. MP</b>                    |                 |                     |       |       |       |              |       |                         |            |         |       |       |
|---------------------------------|-----------------|---------------------|-------|-------|-------|--------------|-------|-------------------------|------------|---------|-------|-------|
| <b>(2) 2-Year Return Period</b> |                 |                     |       |       |       |              |       |                         |            |         |       |       |
| No.                             | Water Depth (m) | Number of Buildings |       |       |       | Stores, Etc. | Total | Agricultural Crops (ha) |            |         |       | Total |
|                                 |                 | Residence           |       |       | Total |              |       | Maize                   | Sugar cane | Pasture | Total |       |
|                                 |                 | Medium              | Low   | Poor  |       |              |       |                         |            |         |       |       |
| 1                               | 0.0-0.25        | 324                 | 757   | 344   | 1,425 | 29           | 1,454 | 185                     | 227        | 1,009   | 1,421 |       |
| 2                               | 0.25-0.5        | 239                 | 557   | 253   | 1,049 | 21           | 1,070 | 143                     | 183        | 814     | 1,149 |       |
| 3                               | 0.5-1.0         | 342                 | 799   | 363   | 1,504 | 30           | 1,534 | 212                     | 266        | 1,227   | 1,705 |       |
| 4                               | 1.0-1.5         | 125                 | 293   | 133   | 551   | 11           | 562   | 73                      | 138        | 586     | 797   |       |
| 5                               | 1.5-2.0         | 171                 | 398   | 181   | 750   | 15           | 765   | 39                      | 150        | 650     | 839   |       |
| Total                           |                 | 1,201               | 2,804 | 1,274 | 5,279 | 106          | 5,385 | 652                     | 964        | 4,286   | 5,902 |       |

  

| <b>1. MP</b>                    |                 |                     |       |       |       |              |       |                         |            |         |       |       |
|---------------------------------|-----------------|---------------------|-------|-------|-------|--------------|-------|-------------------------|------------|---------|-------|-------|
| <b>(3) 5-Year Return Period</b> |                 |                     |       |       |       |              |       |                         |            |         |       |       |
| No.                             | Water Depth (m) | Number of Buildings |       |       |       | Stores, Etc. | Total | Agricultural Crops (ha) |            |         |       | Total |
|                                 |                 | Residence           |       |       | Total |              |       | Maize                   | Sugar cane | Pasture | Total |       |
|                                 |                 | Medium              | Low   | Poor  |       |              |       |                         |            |         |       |       |
| 1                               | 0.0-0.25        | 353                 | 825   | 374   | 1,552 | 31           | 1,583 | 194                     | 229        | 1,012   | 1,435 |       |
| 2                               | 0.25-0.5        | 300                 | 699   | 317   | 1,316 | 26           | 1,342 | 153                     | 190        | 841     | 1,184 |       |
| 3                               | 0.5-1.0         | 444                 | 1,037 | 471   | 1,952 | 39           | 1,991 | 246                     | 328        | 1,446   | 2,020 |       |
| 4                               | 1.0-1.5         | 169                 | 411   | 200   | 830   | 17           | 847   | 102                     | 156        | 749     | 1,007 |       |
| 5                               | 1.5-2.0         | 235                 | 549   | 249   | 1,033 | 21           | 1,054 | 58                      | 183        | 824     | 1,065 |       |
| Total                           |                 | 1,521               | 3,551 | 1,611 | 6,683 | 134          | 6,817 | 753                     | 1,085      | 4,872   | 6,711 |       |

  

| <b>1. MP</b>                     |                 |                     |       |       |       |              |       |                         |            |         |       |       |
|----------------------------------|-----------------|---------------------|-------|-------|-------|--------------|-------|-------------------------|------------|---------|-------|-------|
| <b>(4) 10-Year Return Period</b> |                 |                     |       |       |       |              |       |                         |            |         |       |       |
| No.                              | Water Depth (m) | Number of Buildings |       |       |       | Stores, Etc. | Total | Agricultural Crops (ha) |            |         |       | Total |
|                                  |                 | Residence           |       |       | Total |              |       | Maize                   | Sugar cane | Pasture | Total |       |
|                                  |                 | Medium              | Low   | Poor  |       |              |       |                         |            |         |       |       |
| 1                                | 0.0-0.25        | 495                 | 941   | 428   | 1,777 | 36           | 1,813 | 188                     | 193        | 855     | 1,236 |       |
| 2                                | 0.25-0.5        | 336                 | 785   | 356   | 1,477 | 30           | 1,507 | 171                     | 208        | 913     | 1,292 |       |
| 3                                | 0.5-1.0         | 520                 | 1,214 | 551   | 2,285 | 46           | 2,331 | 273                     | 354        | 1,555   | 2,182 |       |
| 4                                | 1.0-1.5         | 240                 | 559   | 254   | 1,053 | 21           | 1,074 | 126                     | 203        | 900     | 1,229 |       |
| 5                                | 1.5-2.0         | 281                 | 655   | 297   | 1,233 | 25           | 1,258 | 76                      | 189        | 939     | 1,204 |       |
| Total                            |                 | 1,782               | 4,157 | 1,886 | 7,825 | 157          | 7,982 | 834                     | 1,147      | 5,162   | 7,143 |       |

  

| <b>1. MP</b>                     |                 |                     |       |       |       |              |       |                         |            |         |       |       |
|----------------------------------|-----------------|---------------------|-------|-------|-------|--------------|-------|-------------------------|------------|---------|-------|-------|
| <b>(5) 20-Year Return Period</b> |                 |                     |       |       |       |              |       |                         |            |         |       |       |
| No.                              | Water Depth (m) | Number of Buildings |       |       |       | Stores, Etc. | Total | Agricultural Crops (ha) |            |         |       | Total |
|                                  |                 | Residence           |       |       | Total |              |       | Maize                   | Sugar cane | Pasture | Total |       |
|                                  |                 | Medium              | Low   | Poor  |       |              |       |                         |            |         |       |       |
| 1                                | 0.0-0.25        | 372                 | 868   | 394   | 1,634 | 33           | 1,667 | 182                     | 159        | 732     | 1,073 |       |
| 2                                | 0.25-0.5        | 374                 | 872   | 396   | 1,642 | 33           | 1,675 | 177                     | 199        | 860     | 1,236 |       |
| 3                                | 0.5-1.0         | 598                 | 1,396 | 634   | 2,628 | 53           | 2,681 | 320                     | 419        | 1,820   | 2,559 |       |
| 4                                | 1.0-1.5         | 391                 | 710   | 322   | 1,336 | 27           | 1,363 | 168                     | 263        | 1,145   | 1,576 |       |
| 5                                | 1.5-2.0         | 325                 | 759   | 344   | 1,428 | 29           | 1,457 | 165                     | 235        | 1,174   | 1,515 |       |
| Total                            |                 | 1,973               | 4,655 | 2,090 | 8,668 | 173          | 8,841 | 953                     | 1,275      | 5,731   | 7,959 |       |

  

| <b>1. MP</b>                     |                 |                     |       |       |       |              |       |                         |            |         |       |       |
|----------------------------------|-----------------|---------------------|-------|-------|-------|--------------|-------|-------------------------|------------|---------|-------|-------|
| <b>(6) 50-Year Return Period</b> |                 |                     |       |       |       |              |       |                         |            |         |       |       |
| No.                              | Water Depth (m) | Number of Buildings |       |       |       | Stores, Etc. | Total | Agricultural Crops (ha) |            |         |       | Total |
|                                  |                 | Residence           |       |       | Total |              |       | Maize                   | Sugar cane | Pasture | Total |       |
|                                  |                 | Medium              | Low   | Poor  |       |              |       |                         |            |         |       |       |
| 1                                | 0.0-0.25        | 129                 | 301   | 137   | 567   | 11           | 578   | 103                     | 0          | 63      | 166   |       |
| 2                                | 0.25-0.5        | 227                 | 529   | 240   | 996   | 20           | 1,016 | 104                     | 37         | 270     | 411   |       |
| 3                                | 0.5-1.0         | 462                 | 1,077 | 489   | 2,028 | 41           | 2,069 | 232                     | 238        | 1,101   | 1,571 |       |
| 4                                | 1.0-1.5         | 356                 | 831   | 377   | 1,564 | 31           | 1,595 | 188                     | 282        | 1,245   | 1,716 |       |
| 5                                | 1.5-2.0         | 383                 | 894   | 406   | 1,683 | 34           | 1,717 | 147                     | 301        | 1,435   | 1,943 |       |
| Total                            |                 | 1,557               | 3,632 | 1,649 | 6,833 | 137          | 6,975 | 774                     | 858        | 4,175   | 5,807 |       |

  

| <b>1. MP</b>                      |                 |                     |       |       |       |              |       |                         |            |         |       |       |
|-----------------------------------|-----------------|---------------------|-------|-------|-------|--------------|-------|-------------------------|------------|---------|-------|-------|
| <b>(7) 100-Year Return Period</b> |                 |                     |       |       |       |              |       |                         |            |         |       |       |
| No.                               | Water Depth (m) | Number of Buildings |       |       |       | Stores, Etc. | Total | Agricultural Crops (ha) |            |         |       | Total |
|                                   |                 | Residence           |       |       | Total |              |       | Maize                   | Sugar cane | Pasture | Total |       |
|                                   |                 | Medium              | Low   | Poor  |       |              |       |                         |            |         |       |       |
| 1                                 | 0.0-0.25        | 31                  | 72    | 33    | 136   | 3            | 139   | 44                      | 0          | 8       | 52    |       |
| 2                                 | 0.25-0.5        | 148                 | 315   | 157   | 631   | 13           | 644   | 43                      | 0          | 0       | 43    |       |
| 3                                 | 0.5-1.0         | 384                 | 876   | 406   | 1,636 | 31           | 1,720 | 168                     | 115        | 594     | 877   |       |
| 4                                 | 1.0-1.5         | 345                 | 876   | 366   | 1,517 | 30           | 1,547 | 203                     | 258        | 1,165   | 1,626 |       |
| 5                                 | 1.5-2.0         | 112                 | 262   | 119   | 493   | 10           | 503   | 0                       | 203        | 920     | 1,123 |       |
| Total                             |                 | 1,020               | 2,382 | 1,081 | 4,483 | 90           | 4,573 | 458                     | 576        | 2,697   | 3,721 |       |

**TABLE O2.2 REDUCTION IN NUMBER AND AREA OF INUNDATION ASSETS EXPECTED BY IMPLEMENTING THE PROJECT**

| 2. Alt. I(O+J+U)-2-year Flood Control Plan<br>(1) 105-Year Return Period |                 |                     |     |      |       |                 |                         |       |            |         |       |
|--|-----------------|---------------------|-----|------|-------|-----------------|-------------------------|-------|------------|---------|-------|
| No.  | Water Depth (m) | Number of Buildings |     |      |       |                 | Agricultural Crops (ha) |       |            |         |       |
|  |                 | Residence           |     |      |       | Stores & others | Total                   | Maize | Sugar cane | Pasture | Total |
|  |                 | Medium              | Low | Poor | Total |                 |                         |       |            |         |       |
| 1  | 0.0-0.25        | 61                  | 142 | 64   | 267   | 5               | 273                     | 139   | 210        | 876     | 1,225 |
| 2  | 0.25-0.5        | 81                  | 189 | 86   | 356   | 7               | 363                     | 39    | 57         | 242     | 338   |
| 3  | 0.5-1.0         | 114                 | 267 | 121  | 502   | 10              | 512                     | 76    | 155        | 613     | 874   |
| 4  | 1.0-1.5         | 56                  | 132 | 60   | 247   | 5               | 252                     | 17    | 75         | 309     | 491   |
| 5  | 1.5-2.0         | 109                 | 255 | 116  | 480   | 10              | 489                     | 52    | 127        | 572     | 751   |
|  | Total           | 421                 | 984 | 447  | 1,652 | 37              | 1,859                   | 323   | 624        | 2,642   | 3,589 |

  

| 2. Alt. I(O+J+U)-2-year Flood Control Plan<br>(2) 2-Year Return Period |                 |                     |       |      |       |                 |                         |       |            |         |       |
|--|-----------------|---------------------|-------|------|-------|-----------------|-------------------------|-------|------------|---------|-------|
| No.  | Water Depth (m) | Number of Buildings |       |      |       |                 | Agricultural Crops (ha) |       |            |         |       |
|  |                 | Residence           |       |      |       | Stores & others | Total                   | Maize | Sugar cane | Pasture | Total |
|  |                 | Medium              | Low   | Poor | Total |                 |                         |       |            |         |       |
| 1  | 0.0-0.25        | 167                 | 390   | 177  | 734   | 15              | 749                     | 137   | 144        | 633     | 914   |
| 2  | 0.25-0.5        | 134                 | 314   | 143  | 592   | 12              | 603                     | 111   | 134        | 573     | 818   |
| 3  | 0.5-1.0         | 198                 | 462   | 210  | 870   | 17              | 888                     | 166   | 223        | 949     | 1,338 |
| 4  | 1.0-1.5         | 95                  | 221   | 100  | 415   | 8               | 423                     | 64    | 115        | 486     | 665   |
| 5  | 1.5-2.0         | 138                 | 322   | 146  | 606   | 12              | 618                     | 73    | 169        | 719     | 952   |
|  | Total           | 732                 | 1,709 | 776  | 3,217 | 64              | 3,282                   | 551   | 776        | 3,360   | 4,687 |

  

| 2. Alt. I(O+J+U)-2-year Flood Control Plan<br>(3) 5-Year Return Period |                 |                     |       |      |       |                 |                         |       |            |         |       |
|--|-----------------|---------------------|-------|------|-------|-----------------|-------------------------|-------|------------|---------|-------|
| No.  | Water Depth (m) | Number of Buildings |       |      |       |                 | Agricultural Crops (ha) |       |            |         |       |
|  |                 | Residence           |       |      |       | Stores & others | Total                   | Maize | Sugar cane | Pasture | Total |
|  |                 | Medium              | Low   | Poor | Total |                 |                         |       |            |         |       |
| 1  | 0.0-0.25        | 195                 | 454   | 206  | 855   | 17              | 872                     | 160   | 170        | 750     | 1,080 |
| 2  | 0.25-0.5        | 155                 | 361   | 164  | 679   | 14              | 693                     | 133   | 159        | 684     | 976   |
| 3  | 0.5-1.0         | 201                 | 468   | 213  | 882   | 18              | 900                     | 198   | 261        | 1,095   | 1,554 |
| 4  | 1.0-1.5         | 41                  | 97    | 44   | 183   | 4               | 186                     | 60    | 94         | 377     | 531   |
| 5  | 1.5-2.0         | 90                  | 211   | 96   | 398   | 8               | 406                     | 39    | 98         | 425     | 562   |
|  | Total           | 682                 | 1,592 | 722  | 2,996 | 60              | 3,056                   | 590   | 782        | 3,331   | 4,703 |

  

| 2. Alt. I(O+J+U)-2-year Flood Control Plan<br>(4) 10-Year Return Period |                 |                     |       |      |       |                 |                         |       |            |         |       |
|---|-----------------|---------------------|-------|------|-------|-----------------|-------------------------|-------|------------|---------|-------|
| No.   | Water Depth (m) | Number of Buildings |       |      |       |                 | Agricultural Crops (ha) |       |            |         |       |
|   |                 | Residence           |       |      |       | Stores & others | Total                   | Maize | Sugar cane | Pasture | Total |
|   |                 | Medium              | Low   | Poor | Total |                 |                         |       |            |         |       |
| 1   | 0.0-0.25        | 237                 | 552   | 251  | 1,040 | 21              | 1,060                   | 173   | 174        | 789     | 1,127 |
| 2   | 0.25-0.5        | 208                 | 484   | 220  | 912   | 18              | 930                     | 156   | 186        | 801     | 1,143 |
| 3   | 0.5-1.0         | 288                 | 673   | 305  | 1,266 | 25              | 1,292                   | 253   | 336        | 1,410   | 1,909 |
| 4   | 1.0-1.5         | 81                  | 190   | 85   | 357   | 7               | 364                     | 92    | 143        | 589     | 815   |
| 5   | 1.5-2.0         | 102                 | 232   | 109  | 449   | 9               | 458                     | 44    | 110        | 470     | 624   |
|   | Total           | 916                 | 2,133 | 970  | 4,024 | 80              | 4,105                   | 718   | 949        | 4,041   | 5,708 |

  

| 2. Alt. I(O+J+U)-2-year Flood Control Plan<br>(5) 20-Year Return Period |                 |                     |       |       |       |                 |                         |       |            |         |       |
|---|-----------------|---------------------|-------|-------|-------|-----------------|-------------------------|-------|------------|---------|-------|
| No.   | Water Depth (m) | Number of Buildings |       |       |       |                 | Agricultural Crops (ha) |       |            |         |       |
|   |                 | Residence           |       |       |       | Stores & others | Total                   | Maize | Sugar cane | Pasture | Total |
|   |                 | Medium              | Low   | Poor  | Total |                 |                         |       |            |         |       |
| 1   | 0.0-0.25        | 244                 | 568   | 258   | 1,070 | 21              | 1,092                   | 159   | 126        | 596     | 881   |
| 2   | 0.25-0.5        | 247                 | 577   | 262   | 1,086 | 22              | 1,107                   | 173   | 200        | 866     | 1,239 |
| 3   | 0.5-1.0         | 363                 | 847   | 384   | 1,594 | 32              | 1,626                   | 309   | 415        | 1,740   | 2,464 |
| 4   | 1.0-1.5         | 129                 | 300   | 136   | 564   | 11              | 575                     | 136   | 209        | 861     | 1,206 |
| 5   | 1.5-2.0         | 119                 | 277   | 126   | 522   | 10              | 533                     | 58    | 146        | 614     | 818   |
|   | Total           | 1,101               | 2,569 | 1,165 | 4,836 | 97              | 4,933                   | 835   | 1,096      | 4,677   | 6,678 |

  

| 2. Alt. I(O+J+U)-2-year Flood Control Plan<br>(6) 50-Year Return Period |                 |                     |       |      |       |                 |                         |       |            |         |       |
|---|-----------------|---------------------|-------|------|-------|-----------------|-------------------------|-------|------------|---------|-------|
| No.   | Water Depth (m) | Number of Buildings |       |      |       |                 | Agricultural Crops (ha) |       |            |         |       |
|   |                 | Residence           |       |      |       | Stores & others | Total                   | Maize | Sugar cane | Pasture | Total |
|   |                 | Medium              | Low   | Poor | Total |                 |                         |       |            |         |       |
| 1   | 0.0-0.25        | 0                   | 0     | 0    | 0     | 0               | 0                       | 37    | 0          | 0       | 37    |
| 2   | 0.25-0.5        | 244                 | 570   | 258  | 1,072 | 21              | 1,094                   | 73    | 0          | 22      | 95    |
| 3   | 0.5-1.0         | 375                 | 874   | 397  | 1,645 | 33              | 1,678                   | 330   | 428        | 1,796   | 2,554 |
| 4   | 1.0-1.5         | 158                 | 392   | 178  | 738   | 15              | 753                     | 166   | 242        | 1,068   | 1,416 |
| 5   | 1.5-2.0         | 147                 | 344   | 156  | 647   | 13              | 660                     | 85    | 203        | 841     | 1,129 |
|   | Total           | 934                 | 2,179 | 989  | 4,102 | 82              | 4,184                   | 691   | 873        | 3,667   | 5,231 |

  

| 2. Alt. I(O+J+U)-2-year Flood Control Plan<br>(7) 100-Year Return Period |                 |                     |       |       |       |                 |                         |       |            |         |       |
|--|-----------------|---------------------|-------|-------|-------|-----------------|-------------------------|-------|------------|---------|-------|
| No.  | Water Depth (m) | Number of Buildings |       |       |       |                 | Agricultural Crops (ha) |       |            |         |       |
|  |                 | Residence           |       |       |       | Stores & others | Total                   | Maize | Sugar cane | Pasture | Total |
|  |                 | Medium              | Low   | Poor  | Total |                 |                         |       |            |         |       |
| 1  | 0.0-0.25        | 0                   | 0     | 0     | 0     | 0               | 0                       | 37    | 0          | 0       | 37    |
| 2  | 0.25-0.5        | 263                 | 612   | 278   | 1,152 | 23              | 1,175                   | 37    | 0          | 0       | 37    |
| 3  | 0.5-1.0         | 410                 | 958   | 435   | 1,803 | 36              | 1,839                   | 338   | 418        | 1,766   | 2,522 |
| 4  | 1.0-1.5         | 190                 | 442   | 201   | 833   | 17              | 850                     | 183   | 241        | 1,026   | 1,450 |
| 5  | 1.5-2.0         | 162                 | 377   | 171   | 709   | 14              | 723                     | 75    | 195        | 813     | 1,074 |
|  | Total           | 1,024               | 2,338 | 1,084 | 4,477 | 90              | 4,567                   | 670   | 853        | 3,595   | 5,120 |



TABLE 023 REDUCTION IN NUMBER AND AREA OF INUNDATION ASSETS EXPECTED BY IMPLEMENTING THE PROJECT

**3. Alt (O+J+U)-10-year Flood Control Plan  
(1) 1.05-Year Return Period**

| No.   | Water Depth (m) | Number of Buildings |       |      |       | Store. Etc. | Total | Agricultural Crops (ha) |            |         |       |
|-------|-----------------|---------------------|-------|------|-------|-------------|-------|-------------------------|------------|---------|-------|
|       |                 | Residence           |       |      |       |             |       | Maize                   | Sugar cane | Pasture | Total |
|       |                 | Medium              | Low   | Poor | Total |             |       |                         |            |         |       |
| 1     | 0.0-0.25        | 113                 | 264   | 120  | 497   | 10          | 507   | 142                     | 200        | 882     | 1,224 |
| 2     | 0.25-0.5        | 126                 | 293   | 133  | 552   | 11          | 563   | 49                      | 59         | 303     | 411   |
| 3     | 0.5-1.0         | 158                 | 392   | 178  | 738   | 15          | 753   | 90                      | 158        | 667     | 915   |
| 4     | 1.0-1.5         | 49                  | 114   | 52   | 215   | 4           | 219   | 9                       | 71         | 284     | 364   |
| 5     | 1.5-2.0         | 126                 | 299   | 133  | 558   | 11          | 569   | 13                      | 113        | 482     | 608   |
| Total |                 | 582                 | 1,362 | 616  | 2,560 | 51          | 2,611 | 303                     | 601        | 2,618   | 3,522 |

**3. Alt (O+J+U)-10-year Flood Control Plan  
(2) 2-Year Return Period**

| No.   | Water Depth (m) | Number of Buildings |       |       |       | Store. Etc. | Total | Agricultural Crops (ha) |            |         |       |
|-------|-----------------|---------------------|-------|-------|-------|-------------|-------|-------------------------|------------|---------|-------|
|       |                 | Residence           |       |       |       |             |       | Maize                   | Sugar cane | Pasture | Total |
|       |                 | Medium              | Low   | Poor  | Total |             |       |                         |            |         |       |
| 1     | 0.0-0.25        | 319                 | 745   | 338   | 1,402 | 28          | 1,430 | 181                     | 229        | 995     | 1,406 |
| 2     | 0.25-0.5        | 239                 | 557   | 253   | 1,049 | 21          | 1,070 | 142                     | 183        | 801     | 1,126 |
| 3     | 0.5-1.0         | 342                 | 799   | 363   | 1,504 | 30          | 1,534 | 211                     | 266        | 1,227   | 1,704 |
| 4     | 1.0-1.5         | 125                 | 293   | 133   | 551   | 11          | 562   | 72                      | 138        | 581     | 791   |
| 5     | 1.5-2.0         | 171                 | 398   | 181   | 750   | 15          | 765   | 38                      | 150        | 650     | 838   |
| Total |                 | 1,196               | 2,792 | 1,268 | 5,256 | 105         | 5,361 | 647                     | 964        | 4,254   | 5,865 |

**3. Alt (O+J+U)-10-year Flood Control Plan  
(3) 5-Year Return Period**

| No.   | Water Depth (m) | Number of Buildings |       |       |       | Store. Etc. | Total | Agricultural Crops (ha) |            |         |       |
|-------|-----------------|---------------------|-------|-------|-------|-------------|-------|-------------------------|------------|---------|-------|
|       |                 | Residence           |       |       |       |             |       | Maize                   | Sugar cane | Pasture | Total |
|       |                 | Medium              | Low   | Poor  | Total |             |       |                         |            |         |       |
| 1     | 0.0-0.25        | 353                 | 825   | 374   | 1,552 | 31          | 1,583 | 191                     | 229        | 1,068   | 1,431 |
| 2     | 0.25-0.5        | 360                 | 699   | 317   | 1,316 | 26          | 1,342 | 153                     | 190        | 838     | 1,181 |
| 3     | 0.5-1.0         | 444                 | 1,037 | 471   | 1,952 | 39          | 1,991 | 246                     | 328        | 1,438   | 2,012 |
| 4     | 1.0-1.5         | 185                 | 431   | 196   | 812   | 16          | 828   | 100                     | 156        | 749     | 1,005 |
| 5     | 1.5-2.0         | 227                 | 531   | 241   | 999   | 20          | 1,019 | 57                      | 182        | 793     | 1,032 |
| Total |                 | 1,509               | 3,523 | 1,599 | 6,611 | 133         | 6,764 | 750                     | 1,085      | 4,826   | 6,661 |

**3. Alt (O+J+U)-10-year Flood Control Plan  
(4) 10-Year Return Period**

| No.   | Water Depth (m) | Number of Buildings |       |       |       | Store. Etc. | Total | Agricultural Crops (ha) |            |         |       |
|-------|-----------------|---------------------|-------|-------|-------|-------------|-------|-------------------------|------------|---------|-------|
|       |                 | Residence           |       |       |       |             |       | Maize                   | Sugar cane | Pasture | Total |
|       |                 | Medium              | Low   | Poor  | Total |             |       |                         |            |         |       |
| 1     | 0.0-0.25        | 455                 | 941   | 428   | 1,777 | 36          | 1,813 | 188                     | 193        | 851     | 1,232 |
| 2     | 0.25-0.5        | 335                 | 785   | 356   | 1,477 | 30          | 1,507 | 171                     | 208        | 907     | 1,286 |
| 3     | 0.5-1.0         | 520                 | 1,214 | 551   | 2,285 | 46          | 2,331 | 273                     | 354        | 1,549   | 2,176 |
| 4     | 1.0-1.5         | 249                 | 559   | 251   | 1,053 | 21          | 1,074 | 126                     | 203        | 893     | 1,222 |
| 5     | 1.5-2.0         | 265                 | 618   | 281   | 1,164 | 23          | 1,187 | 72                      | 189        | 909     | 1,170 |
| Total |                 | 1,766               | 4,120 | 1,870 | 7,756 | 155         | 7,911 | 830                     | 1,147      | 5,109   | 7,086 |

**3. Alt (O+J+U)-10-year Flood Control Plan  
(5) 20-Year Return Period**

| No.   | Water Depth (m) | Number of Buildings |       |       |       | Store. Etc. | Total | Agricultural Crops (ha) |            |         |       |
|-------|-----------------|---------------------|-------|-------|-------|-------------|-------|-------------------------|------------|---------|-------|
|       |                 | Residence           |       |       |       |             |       | Maize                   | Sugar cane | Pasture | Total |
|       |                 | Medium              | Low   | Poor  | Total |             |       |                         |            |         |       |
| 1     | 0.0-0.25        | 372                 | 868   | 391   | 1,634 | 33          | 1,667 | 181                     | 159        | 716     | 1,056 |
| 2     | 0.25-0.5        | 374                 | 872   | 396   | 1,642 | 33          | 1,675 | 177                     | 199        | 859     | 1,235 |
| 3     | 0.5-1.0         | 598                 | 1,396 | 634   | 2,628 | 53          | 2,681 | 320                     | 419        | 1,811   | 2,550 |
| 4     | 1.0-1.5         | 304                 | 710   | 322   | 1,336 | 27          | 1,363 | 168                     | 263        | 1,139   | 1,570 |
| 5     | 1.5-2.0         | 369                 | 722   | 328   | 1,359 | 27          | 1,386 | 103                     | 235        | 1,136   | 1,474 |
| Total |                 | 1,957               | 4,568 | 2,074 | 8,599 | 172         | 8,771 | 949                     | 1,275      | 5,651   | 7,885 |

**3. Alt (O+J+U)-10-year Flood Control Plan  
(6) 50-Year Return Period**

| No.   | Water Depth (m) | Number of Buildings |       |       |       | Store. Etc. | Total | Agricultural Crops (ha) |            |         |       |
|-------|-----------------|---------------------|-------|-------|-------|-------------|-------|-------------------------|------------|---------|-------|
|       |                 | Residence           |       |       |       |             |       | Maize                   | Sugar cane | Pasture | Total |
|       |                 | Medium              | Low   | Poor  | Total |             |       |                         |            |         |       |
| 1     | 0.0-0.25        | 129                 | 301   | 137   | 567   | 11          | 578   | 102                     | 0          | 42      | 144   |
| 2     | 0.25-0.5        | 227                 | 529   | 240   | 996   | 20          | 1,016 | 104                     | 37         | 261     | 402   |
| 3     | 0.5-1.0         | 462                 | 1,077 | 489   | 2,028 | 41          | 2,069 | 231                     | 238        | 1,086   | 1,555 |
| 4     | 1.0-1.5         | 356                 | 831   | 377   | 1,564 | 31          | 1,595 | 188                     | 282        | 1,238   | 1,708 |
| 5     | 1.5-2.0         | 367                 | 857   | 389   | 1,613 | 32          | 1,645 | 144                     | 301        | 1,454   | 1,899 |
| Total |                 | 1,541               | 3,595 | 1,632 | 6,768 | 135         | 6,903 | 769                     | 858        | 4,081   | 5,708 |

**3. Alt (O+J+U)-10-year Flood Control Plan  
(7) 100-Year Return Period**

| No.   | Water Depth (m) | Number of Buildings |       |       |       | Store. Etc. | Total | Agricultural Crops (ha) |            |         |       |
|-------|-----------------|---------------------|-------|-------|-------|-------------|-------|-------------------------|------------|---------|-------|
|       |                 | Residence           |       |       |       |             |       | Maize                   | Sugar cane | Pasture | Total |
|       |                 | Medium              | Low   | Poor  | Total |             |       |                         |            |         |       |
| 1     | 0.0-0.25        | 27                  | 64    | 29    | 120   | 2           | 122   | 41                      | 0          | 0       | 41    |
| 2     | 0.25-0.5        | 147                 | 341   | 156   | 647   | 13          | 660   | 41                      | 0          | 0       | 41    |
| 3     | 0.5-1.0         | 383                 | 891   | 405   | 1,682 | 34          | 1,716 | 166                     | 115        | 576     | 857   |
| 4     | 1.0-1.5         | 344                 | 804   | 365   | 1,513 | 30          | 1,543 | 203                     | 258        | 1,157   | 1,618 |
| 5     | 1.5-2.0         | 97                  | 225   | 102   | 424   | 8           | 432   | 0                       | 203        | 876     | 1,079 |
| Total |                 | 998                 | 2,331 | 1,037 | 4,386 | 88          | 4,474 | 451                     | 576        | 2,609   | 3,636 |

TABLE O2.4(1/2) ESTIMATE OF ECONOMIC COST

I.M.P

(1) Financial Cost

|      |                      | Unit: Cols. Million |       |       |
|------|----------------------|---------------------|-------|-------|
| No.  | Specification        | L.C.                | F.C.  | Total |
| 1999 |                      |                     |       |       |
| 1    | Construction Cost    | 0.00                | 0.00  | 0.00  |
| 2    | Land Acquisition     | 0.00                | 0.00  | 0.00  |
| 3    | Administration Cost  | 0.00                | 0.00  | 0.00  |
| 4    | Engineering Fee      | 7.53                | 12.84 | 20.37 |
| 5    | Physical Contingency | 0.75                | 1.28  | 2.04  |
|      | Sub-total            | 8.28                | 14.12 | 22.41 |
| 6    | Price Contingency    | 1.02                | 0.86  | 1.88  |
|      | Total                | 9.30                | 14.98 | 24.29 |

OM Cost  
0.00

(2) Economic Cost

|      |                      | Unit: Cols. Million |       |       |
|------|----------------------|---------------------|-------|-------|
| No.  | Specification        | L.C.                | F.C.  | Total |
| 1999 |                      |                     |       |       |
| 1    | Construction Cost    | 0.00                | 0.00  | 0.00  |
| 2    | Land Acquisition     | 0.00                | 0.00  | 0.00  |
| 3    | Administration Cost  | 0.00                | 0.00  | 0.00  |
| 4    | Engineering Fee      | 6.66                | 12.84 | 19.50 |
| 5    | Physical Contingency | 0.67                | 1.28  | 1.95  |
|      | Sub-total            | 7.33                | 14.12 | 21.45 |
| 6    | Price Contingency    | 0.00                | 0.00  | 0.00  |
|      | Total                | 7.33                | 14.12 | 21.45 |

OM Cost  
0.00

|      |                      | Unit: Cols. Million |      |       |
|------|----------------------|---------------------|------|-------|
| No.  | Specification        | L.C.                | F.C. | Total |
| 2000 |                      |                     |      |       |
| 1    | Construction Cost    | 0.00                | 0.00 | 0.00  |
| 2    | Land Acquisition     | 4.80                | 0.00 | 4.80  |
| 3    | Administration Cost  | 0.24                | 0.00 | 0.24  |
| 4    | Engineering Fee      | 2.01                | 3.42 | 5.43  |
| 5    | Physical Contingency | 0.71                | 0.34 | 1.05  |
|      | Sub-total            | 7.76                | 3.76 | 11.52 |
| 6    | Price Contingency    | 1.45                | 0.35 | 1.83  |
|      | Total                | 9.24                | 4.11 | 13.35 |

OM Cost  
0.00

|      |                      | Unit: Cols. Million |      |       |
|------|----------------------|---------------------|------|-------|
| No.  | Specification        | L.C.                | F.C. | Total |
| 2000 |                      |                     |      |       |
| 1    | Construction Cost    | 0.00                | 0.00 | 0.00  |
| 2    | Land Acquisition     | 3.67                | 0.00 | 3.67  |
| 3    | Administration Cost  | 0.21                | 0.00 | 0.21  |
| 4    | Engineering Fee      | 1.78                | 3.42 | 5.20  |
| 5    | Physical Contingency | 0.57                | 0.34 | 0.91  |
|      | Sub-total            | 6.23                | 3.76 | 9.99  |
| 6    | Price Contingency    | 0.00                | 0.00 | 0.00  |
|      | Total                | 6.23                | 3.76 | 9.99  |

OM Cost  
0.00

|      |                      | Unit: Cols. Million |       |        |
|------|----------------------|---------------------|-------|--------|
| No.  | Specification        | L.C.                | F.C.  | Total  |
| 2001 |                      |                     |       |        |
| 1    | Construction Cost    | 42.06               | 44.68 | 86.74  |
| 2    | Land Acquisition     | 4.80                | 0.00  | 4.80   |
| 3    | Administration Cost  | 4.58                | 0.00  | 4.58   |
| 4    | Engineering Fee      | 3.11                | 5.31  | 8.42   |
| 5    | Physical Contingency | 5.46                | 5.00  | 10.45  |
|      | Sub-total            | 60.01               | 54.99 | 114.99 |
| 6    | Price Contingency    | 15.75               | 6.90  | 22.65  |
|      | Total                | 75.76               | 61.89 | 137.64 |

OM Cost  
0.00

|      |                      | Unit: Cols. Million |       |        |
|------|----------------------|---------------------|-------|--------|
| No.  | Specification        | L.C.                | F.C.  | Total  |
| 2001 |                      |                     |       |        |
| 1    | Construction Cost    | 33.59               | 44.68 | 78.27  |
| 2    | Land Acquisition     | 3.67                | 0.00  | 3.67   |
| 3    | Administration Cost  | 4.05                | 0.00  | 4.05   |
| 4    | Engineering Fee      | 2.75                | 5.31  | 8.06   |
| 5    | Physical Contingency | 4.41                | 5.00  | 9.41   |
|      | Sub-total            | 48.47               | 54.99 | 103.46 |
| 6    | Price Contingency    | 0.00                | 0.00  | 0.00   |
|      | Total                | 48.47               | 54.99 | 103.46 |

OM Cost  
0.00

|      |                      | Unit: Cols. Million |       |        |
|------|----------------------|---------------------|-------|--------|
| No.  | Specification        | L.C.                | F.C.  | Total  |
| 2002 |                      |                     |       |        |
| 1    | Construction Cost    | 42.06               | 44.68 | 86.74  |
| 2    | Land Acquisition     | 4.80                | 0.00  | 4.80   |
| 3    | Administration Cost  | 4.58                | 0.00  | 4.58   |
| 4    | Engineering Fee      | 3.11                | 5.31  | 8.42   |
| 5    | Physical Contingency | 5.46                | 5.00  | 10.45  |
|      | Sub-total            | 60.01               | 54.99 | 114.99 |
| 6    | Price Contingency    | 20.30               | 9.76  | 29.06  |
|      | Total                | 80.31               | 63.75 | 144.05 |

OM Cost  
0.64

|      |                      | Unit: Cols. Million |       |        |
|------|----------------------|---------------------|-------|--------|
| No.  | Specification        | L.C.                | F.C.  | Total  |
| 2002 |                      |                     |       |        |
| 1    | Construction Cost    | 33.59               | 44.68 | 78.27  |
| 2    | Land Acquisition     | 3.67                | 0.00  | 3.67   |
| 3    | Administration Cost  | 4.05                | 0.00  | 4.05   |
| 4    | Engineering Fee      | 2.75                | 5.31  | 8.06   |
| 5    | Physical Contingency | 4.41                | 5.00  | 9.41   |
|      | Sub-total            | 48.47               | 54.99 | 103.46 |
| 6    | Price Contingency    | 0.00                | 0.00  | 0.00   |
|      | Total                | 48.47               | 54.99 | 103.46 |

OM Cost  
0.43

|      |                      | Unit: Cols. Million |       |        |
|------|----------------------|---------------------|-------|--------|
| No.  | Specification        | L.C.                | F.C.  | Total  |
| 2003 |                      |                     |       |        |
| 1    | Construction Cost    | 42.06               | 44.68 | 86.74  |
| 2    | Land Acquisition     | 4.80                | 0.00  | 4.80   |
| 3    | Administration Cost  | 4.58                | 0.00  | 4.58   |
| 4    | Engineering Fee      | 3.11                | 5.31  | 8.42   |
| 5    | Physical Contingency | 5.46                | 5.00  | 10.45  |
|      | Sub-total            | 60.01               | 54.99 | 114.99 |
| 6    | Price Contingency    | 25.11               | 10.68 | 35.79  |
|      | Total                | 85.12               | 65.67 | 150.78 |

OM Cost  
1.35

|      |                      | Unit: Cols. Million |       |        |
|------|----------------------|---------------------|-------|--------|
| No.  | Specification        | L.C.                | F.C.  | Total  |
| 2003 |                      |                     |       |        |
| 1    | Construction Cost    | 33.59               | 44.68 | 78.27  |
| 2    | Land Acquisition     | 3.67                | 0.00  | 3.67   |
| 3    | Administration Cost  | 4.05                | 0.00  | 4.05   |
| 4    | Engineering Fee      | 2.75                | 5.31  | 8.06   |
| 5    | Physical Contingency | 4.41                | 5.00  | 9.41   |
|      | Sub-total            | 48.47               | 54.99 | 103.46 |
| 6    | Price Contingency    | 0.00                | 0.00  | 0.00   |
|      | Total                | 48.47               | 54.99 | 103.46 |

OM Cost  
0.86

|      |                      | Unit: Cols. Million |       |        |
|------|----------------------|---------------------|-------|--------|
| No.  | Specification        | L.C.                | F.C.  | Total  |
| 2004 |                      |                     |       |        |
| 1    | Construction Cost    | 42.06               | 44.68 | 86.74  |
| 2    | Land Acquisition     | 0.00                | 0.00  | 0.00   |
| 3    | Administration Cost  | 4.34                | 0.00  | 4.34   |
| 4    | Engineering Fee      | 9.41                | 16.14 | 25.55  |
| 5    | Physical Contingency | 5.58                | 6.08  | 11.66  |
|      | Sub-total            | 61.39               | 66.90 | 128.29 |
| 6    | Price Contingency    | 30.92               | 15.38 | 46.30  |
|      | Total                | 92.31               | 82.28 | 174.59 |

OM Cost  
2.15

|      |                      | Unit: Cols. Million |       |        |
|------|----------------------|---------------------|-------|--------|
| No.  | Specification        | L.C.                | F.C.  | Total  |
| 2004 |                      |                     |       |        |
| 1    | Construction Cost    | 33.59               | 44.68 | 78.27  |
| 2    | Land Acquisition     | 0.00                | 0.00  | 0.00   |
| 3    | Administration Cost  | 3.84                | 0.00  | 3.84   |
| 4    | Engineering Fee      | 8.33                | 16.14 | 24.47  |
| 5    | Physical Contingency | 4.58                | 6.08  | 10.66  |
|      | Sub-total            | 50.33               | 66.90 | 117.23 |
| 6    | Price Contingency    | 0.00                | 0.00  | 0.00   |
|      | Total                | 50.33               | 66.90 | 117.23 |

OM Cost  
1.29

|      |                      | Unit: Cols. Million |       |        |
|------|----------------------|---------------------|-------|--------|
| No.  | Specification        | L.C.                | F.C.  | Total  |
| 2005 |                      |                     |       |        |
| 1    | Construction Cost    | 42.06               | 44.68 | 86.74  |
| 2    | Land Acquisition     | 2.30                | 0.00  | 2.30   |
| 3    | Administration Cost  | 4.45                | 0.00  | 4.45   |
| 4    | Engineering Fee      | 4.79                | 8.20  | 12.99  |
| 5    | Physical Contingency | 5.36                | 5.29  | 10.65  |
|      | Sub-total            | 58.96               | 58.17 | 117.13 |
| 6    | Price Contingency    | 35.02               | 15.52 | 50.54  |
|      | Total                | 93.98               | 73.69 | 167.67 |

OM Cost  
3.01

|      |                      | Unit: Cols. Million |       |        |
|------|----------------------|---------------------|-------|--------|
| No.  | Specification        | L.C.                | F.C.  | Total  |
| 2005 |                      |                     |       |        |
| 1    | Construction Cost    | 33.59               | 44.68 | 78.27  |
| 2    | Land Acquisition     | 1.76                | 0.00  | 1.76   |
| 3    | Administration Cost  | 3.94                | 0.00  | 3.94   |
| 4    | Engineering Fee      | 4.24                | 8.20  | 12.44  |
| 5    | Physical Contingency | 4.35                | 5.29  | 9.64   |
|      | Sub-total            | 47.88               | 58.17 | 106.04 |
| 6    | Price Contingency    | 0.00                | 0.00  | 0.00   |
|      | Total                | 47.88               | 58.17 | 106.04 |

OM Cost  
1.72

TABLE O2.4(2/2) ESTIMATE OF ECONOMIC COST

I.M.P

(1) Financial Cost

| 2006 |                      | Unit : Cols. Million |       |        |
|------|----------------------|----------------------|-------|--------|
| No.  | Specification        | L.C.                 | F.C.  | Total  |
| 1    | Construction Cost    | 31.50                | 42.96 | 74.76  |
| 2    | Land Acquisition     | 2.30                 | 0.00  | 2.30   |
| 3    | Administration Cost  | 3.85                 | 0.00  | 3.85   |
| 4    | Engineering Fee      | 2.60                 | 4.42  | 7.02   |
| 5    | Physical Contingency | 4.06                 | 4.74  | 8.79   |
|      | Sub-total            | 44.61                | 52.12 | 96.72  |
| 6    | Price Contingency    | 30.76                | 15.88 | 46.64  |
|      | Total                | 75.37                | 68.00 | 143.36 |

OM Cost  
4.03

| 2007 |                      | Unit : Cols. Million |       |        |
|------|----------------------|----------------------|-------|--------|
| No.  | Specification        | L.C.                 | F.C.  | Total  |
| 1    | Construction Cost    | 31.80                | 42.96 | 74.76  |
| 2    | Land Acquisition     | 0.00                 | 0.00  | 0.00   |
| 3    | Administration Cost  | 3.74                 | 0.00  | 3.74   |
| 4    | Engineering Fee      | 2.60                 | 4.42  | 7.02   |
| 5    | Physical Contingency | 3.81                 | 4.74  | 8.55   |
|      | Sub-total            | 41.95                | 52.12 | 94.07  |
| 6    | Price Contingency    | 33.18                | 17.92 | 51.10  |
|      | Total                | 75.13                | 70.04 | 145.17 |

OM Cost  
5.01

| 2008 |                      | Unit : Cols. Million |       |        |
|------|----------------------|----------------------|-------|--------|
| No.  | Specification        | L.C.                 | F.C.  | Total  |
| 1    | Construction Cost    | 31.80                | 42.96 | 74.76  |
| 2    | Land Acquisition     | 0.00                 | 0.00  | 0.00   |
| 3    | Administration Cost  | 3.74                 | 0.00  | 3.74   |
| 4    | Engineering Fee      | 2.60                 | 4.42  | 7.02   |
| 5    | Physical Contingency | 3.81                 | 4.74  | 8.55   |
|      | Sub-total            | 41.95                | 52.12 | 94.07  |
| 6    | Price Contingency    | 37.69                | 20.02 | 57.71  |
|      | Total                | 79.64                | 72.14 | 151.78 |

OM Cost  
6.09

| 2009 |                      | Unit : Cols. Million |       |        |
|------|----------------------|----------------------|-------|--------|
| No.  | Specification        | L.C.                 | F.C.  | Total  |
| 1    | Construction Cost    | 31.80                | 42.96 | 74.76  |
| 2    | Land Acquisition     | 0.00                 | 0.00  | 0.00   |
| 3    | Administration Cost  | 3.74                 | 0.00  | 3.74   |
| 4    | Engineering Fee      | 2.60                 | 4.42  | 7.02   |
| 5    | Physical Contingency | 3.81                 | 4.74  | 8.55   |
|      | Sub-total            | 41.95                | 52.12 | 94.07  |
| 6    | Price Contingency    | 42.47                | 22.19 | 64.66  |
|      | Total                | 84.42                | 74.31 | 158.73 |

OM Cost  
7.28

| 2010 |                      | Unit : Cols. Million |       |        |
|------|----------------------|----------------------|-------|--------|
| No.  | Specification        | L.C.                 | F.C.  | Total  |
| 1    | Construction Cost    | 31.80                | 42.96 | 74.76  |
| 2    | Land Acquisition     | 0.00                 | 0.00  | 0.00   |
| 3    | Administration Cost  | 3.77                 | 0.00  | 3.77   |
| 4    | Engineering Fee      | 2.60                 | 4.42  | 7.02   |
| 5    | Physical Contingency | 3.82                 | 4.74  | 8.56   |
|      | Sub-total            | 41.99                | 52.12 | 94.11  |
| 6    | Price Contingency    | 47.60                | 24.43 | 72.03  |
|      | Total                | 89.59                | 76.55 | 166.14 |

OM Cost  
8.60

| Total |                      | Unit : Cols. Million |        |          |
|-------|----------------------|----------------------|--------|----------|
| No.   | Specification        | L.C.                 | F.C.   | Total    |
| 1     | Construction Cost    | 369.30               | 438.20 | 807.50   |
| 2     | Land Acquisition     | 23.50                | 0.00   | 23.50    |
| 3     | Administration Cost  | 41.61                | 0.00   | 41.61    |
| 4     | Engineering Fee      | 46.07                | 78.63  | 124.70   |
| 5     | Physical Contingency | 48.08                | 51.68  | 99.76    |
|       | Sub-total            | 528.86               | 568.51 | 1,097.37 |
| 6     | Price Contingency    | 321.30               | 158.89 | 480.19   |
|       | Total                | 850.16               | 727.40 | 1,577.56 |

OM Cost  
10.04

(2) Economic Cost

| 2006 |                      | Unit : Cols. Million |       |       |
|------|----------------------|----------------------|-------|-------|
| No.  | Specification        | L.C.                 | F.C.  | Total |
| 1    | Construction Cost    | 25.39                | 42.96 | 68.35 |
| 2    | Land Acquisition     | 1.76                 | 0.00  | 1.76  |
| 3    | Administration Cost  | 3.41                 | 0.00  | 3.41  |
| 4    | Engineering Fee      | 2.30                 | 4.42  | 6.72  |
| 5    | Physical Contingency | 3.29                 | 4.74  | 8.02  |
|      | Sub-total            | 35.15                | 52.12 | 88.27 |
| 6    | Price Contingency    | 0.00                 | 0.00  | 0.00  |
|      | Total                | 36.15                | 52.12 | 88.27 |

OM Cost  
2.15

| 2007 |                      | Unit : Cols. Million |       |       |
|------|----------------------|----------------------|-------|-------|
| No.  | Specification        | L.C.                 | F.C.  | Total |
| 1    | Construction Cost    | 25.39                | 42.96 | 68.35 |
| 2    | Land Acquisition     | 0.00                 | 0.00  | 0.00  |
| 3    | Administration Cost  | 3.31                 | 0.00  | 3.31  |
| 4    | Engineering Fee      | 2.30                 | 4.42  | 6.72  |
| 5    | Physical Contingency | 3.10                 | 4.74  | 7.84  |
|      | Sub-total            | 34.11                | 52.12 | 86.22 |
| 6    | Price Contingency    | 0.00                 | 0.00  | 0.00  |
|      | Total                | 34.11                | 52.12 | 86.22 |

OM Cost  
2.53

| 2008 |                      | Unit : Cols. Million |       |       |
|------|----------------------|----------------------|-------|-------|
| No.  | Specification        | L.C.                 | F.C.  | Total |
| 1    | Construction Cost    | 25.39                | 42.96 | 68.35 |
| 2    | Land Acquisition     | 0.00                 | 0.00  | 0.00  |
| 3    | Administration Cost  | 3.31                 | 0.00  | 3.31  |
| 4    | Engineering Fee      | 2.30                 | 4.42  | 6.72  |
| 5    | Physical Contingency | 3.10                 | 4.74  | 7.84  |
|      | Sub-total            | 34.11                | 52.12 | 86.22 |
| 6    | Price Contingency    | 0.00                 | 0.00  | 0.00  |
|      | Total                | 34.11                | 52.12 | 86.22 |

OM Cost  
2.90

| 2009 |                      | Unit : Cols. Million |       |       |
|------|----------------------|----------------------|-------|-------|
| No.  | Specification        | L.C.                 | F.C.  | Total |
| 1    | Construction Cost    | 25.39                | 42.96 | 68.35 |
| 2    | Land Acquisition     | 0.00                 | 0.00  | 0.00  |
| 3    | Administration Cost  | 3.31                 | 0.00  | 3.31  |
| 4    | Engineering Fee      | 2.30                 | 4.42  | 6.72  |
| 5    | Physical Contingency | 3.10                 | 4.74  | 7.84  |
|      | Sub-total            | 34.11                | 52.12 | 86.22 |
| 6    | Price Contingency    | 0.00                 | 0.00  | 0.00  |
|      | Total                | 34.11                | 52.12 | 86.22 |

OM Cost  
3.28

| 2010 |                      | Unit : Cols. Million |       |       |
|------|----------------------|----------------------|-------|-------|
| No.  | Specification        | L.C.                 | F.C.  | Total |
| 1    | Construction Cost    | 25.39                | 42.96 | 68.35 |
| 2    | Land Acquisition     | 0.00                 | 0.00  | 0.00  |
| 3    | Administration Cost  | 3.34                 | 0.00  | 3.34  |
| 4    | Engineering Fee      | 2.30                 | 4.42  | 6.72  |
| 5    | Physical Contingency | 3.10                 | 4.74  | 7.84  |
|      | Sub-total            | 34.14                | 52.12 | 86.25 |
| 6    | Price Contingency    | 0.00                 | 0.00  | 0.00  |
|      | Total                | 34.14                | 52.12 | 86.25 |

OM Cost  
3.66

| Total |                      | Unit : Cols. Million |        |        |
|-------|----------------------|----------------------|--------|--------|
| No.   | Specification        | L.C.                 | F.C.   | Total  |
| 1     | Construction Cost    | 294.92               | 438.20 | 733.12 |
| 2     | Land Acquisition     | 18.20                | 0.00   | 18.20  |
| 3     | Administration Cost  | 35.82                | 0.00   | 35.82  |
| 4     | Engineering Fee      | 40.77                | 78.63  | 119.40 |
| 5     | Physical Contingency | 39.07                | 51.68  | 90.75  |
|       | Sub-total            | 429.78               | 568.51 | 998.29 |
| 6     | Price Contingency    | 0.00                 | 0.00   | 0.00   |
|       | Total                | 429.78               | 568.51 | 998.29 |

OM Cost  
4.03

TABLE O25 (12) ESTIMATE OF ECONOMIC COST

II. Priority Project-Alt. 1 (O+J+U)-2-year Flood Control Plan

(1) Financial Cost

|      |                      | Unit : Cols. Million |       |       |                 |
|------|----------------------|----------------------|-------|-------|-----------------|
| 1999 |                      | L.C.                 | F.C.  | Total |                 |
| 1    | Construction Cost    | 0.00                 | 0.00  | 0.00  |                 |
| 2    | Land Acquisition     | 0.00                 | 0.00  | 0.00  |                 |
| 3    | Administration Cost  | 0.00                 | 0.00  | 0.00  |                 |
| 4    | Engineering Fee      | 7.53                 | 12.84 | 20.37 |                 |
| 5    | Physical Contingency | 0.75                 | 1.28  | 2.04  |                 |
|      | Sub-total            | 8.28                 | 14.12 | 22.41 |                 |
| 6    | Price Contingency    | 1.02                 | 0.85  | 1.88  |                 |
|      | Total                | 9.30                 | 14.98 | 24.29 | OM Cost<br>0.00 |

|      |                      | Unit : Cols. Million |      |       |                 |
|------|----------------------|----------------------|------|-------|-----------------|
| 2000 |                      | L.C.                 | F.C. | Total |                 |
| 1    | Construction Cost    | 0.00                 | 0.00 | 0.00  |                 |
| 2    | Land Acquisition     | 4.80                 | 0.00 | 4.80  |                 |
| 3    | Administration Cost  | 0.24                 | 0.00 | 0.24  |                 |
| 4    | Engineering Fee      | 2.01                 | 3.42 | 5.43  |                 |
| 5    | Physical Contingency | 0.71                 | 0.31 | 1.05  |                 |
|      | Sub-total            | 7.76                 | 3.76 | 11.52 |                 |
| 6    | Price Contingency    | 1.48                 | 0.35 | 1.83  |                 |
|      | Total                | 9.24                 | 4.11 | 13.35 | OM Cost<br>0.00 |

|      |                      | Unit : Cols. Million |       |        |                 |
|------|----------------------|----------------------|-------|--------|-----------------|
| 2001 |                      | L.C.                 | F.C.  | Total  |                 |
| 1    | Construction Cost    | 42.06                | 44.68 | 86.74  |                 |
| 2    | Land Acquisition     | 4.80                 | 0.00  | 4.80   |                 |
| 3    | Administration Cost  | 4.58                 | 0.00  | 4.58   |                 |
| 4    | Engineering Fee      | 3.11                 | 5.31  | 8.42   |                 |
| 5    | Physical Contingency | 5.46                 | 5.00  | 10.45  |                 |
|      | Sub-total            | 60.01                | 54.99 | 114.99 |                 |
| 6    | Price Contingency    | 15.75                | 6.90  | 22.65  |                 |
|      | Total                | 75.76                | 61.89 | 137.64 | OM Cost<br>0.00 |

|      |                      | Unit : Cols. Million |       |        |                 |
|------|----------------------|----------------------|-------|--------|-----------------|
| 2002 |                      | L.C.                 | F.C.  | Total  |                 |
| 1    | Construction Cost    | 42.06                | 44.68 | 86.74  |                 |
| 2    | Land Acquisition     | 4.80                 | 0.00  | 4.80   |                 |
| 3    | Administration Cost  | 4.58                 | 0.00  | 4.58   |                 |
| 4    | Engineering Fee      | 3.11                 | 5.31  | 8.42   |                 |
| 5    | Physical Contingency | 5.46                 | 5.00  | 10.45  |                 |
|      | Sub-total            | 60.01                | 54.99 | 114.99 |                 |
| 6    | Price Contingency    | 20.30                | 8.76  | 29.06  |                 |
|      | Total                | 80.31                | 63.75 | 144.05 | OM Cost<br>0.64 |

|      |                      | Unit : Cols. Million |       |        |                 |
|------|----------------------|----------------------|-------|--------|-----------------|
| 2003 |                      | L.C.                 | F.C.  | Total  |                 |
| 1    | Construction Cost    | 42.06                | 44.68 | 86.74  |                 |
| 2    | Land Acquisition     | 4.80                 | 0.00  | 4.80   |                 |
| 3    | Administration Cost  | 4.58                 | 0.00  | 4.58   |                 |
| 4    | Engineering Fee      | 3.11                 | 5.31  | 8.42   |                 |
| 5    | Physical Contingency | 5.46                 | 5.00  | 10.45  |                 |
|      | Sub-total            | 60.01                | 54.99 | 114.99 |                 |
| 6    | Price Contingency    | 25.11                | 10.67 | 35.78  |                 |
|      | Total                | 85.12                | 65.66 | 150.77 | OM Cost<br>1.35 |

|      |                      | Unit : Cols. Million |       |        |                 |
|------|----------------------|----------------------|-------|--------|-----------------|
| 2004 |                      | L.C.                 | F.C.  | Total  |                 |
| 1    | Construction Cost    | 42.06                | 44.68 | 86.74  |                 |
| 2    | Land Acquisition     | 0.00                 | 0.00  | 0.00   |                 |
| 3    | Administration Cost  | 4.34                 | 0.00  | 4.34   |                 |
| 4    | Engineering Fee      | 3.11                 | 5.31  | 8.42   |                 |
| 5    | Physical Contingency | 4.95                 | 5.00  | 9.95   |                 |
|      | Sub-total            | 54.46                | 54.99 | 109.45 |                 |
| 6    | Price Contingency    | 27.43                | 12.64 | 40.07  |                 |
|      | Total                | 81.89                | 67.63 | 149.52 | OM Cost<br>2.15 |

|      |                      | Unit : Cols. Million |       |        |                 |
|------|----------------------|----------------------|-------|--------|-----------------|
| 2005 |                      | L.C.                 | F.C.  | Total  |                 |
| 1    | Construction Cost    | 42.06                | 44.68 | 86.74  |                 |
| 2    | Land Acquisition     | 0.00                 | 0.00  | 0.00   |                 |
| 3    | Administration Cost  | 4.29                 | 0.00  | 4.29   |                 |
| 4    | Engineering Fee      | 3.11                 | 5.31  | 8.42   |                 |
| 5    | Physical Contingency | 4.95                 | 5.00  | 9.95   |                 |
|      | Sub-total            | 54.41                | 54.99 | 109.40 |                 |
| 6    | Price Contingency    | 32.30                | 11.66 | 46.96  |                 |
|      | Total                | 86.71                | 66.65 | 156.36 | OM Cost<br>3.04 |

(2) Economic Cost

|      |                      | Unit : Cols. Million |       |       |                 |
|------|----------------------|----------------------|-------|-------|-----------------|
| 1999 |                      | L.C.                 | F.C.  | Total |                 |
| 1    | Construction Cost    | 0.00                 | 0.00  | 0.00  |                 |
| 2    | Land Acquisition     | 0.00                 | 0.00  | 0.00  |                 |
| 3    | Administration Cost  | 0.00                 | 0.00  | 0.00  |                 |
| 4    | Engineering Fee      | 6.66                 | 12.84 | 19.50 |                 |
| 5    | Physical Contingency | 0.67                 | 1.28  | 1.95  |                 |
|      | Sub-total            | 7.33                 | 14.12 | 21.45 |                 |
| 6    | Price Contingency    | 0.00                 | 0.00  | 0.00  |                 |
|      | Total                | 7.33                 | 14.12 | 21.45 | OM Cost<br>0.00 |

|      |                      | Unit : Cols. Million |      |       |                 |
|------|----------------------|----------------------|------|-------|-----------------|
| 2000 |                      | L.C.                 | F.C. | Total |                 |
| 1    | Construction Cost    | 0.00                 | 0.00 | 0.00  |                 |
| 2    | Land Acquisition     | 3.67                 | 0.00 | 3.67  |                 |
| 3    | Administration Cost  | 0.21                 | 0.00 | 0.21  |                 |
| 4    | Engineering Fee      | 1.78                 | 3.42 | 5.20  |                 |
| 5    | Physical Contingency | 0.57                 | 0.31 | 0.91  |                 |
|      | Sub-total            | 6.23                 | 3.76 | 9.99  |                 |
| 6    | Price Contingency    | 0.00                 | 0.00 | 0.00  |                 |
|      | Total                | 6.23                 | 3.76 | 9.99  | OM Cost<br>0.00 |

|      |                      | Unit : Cols. Million |       |        |                 |
|------|----------------------|----------------------|-------|--------|-----------------|
| 2001 |                      | L.C.                 | F.C.  | Total  |                 |
| 1    | Construction Cost    | 33.59                | 44.68 | 78.27  |                 |
| 2    | Land Acquisition     | 3.67                 | 0.00  | 3.67   |                 |
| 3    | Administration Cost  | 4.05                 | 0.00  | 4.05   |                 |
| 4    | Engineering Fee      | 2.75                 | 5.31  | 8.06   |                 |
| 5    | Physical Contingency | 4.41                 | 5.00  | 9.41   |                 |
|      | Sub-total            | 48.47                | 54.99 | 103.46 |                 |
| 6    | Price Contingency    | 0.00                 | 0.00  | 0.00   |                 |
|      | Total                | 48.47                | 54.99 | 103.46 | OM Cost<br>6.00 |

|      |                      | Unit : Cols. Million |       |        |                 |
|------|----------------------|----------------------|-------|--------|-----------------|
| 2002 |                      | L.C.                 | F.C.  | Total  |                 |
| 1    | Construction Cost    | 33.59                | 44.68 | 78.27  |                 |
| 2    | Land Acquisition     | 3.67                 | 0.00  | 3.67   |                 |
| 3    | Administration Cost  | 4.05                 | 0.00  | 4.05   |                 |
| 4    | Engineering Fee      | 2.75                 | 5.31  | 8.06   |                 |
| 5    | Physical Contingency | 4.41                 | 5.00  | 9.41   |                 |
|      | Sub-total            | 48.47                | 54.99 | 103.46 |                 |
| 6    | Price Contingency    | 0.00                 | 0.00  | 0.00   |                 |
|      | Total                | 48.47                | 54.99 | 103.46 | OM Cost<br>6.43 |

|      |                      | Unit : Cols. Million |       |        |                 |
|------|----------------------|----------------------|-------|--------|-----------------|
| 2003 |                      | L.C.                 | F.C.  | Total  |                 |
| 1    | Construction Cost    | 33.59                | 44.68 | 78.27  |                 |
| 2    | Land Acquisition     | 3.67                 | 0.00  | 3.67   |                 |
| 3    | Administration Cost  | 4.05                 | 0.00  | 4.05   |                 |
| 4    | Engineering Fee      | 2.75                 | 5.31  | 8.06   |                 |
| 5    | Physical Contingency | 4.41                 | 5.00  | 9.41   |                 |
|      | Sub-total            | 48.47                | 54.99 | 103.46 |                 |
| 6    | Price Contingency    | 0.00                 | 0.00  | 0.00   |                 |
|      | Total                | 48.47                | 54.99 | 103.46 | OM Cost<br>0.85 |

|      |                      | Unit : Cols. Million |       |       |                 |
|------|----------------------|----------------------|-------|-------|-----------------|
| 2004 |                      | L.C.                 | F.C.  | Total |                 |
| 1    | Construction Cost    | 33.59                | 44.68 | 78.27 |                 |
| 2    | Land Acquisition     | 0.00                 | 0.00  | 0.00  |                 |
| 3    | Administration Cost  | 3.84                 | 0.00  | 3.84  |                 |
| 4    | Engineering Fee      | 2.75                 | 5.31  | 8.06  |                 |
| 5    | Physical Contingency | 4.02                 | 5.00  | 9.02  |                 |
|      | Sub-total            | 44.20                | 54.99 | 99.19 |                 |
| 6    | Price Contingency    | 0.00                 | 0.00  | 0.00  |                 |
|      | Total                | 44.20                | 54.99 | 99.19 | OM Cost<br>1.29 |

|      |                      | Unit : Cols. Million |       |       |                 |
|------|----------------------|----------------------|-------|-------|-----------------|
| 2005 |                      | L.C.                 | F.C.  | Total |                 |
| 1    | Construction Cost    | 33.59                | 44.68 | 78.27 |                 |
| 2    | Land Acquisition     | 0.00                 | 0.00  | 0.00  |                 |
| 3    | Administration Cost  | 3.80                 | 0.00  | 3.80  |                 |
| 4    | Engineering Fee      | 2.75                 | 5.31  | 8.06  |                 |
| 5    | Physical Contingency | 4.01                 | 5.00  | 9.01  |                 |
|      | Sub-total            | 44.15                | 54.99 | 99.14 |                 |
| 6    | Price Contingency    | 0.00                 | 0.00  | 0.00  |                 |
|      | Total                | 44.15                | 54.99 | 99.14 | OM Cost<br>1.72 |

TABLE 02.5 (2.2) ESTIMATE OF ECONOMIC COST

11 Priority Project-Mc 1 (D:J:U)-2-year Flood Control Plan

(1) Financial Cost

| Total |                      | Unit: Cols. Million |        |        |
|-------|----------------------|---------------------|--------|--------|
| No    | Specification        | I.C                 | F.C    | Total  |
| 1     | Construction Cost    | 210.30              | 223.40 | 433.70 |
| 2     | Land Acquisition     | 19.20               | 0.00   | 19.20  |
| 3     | Administration Cost  | 22.61               | 0.00   | 22.61  |
| 4     | Engineering Fee      | 25.09               | 42.81  | 67.90  |
| 5     | Physical Contingency | 27.72               | 26.62  | 54.34  |
|       | Sub-total            | 304.92              | 292.83 | 597.75 |
| 6     | Price Contingency    | 123.39              | 54.84  | 178.23 |
|       | Total                | 428.31              | 347.67 | 775.98 |

OM Cost  
4.03

(2) Economic Cost

| Total |                      | Unit: Cols. Million |        |        |
|-------|----------------------|---------------------|--------|--------|
| No    | Specification        | I.C                 | F.C    | Total  |
| 1     | Construction Cost    | 167.94              | 223.40 | 391.34 |
| 2     | Land Acquisition     | 14.68               | 0.00   | 14.68  |
| 3     | Administration Cost  | 20.01               | 0.00   | 20.01  |
| 4     | Engineering Fee      | 22.20               | 42.81  | 65.01  |
| 5     | Physical Contingency | 22.48               | 26.62  | 49.10  |
|       | Sub-total            | 247.32              | 292.83 | 540.15 |
| 6     | Price Contingency    | 0.00                | 0.00   | 0.00   |
|       | Total                | 247.32              | 292.83 | 540.15 |

OM Cost  
2.15

TABLE 02.6(12) ESTIMATE OF ECONOMIC COST

II. Priority Project-Art. I' (O:J+U)-10-Year Flood Control Plan

(1) Financial Cost

| 1999 |                      | Unit: Cols. Million |       |       |
|------|----------------------|---------------------|-------|-------|
| No.  | Specification        | I.C.                | F.C.  | Total |
| 1    | Construction Cost    | 0.00                | 0.00  | 0.00  |
| 2    | Land Acquisition     | 0.00                | 0.00  | 0.00  |
| 3    | Administration Cost  | 0.00                | 0.00  | 0.00  |
| 4    | Engineering Fee      | 13.23               | 22.50 | 35.73 |
| 5    | Physical Contingency | 1.32                | 2.25  | 3.57  |
|      | Sub-total            | 14.55               | 24.75 | 39.30 |
| 6    | Price Contingency    | 1.80                | 1.51  | 3.31  |
|      | Total                | 16.35               | 26.26 | 42.61 |

OM Cost  
0.00

| 2000 |                      | Unit: Cols. Million |      |       |
|------|----------------------|---------------------|------|-------|
| No.  | Specification        | I.C.                | F.C. | Total |
| 1    | Construction Cost    | 0.00                | 0.00 | 0.00  |
| 2    | Land Acquisition     | 5.95                | 0.00 | 5.95  |
| 3    | Administration Cost  | 0.30                | 0.00 | 0.30  |
| 4    | Engineering Fee      | 3.53                | 6.00 | 9.53  |
| 5    | Physical Contingency | 0.98                | 0.60 | 1.58  |
|      | Sub-total            | 10.76               | 6.60 | 17.36 |
| 6    | Price Contingency    | 2.05                | 0.61 | 2.66  |
|      | Total                | 12.81               | 7.21 | 20.02 |

OM Cost  
0.00

| 2001 |                      | Unit: Cols. Million |        |        |
|------|----------------------|---------------------|--------|--------|
| No.  | Specification        | I.C.                | F.C.   | Total  |
| 1    | Construction Cost    | 70.78               | 83.22  | 154.00 |
| 2    | Land Acquisition     | 5.95                | 0.00   | 5.95   |
| 3    | Administration Cost  | 8.00                | 0.00   | 8.00   |
| 4    | Engineering Fee      | 5.47                | 9.30   | 14.77  |
| 5    | Physical Contingency | 9.02                | 9.25   | 18.27  |
|      | Sub-total            | 99.22               | 101.77 | 200.99 |
| 6    | Price Contingency    | 26.04               | 12.77  | 38.81  |
|      | Total                | 125.26              | 114.54 | 239.80 |

OM Cost  
0.00

| 2002 |                      | Unit: Cols. Million |        |        |
|------|----------------------|---------------------|--------|--------|
| No.  | Specification        | I.C.                | F.C.   | Total  |
| 1    | Construction Cost    | 70.78               | 83.22  | 154.00 |
| 2    | Land Acquisition     | 5.95                | 0.00   | 5.95   |
| 3    | Administration Cost  | 8.00                | 0.00   | 8.00   |
| 4    | Engineering Fee      | 5.47                | 9.30   | 14.77  |
| 5    | Physical Contingency | 9.02                | 9.25   | 18.27  |
|      | Sub-total            | 99.22               | 101.77 | 200.99 |
| 6    | Price Contingency    | 33.56               | 16.21  | 49.77  |
|      | Total                | 132.78              | 117.98 | 250.76 |

OM Cost  
1.13

| 2003 |                      | Unit: Cols. Million |        |        |
|------|----------------------|---------------------|--------|--------|
| No.  | Specification        | I.C.                | F.C.   | Total  |
| 1    | Construction Cost    | 70.78               | 83.22  | 154.00 |
| 2    | Land Acquisition     | 5.95                | 0.00   | 5.95   |
| 3    | Administration Cost  | 8.00                | 0.00   | 8.00   |
| 4    | Engineering Fee      | 5.47                | 9.30   | 14.77  |
| 5    | Physical Contingency | 9.02                | 9.25   | 18.27  |
|      | Sub-total            | 99.22               | 101.77 | 200.99 |
| 6    | Price Contingency    | 41.52               | 19.75  | 61.27  |
|      | Total                | 140.74              | 121.52 | 262.26 |

OM Cost  
2.40

| 2004 |                      | Unit: Cols. Million |        |        |
|------|----------------------|---------------------|--------|--------|
| No.  | Specification        | I.C.                | F.C.   | Total  |
| 1    | Construction Cost    | 70.78               | 83.22  | 154.00 |
| 2    | Land Acquisition     | 0.00                | 0.00   | 0.00   |
| 3    | Administration Cost  | 7.70                | 0.00   | 7.70   |
| 4    | Engineering Fee      | 5.47                | 9.30   | 14.77  |
| 5    | Physical Contingency | 8.40                | 9.25   | 17.65  |
|      | Sub-total            | 92.35               | 101.77 | 194.12 |
| 6    | Price Contingency    | 46.51               | 23.40  | 69.91  |
|      | Total                | 138.86              | 125.17 | 264.03 |

OM Cost  
3.82

| 2005 |                      | Unit: Cols. Million |        |        |
|------|----------------------|---------------------|--------|--------|
| No.  | Specification        | I.C.                | F.C.   | Total  |
| 1    | Construction Cost    | 70.78               | 83.22  | 154.00 |
| 2    | Land Acquisition     | 0.00                | 0.00   | 0.00   |
| 3    | Administration Cost  | 7.71                | 0.00   | 7.71   |
| 4    | Engineering Fee      | 5.47                | 9.30   | 14.77  |
| 5    | Physical Contingency | 8.40                | 9.25   | 17.65  |
|      | Sub-total            | 92.36               | 101.77 | 194.13 |
| 6    | Price Contingency    | 54.87               | 27.15  | 82.02  |
|      | Total                | 147.23              | 128.92 | 276.15 |

OM Cost  
5.40

(2) Economic Cost

| 1999 |                      | Unit: Cols. Million |       |       |
|------|----------------------|---------------------|-------|-------|
| No.  | Specification        | I.C.                | F.C.  | Total |
| 1    | Construction Cost    | 0.00                | 0.00  | 0.00  |
| 2    | Land Acquisition     | 0.00                | 0.00  | 0.00  |
| 3    | Administration Cost  | 0.00                | 0.00  | 0.00  |
| 4    | Engineering Fee      | 11.71               | 22.50 | 34.21 |
| 5    | Physical Contingency | 1.17                | 2.25  | 3.42  |
|      | Sub-total            | 12.88               | 24.75 | 37.63 |
| 6    | Price Contingency    | 0.00                | 0.00  | 0.00  |
|      | Total                | 12.88               | 24.75 | 37.63 |

OM Cost  
0.00

| 2000 |                      | Unit: Cols. Million |      |       |
|------|----------------------|---------------------|------|-------|
| No.  | Specification        | I.C.                | F.C. | Total |
| 1    | Construction Cost    | 0.00                | 0.00 | 0.00  |
| 2    | Land Acquisition     | 4.55                | 0.00 | 4.55  |
| 3    | Administration Cost  | 0.27                | 0.00 | 0.27  |
| 4    | Engineering Fee      | 3.12                | 6.00 | 9.12  |
| 5    | Physical Contingency | 0.79                | 0.60 | 1.39  |
|      | Sub-total            | 8.73                | 6.60 | 15.33 |
| 6    | Price Contingency    | 0.00                | 0.00 | 0.00  |
|      | Total                | 8.73                | 6.60 | 15.33 |

OM Cost  
0.00

| 2001 |                      | Unit: Cols. Million |        |        |
|------|----------------------|---------------------|--------|--------|
| No.  | Specification        | I.C.                | F.C.   | Total  |
| 1    | Construction Cost    | 56.52               | 83.22  | 139.74 |
| 2    | Land Acquisition     | 4.55                | 0.00   | 4.55   |
| 3    | Administration Cost  | 7.08                | 0.00   | 7.08   |
| 4    | Engineering Fee      | 4.84                | 9.30   | 14.14  |
| 5    | Physical Contingency | 7.30                | 9.25   | 16.55  |
|      | Sub-total            | 80.29               | 101.77 | 182.06 |
| 6    | Price Contingency    | 0.00                | 0.00   | 0.00   |
|      | Total                | 80.29               | 101.77 | 182.06 |

OM Cost  
0.00

| 2002 |                      | Unit: Cols. Million |        |        |
|------|----------------------|---------------------|--------|--------|
| No.  | Specification        | I.C.                | F.C.   | Total  |
| 1    | Construction Cost    | 56.52               | 83.22  | 139.74 |
| 2    | Land Acquisition     | 4.55                | 0.00   | 4.55   |
| 3    | Administration Cost  | 7.08                | 0.00   | 7.08   |
| 4    | Engineering Fee      | 4.84                | 9.30   | 14.14  |
| 5    | Physical Contingency | 7.30                | 9.25   | 16.55  |
|      | Sub-total            | 80.29               | 101.77 | 182.06 |
| 6    | Price Contingency    | 0.00                | 0.00   | 0.00   |
|      | Total                | 80.29               | 101.77 | 182.06 |

OM Cost  
0.77

| 2003 |                      | Unit: Cols. Million |        |        |
|------|----------------------|---------------------|--------|--------|
| No.  | Specification        | I.C.                | F.C.   | Total  |
| 1    | Construction Cost    | 56.52               | 83.22  | 139.74 |
| 2    | Land Acquisition     | 4.55                | 0.00   | 4.55   |
| 3    | Administration Cost  | 7.08                | 0.00   | 7.08   |
| 4    | Engineering Fee      | 4.84                | 9.30   | 14.14  |
| 5    | Physical Contingency | 7.30                | 9.25   | 16.55  |
|      | Sub-total            | 80.29               | 101.77 | 182.06 |
| 6    | Price Contingency    | 0.00                | 0.00   | 0.00   |
|      | Total                | 80.29               | 101.77 | 182.06 |

OM Cost  
1.54

| 2004 |                      | Unit: Cols. Million |        |        |
|------|----------------------|---------------------|--------|--------|
| No.  | Specification        | I.C.                | F.C.   | Total  |
| 1    | Construction Cost    | 56.52               | 83.22  | 139.74 |
| 2    | Land Acquisition     | 0.00                | 0.00   | 0.00   |
| 3    | Administration Cost  | 6.81                | 0.00   | 6.81   |
| 4    | Engineering Fee      | 4.84                | 9.30   | 14.14  |
| 5    | Physical Contingency | 6.82                | 9.25   | 16.07  |
|      | Sub-total            | 75.00               | 101.77 | 176.77 |
| 6    | Price Contingency    | 0.00                | 0.00   | 0.00   |
|      | Total                | 75.00               | 101.77 | 176.77 |

OM Cost  
2.31

| 2005 |                      | Unit: Cols. Million |        |        |
|------|----------------------|---------------------|--------|--------|
| No.  | Specification        | I.C.                | F.C.   | Total  |
| 1    | Construction Cost    | 56.52               | 83.22  | 139.74 |
| 2    | Land Acquisition     | 0.00                | 0.00   | 0.00   |
| 3    | Administration Cost  | 6.82                | 0.00   | 6.82   |
| 4    | Engineering Fee      | 4.84                | 9.30   | 14.14  |
| 5    | Physical Contingency | 6.82                | 9.25   | 16.07  |
|      | Sub-total            | 75.01               | 101.77 | 176.78 |
| 6    | Price Contingency    | 0.00                | 0.00   | 0.00   |
|      | Total                | 75.01               | 101.77 | 176.78 |

OM Cost  
3.02

TABLE O.2.6(24) ESTIMATE OF ECONOMIC COST

H Priority Project-Alt. 1' (O+D+U)-10-Year Flood Control Plan

(1) Financial Cost

| Total |                      | Unit : Cols. Million |        |              |
|-------|----------------------|----------------------|--------|--------------|
| No    | Specification        | I.C.                 | F.C.   | Total        |
| 1     | Construction Cost    | 353.90               | 416.10 | 770.00       |
| 2     | Land Acquisition     | 23.80                | 0.00   | 23.80        |
| 3     | Administration Cost  | 39.71                | 0.00   | 39.71        |
| 4     | Engineering Fee      | 44.11                | 75.00  | 119.11       |
| 5     | Physical Contingency | 46.15                | 49.11  | 95.26        |
|       | Sub-total            | 507.67               | 540.21 | 1,047.88     |
| 6     | Price Contingency    | 206.35               | 101.40 | 307.75       |
|       | Total                | 714.02               | 641.61 | 1,355.63     |
|       |                      |                      |        | OM Cost 7.16 |

(2) Economic Cost

| Total |                      | Unit : Cols. Million |        |              |
|-------|----------------------|----------------------|--------|--------------|
| No    | Specification        | I.C.                 | F.C.   | Total        |
| 1     | Construction Cost    | 282.62               | 416.10 | 698.72       |
| 2     | Land Acquisition     | 18.20                | 0.00   | 18.20        |
| 3     | Administration Cost  | 35.14                | 0.00   | 35.14        |
| 4     | Engineering Fee      | 39.04                | 75.00  | 114.04       |
| 5     | Physical Contingency | 37.50                | 49.11  | 86.61        |
|       | Sub-total            | 412.49               | 540.21 | 952.70       |
| 6     | Price Contingency    | 0.00                 | 0.00   | 0.00         |
|       | Total                | 412.49               | 540.21 | 952.70       |
|       |                      |                      |        | OM Cost 3.84 |

TABLE OI.1 (1/2) ESTIMATE OF ECONOMIC COST

II. Priority Project-Alt. 1" (OH+U)-5-Year Flood Control Plan

(1) Financial Cost

|     |                      | Unit: Cols Million |       |       |
|-----|----------------------|--------------------|-------|-------|
| No. | Specification        | L.C.               | F.C.  | Total |
| 1   | Construction Cost    | 0.00               | 0.00  | 0.00  |
| 2   | Land Acquisition     | 0.00               | 0.00  | 0.00  |
| 3   | Administration Cost  | 0.00               | 0.00  | 0.00  |
| 4   | Engineering Fee      | 10.03              | 17.13 | 27.21 |
| 5   | Physical Contingency | 1.01               | 1.71  | 2.72  |
|     | Sub-total            | 11.09              | 18.84 | 29.93 |
| 6   | Price Contingency    | 1.37               | 1.15  | 2.52  |
|     | Total                | 12.46              | 19.99 | 32.45 |

OM Cost  
0.00

|     |                      | Unit: Cols Million |      |       |
|-----|----------------------|--------------------|------|-------|
| No. | Specification        | L.C.               | F.C. | Total |
| 1   | Construction Cost    | 0.00               | 0.00 | 0.00  |
| 2   | Land Acquisition     | 4.80               | 0.00 | 4.80  |
| 3   | Administration Cost  | 0.24               | 0.00 | 0.24  |
| 4   | Engineering Fee      | 2.69               | 4.57 | 7.26  |
| 5   | Physical Contingency | 0.77               | 0.46 | 1.23  |
|     | Sub-total            | 8.50               | 5.03 | 13.53 |
| 6   | Price Contingency    | 1.62               | 0.47 | 2.09  |
|     | Total                | 10.12              | 5.50 | 15.62 |

OM Cost  
0.00

|     |                      | Unit: Cols Million |       |        |
|-----|----------------------|--------------------|-------|--------|
| No. | Specification        | L.C.               | F.C.  | Total  |
| 1   | Construction Cost    | 54.52              | 62.60 | 117.12 |
| 2   | Land Acquisition     | 4.80               | 0.00  | 4.80   |
| 3   | Administration Cost  | 6.10               | 0.00  | 6.10   |
| 4   | Engineering Fee      | 4.17               | 7.08  | 11.25  |
| 5   | Physical Contingency | 6.96               | 6.97  | 13.93  |
|     | Sub-total            | 76.55              | 76.65 | 153.20 |
| 6   | Price Contingency    | 20.09              | 9.62  | 29.71  |
|     | Total                | 96.64              | 86.27 | 182.91 |

OM Cost  
0.00

|     |                      | Unit: Cols Million |       |        |
|-----|----------------------|--------------------|-------|--------|
| No. | Specification        | L.C.               | F.C.  | Total  |
| 1   | Construction Cost    | 54.52              | 62.60 | 117.12 |
| 2   | Land Acquisition     | 4.80               | 0.00  | 4.80   |
| 3   | Administration Cost  | 6.10               | 0.00  | 6.10   |
| 4   | Engineering Fee      | 4.17               | 7.08  | 11.25  |
| 5   | Physical Contingency | 6.96               | 6.97  | 13.93  |
|     | Sub-total            | 76.55              | 76.65 | 153.20 |
| 6   | Price Contingency    | 25.89              | 12.21 | 38.10  |
|     | Total                | 102.44             | 88.86 | 191.30 |

OM Cost  
0.85

|     |                      | Unit: Cols Million |       |        |
|-----|----------------------|--------------------|-------|--------|
| No. | Specification        | L.C.               | F.C.  | Total  |
| 1   | Construction Cost    | 54.52              | 62.60 | 117.12 |
| 2   | Land Acquisition     | 4.80               | 0.00  | 4.80   |
| 3   | Administration Cost  | 6.10               | 0.00  | 6.10   |
| 4   | Engineering Fee      | 4.17               | 7.08  | 11.25  |
| 5   | Physical Contingency | 6.96               | 6.97  | 13.93  |
|     | Sub-total            | 76.55              | 76.65 | 153.20 |
| 6   | Price Contingency    | 32.03              | 14.87 | 46.90  |
|     | Total                | 108.58             | 91.52 | 200.10 |

OM Cost  
1.83

|     |                      | Unit: Cols Million |       |        |
|-----|----------------------|--------------------|-------|--------|
| No. | Specification        | L.C.               | F.C.  | Total  |
| 1   | Construction Cost    | 54.52              | 62.60 | 117.12 |
| 2   | Land Acquisition     | 0.00               | 0.00  | 0.00   |
| 3   | Administration Cost  | 5.86               | 0.00  | 5.86   |
| 4   | Engineering Fee      | 4.17               | 7.08  | 11.25  |
| 5   | Physical Contingency | 6.46               | 6.97  | 13.42  |
|     | Sub-total            | 71.01              | 76.65 | 147.65 |
| 6   | Price Contingency    | 35.76              | 17.62 | 53.38  |
|     | Total                | 106.77             | 94.27 | 201.03 |

OM Cost  
2.91

|     |                      | Unit: Cols Million |       |        |
|-----|----------------------|--------------------|-------|--------|
| No. | Specification        | L.C.               | F.C.  | Total  |
| 1   | Construction Cost    | 54.52              | 62.60 | 117.12 |
| 2   | Land Acquisition     | 0.00               | 0.00  | 0.00   |
| 3   | Administration Cost  | 5.82               | 0.00  | 5.82   |
| 4   | Engineering Fee      | 4.17               | 7.08  | 11.25  |
| 5   | Physical Contingency | 6.45               | 6.97  | 13.42  |
|     | Sub-total            | 70.96              | 76.65 | 147.61 |
| 6   | Price Contingency    | 42.16              | 20.45 | 62.61  |
|     | Total                | 113.12             | 97.10 | 210.22 |

OM Cost  
4.11

(2) Economic Cost

|     |                      | Unit: Cols Million |       |       |
|-----|----------------------|--------------------|-------|-------|
| No. | Specification        | L.C.               | F.C.  | Total |
| 1   | Construction Cost    | 0.00               | 0.00  | 0.00  |
| 2   | Land Acquisition     | 0.00               | 0.00  | 0.00  |
| 3   | Administration Cost  | 0.00               | 0.00  | 0.00  |
| 4   | Engineering Fee      | 8.92               | 17.13 | 26.05 |
| 5   | Physical Contingency | 0.89               | 1.71  | 2.61  |
|     | Sub-total            | 9.81               | 18.84 | 28.66 |
| 6   | Price Contingency    | 0.00               | 0.00  | 0.00  |
|     | Total                | 9.81               | 18.84 | 28.66 |

OM Cost  
0.00

|     |                      | Unit: Cols Million |      |       |
|-----|----------------------|--------------------|------|-------|
| No. | Specification        | L.C.               | F.C. | Total |
| 1   | Construction Cost    | 0.00               | 0.00 | 0.00  |
| 2   | Land Acquisition     | 3.67               | 0.00 | 3.67  |
| 3   | Administration Cost  | 0.21               | 0.00 | 0.21  |
| 4   | Engineering Fee      | 2.38               | 4.57 | 6.95  |
| 5   | Physical Contingency | 0.63               | 0.46 | 1.08  |
|     | Sub-total            | 6.89               | 5.03 | 11.92 |
| 6   | Price Contingency    | 0.00               | 0.00 | 0.00  |
|     | Total                | 6.89               | 5.03 | 11.92 |

OM Cost  
0.00

|     |                      | Unit: Cols Million |       |        |
|-----|----------------------|--------------------|-------|--------|
| No. | Specification        | L.C.               | F.C.  | Total  |
| 1   | Construction Cost    | 43.54              | 62.60 | 106.14 |
| 2   | Land Acquisition     | 3.67               | 0.00  | 3.67   |
| 3   | Administration Cost  | 5.40               | 0.00  | 5.40   |
| 4   | Engineering Fee      | 3.69               | 7.08  | 10.77  |
| 5   | Physical Contingency | 5.63               | 6.97  | 12.60  |
|     | Sub-total            | 61.93              | 76.65 | 138.58 |
| 6   | Price Contingency    | 0.00               | 0.00  | 0.00   |
|     | Total                | 61.93              | 76.65 | 138.58 |

OM Cost  
0.00

|     |                      | Unit: Cols Million |       |        |
|-----|----------------------|--------------------|-------|--------|
| No. | Specification        | L.C.               | F.C.  | Total  |
| 1   | Construction Cost    | 43.54              | 62.60 | 106.14 |
| 2   | Land Acquisition     | 3.67               | 0.00  | 3.67   |
| 3   | Administration Cost  | 5.40               | 0.00  | 5.40   |
| 4   | Engineering Fee      | 3.69               | 7.08  | 10.77  |
| 5   | Physical Contingency | 5.63               | 6.97  | 12.60  |
|     | Sub-total            | 61.93              | 76.65 | 138.58 |
| 6   | Price Contingency    | 0.00               | 0.00  | 0.00   |
|     | Total                | 61.93              | 76.65 | 138.58 |

OM Cost  
0.58

|     |                      | Unit: Cols Million |       |        |
|-----|----------------------|--------------------|-------|--------|
| No. | Specification        | L.C.               | F.C.  | Total  |
| 1   | Construction Cost    | 43.54              | 62.60 | 106.14 |
| 2   | Land Acquisition     | 3.67               | 0.00  | 3.67   |
| 3   | Administration Cost  | 5.40               | 0.00  | 5.40   |
| 4   | Engineering Fee      | 3.69               | 7.08  | 10.77  |
| 5   | Physical Contingency | 5.63               | 6.97  | 12.60  |
|     | Sub-total            | 61.93              | 76.65 | 138.58 |
| 6   | Price Contingency    | 0.00               | 0.00  | 0.00   |
|     | Total                | 61.93              | 76.65 | 138.58 |

OM Cost  
1.17

|     |                      | Unit: Cols Million |       |        |
|-----|----------------------|--------------------|-------|--------|
| No. | Specification        | L.C.               | F.C.  | Total  |
| 1   | Construction Cost    | 43.54              | 62.60 | 106.14 |
| 2   | Land Acquisition     | 0.00               | 0.00  | 0.00   |
| 3   | Administration Cost  | 5.19               | 0.00  | 5.19   |
| 4   | Engineering Fee      | 3.69               | 7.08  | 10.77  |
| 5   | Physical Contingency | 5.24               | 6.97  | 12.21  |
|     | Sub-total            | 57.66              | 76.65 | 134.30 |
| 6   | Price Contingency    | 0.00               | 0.00  | 0.00   |
|     | Total                | 57.66              | 76.65 | 134.30 |

OM Cost  
1.75

|     |                      | Unit: Cols Million |       |        |
|-----|----------------------|--------------------|-------|--------|
| No. | Specification        | L.C.               | F.C.  | Total  |
| 1   | Construction Cost    | 43.54              | 62.60 | 106.14 |
| 2   | Land Acquisition     | 0.00               | 0.00  | 0.00   |
| 3   | Administration Cost  | 5.15               | 0.00  | 5.15   |
| 4   | Engineering Fee      | 3.69               | 7.08  | 10.77  |
| 5   | Physical Contingency | 5.24               | 6.97  | 12.21  |
|     | Sub-total            | 57.62              | 76.65 | 134.27 |
| 6   | Price Contingency    | 0.00               | 0.00  | 0.00   |
|     | Total                | 57.62              | 76.65 | 134.27 |

OM Cost  
2.34



TABLE O2.7 (2/2) ESTIMATE OF ECONOMIC COST

H Priority Project-Alc. 1" (O+J+U)-5-Year Flood Control Plan

(1) Financial Cost

| Total |                      | Unit : Cols Million |        |                 |
|-------|----------------------|---------------------|--------|-----------------|
| No    | Specification        | I.C.                | F.C.   | Total           |
| 1     | Construction Cost    | 272.66              | 313.00 | 585.66          |
| 2     | Land Acquisition     | 19.20               | 0.00   | 19.20           |
| 3     | Administration Cost  | 30.22               | 0.00   | 30.22           |
| 4     | Engineering Fee      | 33.62               | 57.10  | 90.72           |
| 5     | Physical Contingency | 35.56               | 37.01  | 72.57           |
|       | Sub-total            | 391.26              | 407.11 | 798.37          |
| 6     | Price Contingency    | 158.92              | 76.39  | 235.31          |
|       | Total                | 550.12              | 483.50 | 1,033.62        |
|       |                      |                     |        | OM Cost<br>5.44 |

(2) Economic Cost

| Total |                      | Unit : Cols Million |        |                 |
|-------|----------------------|---------------------|--------|-----------------|
| No    | Specification        | I.C.                | F.C.   | Total           |
| 1     | Construction Cost    | 217.69              | 313.00 | 530.69          |
| 2     | Land Acquisition     | 14.68               | 0.00   | 14.68           |
| 3     | Administration Cost  | 26.74               | 0.00   | 26.74           |
| 4     | Engineering Fee      | 29.75               | 57.10  | 86.85           |
| 5     | Physical Contingency | 28.89               | 37.01  | 65.90           |
|       | Sub-total            | 317.76              | 407.11 | 724.87          |
| 6     | Price Contingency    | 0.00                | 0.00   | 0.00            |
|       | Total                | 317.76              | 407.11 | 724.87          |
|       |                      |                     |        | OM Cost<br>2.92 |

TABLE O28 (1/2) ESTIMATE OF ECONOMIC COST

III. Remaining Projects (MP-P/P)

(1) Financial Cost

|     |                      | Unit : Cols. Million |      |       |
|-----|----------------------|----------------------|------|-------|
| No. | Specification        | I.C.                 | F.C. | Total |
| 1   | Construction Cost    | 0.00                 | 0.00 | 0.00  |
| 2   | Land Acquisition     | 0.00                 | 0.00 | 0.00  |
| 3   | Administration Cost  | 0.00                 | 0.00 | 0.00  |
| 4   | Engineering Fee      | 0.00                 | 0.00 | 0.00  |
| 5   | Physical Contingency | 0.00                 | 0.00 | 0.00  |
|     | Sub-total            | 0.00                 | 0.00 | 0.00  |
| 6   | Price Contingency    | 0.00                 | 0.00 | 0.00  |
|     | Total                | 0.00                 | 0.00 | 0.00  |

OM Cost  
0.00

|     |                      | Unit : Cols. Million |      |       |
|-----|----------------------|----------------------|------|-------|
| No. | Specification        | I.C.                 | F.C. | Total |
| 1   | Construction Cost    | 0.00                 | 0.00 | 0.00  |
| 2   | Land Acquisition     | 0.00                 | 0.00 | 0.00  |
| 3   | Administration Cost  | 0.00                 | 0.00 | 0.00  |
| 4   | Engineering Fee      | 0.00                 | 0.00 | 0.00  |
| 5   | Physical Contingency | 0.00                 | 0.00 | 0.00  |
|     | Sub-total            | 0.00                 | 0.00 | 0.00  |
| 6   | Price Contingency    | 0.00                 | 0.00 | 0.00  |
|     | Total                | 0.00                 | 0.00 | 0.00  |

OM Cost  
0.00

|     |                      | Unit : Cols. Million |      |       |
|-----|----------------------|----------------------|------|-------|
| No. | Specification        | I.C.                 | F.C. | Total |
| 1   | Construction Cost    | 0.00                 | 0.00 | 0.00  |
| 2   | Land Acquisition     | 0.00                 | 0.00 | 0.00  |
| 3   | Administration Cost  | 0.00                 | 0.00 | 0.00  |
| 4   | Engineering Fee      | 0.00                 | 0.00 | 0.00  |
| 5   | Physical Contingency | 0.00                 | 0.00 | 0.00  |
|     | Sub-total            | 0.00                 | 0.00 | 0.00  |
| 6   | Price Contingency    | 0.00                 | 0.00 | 0.00  |
|     | Total                | 0.00                 | 0.00 | 0.00  |

OM Cost  
0.00

|     |                      | Unit : Cols. Million |      |       |
|-----|----------------------|----------------------|------|-------|
| No. | Specification        | I.C.                 | F.C. | Total |
| 1   | Construction Cost    | 0.00                 | 0.00 | 0.00  |
| 2   | Land Acquisition     | 0.00                 | 0.00 | 0.00  |
| 3   | Administration Cost  | 0.00                 | 0.00 | 0.00  |
| 4   | Engineering Fee      | 0.00                 | 0.00 | 0.00  |
| 5   | Physical Contingency | 0.00                 | 0.00 | 0.00  |
|     | Sub-total            | 0.00                 | 0.00 | 0.00  |
| 6   | Price Contingency    | 0.00                 | 0.00 | 0.00  |
|     | Total                | 0.00                 | 0.00 | 0.00  |

OM Cost  
0.00

|     |                      | Unit : Cols. Million |      |       |
|-----|----------------------|----------------------|------|-------|
| No. | Specification        | I.C.                 | F.C. | Total |
| 1   | Construction Cost    | 0.00                 | 0.00 | 0.00  |
| 2   | Land Acquisition     | 0.00                 | 0.00 | 0.00  |
| 3   | Administration Cost  | 0.00                 | 0.00 | 0.00  |
| 4   | Engineering Fee      | 0.00                 | 0.00 | 0.00  |
| 5   | Physical Contingency | 0.00                 | 0.00 | 0.00  |
|     | Sub-total            | 0.00                 | 0.00 | 0.00  |
| 6   | Price Contingency    | 0.00                 | 0.00 | 0.00  |
|     | Total                | 0.00                 | 0.00 | 0.00  |

OM Cost  
0.00

|     |                      | Unit : Cols. Million |       |       |
|-----|----------------------|----------------------|-------|-------|
| No. | Specification        | I.C.                 | F.C.  | Total |
| 1   | Construction Cost    | 0.00                 | 0.00  | 0.00  |
| 2   | Land Acquisition     | 0.00                 | 0.00  | 0.00  |
| 3   | Administration Cost  | 0.00                 | 0.00  | 0.00  |
| 4   | Engineering Fee      | 6.30                 | 10.83 | 17.13 |
| 5   | Physical Contingency | 0.63                 | 1.08  | 1.71  |
|     | Sub-total            | 6.93                 | 11.91 | 18.84 |
| 6   | Price Contingency    | 3.49                 | 2.74  | 6.23  |
|     | Total                | 10.42                | 14.65 | 25.07 |

OM Cost  
0.00

|     |                      | Unit : Cols. Million |      |       |
|-----|----------------------|----------------------|------|-------|
| No. | Specification        | I.C.                 | F.C. | Total |
| 1   | Construction Cost    | 0.00                 | 0.00 | 0.00  |
| 2   | Land Acquisition     | 2.30                 | 0.00 | 2.30  |
| 3   | Administration Cost  | 0.16                 | 0.00 | 0.16  |
| 4   | Engineering Fee      | 1.68                 | 2.89 | 4.57  |
| 5   | Physical Contingency | 0.41                 | 0.29 | 0.70  |
|     | Sub-total            | 4.55                 | 3.18 | 7.73  |
| 6   | Price Contingency    | 2.72                 | 0.85 | 3.57  |
|     | Total                | 7.27                 | 4.03 | 11.30 |

OM Cost  
0.00

(2) Economic Cost

|     |                      | Unit : Cols. Million |      |       |
|-----|----------------------|----------------------|------|-------|
| No. | Specification        | I.C.                 | F.C. | Total |
| 1   | Construction Cost    | 0.00                 | 0.00 | 0.00  |
| 2   | Land Acquisition     | 0.00                 | 0.00 | 0.00  |
| 3   | Administration Cost  | 0.00                 | 0.00 | 0.00  |
| 4   | Engineering Fee      | 0.00                 | 0.00 | 0.00  |
| 5   | Physical Contingency | 0.00                 | 0.00 | 0.00  |
|     | Sub-total            | 0.00                 | 0.00 | 0.00  |
| 6   | Price Contingency    | 0.00                 | 0.00 | 0.00  |
|     | Total                | 0.00                 | 0.00 | 0.00  |

OM Cost  
0.00

|     |                      | Unit : Cols. Million |      |       |
|-----|----------------------|----------------------|------|-------|
| No. | Specification        | I.C.                 | F.C. | Total |
| 1   | Construction Cost    | 0.00                 | 0.00 | 0.00  |
| 2   | Land Acquisition     | 0.00                 | 0.00 | 0.00  |
| 3   | Administration Cost  | 0.00                 | 0.00 | 0.00  |
| 4   | Engineering Fee      | 0.00                 | 0.00 | 0.00  |
| 5   | Physical Contingency | 0.00                 | 0.00 | 0.00  |
|     | Sub-total            | 0.00                 | 0.00 | 0.00  |
| 6   | Price Contingency    | 0.00                 | 0.00 | 0.00  |
|     | Total                | 0.00                 | 0.00 | 0.00  |

OM Cost  
0.00

|     |                      | Unit : Cols. Million |      |       |
|-----|----------------------|----------------------|------|-------|
| No. | Specification        | I.C.                 | F.C. | Total |
| 1   | Construction Cost    | 0.00                 | 0.00 | 0.00  |
| 2   | Land Acquisition     | 0.00                 | 0.00 | 0.00  |
| 3   | Administration Cost  | 0.00                 | 0.00 | 0.00  |
| 4   | Engineering Fee      | 0.00                 | 0.00 | 0.00  |
| 5   | Physical Contingency | 0.00                 | 0.00 | 0.00  |
|     | Sub-total            | 0.00                 | 0.00 | 0.00  |
| 6   | Price Contingency    | 0.00                 | 0.00 | 0.00  |
|     | Total                | 0.00                 | 0.00 | 0.00  |

OM Cost  
0.00

|     |                      | Unit : Cols. Million |      |       |
|-----|----------------------|----------------------|------|-------|
| No. | Specification        | I.C.                 | F.C. | Total |
| 1   | Construction Cost    | 0.00                 | 0.00 | 0.00  |
| 2   | Land Acquisition     | 0.00                 | 0.00 | 0.00  |
| 3   | Administration Cost  | 0.00                 | 0.00 | 0.00  |
| 4   | Engineering Fee      | 0.00                 | 0.00 | 0.00  |
| 5   | Physical Contingency | 0.00                 | 0.00 | 0.00  |
|     | Sub-total            | 0.00                 | 0.00 | 0.00  |
| 6   | Price Contingency    | 0.00                 | 0.00 | 0.00  |
|     | Total                | 0.00                 | 0.00 | 0.00  |

OM Cost  
0.00

|     |                      | Unit : Cols. Million |      |       |
|-----|----------------------|----------------------|------|-------|
| No. | Specification        | I.C.                 | F.C. | Total |
| 1   | Construction Cost    | 0.00                 | 0.00 | 0.00  |
| 2   | Land Acquisition     | 0.00                 | 0.00 | 0.00  |
| 3   | Administration Cost  | 0.00                 | 0.00 | 0.00  |
| 4   | Engineering Fee      | 0.00                 | 0.00 | 0.00  |
| 5   | Physical Contingency | 0.00                 | 0.00 | 0.00  |
|     | Sub-total            | 0.00                 | 0.00 | 0.00  |
| 6   | Price Contingency    | 0.00                 | 0.00 | 0.00  |
|     | Total                | 0.00                 | 0.00 | 0.00  |

OM Cost  
0.00

|     |                      | Unit : Cols. Million |       |       |
|-----|----------------------|----------------------|-------|-------|
| No. | Specification        | I.C.                 | F.C.  | Total |
| 1   | Construction Cost    | 0.00                 | 0.00  | 0.00  |
| 2   | Land Acquisition     | 0.00                 | 0.00  | 0.00  |
| 3   | Administration Cost  | 0.00                 | 0.00  | 0.00  |
| 4   | Engineering Fee      | 5.58                 | 10.83 | 16.41 |
| 5   | Physical Contingency | 0.55                 | 1.08  | 1.64  |
|     | Sub-total            | 6.13                 | 11.91 | 18.05 |
| 6   | Price Contingency    | 0.00                 | 0.00  | 0.00  |
|     | Total                | 6.13                 | 11.91 | 18.05 |

OM Cost  
0.00

|     |                      | Unit : Cols. Million |      |       |
|-----|----------------------|----------------------|------|-------|
| No. | Specification        | I.C.                 | F.C. | Total |
| 1   | Construction Cost    | 0.00                 | 0.00 | 0.00  |
| 2   | Land Acquisition     | 1.76                 | 0.00 | 1.76  |
| 3   | Administration Cost  | 0.14                 | 0.00 | 0.14  |
| 4   | Engineering Fee      | 1.49                 | 2.89 | 4.38  |
| 5   | Physical Contingency | 0.34                 | 0.29 | 0.63  |
|     | Sub-total            | 3.73                 | 3.18 | 6.90  |
| 6   | Price Contingency    | 0.00                 | 0.00 | 0.00  |
|     | Total                | 3.73                 | 3.18 | 6.90  |

OM Cost  
0.00

TABLE 028(2/2) ESTIMATE OF ECONOMIC COST

III. Remaining Projects (MPP)

(1) Financial Cost

| 2006 |                      | Unit : Cols. Million |       |        |
|------|----------------------|----------------------|-------|--------|
| No.  | Specification        | L.C.                 | F.C.  | Total  |
| 1    | Construction Cost    | 31.89                | 42.96 | 74.76  |
| 2    | Land Acquisition     | 2.30                 | 0.00  | 2.30   |
| 3    | Administration Cost  | 3.85                 | 0.00  | 3.85   |
| 4    | Engineering Fee      | 2.60                 | 4.42  | 7.02   |
| 5    | Physical Contingency | 4.06                 | 4.74  | 8.79   |
|      | Sub-total            | 44.61                | 52.12 | 96.72  |
| 6    | Price Contingency    | 39.76                | 15.88 | 46.64  |
|      | Total                | 75.37                | 68.00 | 143.36 |

OM Cost  
0.00

| 2007 |                      | Unit : Cols. Million |       |        |
|------|----------------------|----------------------|-------|--------|
| No.  | Specification        | L.C.                 | F.C.  | Total  |
| 1    | Construction Cost    | 31.80                | 42.96 | 74.76  |
| 2    | Land Acquisition     | 0.00                 | 0.00  | 0.00   |
| 3    | Administration Cost  | 3.74                 | 0.00  | 3.74   |
| 4    | Engineering Fee      | 2.60                 | 4.42  | 7.02   |
| 5    | Physical Contingency | 3.81                 | 4.74  | 8.55   |
|      | Sub-total            | 41.95                | 52.12 | 94.07  |
| 6    | Price Contingency    | 33.18                | 17.92 | 51.10  |
|      | Total                | 75.13                | 70.04 | 145.17 |

OM Cost  
0.74

| 2008 |                      | Unit : Cols. Million |       |        |
|------|----------------------|----------------------|-------|--------|
| No.  | Specification        | L.C.                 | F.C.  | Total  |
| 1    | Construction Cost    | 31.80                | 42.96 | 74.76  |
| 2    | Land Acquisition     | 0.00                 | 0.00  | 0.00   |
| 3    | Administration Cost  | 3.74                 | 0.00  | 3.74   |
| 4    | Engineering Fee      | 2.60                 | 4.42  | 7.02   |
| 5    | Physical Contingency | 3.81                 | 4.74  | 8.55   |
|      | Sub-total            | 41.95                | 52.12 | 94.07  |
| 6    | Price Contingency    | 37.69                | 20.02 | 57.71  |
|      | Total                | 79.64                | 72.14 | 151.78 |

OM Cost  
1.56

| 2009 |                      | Unit : Cols. Million |       |        |
|------|----------------------|----------------------|-------|--------|
| No.  | Specification        | L.C.                 | F.C.  | Total  |
| 1    | Construction Cost    | 31.80                | 42.96 | 74.76  |
| 2    | Land Acquisition     | 0.00                 | 0.00  | 0.00   |
| 3    | Administration Cost  | 3.74                 | 0.00  | 3.74   |
| 4    | Engineering Fee      | 2.60                 | 4.42  | 7.02   |
| 5    | Physical Contingency | 3.81                 | 4.74  | 8.55   |
|      | Sub-total            | 41.95                | 52.12 | 94.07  |
| 6    | Price Contingency    | 42.47                | 22.19 | 64.66  |
|      | Total                | 84.42                | 74.31 | 158.73 |

OM Cost  
2.48

| 2010 |                      | Unit : Cols. Million |       |        |
|------|----------------------|----------------------|-------|--------|
| No.  | Specification        | L.C.                 | F.C.  | Total  |
| 1    | Construction Cost    | 31.80                | 42.96 | 74.76  |
| 2    | Land Acquisition     | 0.00                 | 0.00  | 0.00   |
| 3    | Administration Cost  | 3.77                 | 0.00  | 3.77   |
| 4    | Engineering Fee      | 2.60                 | 4.42  | 7.02   |
| 5    | Physical Contingency | 3.82                 | 4.74  | 8.56   |
|      | Sub-total            | 41.99                | 52.12 | 94.11  |
| 6    | Price Contingency    | 47.60                | 24.43 | 72.03  |
|      | Total                | 89.59                | 76.55 | 166.14 |

OM Cost  
3.51

| Total |                      | Unit : Cols. Million |        |        |
|-------|----------------------|----------------------|--------|--------|
| No.   | Specification        | L.C.                 | F.C.   | Total  |
| 1     | Construction Cost    | 159.00               | 214.80 | 373.80 |
| 2     | Land Acquisition     | 4.60                 | 0.00   | 4.60   |
| 3     | Administration Cost  | 19.00                | 0.00   | 19.00  |
| 4     | Engineering Fee      | 20.98                | 35.82  | 56.80  |
| 5     | Physical Contingency | 20.36                | 25.06  | 45.42  |
|       | Sub-total            | 223.94               | 275.68 | 499.62 |
| 6     | Price Contingency    | 197.91               | 104.03 | 301.94 |
|       | Total                | 421.85               | 379.71 | 801.56 |

OM Cost  
4.65

(2) Economic Cost

| 2006 |                      | Unit : Cols. Million |       |       |
|------|----------------------|----------------------|-------|-------|
| No.  | Specification        | L.C.                 | F.C.  | Total |
| 1    | Construction Cost    | 25.39                | 42.96 | 68.35 |
| 2    | Land Acquisition     | 1.76                 | 0.00  | 1.76  |
| 3    | Administration Cost  | 3.41                 | 0.00  | 3.41  |
| 4    | Engineering Fee      | 2.30                 | 4.42  | 6.72  |
| 5    | Physical Contingency | 3.29                 | 4.74  | 8.02  |
|      | Sub-total            | 36.15                | 52.12 | 88.27 |
| 6    | Price Contingency    | 0.00                 | 0.00  | 0.00  |
|      | Total                | 36.15                | 52.12 | 88.27 |

OM Cost  
0.00

| 2007 |                      | Unit : Cols. Million |       |       |
|------|----------------------|----------------------|-------|-------|
| No.  | Specification        | L.C.                 | F.C.  | Total |
| 1    | Construction Cost    | 25.39                | 42.96 | 68.35 |
| 2    | Land Acquisition     | 0.00                 | 0.00  | 0.00  |
| 3    | Administration Cost  | 3.31                 | 0.00  | 3.31  |
| 4    | Engineering Fee      | 2.30                 | 4.42  | 6.72  |
| 5    | Physical Contingency | 3.10                 | 4.74  | 7.84  |
|      | Sub-total            | 34.11                | 52.12 | 86.22 |
| 6    | Price Contingency    | 0.00                 | 0.00  | 0.00  |
|      | Total                | 34.11                | 52.12 | 86.22 |

OM Cost  
0.38

| 2008 |                      | Unit : Cols. Million |       |       |
|------|----------------------|----------------------|-------|-------|
| No.  | Specification        | L.C.                 | F.C.  | Total |
| 1    | Construction Cost    | 25.39                | 42.96 | 68.35 |
| 2    | Land Acquisition     | 0.00                 | 0.00  | 0.00  |
| 3    | Administration Cost  | 3.31                 | 0.00  | 3.31  |
| 4    | Engineering Fee      | 2.30                 | 4.42  | 6.72  |
| 5    | Physical Contingency | 3.10                 | 4.74  | 7.84  |
|      | Sub-total            | 34.11                | 52.12 | 86.22 |
| 6    | Price Contingency    | 0.00                 | 0.00  | 0.00  |
|      | Total                | 34.11                | 52.12 | 86.22 |

OM Cost  
0.75

| 2009 |                      | Unit : Cols. Million |       |       |
|------|----------------------|----------------------|-------|-------|
| No.  | Specification        | L.C.                 | F.C.  | Total |
| 1    | Construction Cost    | 25.39                | 42.96 | 68.35 |
| 2    | Land Acquisition     | 0.00                 | 0.00  | 0.00  |
| 3    | Administration Cost  | 3.31                 | 0.00  | 3.31  |
| 4    | Engineering Fee      | 2.30                 | 4.42  | 6.72  |
| 5    | Physical Contingency | 3.10                 | 4.74  | 7.84  |
|      | Sub-total            | 34.11                | 52.12 | 86.22 |
| 6    | Price Contingency    | 0.00                 | 0.00  | 0.00  |
|      | Total                | 34.11                | 52.12 | 86.22 |

OM Cost  
1.13

| 2010 |                      | Unit : Cols. Million |       |       |
|------|----------------------|----------------------|-------|-------|
| No.  | Specification        | L.C.                 | F.C.  | Total |
| 1    | Construction Cost    | 25.39                | 42.96 | 68.35 |
| 2    | Land Acquisition     | 0.00                 | 0.00  | 0.00  |
| 3    | Administration Cost  | 3.34                 | 0.00  | 3.34  |
| 4    | Engineering Fee      | 2.30                 | 4.42  | 6.72  |
| 5    | Physical Contingency | 3.10                 | 4.74  | 7.84  |
|      | Sub-total            | 34.14                | 52.12 | 86.25 |
| 6    | Price Contingency    | 0.00                 | 0.00  | 0.00  |
|      | Total                | 34.14                | 52.12 | 86.25 |

OM Cost  
1.50

| Total |                      | Unit : Cols. Million |        |        |
|-------|----------------------|----------------------|--------|--------|
| No.   | Specification        | L.C.                 | F.C.   | Total  |
| 1     | Construction Cost    | 126.97               | 214.80 | 341.77 |
| 2     | Land Acquisition     | 3.52                 | 0.00   | 3.52   |
| 3     | Administration Cost  | 16.81                | 0.00   | 16.81  |
| 4     | Engineering Fee      | 18.57                | 35.82  | 54.39  |
| 5     | Physical Contingency | 16.59                | 25.06  | 41.65  |
|       | Sub-total            | 182.46               | 275.68 | 458.14 |
| 6     | Price Contingency    | 0.00                 | 0.00   | 0.00   |
|       | Total                | 182.46               | 275.68 | 458.14 |

OM Cost  
1.83

**TABLE O2.9 ECONOMIC ANALYSIS**

| I. M/P |      | Unit : Cols. Million |        |           |                      |                     |
|--------|------|----------------------|--------|-----------|----------------------|---------------------|
|        |      | Economic Cost        |        |           | Economic Benefit (B) | Net Benefit (B)-(C) |
|        |      | Construction         | OM     | Total (C) |                      |                     |
| 1      | 1999 | 21.45                | 0.00   | 21.45     | 0.00                 | -21.45              |
| 2      | 2000 | 9.99                 | 0.00   | 9.99      | 0.00                 | -9.99               |
| 3      | 2001 | 103.46               | 0.00   | 103.46    | 0.00                 | -103.46             |
| 4      | 2002 | 103.46               | 0.43   | 103.89    | 16.74                | -87.15              |
| 5      | 2003 | 103.46               | 0.86   | 104.32    | 33.48                | -70.84              |
| 6      | 2004 | 117.23               | 1.29   | 118.52    | 50.21                | -68.31              |
| 7      | 2005 | 106.04               | 1.72   | 107.76    | 66.95                | -40.81              |
| 8      | 2006 | 88.27                | 2.15   | 90.42     | 83.69                | -6.73               |
| 9      | 2007 | 86.22                | 2.53   | 88.75     | 98.48                | 9.73                |
| 10     | 2008 | 86.22                | 2.90   | 89.12     | 112.88               | 23.76               |
| 11     | 2009 | 86.22                | 3.28   | 89.50     | 127.68               | 38.18               |
| 12     | 2010 | 86.25                | 3.66   | 89.91     | 142.47               | 52.56               |
| 13     | 2011 | 0.00                 | 4.03   | 4.03      | 156.87               | 152.84              |
| 14     | 2012 | 0.00                 | 4.03   | 4.03      | 156.87               | 152.84              |
| 15     | 2013 | 0.00                 | 4.03   | 4.03      | 156.87               | 152.84              |
| 16     | 2014 | 0.00                 | 4.03   | 4.03      | 156.87               | 152.84              |
| 17     | 2015 | 0.00                 | 4.03   | 4.03      | 156.87               | 152.84              |
| 18     | 2016 | 0.00                 | 4.03   | 4.03      | 156.87               | 152.84              |
| 19     | 2017 | 0.00                 | 4.03   | 4.03      | 156.87               | 152.84              |
| 20     | 2018 | 0.00                 | 4.03   | 4.03      | 156.87               | 152.84              |
| 21     | 2019 | 0.00                 | 4.03   | 4.03      | 156.87               | 152.84              |
| 22     | 2020 | 0.00                 | 4.03   | 4.03      | 156.87               | 152.84              |
| 23     | 2021 | 0.00                 | 4.03   | 4.03      | 156.87               | 152.84              |
| 24     | 2022 | 0.00                 | 4.03   | 4.03      | 156.87               | 152.84              |
| 25     | 2023 | 0.00                 | 4.03   | 4.03      | 156.87               | 152.84              |
| 26     | 2024 | 0.00                 | 4.03   | 4.03      | 156.87               | 152.84              |
| 27     | 2025 | 0.00                 | 4.03   | 4.03      | 156.87               | 152.84              |
| 28     | 2026 | 0.00                 | 4.03   | 4.03      | 156.87               | 152.84              |
| 29     | 2027 | 0.00                 | 4.03   | 4.03      | 156.87               | 152.84              |
| 30     | 2028 | 0.00                 | 4.03   | 4.03      | 156.87               | 152.84              |
| 31     | 2029 | 0.00                 | 4.03   | 4.03      | 156.87               | 152.84              |
| 32     | 2030 | 0.00                 | 4.03   | 4.03      | 156.87               | 152.84              |
| 33     | 2031 | 0.00                 | 4.03   | 4.03      | 156.87               | 152.84              |
| 34     | 2032 | 0.00                 | 4.03   | 4.03      | 156.87               | 152.84              |
| 35     | 2033 | 0.00                 | 4.03   | 4.03      | 156.87               | 152.84              |
| 36     | 2034 | 0.00                 | 4.03   | 4.03      | 156.87               | 152.84              |
| 37     | 2035 | 0.00                 | 4.03   | 4.03      | 156.87               | 152.84              |
| 38     | 2036 | 0.00                 | 4.03   | 4.03      | 156.87               | 152.84              |
| 39     | 2037 | 0.00                 | 4.03   | 4.03      | 156.87               | 152.84              |
| 40     | 2038 | 0.00                 | 4.03   | 4.03      | 156.87               | 152.84              |
| 41     | 2039 | 0.00                 | 4.03   | 4.03      | 156.87               | 152.84              |
| 42     | 2040 | 0.00                 | 4.03   | 4.03      | 156.87               | 152.84              |
| Total  |      | 998.27               | 139.72 | 1,137.99  | 5,438.68             | 4,300.69            |

| Discount Rate (%) | B/C  | EIRR (%)          |          | NPV (Cols. Million) |
|-------------------|------|-------------------|----------|---------------------|
|                   |      | 14.56             |          |                     |
|                   |      | PV(Cols. Million) |          |                     |
|                   |      | Cost              | Benefit  |                     |
| 20                | 0.73 | 323.48            | 234.57   | -88.91              |
| 15                | 0.97 | 415.05            | 402.93   | -12.12              |
| 12                | 1.20 | 489.12            | 588.63   | 99.51               |
| 10                | 1.42 | 549.72            | 780.58   | 230.86              |
| 5                 | 2.38 | 761.11            | 1,811.26 | 1,050.15            |

**TABLE O2.10 ECONOMIC ANALYSIS**

**II. Priority Project-AH.1(O+J+U)-2-Year P Unit : Cols. Million**

| Year         | Economic Cost |              |               | Economic Benefit (B) | Net Benefit (B)-(C) |
|--------------|---------------|--------------|---------------|----------------------|---------------------|
|              | Construction  | OM           | Total (C)     |                      |                     |
| 1 1999       | 21.45         | 0.00         | 21.45         | 0.00                 | -21.45              |
| 2 2000       | 9.99          | 0.00         | 9.99          | 0.00                 | -9.99               |
| 3 2001       | 103.46        | 0.00         | 103.46        | 0.00                 | -103.46             |
| 4 2002       | 103.46        | 0.43         | 103.89        | 21.08                | -82.81              |
| 5 2003       | 103.46        | 0.86         | 104.32        | 42.17                | -62.15              |
| 6 2004       | 99.19         | 1.29         | 100.48        | 63.25                | -37.23              |
| 7 2005       | 99.14         | 1.72         | 100.86        | 84.34                | -16.52              |
| 8 2006       | 0.00          | 2.15         | 2.15          | 105.42               | 103.27              |
| 9 2007       | 0.00          | 2.15         | 2.15          | 105.42               | 103.27              |
| 10 2008      | 0.00          | 2.15         | 2.15          | 105.42               | 103.27              |
| 11 2009      | 0.00          | 2.15         | 2.15          | 105.42               | 103.27              |
| 12 2010      | 0.00          | 2.15         | 2.15          | 105.42               | 103.27              |
| 13 2011      | 0.00          | 2.15         | 2.15          | 105.42               | 103.27              |
| 14 2012      | 0.00          | 2.15         | 2.15          | 105.42               | 103.27              |
| 15 2013      | 0.00          | 2.15         | 2.15          | 105.42               | 103.27              |
| 16 2014      | 0.00          | 2.15         | 2.15          | 105.42               | 103.27              |
| 17 2015      | 0.00          | 2.15         | 2.15          | 105.42               | 103.27              |
| 18 2016      | 0.00          | 2.15         | 2.15          | 105.42               | 103.27              |
| 19 2017      | 0.00          | 2.15         | 2.15          | 105.42               | 103.27              |
| 20 2018      | 0.00          | 2.15         | 2.15          | 105.42               | 103.27              |
| 21 2019      | 0.00          | 2.15         | 2.15          | 105.42               | 103.27              |
| 22 2020      | 0.00          | 2.15         | 2.15          | 105.42               | 103.27              |
| 23 2021      | 0.00          | 2.15         | 2.15          | 105.42               | 103.27              |
| 24 2022      | 0.00          | 2.15         | 2.15          | 105.42               | 103.27              |
| 25 2023      | 0.00          | 2.15         | 2.15          | 105.42               | 103.27              |
| 26 2024      | 0.00          | 2.15         | 2.15          | 105.42               | 103.27              |
| 27 2025      | 0.00          | 2.15         | 2.15          | 105.42               | 103.27              |
| 28 2026      | 0.00          | 2.15         | 2.15          | 105.42               | 103.27              |
| 29 2027      | 0.00          | 2.15         | 2.15          | 105.42               | 103.27              |
| 30 2028      | 0.00          | 2.15         | 2.15          | 105.42               | 103.27              |
| 31 2029      | 0.00          | 2.15         | 2.15          | 105.42               | 103.27              |
| 32 2030      | 0.00          | 2.15         | 2.15          | 105.42               | 103.27              |
| 33 2031      | 0.60          | 2.15         | 2.15          | 105.42               | 103.27              |
| 34 2032      | 0.00          | 2.15         | 2.15          | 105.42               | 103.27              |
| 35 2033      | 0.00          | 2.15         | 2.15          | 105.42               | 103.27              |
| 36 2034      | 0.00          | 2.15         | 2.15          | 105.42               | 103.27              |
| 37 2035      | 0.00          | 2.15         | 2.15          | 105.42               | 103.27              |
| 38 2036      | 0.00          | 0.00         | 0.00          | 0.00                 | 0.00                |
| 39 2037      | 0.00          | 0.00         | 0.00          | 0.00                 | 0.00                |
| 40 2038      | 0.00          | 0.00         | 0.00          | 0.00                 | 0.00                |
| 41 2039      | 0.00          | 0.00         | 0.00          | 0.00                 | 0.00                |
| 42 2040      | 0.00          | 0.00         | 0.00          | 0.00                 | 0.00                |
| <b>Total</b> | <b>540.15</b> | <b>68.80</b> | <b>608.95</b> | <b>3,373.44</b>      | <b>2,764.49</b>     |

| Discount Rate (%) | B/C  | EIRR (%)          |          | NPV (Cols. Million) |
|-------------------|------|-------------------|----------|---------------------|
|                   |      | 18.11             |          |                     |
|                   |      | PV(Cols. Million) |          |                     |
|                   |      | Cost              | Benefit  |                     |
| 20                | 0.90 | 241.50            | 218.32   | -23.18              |
| 15                | 1.21 | 292.16            | 352.29   | 60.13               |
| 12                | 1.49 | 330.34            | 491.65   | 161.31              |
| 10                | 1.75 | 360.10            | 629.53   | 269.44              |
| 5                 | 2.87 | 456.22            | 1,309.23 | 853.01              |

**TABLE O2.11 ECONOMIC ANALYSIS**

**II. Priority Project-Alt.1'(O+J+U)-10Year** Unit: Cols. Million

| Year         | Economic Cost |               |                 | Economic Benefit (B) | Net Benefit (B)-(C) |
|--------------|---------------|---------------|-----------------|----------------------|---------------------|
|              | Construction  | OM            | Total (C)       |                      |                     |
| 1 1999       | 37.63         | 0.00          | 37.63           | 0.00                 | -37.63              |
| 2 2000       | 15.33         | 0.00          | 15.33           | 0.00                 | -15.33              |
| 3 2001       | 182.06        | 0.00          | 182.06          | 0.00                 | -182.06             |
| 4 2002       | 182.06        | 0.77          | 182.83          | 31.19                | -151.64             |
| 5 2003       | 182.06        | 1.54          | 183.60          | 62.38                | -121.22             |
| 6 2004       | 176.77        | 2.31          | 179.08          | 93.57                | -85.51              |
| 7 2005       | 176.78        | 3.07          | 179.85          | 124.35               | -55.50              |
| 8 2006       | 0.00          | 3.84          | 3.84            | 155.54               | 151.70              |
| 9 2007       | 0.00          | 3.84          | 3.84            | 155.54               | 151.70              |
| 10 2008      | 0.00          | 3.84          | 3.84            | 155.54               | 151.70              |
| 11 2009      | 0.00          | 3.84          | 3.84            | 155.54               | 151.70              |
| 12 2010      | 0.00          | 3.84          | 3.84            | 155.54               | 151.70              |
| 13 2011      | 0.00          | 3.84          | 3.84            | 155.54               | 151.70              |
| 14 2012      | 0.00          | 3.84          | 3.84            | 155.54               | 151.70              |
| 15 2013      | 0.00          | 3.84          | 3.84            | 155.54               | 151.70              |
| 16 2014      | 0.00          | 3.84          | 3.84            | 155.54               | 151.70              |
| 17 2015      | 0.00          | 3.84          | 3.84            | 155.54               | 151.70              |
| 18 2016      | 0.00          | 3.84          | 3.84            | 155.54               | 151.70              |
| 19 2017      | 0.00          | 3.84          | 3.84            | 155.54               | 151.70              |
| 20 2018      | 0.00          | 3.84          | 3.84            | 155.54               | 151.70              |
| 21 2019      | 0.00          | 3.84          | 3.84            | 155.54               | 151.70              |
| 22 2020      | 0.00          | 3.84          | 3.84            | 155.54               | 151.70              |
| 23 2021      | 0.00          | 3.84          | 3.84            | 155.54               | 151.70              |
| 24 2022      | 0.00          | 3.84          | 3.84            | 155.54               | 151.70              |
| 25 2023      | 0.00          | 3.84          | 3.84            | 155.54               | 151.70              |
| 26 2024      | 0.00          | 3.84          | 3.84            | 155.54               | 151.70              |
| 27 2025      | 0.00          | 3.84          | 3.84            | 155.54               | 151.70              |
| 28 2026      | 0.00          | 3.84          | 3.84            | 155.54               | 151.70              |
| 29 2027      | 0.00          | 3.84          | 3.84            | 155.54               | 151.70              |
| 30 2028      | 0.00          | 3.84          | 3.84            | 155.54               | 151.70              |
| 31 2029      | 0.00          | 3.84          | 3.84            | 155.54               | 151.70              |
| 32 2030      | 0.00          | 3.84          | 3.84            | 155.54               | 151.70              |
| 33 2031      | 0.00          | 3.84          | 3.84            | 155.54               | 151.70              |
| 34 2032      | 0.00          | 3.84          | 3.84            | 155.54               | 151.70              |
| 35 2033      | 0.00          | 3.84          | 3.84            | 155.54               | 151.70              |
| 36 2034      | 0.00          | 3.84          | 3.84            | 155.54               | 151.70              |
| 37 2035      | 0.00          | 3.84          | 3.84            | 155.54               | 151.70              |
| 38 2036      | 0.00          | 0.00          | 0.00            | 0.00                 | 0.00                |
| 39 2037      | 0.00          | 0.00          | 0.00            | 0.00                 | 0.00                |
| 40 2038      | 0.00          | 0.00          | 0.00            | 0.00                 | 0.00                |
| 41 2039      | 0.00          | 0.00          | 0.00            | 0.00                 | 0.00                |
| 42 2040      | 0.00          | 0.00          | 0.00            | 0.00                 | 0.00                |
| <b>Total</b> | <b>952.69</b> | <b>122.89</b> | <b>1,075.58</b> | <b>4,977.69</b>      | <b>3,902.11</b>     |

| Discount Rate (%) | B/C  | EIRR (%)          |          | NPV (Cols. Million) |
|-------------------|------|-------------------|----------|---------------------|
|                   |      | 15.17             |          |                     |
|                   |      | PV(Cols. Million) |          |                     |
|                   |      | Cost              | Benefit  |                     |
| 20                | 0.76 | 424.82            | 322.28   | -102.54             |
| 15                | 1.01 | 514.35            | 519.98   | 5.63                |
| 12                | 1.25 | 581.85            | 725.62   | 143.77              |
| 10                | 1.46 | 634.49            | 929.09   | 294.59              |
| 5                 | 2.40 | 804.68            | 1,931.99 | 1,127.31            |

**TABLE O2.12 ECONOMIC ANALYSIS**

**II. Priority Project-Alt.1'(O+J+U)-5Year IUnit : Cols. Million**

| Year         | Economic Cost |              |               | Economic Benefit (B) | Net Benefit (B)-(C) |
|--------------|---------------|--------------|---------------|----------------------|---------------------|
|              | Construction  | OM           | Total (C)     |                      |                     |
| 1 1999       | 28.66         | 0.00         | 28.66         | 0.00                 | -28.66              |
| 2 2000       | 11.92         | 0.00         | 11.92         | 0.00                 | -11.92              |
| 3 2001       | 138.58        | 0.00         | 138.58        | 0.00                 | -138.58             |
| 4 2002       | 138.58        | 0.58         | 139.16        | 24.67                | -114.49             |
| 5 2003       | 138.58        | 1.17         | 139.75        | 49.77                | -89.98              |
| 6 2004       | 134.30        | 1.75         | 136.05        | 74.44                | -61.61              |
| 7 2005       | 134.27        | 2.34         | 136.61        | 99.54                | -37.07              |
| 8 2006       | 0.00          | 2.92         | 2.92          | 124.21               | 121.29              |
| 9 2007       | 0.00          | 2.92         | 2.92          | 124.21               | 121.29              |
| 10 2008      | 0.00          | 2.92         | 2.92          | 124.21               | 121.29              |
| 11 2009      | 0.00          | 2.92         | 2.92          | 124.21               | 121.29              |
| 12 2010      | 0.00          | 2.92         | 2.92          | 124.21               | 121.29              |
| 13 2011      | 0.00          | 2.92         | 2.92          | 124.21               | 121.29              |
| 14 2012      | 0.00          | 2.92         | 2.92          | 124.21               | 121.29              |
| 15 2013      | 0.00          | 2.92         | 2.92          | 124.21               | 121.29              |
| 16 2014      | 0.00          | 2.92         | 2.92          | 124.21               | 121.29              |
| 17 2015      | 0.00          | 2.92         | 2.92          | 124.21               | 121.29              |
| 18 2016      | 0.00          | 2.92         | 2.92          | 124.21               | 121.29              |
| 19 2017      | 0.00          | 2.92         | 2.92          | 124.21               | 121.29              |
| 20 2018      | 0.00          | 2.92         | 2.92          | 124.21               | 121.29              |
| 21 2019      | 0.00          | 2.92         | 2.92          | 124.21               | 121.29              |
| 22 2020      | 0.00          | 2.92         | 2.92          | 124.21               | 121.29              |
| 23 2021      | 0.00          | 2.92         | 2.92          | 124.21               | 121.29              |
| 24 2022      | 0.00          | 2.92         | 2.92          | 124.21               | 121.29              |
| 25 2023      | 0.00          | 2.92         | 2.92          | 124.21               | 121.29              |
| 26 2024      | 0.00          | 2.92         | 2.92          | 124.21               | 121.29              |
| 27 2025      | 0.00          | 2.92         | 2.92          | 124.21               | 121.29              |
| 28 2026      | 0.00          | 2.92         | 2.92          | 124.21               | 121.29              |
| 29 2027      | 0.00          | 2.92         | 2.92          | 124.21               | 121.29              |
| 30 2028      | 0.00          | 2.92         | 2.92          | 124.21               | 121.29              |
| 31 2029      | 0.00          | 2.92         | 2.92          | 124.21               | 121.29              |
| 32 2030      | 0.00          | 2.92         | 2.92          | 124.21               | 121.29              |
| 33 2031      | 0.00          | 2.92         | 2.92          | 124.21               | 121.29              |
| 34 2032      | 0.00          | 2.92         | 2.92          | 124.21               | 121.29              |
| 35 2033      | 0.00          | 2.92         | 2.92          | 124.21               | 121.29              |
| 36 2034      | 0.00          | 2.92         | 2.92          | 124.21               | 121.29              |
| 37 2035      | 0.00          | 2.92         | 2.92          | 124.21               | 121.29              |
| 38 2036      | 0.00          | 0.00         | 0.00          | 0.00                 | 0.00                |
| 39 2037      | 0.00          | 0.00         | 0.00          | 0.00                 | 0.00                |
| 40 2038      | 0.00          | 0.00         | 0.00          | 0.00                 | 0.00                |
| 41 2039      | 0.00          | 0.00         | 0.00          | 0.00                 | 0.00                |
| 42 2040      | 0.00          | 0.00         | 0.00          | 0.00                 | 0.00                |
| <b>Total</b> | <b>724.89</b> | <b>93.44</b> | <b>818.33</b> | <b>3,974.72</b>      | <b>3,156.39</b>     |

| Discount Rate (%) | B/C  | EIRR (%)          |          | NPV (Cols. Million) |
|-------------------|------|-------------------|----------|---------------------|
|                   |      | 15.93             | 15.93    |                     |
|                   |      | PV(Cols. Million) |          |                     |
|                   |      | Cost              | Benefit  |                     |
| 20                | 0.80 | 323.38            | 257.20   | -66.17              |
| 15                | 1.06 | 391.48            | 415.05   | 23.57               |
| 12                | 1.31 | 442.83            | 579.25   | 136.42              |
| 10                | 1.54 | 482.87            | 741.72   | 258.85              |
| 5                 | 2.52 | 612.31            | 1,542.57 | 930.25              |

**TABLE O2.13 ECONOMIC ANALYSIS**

| III. Remaining Projects (M/P - P/P) |               |               | Unit : Cols. Million |                      |                     |                 |
|-------------------------------------|---------------|---------------|----------------------|----------------------|---------------------|-----------------|
| Year                                | Economic Cost |               |                      | Economic Benefit (B) | Net Benefit (B)-(C) |                 |
|                                     | Construction  | OM            | Total (C)            |                      |                     |                 |
| 1                                   | 1999          | 0.00          | 0.00                 | 0.00                 | 0.00                | 0.00            |
| 2                                   | 2000          | 0.00          | 0.00                 | 0.00                 | 0.00                | 0.00            |
| 3                                   | 2001          | 0.00          | 0.00                 | 0.00                 | 0.00                | 0.00            |
| 4                                   | 2002          | 0.00          | 0.00                 | 0.00                 | 0.00                | 0.00            |
| 5                                   | 2003          | 0.00          | 0.00                 | 0.00                 | 0.00                | 0.00            |
| 6                                   | 2004          | 18.05         | 0.00                 | 18.05                | 0.00                | -18.05          |
| 7                                   | 2005          | 6.90          | 0.00                 | 6.90                 | 0.00                | -6.90           |
| 8                                   | 2006          | 88.27         | 0.00                 | 88.27                | 0.00                | -88.27          |
| 9                                   | 2007          | 86.22         | 0.38                 | 86.60                | 10.40               | -76.20          |
| 10                                  | 2008          | 86.22         | 0.75                 | 86.97                | 20.53               | -66.44          |
| 11                                  | 2009          | 86.22         | 1.13                 | 87.35                | 30.92               | -56.43          |
| 12                                  | 2010          | 86.25         | 1.50                 | 87.75                | 41.05               | -46.70          |
| 13                                  | 2011          | 0.00          | 1.88                 | 1.88                 | 51.45               | 49.57           |
| 14                                  | 2012          | 0.00          | 1.88                 | 1.88                 | 51.45               | 49.57           |
| 15                                  | 2013          | 0.00          | 1.88                 | 1.88                 | 51.45               | 49.57           |
| 16                                  | 2014          | 0.00          | 1.88                 | 1.88                 | 51.45               | 49.57           |
| 17                                  | 2015          | 0.00          | 1.88                 | 1.88                 | 51.45               | 49.57           |
| 18                                  | 2016          | 0.00          | 1.88                 | 1.88                 | 51.45               | 49.57           |
| 19                                  | 2017          | 0.00          | 1.88                 | 1.88                 | 51.45               | 49.57           |
| 20                                  | 2018          | 0.00          | 1.88                 | 1.88                 | 51.45               | 49.57           |
| 21                                  | 2019          | 0.00          | 1.88                 | 1.88                 | 51.45               | 49.57           |
| 22                                  | 2020          | 0.00          | 1.88                 | 1.88                 | 51.45               | 49.57           |
| 23                                  | 2021          | 0.00          | 1.88                 | 1.88                 | 51.45               | 49.57           |
| 24                                  | 2022          | 0.00          | 1.88                 | 1.88                 | 51.45               | 49.57           |
| 25                                  | 2023          | 0.00          | 1.88                 | 1.88                 | 51.45               | 49.57           |
| 26                                  | 2024          | 0.00          | 1.88                 | 1.88                 | 51.45               | 49.57           |
| 27                                  | 2025          | 0.00          | 1.88                 | 1.88                 | 51.45               | 49.57           |
| 28                                  | 2026          | 0.00          | 1.88                 | 1.88                 | 51.45               | 49.57           |
| 29                                  | 2027          | 0.00          | 1.88                 | 1.88                 | 51.45               | 49.57           |
| 30                                  | 2028          | 0.00          | 1.88                 | 1.88                 | 51.45               | 49.57           |
| 31                                  | 2029          | 0.00          | 1.88                 | 1.88                 | 51.45               | 49.57           |
| 32                                  | 2030          | 0.00          | 1.88                 | 1.88                 | 51.45               | 49.57           |
| 33                                  | 2031          | 0.00          | 1.88                 | 1.88                 | 51.45               | 49.57           |
| 34                                  | 2032          | 0.00          | 1.88                 | 1.88                 | 51.45               | 49.57           |
| 35                                  | 2033          | 0.00          | 1.88                 | 1.88                 | 51.45               | 49.57           |
| 36                                  | 2034          | 0.00          | 1.88                 | 1.88                 | 51.45               | 49.57           |
| 37                                  | 2035          | 0.00          | 1.88                 | 1.88                 | 51.45               | 49.57           |
| 38                                  | 2036          | 0.00          | 1.88                 | 1.88                 | 51.45               | 49.57           |
| 39                                  | 2037          | 0.00          | 1.88                 | 1.88                 | 51.45               | 49.57           |
| 40                                  | 2038          | 0.00          | 1.88                 | 1.88                 | 51.45               | 49.57           |
| 41                                  | 2039          | 0.00          | 1.88                 | 1.88                 | 51.45               | 49.57           |
| 42                                  | 2040          | 0.00          | 1.88                 | 1.88                 | 51.45               | 49.57           |
| <b>Total</b>                        |               | <b>458.13</b> | <b>60.16</b>         | <b>518.29</b>        | <b>1,646.40</b>     | <b>1,128.11</b> |

| Discount Rate (%) | B/C  | EIRR (%)          |         | 10.09           |
|-------------------|------|-------------------|---------|-----------------|
|                   |      | PV(Cols. Million) |         | NPV             |
|                   |      | Cost              | Benefit | (Cols. Million) |
| 20                | 0.52 | 81.98             | 42.83   | -39.15          |
| 15                | 0.70 | 122.85            | 85.49   | -37.36          |
| 12                | 0.86 | 158.67            | 136.16  | -22.51          |
| 10                | 1.01 | 189.39            | 190.78  | 1.40            |
| 5                 | 1.65 | 303.36            | 500.65  | 197.29          |



**TABLE O2.14 ECONOMIC ANALYSIS OF MULTI-PURPOSE DAM PROJECT**

Unit : Colones 1,000

| Year         | Economic Cost    |                |                  | Economic Benefit |                   |                  |                   | (B)-(C)           |
|--------------|------------------|----------------|------------------|------------------|-------------------|------------------|-------------------|-------------------|
|              | Construction     | OM             | Total (C)        | Flood (B1)       | Irrigation (B2)   | Power (B3)       | Total (B)         |                   |
| 1 1999       | 34,405           | 0              | 34,405           | 0                | 0                 | 0                | 0                 | -34,405           |
| 2 2000       | 175,614          | 0              | 175,614          | 0                | 0                 | 0                | 0                 | -175,614          |
| 3 2001       | 306,437          | 0              | 306,437          | 0                | 0                 | 0                | 0                 | -306,437          |
| 4 2002       | 306,437          | 0              | 306,437          | 0                | 0                 | 0                | 0                 | -306,437          |
| 5 2003       | 306,437          | 0              | 306,437          | 0                | 0                 | 0                | 0                 | -306,437          |
| 6 2004       | 306,437          | 0              | 306,437          | 0                | 0                 | 0                | 0                 | -306,437          |
| 7 2005       | 306,437          | 0              | 306,437          | 0                | 0                 | 0                | 0                 | -306,437          |
| 8 2006       | 306,437          | 0              | 306,437          | 0                | 0                 | 0                | 0                 | -306,437          |
| 9 2007       | 306,437          | 0              | 306,437          | 0                | 0                 | 0                | 0                 | -306,437          |
| 10 2008      | 301,724          | 0              | 301,724          | 0                | 0                 | 35,527           | 35,527            | -266,197          |
| 11 2009      | 148,506          | 0              | 148,506          | 0                | 0                 | 35,527           | 35,527            | -112,979          |
| 12 2010      | 0                | 11,774         | 11,774           | 156,872          | 93,830            | 22,565           | 273,267           | 261,493           |
| 13 2011      | 0                | 11,774         | 11,774           | 156,872          | 172,536           | 22,565           | 351,973           | 340,199           |
| 14 2012      | 0                | 11,774         | 11,774           | 156,872          | 224,489           | 22,565           | 403,926           | 392,152           |
| 15 2013      | 0                | 11,774         | 11,774           | 156,872          | 276,128           | 22,565           | 455,565           | 443,791           |
| 16 2014      | 0                | 11,774         | 11,774           | 156,872          | 290,240           | 22,565           | 469,677           | 457,903           |
| 17 2015      | 0                | 11,774         | 11,774           | 156,872          | 345,322           | 22,565           | 524,759           | 512,985           |
| 18 2016      | 0                | 11,774         | 11,774           | 156,872          | 350,183           | 22,565           | 529,620           | 517,846           |
| 19 2017      | 0                | 11,774         | 11,774           | 156,872          | 351,193           | 22,565           | 530,630           | 518,856           |
| 20 2018      | 0                | 11,774         | 11,774           | 156,872          | 351,193           | 22,565           | 530,630           | 518,856           |
| 21 2019      | 0                | 11,774         | 11,774           | 156,872          | 351,193           | 22,565           | 530,630           | 518,856           |
| 22 2020      | 0                | 11,774         | 11,774           | 156,872          | 351,193           | 22,565           | 530,630           | 518,856           |
| 23 2021      | 0                | 11,774         | 11,774           | 156,872          | 351,193           | 22,565           | 530,630           | 518,856           |
| 24 2022      | 0                | 11,774         | 11,774           | 156,872          | 351,193           | 22,565           | 530,630           | 518,856           |
| 25 2023      | 0                | 11,774         | 11,774           | 156,872          | 351,193           | 58,092           | 566,157           | 554,383           |
| 26 2024      | 0                | 11,774         | 11,774           | 156,872          | 351,193           | 58,092           | 566,157           | 554,383           |
| 27 2025      | 0                | 11,774         | 11,774           | 156,872          | 351,193           | 22,565           | 530,630           | 518,856           |
| 28 2026      | 0                | 11,774         | 11,774           | 156,872          | 351,193           | 22,565           | 530,630           | 518,856           |
| 29 2027      | 0                | 11,774         | 11,774           | 156,872          | 351,193           | 22,565           | 530,630           | 518,856           |
| 30 2028      | 0                | 11,774         | 11,774           | 156,872          | 351,193           | 22,565           | 530,630           | 518,856           |
| 31 2029      | 0                | 11,774         | 11,774           | 156,872          | 351,193           | 22,565           | 530,630           | 518,856           |
| 32 2030      | 0                | 11,774         | 11,774           | 156,872          | 351,193           | 22,565           | 530,630           | 518,856           |
| 33 2031      | 0                | 11,774         | 11,774           | 156,872          | 351,193           | 22,565           | 530,630           | 518,856           |
| 34 2032      | 0                | 11,774         | 11,774           | 156,872          | 351,193           | 22,565           | 530,630           | 518,856           |
| 35 2033      | 0                | 11,774         | 11,774           | 156,872          | 351,193           | 22,565           | 530,630           | 518,856           |
| 36 2034      | 0                | 11,774         | 11,774           | 156,872          | 351,193           | 22,565           | 530,630           | 518,856           |
| 37 2035      | 0                | 11,774         | 11,774           | 156,872          | 351,193           | 22,565           | 530,630           | 518,856           |
| 38 2036      | 0                | 11,774         | 11,774           | 156,872          | 351,193           | 22,565           | 530,630           | 518,856           |
| 39 2037      | 0                | 11,774         | 11,774           | 156,872          | 351,193           | 22,565           | 530,630           | 518,856           |
| 40 2038      | 0                | 11,774         | 11,774           | 156,872          | 351,193           | 58,092           | 566,157           | 554,383           |
| 41 2039      | 0                | 11,774         | 11,774           | 156,872          | 351,193           | 58,092           | 566,157           | 554,383           |
| 42 2040      | 0                | 11,774         | 11,774           | 156,872          | 351,193           | 22,565           | 530,630           | 518,856           |
| 43 2041      | 0                | 11,774         | 11,774           | 156,872          | 351,193           | 22,565           | 530,630           | 518,856           |
| 44 2042      | 0                | 11,774         | 11,774           | 156,872          | 351,193           | 22,565           | 530,630           | 518,856           |
| 45 2043      | 0                | 11,774         | 11,774           | 156,872          | 351,193           | 22,565           | 530,630           | 518,856           |
| 46 2044      | 0                | 11,774         | 11,774           | 156,872          | 351,193           | 22,565           | 530,630           | 518,856           |
| 47 2045      | 0                | 11,774         | 11,774           | 156,872          | 351,193           | 22,565           | 530,630           | 518,856           |
| 48 2046      | 0                | 11,774         | 11,774           | 156,872          | 351,193           | 22,565           | 530,630           | 518,856           |
| 49 2047      | 0                | 11,774         | 11,774           | 156,872          | 351,193           | 22,565           | 530,630           | 518,856           |
| 50 2048      | 0                | 11,774         | 11,774           | 156,872          | 351,193           | 22,565           | 530,630           | 518,856           |
| 51 2049      | 0                | 11,774         | 11,774           | 156,872          | 351,193           | 22,565           | 530,630           | 518,856           |
| 52 2050      | 0                | 11,774         | 11,774           | 156,872          | 351,193           | 22,565           | 530,630           | 518,856           |
| 53 2051      | 0                | 11,774         | 11,774           | 156,872          | 351,193           | 22,565           | 530,630           | 518,856           |
| 54 2052      | 0                | 11,774         | 11,774           | 156,872          | 351,193           | 22,565           | 530,630           | 518,856           |
| 55 2053      | 0                | 11,774         | 11,774           | 156,872          | 351,193           | 58,092           | 566,157           | 554,383           |
| 56 2054      | 0                | 11,774         | 11,774           | 156,872          | 351,193           | 58,092           | 566,157           | 554,383           |
| 57 2055      | 0                | 11,774         | 11,774           | 156,872          | 351,193           | 22,565           | 530,630           | 518,856           |
| 58 2056      | 0                | 11,774         | 11,774           | 156,872          | 351,193           | 22,565           | 530,630           | 518,856           |
| 59 2057      | 0                | 11,774         | 11,774           | 156,872          | 351,193           | 22,565           | 530,630           | 518,856           |
| 60 2058      | 0                | 11,774         | 11,774           | 156,872          | 351,193           | 22,565           | 530,630           | 518,856           |
| 61 2059      | 0                | 11,774         | 11,774           | 156,872          | 351,193           | 22,565           | 530,630           | 518,856           |
| <b>Total</b> | <b>2,805,308</b> | <b>588,700</b> | <b>3,394,068</b> | <b>7,843,600</b> | <b>16,854,027</b> | <b>1,412,456</b> | <b>26,110,093</b> | <b>22,716,085</b> |

| Discount Rate (%) | B-C   | PV(Cols. 1,000) |           |           |         |           | Benefit (Cols. 1,000) | NPV (Cols. 1,000) |
|-------------------|-------|-----------------|-----------|-----------|---------|-----------|-----------------------|-------------------|
|                   |       | Cost            | B1        | B2        | B3      | EIRR (%)  |                       |                   |
| 15                | -0.53 | 1,250,077       | 224,583   | 391,367   | 51,019  | 666,969   | -581,109              |                   |
| 12                | 0.78  | 1,453,543       | 374,508   | 680,847   | 80,333  | 1,135,688 | -317,856              |                   |
| 10                | 1.04  | 1,618,652       | 545,143   | 1,020,727 | 112,682 | 1,678,551 | 59,900                |                   |
| 5                 | 2.44  | 2,198,096       | 1,674,430 | 3,379,524 | 318,513 | 5,372,467 | 3,174,371             |                   |
| 3                 | 3.73  | 2,549,177       | 2,913,894 | 6,051,637 | 540,217 | 9,507,749 | 6,938,572             |                   |

**TABLE O3.1 REDUCTION IN NUMBER AND AREA OF INUNDATION ASSETS EXPECTED BY IMPLEMENTING THE PROJECT**

**Alt. I(O+J+U)-2-year Flood Control Plan  
(1) 1.05-Year Return Period**

| No.          | Water Depth (m) | Number of Buildings |            |            |              |                 | Agricultural Crops (ha) |            |            |              |              |
|--------------|-----------------|---------------------|------------|------------|--------------|-----------------|-------------------------|------------|------------|--------------|--------------|
|              |                 | Residence           |            |            |              | Stores & others | Total                   | Maize      | Sugar cane | Pasture      | Total        |
|              |                 | Medium              | Low        | Poor       | Total        |                 |                         |            |            |              |              |
| 1            | 0.0-0.25        | 61                  | 142        | 61         | 267          | 5               | 273                     | 139        | 210        | 876          | 1225         |
| 2            | 0.25-0.5        | 81                  | 189        | 86         | 356          | 7               | 363                     | 39         | 57         | 242          | 338          |
| 3            | 0.5-1.0         | 114                 | 267        | 121        | 502          | 10              | 512                     | 76         | 155        | 643          | 874          |
| 4            | 1.0-1.5         | 56                  | 132        | 60         | 247          | 5               | 252                     | 17         | 75         | 309          | 401          |
| 5            | 1.5-2.0         | 102                 | 255        | 116        | 480          | 10              | 489                     | 52         | 127        | 572          | 751          |
| <b>Total</b> |                 | <b>421</b>          | <b>981</b> | <b>447</b> | <b>1,852</b> | <b>37</b>       | <b>1,889</b>            | <b>323</b> | <b>624</b> | <b>2,642</b> | <b>3,589</b> |

**Alt. I(O+J+U)-2-year Flood Control Plan  
(2) 2-Year Return Period**

| No.          | Water Depth (m) | Number of Buildings |              |            |              |                 | Agricultural Crops (ha) |            |            |              |              |
|--------------|-----------------|---------------------|--------------|------------|--------------|-----------------|-------------------------|------------|------------|--------------|--------------|
|              |                 | Residence           |              |            |              | Stores & others | Total                   | Maize      | Sugar cane | Pasture      | Total        |
|              |                 | Medium              | Low          | Poor       | Total        |                 |                         |            |            |              |              |
| 1            | 0.0-0.25        | 167                 | 390          | 177        | 734          | 15              | 749                     | 137        | 144        | 633          | 914          |
| 2            | 0.25-0.5        | 134                 | 314          | 143        | 592          | 12              | 603                     | 111        | 131        | 573          | 818          |
| 3            | 0.5-1.0         | 198                 | 462          | 210        | 870          | 17              | 883                     | 166        | 223        | 949          | 1,338        |
| 4            | 1.0-1.5         | 95                  | 221          | 100        | 415          | 8               | 423                     | 64         | 115        | 486          | 665          |
| 5            | 1.5-2.0         | 138                 | 322          | 146        | 606          | 12              | 618                     | 73         | 160        | 719          | 952          |
| <b>Total</b> |                 | <b>732</b>          | <b>1,709</b> | <b>776</b> | <b>3,217</b> | <b>64</b>       | <b>3,282</b>            | <b>551</b> | <b>776</b> | <b>3,360</b> | <b>4,687</b> |

**Alt. I(O+J+U)-2-year Flood Control Plan  
(3) 5-Year Return Period**

| No.          | Water Depth (m) | Number of Buildings |              |            |              |                 | Agricultural Crops (ha) |            |            |              |              |
|--------------|-----------------|---------------------|--------------|------------|--------------|-----------------|-------------------------|------------|------------|--------------|--------------|
|              |                 | Residence           |              |            |              | Stores & others | Total                   | Maize      | Sugar cane | Pasture      | Total        |
|              |                 | Medium              | Low          | Poor       | Total        |                 |                         |            |            |              |              |
| 1            | 0.0-0.25        | 195                 | 454          | 206        | 855          | 17              | 872                     | 160        | 170        | 750          | 1,080        |
| 2            | 0.25-0.5        | 155                 | 361          | 164        | 679          | 14              | 693                     | 133        | 159        | 681          | 976          |
| 3            | 0.5-1.0         | 201                 | 468          | 213        | 882          | 18              | 900                     | 198        | 261        | 1,095        | 1,554        |
| 4            | 1.0-1.5         | 41                  | 97           | 44         | 183          | 4               | 186                     | 60         | 94         | 377          | 531          |
| 5            | 1.5-2.0         | 90                  | 211          | 96         | 398          | 8               | 406                     | 39         | 98         | 425          | 562          |
| <b>Total</b> |                 | <b>682</b>          | <b>1,592</b> | <b>722</b> | <b>2,996</b> | <b>60</b>       | <b>3,056</b>            | <b>590</b> | <b>782</b> | <b>3,331</b> | <b>4,703</b> |

**Alt. I(O+J+U)-2-year Flood Control Plan  
(4) 10-Year Return Period**

| No.          | Water Depth (m) | Number of Buildings |              |            |              |                 | Agricultural Crops (ha) |            |            |              |              |
|--------------|-----------------|---------------------|--------------|------------|--------------|-----------------|-------------------------|------------|------------|--------------|--------------|
|              |                 | Residence           |              |            |              | Stores & others | Total                   | Maize      | Sugar cane | Pasture      | Total        |
|              |                 | Medium              | Low          | Poor       | Total        |                 |                         |            |            |              |              |
| 1            | 0.0-0.25        | 237                 | 552          | 251        | 1,040        | 21              | 1,060                   | 173        | 174        | 780          | 1,127        |
| 2            | 0.25-0.5        | 268                 | 484          | 220        | 912          | 18              | 930                     | 156        | 186        | 801          | 1,143        |
| 3            | 0.5-1.0         | 288                 | 673          | 305        | 1,266        | 25              | 1,292                   | 253        | 335        | 1,410        | 1,999        |
| 4            | 1.0-1.5         | 81                  | 190          | 86         | 357          | 7               | 364                     | 92         | 143        | 550          | 815          |
| 5            | 1.5-2.0         | 102                 | 239          | 109        | 449          | 9               | 458                     | 41         | 110        | 470          | 624          |
| <b>Total</b> |                 | <b>915</b>          | <b>2,138</b> | <b>970</b> | <b>4,024</b> | <b>80</b>       | <b>4,105</b>            | <b>718</b> | <b>949</b> | <b>4,041</b> | <b>5,708</b> |

**Alt. I(O+J+U)-2-year Flood Control Plan  
(5) 20-Year Return Period**

| No.          | Water Depth (m) | Number of Buildings |              |              |              |                 | Agricultural Crops (ha) |            |              |              |              |
|--------------|-----------------|---------------------|--------------|--------------|--------------|-----------------|-------------------------|------------|--------------|--------------|--------------|
|              |                 | Residence           |              |              |              | Stores & others | Total                   | Maize      | Sugar cane   | Pasture      | Total        |
|              |                 | Medium              | Low          | Poor         | Total        |                 |                         |            |              |              |              |
| 1            | 0.0-0.25        | 241                 | 568          | 258          | 1,070        | 21              | 1,092                   | 159        | 126          | 596          | 881          |
| 2            | 0.25-0.5        | 247                 | 577          | 262          | 1,086        | 22              | 1,107                   | 173        | 200          | 866          | 1,239        |
| 3            | 0.5-1.0         | 363                 | 847          | 384          | 1,594        | 32              | 1,626                   | 309        | 415          | 1,740        | 2,464        |
| 4            | 1.0-1.5         | 129                 | 300          | 136          | 564          | 11              | 575                     | 136        | 209          | 851          | 1,206        |
| 5            | 1.5-2.0         | 119                 | 277          | 126          | 522          | 10              | 533                     | 58         | 146          | 614          | 818          |
| <b>Total</b> |                 | <b>1,101</b>        | <b>2,569</b> | <b>1,166</b> | <b>4,836</b> | <b>97</b>       | <b>4,933</b>            | <b>835</b> | <b>1,096</b> | <b>4,677</b> | <b>6,668</b> |

**Alt. I(O+J+U)-2-year Flood Control Plan  
(6) 50-Year Return Period**

| No.          | Water Depth (m) | Number of Buildings |              |            |              |                 | Agricultural Crops (ha) |            |            |              |              |
|--------------|-----------------|---------------------|--------------|------------|--------------|-----------------|-------------------------|------------|------------|--------------|--------------|
|              |                 | Residence           |              |            |              | Stores & others | Total                   | Maize      | Sugar cane | Pasture      | Total        |
|              |                 | Medium              | Low          | Poor       | Total        |                 |                         |            |            |              |              |
| 1            | 0.0-0.25        | 0                   | 0            | 0          | 0            | 0               | 0                       | 37         | 0          | 0            | 37           |
| 2            | 0.25-0.5        | 244                 | 570          | 258        | 1,072        | 21              | 1,094                   | 73         | 0          | 22           | 95           |
| 3            | 0.5-1.0         | 375                 | 874          | 397        | 1,645        | 33              | 1,678                   | 330        | 428        | 1,796        | 2,554        |
| 4            | 1.0-1.5         | 168                 | 392          | 178        | 733          | 15              | 753                     | 156        | 242        | 1,008        | 1,416        |
| 5            | 1.5-2.0         | 147                 | 344          | 156        | 647          | 13              | 660                     | 85         | 203        | 841          | 1,129        |
| <b>Total</b> |                 | <b>934</b>          | <b>2,179</b> | <b>989</b> | <b>4,102</b> | <b>82</b>       | <b>4,184</b>            | <b>691</b> | <b>873</b> | <b>3,667</b> | <b>5,231</b> |

**Alt. I(O+J+U)-2-year Flood Control Plan  
(7) 100-Year Return Period**

| No.          | Water Depth (m) | Number of Buildings |              |              |              |                 | Agricultural Crops (ha) |            |            |              |              |
|--------------|-----------------|---------------------|--------------|--------------|--------------|-----------------|-------------------------|------------|------------|--------------|--------------|
|              |                 | Residence           |              |              |              | Stores & others | Total                   | Maize      | Sugar cane | Pasture      | Total        |
|              |                 | Medium              | Low          | Poor         | Total        |                 |                         |            |            |              |              |
| 1            | 0.0-0.25        | 0                   | 0            | 0            | 0            | 0               | 0                       | 37         | 0          | 0            | 37           |
| 2            | 0.25-0.5        | 263                 | 612          | 278          | 1,152        | 23              | 1,175                   | 37         | 0          | 0            | 37           |
| 3            | 0.5-1.0         | 410                 | 958          | 435          | 1,803        | 36              | 1,839                   | 338        | 418        | 1,766        | 2,522        |
| 4            | 1.0-1.5         | 190                 | 412          | 201          | 803          | 17              | 850                     | 183        | 241        | 1,026        | 1,450        |
| 5            | 1.5-2.0         | 162                 | 377          | 171          | 709          | 14              | 723                     | 75         | 196        | 803          | 1,074        |
| <b>Total</b> |                 | <b>1,024</b>        | <b>2,388</b> | <b>1,084</b> | <b>4,497</b> | <b>90</b>       | <b>4,587</b>            | <b>670</b> | <b>855</b> | <b>3,593</b> | <b>5,120</b> |

**TABLE O3.2 REDUCTION IN NUMBER AND AREA OF INUNDATION ASSETS EXPECTED BY IMPLEMENTING THE PROJECT**

**Alt. II (J+U)**  
**(1) 1.65-Year Return Period**

| No.   | Water Depth (m) | Number of Buildings |     |      |       |                 | Agricultural Crops (ha) |       |            |         |       |
|-------|-----------------|---------------------|-----|------|-------|-----------------|-------------------------|-------|------------|---------|-------|
|       |                 | Residence           |     |      |       | Stores & others | Total                   | Maize | Sugar cane | Pasture | Total |
|       |                 | Medium              | Low | Poor | Total |                 |                         |       |            |         |       |
| 1     | 0.0-0.25        | 37                  | 86  | 39   | 162   | 3               | 166                     | 43    | 39         | 194     | 276   |
| 2     | 0.25-0.5        | 23                  | 55  | 23   | 102   | 2               | 104                     | 23    | 30         | 142     | 195   |
| 3     | 0.5-1.0         | 39                  | 92  | 42   | 173   | 3               | 176                     | 16    | 46         | 203     | 265   |
| 4     | 1.0-1.5         | 35                  | 82  | 37   | 154   | 3               | 157                     | 6     | 35         | 149     | 190   |
| 5     | 1.5-2.0         | 97                  | 228 | 104  | 428   | 9               | 437                     | 54    | 105        | 493     | 642   |
| Total |                 | 232                 | 542 | 245  | 1,020 | 20              | 1,040                   | 142   | 255        | 1,171   | 1,568 |

**Alt. II (J+U)**  
**(2) 2-Year Return Period**

| No.   | Water Depth (m) | Number of Buildings |     |      |       |                 | Agricultural Crops (ha) |       |            |         |       |
|-------|-----------------|---------------------|-----|------|-------|-----------------|-------------------------|-------|------------|---------|-------|
|       |                 | Residence           |     |      |       | Stores & others | Total                   | Maize | Sugar cane | Pasture | Total |
|       |                 | Medium              | Low | Poor | Total |                 |                         |       |            |         |       |
| 1     | 0.0-0.25        | 75                  | 174 | 79   | 328   | 7               | 335                     | 87    | 55         | 293     | 435   |
| 2     | 0.25-0.5        | 56                  | 131 | 60   | 246   | 5               | 251                     | 62    | 45         | 233     | 340   |
| 3     | 0.5-1.0         | 83                  | 194 | 88   | 365   | 7               | 373                     | 84    | 73         | 368     | 525   |
| 4     | 1.0-1.5         | 43                  | 99  | 45   | 188   | 4               | 191                     | 27    | 45         | 207     | 279   |
| 5     | 1.5-2.0         | 114                 | 267 | 121  | 502   | 10              | 512                     | 53    | 123        | 557     | 733   |
| Total |                 | 371                 | 865 | 393  | 1,630 | 33              | 1,662                   | 313   | 341        | 1,658   | 2,312 |

**Alt. II (J+U)**  
**(3) 5-Year Return Period**

| No.   | Water Depth (m) | Number of Buildings |       |      |       |                 | Agricultural Crops (ha) |       |            |         |       |
|-------|-----------------|---------------------|-------|------|-------|-----------------|-------------------------|-------|------------|---------|-------|
|       |                 | Residence           |       |      |       | Stores & others | Total                   | Maize | Sugar cane | Pasture | Total |
|       |                 | Medium              | Low   | Poor | Total |                 |                         |       |            |         |       |
| 1     | 0.0-0.25        | 89                  | 208   | 95   | 391   | 8               | 399                     | 99    | 59         | 321     | 479   |
| 2     | 0.25-0.5        | 68                  | 159   | 72   | 299   | 6               | 305                     | 72    | 48         | 253     | 373   |
| 3     | 0.5-1.0         | 104                 | 242   | 109  | 454   | 9               | 463                     | 98    | 80         | 406     | 584   |
| 4     | 1.0-1.5         | 52                  | 120   | 55   | 227   | 5               | 231                     | 34    | 52         | 242     | 328   |
| 5     | 1.5-2.0         | 142                 | 332   | 151  | 624   | 12              | 637                     | 60    | 144        | 648     | 852   |
| Total |                 | 454                 | 1,061 | 481  | 1,996 | 40              | 2,036                   | 363   | 383        | 1,870   | 2,616 |

**Alt. II (J+U)**  
**(4) 10-Year Return Period**

| No.   | Water Depth (m) | Number of Buildings |       |      |       |                 | Agricultural Crops (ha) |       |            |         |       |
|-------|-----------------|---------------------|-------|------|-------|-----------------|-------------------------|-------|------------|---------|-------|
|       |                 | Residence           |       |      |       | Stores & others | Total                   | Maize | Sugar cane | Pasture | Total |
|       |                 | Medium              | Low   | Poor | Total |                 |                         |       |            |         |       |
| 1     | 0.0-0.25        | 99                  | 232   | 105  | 436   | 9               | 445                     | 113   | 64         | 354     | 531   |
| 2     | 0.25-0.5        | 76                  | 178   | 81   | 335   | 7               | 341                     | 82    | 51         | 277     | 410   |
| 3     | 0.5-1.0         | 118                 | 274   | 125  | 517   | 10              | 527                     | 115   | 86         | 443     | 644   |
| 4     | 1.0-1.5         | 57                  | 132   | 60   | 249   | 5               | 254                     | 43    | 58         | 274     | 375   |
| 5     | 1.5-2.0         | 155                 | 361   | 164  | 690   | 14              | 703                     | 63    | 153        | 688     | 904   |
| Total |                 | 505                 | 1,177 | 534  | 2,216 | 44              | 2,261                   | 416   | 412        | 2,036   | 2,864 |

**Alt. II (J+U)**  
**(5) 20-Year Return Period**

| No.   | Water Depth (m) | Number of Buildings |       |      |       |                 | Agricultural Crops (ha) |       |            |         |       |
|-------|-----------------|---------------------|-------|------|-------|-----------------|-------------------------|-------|------------|---------|-------|
|       |                 | Residence           |       |      |       | Stores & others | Total                   | Maize | Sugar cane | Pasture | Total |
|       |                 | Medium              | Low   | Poor | Total |                 |                         |       |            |         |       |
| 1     | 0.0-0.25        | 109                 | 255   | 116  | 480   | 10              | 489                     | 124   | 61         | 347     | 532   |
| 2     | 0.25-0.5        | 78                  | 182   | 83   | 342   | 7               | 349                     | 97    | 60         | 322     | 479   |
| 3     | 0.5-1.0         | 126                 | 294   | 134  | 554   | 11              | 565                     | 130   | 87         | 461     | 678   |
| 4     | 1.0-1.5         | 64                  | 150   | 68   | 282   | 6               | 288                     | 58    | 69         | 330     | 457   |
| 5     | 1.5-2.0         | 174                 | 398   | 181  | 749   | 15              | 764                     | 71    | 176        | 788     | 1,035 |
| Total |                 | 548                 | 1,278 | 580  | 2,407 | 49              | 2,455                   | 480   | 453        | 2,248   | 3,181 |

**Alt. II (J+U)**  
**(6) 50-Year Return Period**

| No.   | Water Depth (m) | Number of Buildings |       |      |       |                 | Agricultural Crops (ha) |       |            |         |       |
|-------|-----------------|---------------------|-------|------|-------|-----------------|-------------------------|-------|------------|---------|-------|
|       |                 | Residence           |       |      |       | Stores & others | Total                   | Maize | Sugar cane | Pasture | Total |
|       |                 | Medium              | Low   | Poor | Total |                 |                         |       |            |         |       |
| 1     | 0.0-0.25        | 109                 | 255   | 116  | 480   | 10              | 489                     | 142   | 68         | 392     | 602   |
| 2     | 0.25-0.5        | 81                  | 189   | 86   | 356   | 7               | 363                     | 109   | 55         | 313     | 477   |
| 3     | 0.5-1.0         | 139                 | 324   | 147  | 610   | 12              | 622                     | 142   | 85         | 457     | 684   |
| 4     | 1.0-1.5         | 77                  | 179   | 81   | 337   | 7               | 344                     | 75    | 79         | 388     | 542   |
| 5     | 1.5-2.0         | 181                 | 422   | 192  | 795   | 16              | 810                     | 76    | 194        | 867     | 1,137 |
| Total |                 | 587                 | 1,359 | 622  | 2,577 | 52              | 2,629                   | 544   | 481        | 2,417   | 3,442 |

**Alt. II (J+U)**  
**(7) 100-Year Return Period**

| No.   | Water Depth (m) | Number of Buildings |       |      |       |                 | Agricultural Crops (ha) |       |            |         |       |
|-------|-----------------|---------------------|-------|------|-------|-----------------|-------------------------|-------|------------|---------|-------|
|       |                 | Residence           |       |      |       | Stores & others | Total                   | Maize | Sugar cane | Pasture | Total |
|       |                 | Medium              | Low   | Poor | Total |                 |                         |       |            |         |       |
| 1     | 0.0-0.25        | 135                 | 316   | 144  | 594   | 12              | 606                     | 142   | 69         | 392     | 603   |
| 2     | 0.25-0.5        | 81                  | 188   | 85   | 354   | 7               | 361                     | 142   | 69         | 392     | 603   |
| 3     | 0.5-1.0         | 146                 | 342   | 155  | 643   | 13              | 657                     | 155   | 84         | 463     | 702   |
| 4     | 1.0-1.5         | 83                  | 195   | 88   | 366   | 7               | 373                     | 99    | 89         | 445     | 634   |
| 5     | 1.5-2.0         | 191                 | 447   | 202  | 840   | 17              | 857                     | 73    | 203        | 902     | 1,178 |
| Total |                 | 636                 | 1,458 | 675  | 2,799 | 56              | 2,855                   | 611   | 514        | 2,595   | 3,720 |

**TABLE O3.3 REDUCTION IN NUMBER AND AREA OF INUNDATION ASSETS EXPECTED BY IMPLEMENTING THE PROJECT**

**Alt. III (U)**  
**(1) 1.05-Year Return Period**

| No.   | Water Depth (m) | Number of Buildings |     |      |       | Stores & others | Total | Agricultural Crops (ha) |            |         |       | Total |
|-------|-----------------|---------------------|-----|------|-------|-----------------|-------|-------------------------|------------|---------|-------|-------|
|       |                 | Residence           |     |      | Total |                 |       | Maize                   | Sugar cane | Pasture | Total |       |
|       |                 | Medium              | Low | Poor |       |                 |       |                         |            |         |       |       |
| 1     | 0.0-0.25        | 14                  | 33  | 15   | 62    | 1               | 63    | 30                      | 12         | 69      | 111   |       |
| 2     | 0.25-0.5        | 7                   | 17  | 8    | 32    | 1               | 32    | 17                      | 6          | 39      | 62    |       |
| 3     | 0.5-1.0         | 9                   | 21  | 10   | 40    | 1               | 41    | 17                      | 7          | 40      | 64    |       |
| 4     | 1.0-1.5         | 2                   | 4   | 2    | 8     | 0               | 9     | 3                       | 2          | 8       | 13    |       |
| 5     | 1.5-2.0         | 0                   | 1   | 0    | 1     | 0               | 1     | 1                       | 1          | 2       | 4     |       |
| Total |                 | 32                  | 76  | 34   | 142   | 3               | 145   | 68                      | 28         | 153     | 254   |       |

**Alt. III (U)**  
**(2) 2-Year Return Period**

| No.   | Water Depth (m) | Number of Buildings |     |      |       | Stores & others | Total | Agricultural Crops (ha) |            |         |       | Total |
|-------|-----------------|---------------------|-----|------|-------|-----------------|-------|-------------------------|------------|---------|-------|-------|
|       |                 | Residence           |     |      | Total |                 |       | Maize                   | Sugar cane | Pasture | Total |       |
|       |                 | Medium              | Low | Poor |       |                 |       |                         |            |         |       |       |
| 1     | 0.0-0.25        | 38                  | 88  | 40   | 166   | 3               | 169   | 72                      | 27         | 164     | 263   |       |
| 2     | 0.25-0.5        | 30                  | 71  | 32   | 133   | 3               | 136   | 46                      | 17         | 104     | 167   |       |
| 3     | 0.5-1.0         | 45                  | 105 | 48   | 197   | 4               | 201   | 74                      | 27         | 168     | 269   |       |
| 4     | 1.0-1.5         | 18                  | 41  | 19   | 78    | 2               | 79    | 35                      | 13         | 79      | 127   |       |
| 5     | 1.5-2.0         | 5                   | 11  | 5    | 21    | 0               | 21    | 11                      | 3          | 22      | 36    |       |
| Total |                 | 135                 | 316 | 144  | 595   | 12              | 607   | 238                     | 87         | 537     | 862   |       |

**Alt. III (U)**  
**(3) 5-Year Return Period**

| No.   | Water Depth (m) | Number of Buildings |     |      |       | Stores & others | Total | Agricultural Crops (ha) |            |         |       | Total |
|-------|-----------------|---------------------|-----|------|-------|-----------------|-------|-------------------------|------------|---------|-------|-------|
|       |                 | Residence           |     |      | Total |                 |       | Maize                   | Sugar cane | Pasture | Total |       |
|       |                 | Medium              | Low | Poor |       |                 |       |                         |            |         |       |       |
| 1     | 0.0-0.25        | 48                  | 112 | 51   | 211   | 4               | 216   | 80                      | 29         | 184     | 293   |       |
| 2     | 0.25-0.5        | 32                  | 74  | 34   | 140   | 3               | 143   | 55                      | 20         | 123     | 199   |       |
| 3     | 0.5-1.0         | 45                  | 104 | 47   | 195   | 4               | 199   | 71                      | 27         | 164     | 262   |       |
| 4     | 1.0-1.5         | 15                  | 34  | 15   | 64    | 1               | 66    | 28                      | 10         | 63      | 101   |       |
| 5     | 1.5-2.0         | 5                   | 11  | 5    | 20    | 0               | 21    | 6                       | 3          | 15      | 24    |       |
| Total |                 | 145                 | 335 | 152  | 631   | 13              | 644   | 240                     | 89         | 550     | 879   |       |

**Alt. III (U)**  
**(4) 10-Year Return Period**

| No.   | Water Depth (m) | Number of Buildings |     |      |       | Stores & others | Total | Agricultural Crops (ha) |            |         |       | Total |
|-------|-----------------|---------------------|-----|------|-------|-----------------|-------|-------------------------|------------|---------|-------|-------|
|       |                 | Residence           |     |      | Total |                 |       | Maize                   | Sugar cane | Pasture | Total |       |
|       |                 | Medium              | Low | Poor |       |                 |       |                         |            |         |       |       |
| 1     | 0.0-0.25        | 60                  | 139 | 63   | 261   | 5               | 266   | 98                      | 36         | 224     | 358   |       |
| 2     | 0.25-0.5        | 38                  | 88  | 40   | 166   | 3               | 169   | 66                      | 24         | 152     | 242   |       |
| 3     | 0.5-1.0         | 50                  | 118 | 53   | 221   | 4               | 226   | 85                      | 31         | 191     | 397   |       |
| 4     | 1.0-1.5         | 13                  | 29  | 13   | 55    | 1               | 56    | 27                      | 10         | 61      | 98    |       |
| 5     | 1.5-2.0         | 3                   | 7   | 3    | 13    | 0               | 13    | 1                       | 0          | 3       | 4     |       |
| Total |                 | 163                 | 381 | 172  | 716   | 14              | 730   | 277                     | 101        | 631     | 1039  |       |

**Alt. III (U)**  
**(5) 20-Year Return Period**

| No.   | Water Depth (m) | Number of Buildings |     |      |       | Stores & others | Total | Agricultural Crops (ha) |            |         |       | Total |
|-------|-----------------|---------------------|-----|------|-------|-----------------|-------|-------------------------|------------|---------|-------|-------|
|       |                 | Residence           |     |      | Total |                 |       | Maize                   | Sugar cane | Pasture | Total |       |
|       |                 | Medium              | Low | Poor |       |                 |       |                         |            |         |       |       |
| 1     | 0.0-0.25        | 68                  | 158 | 71   | 297   | 6               | 303   | 115                     | 42         | 263     | 420   |       |
| 2     | 0.25-0.5        | 41                  | 97  | 44   | 182   | 4               | 186   | 81                      | 30         | 187     | 298   |       |
| 3     | 0.5-1.0         | 55                  | 127 | 57   | 239   | 5               | 244   | 101                     | 37         | 229     | 367   |       |
| 4     | 1.0-1.5         | 11                  | 25  | 11   | 46    | 1               | 47    | 32                      | 11         | 72      | 115   |       |
| 5     | 1.5-2.0         | 0                   | 0   | 0    | 0     | 0               | 0     | 0                       | 0          | 0       | 0     |       |
| Total |                 | 174                 | 406 | 184  | 764   | 15              | 780   | 329                     | 120        | 751     | 1209  |       |

**Alt. III (U)**  
**(6) 50-Year Return Period**

| No.   | Water Depth (m) | Number of Buildings |     |      |       | Stores & others | Total | Agricultural Crops (ha) |            |         |       | Total |
|-------|-----------------|---------------------|-----|------|-------|-----------------|-------|-------------------------|------------|---------|-------|-------|
|       |                 | Residence           |     |      | Total |                 |       | Maize                   | Sugar cane | Pasture | Total |       |
|       |                 | Medium              | Low | Poor |       |                 |       |                         |            |         |       |       |
| 1     | 0.0-0.25        | 81                  | 189 | 85   | 356   | 7               | 363   | 132                     | 49         | 303     | 481   |       |
| 2     | 0.25-0.5        | 49                  | 114 | 52   | 215   | 4               | 219   | 101                     | 37         | 231     | 369   |       |
| 3     | 0.5-1.0         | 67                  | 155 | 70   | 291   | 6               | 297   | 121                     | 45         | 276     | 442   |       |
| 4     | 1.0-1.5         | 11                  | 27  | 12   | 50    | 1               | 51    | 43                      | 15         | 98      | 156   |       |
| 5     | 1.5-2.0         | 0                   | 0   | 0    | 0     | 0               | 0     | 0                       | 0          | 0       | 0     |       |
| Total |                 | 208                 | 484 | 219  | 911   | 18              | 930   | 397                     | 146        | 958     | 1451  |       |

**Alt. III (U)**  
**(7) 100-Year Return Period**

| No.   | Water Depth (m) | Number of Buildings |     |      |       | Stores & others | Total | Agricultural Crops (ha) |            |         |       | Total |
|-------|-----------------|---------------------|-----|------|-------|-----------------|-------|-------------------------|------------|---------|-------|-------|
|       |                 | Residence           |     |      | Total |                 |       | Maize                   | Sugar cane | Pasture | Total |       |
|       |                 | Medium              | Low | Poor |       |                 |       |                         |            |         |       |       |
| 1     | 0.0-0.25        | 106                 | 245 | 112  | 464   | 9               | 473   | 132                     | 50         | 303     | 485   |       |
| 2     | 0.25-0.5        | 53                  | 123 | 56   | 232   | 5               | 237   | 133                     | 50         | 303     | 485   |       |
| 3     | 0.5-1.0         | 78                  | 182 | 83   | 343   | 7               | 350   | 140                     | 52         | 318     | 519   |       |
| 4     | 1.0-1.5         | 10                  | 23  | 11   | 43    | 1               | 44    | 69                      | 25         | 155     | 250   |       |
| 5     | 1.5-2.0         | 0                   | 0   | 0    | 0     | 0               | 0     | 0                       | 0          | 0       | 0     |       |
| Total |                 | 247                 | 575 | 261  | 1083  | 22              | 1105  | 474                     | 177        | 1080    | 1731  |       |

TABLE O3.4(D-2) ESTIMATE OF ECONOMIC COST

Priority Project-Mt. I(O+J+L)-2-year Flood Control Plan

(1) Financial Cost

| 1999 |                      | Unit: Cols. Million |       |       |
|------|----------------------|---------------------|-------|-------|
| No.  | Specification        | I.C.                | F.C.  | Total |
| 1    | Construction Cost    | 0.00                | 0.00  | 0.00  |
| 2    | Land Acquisition     | 0.00                | 0.00  | 0.00  |
| 3    | Administration Cost  | 0.00                | 0.00  | 0.00  |
| 4    | Engineering Fee      | 7.53                | 12.84 | 20.37 |
| 5    | Physical Contingency | 0.75                | 1.28  | 2.04  |
|      | Sub-total            | 8.28                | 14.12 | 22.41 |
| 6    | Price Contingency    | 1.02                | 0.86  | 1.88  |
|      | Total                | 9.30                | 14.98 | 24.29 |

(2) Economic Cost

| 1999 |                      | Unit: Cols. Million |       |       |
|------|----------------------|---------------------|-------|-------|
| No.  | Specification        | I.C.                | F.C.  | Total |
| 1    | Construction Cost    | 0.00                | 0.00  | 0.00  |
| 2    | Land Acquisition     | 0.00                | 0.00  | 0.00  |
| 3    | Administration Cost  | 0.00                | 0.00  | 0.00  |
| 4    | Engineering Fee      | 6.66                | 12.84 | 19.50 |
| 5    | Physical Contingency | 0.67                | 1.28  | 1.95  |
|      | Sub-total            | 7.33                | 14.12 | 21.45 |
| 6    | Price Contingency    | 0.00                | 0.00  | 0.00  |
|      | Total                | 7.33                | 14.12 | 21.45 |

| 2000 |                      | Unit: Cols. Million |      |       |
|------|----------------------|---------------------|------|-------|
| No.  | Specification        | I.C.                | F.C. | Total |
| 1    | Construction Cost    | 0.00                | 0.00 | 0.00  |
| 2    | Land Acquisition     | 4.80                | 0.00 | 4.80  |
| 3    | Administration Cost  | 0.24                | 0.00 | 0.24  |
| 4    | Engineering Fee      | 2.01                | 3.42 | 5.43  |
| 5    | Physical Contingency | 0.71                | 0.31 | 1.05  |
|      | Sub-total            | 7.76                | 3.76 | 11.52 |
| 6    | Price Contingency    | 1.48                | 0.35 | 1.83  |
|      | Total                | 9.24                | 4.11 | 13.35 |

| 2000 |                      | Unit: Cols. Million |      |       |
|------|----------------------|---------------------|------|-------|
| No.  | Specification        | I.C.                | F.C. | Total |
| 1    | Construction Cost    | 0.00                | 0.00 | 0.00  |
| 2    | Land Acquisition     | 3.67                | 0.00 | 3.67  |
| 3    | Administration Cost  | 0.21                | 0.00 | 0.21  |
| 4    | Engineering Fee      | 1.78                | 3.42 | 5.20  |
| 5    | Physical Contingency | 0.57                | 0.31 | 0.91  |
|      | Sub-total            | 6.23                | 3.76 | 9.99  |
| 6    | Price Contingency    | 0.00                | 0.00 | 0.00  |
|      | Total                | 6.23                | 3.76 | 9.99  |

| 2001 |                      | Unit: Cols. Million |       |        |
|------|----------------------|---------------------|-------|--------|
| No.  | Specification        | I.C.                | F.C.  | Total  |
| 1    | Construction Cost    | 42.06               | 44.68 | 86.74  |
| 2    | Land Acquisition     | 4.80                | 0.00  | 4.80   |
| 3    | Administration Cost  | 4.58                | 0.00  | 4.58   |
| 4    | Engineering Fee      | 3.11                | 5.31  | 8.42   |
| 5    | Physical Contingency | 5.46                | 5.00  | 10.45  |
|      | Sub-total            | 60.01               | 54.99 | 114.99 |
| 6    | Price Contingency    | 15.75               | 6.90  | 22.65  |
|      | Total                | 75.76               | 61.89 | 137.64 |

| 2001 |                      | Unit: Cols. Million |       |        |
|------|----------------------|---------------------|-------|--------|
| No.  | Specification        | I.C.                | F.C.  | Total  |
| 1    | Construction Cost    | 33.59               | 44.68 | 78.27  |
| 2    | Land Acquisition     | 3.67                | 0.00  | 3.67   |
| 3    | Administration Cost  | 4.05                | 0.00  | 4.05   |
| 4    | Engineering Fee      | 2.75                | 5.31  | 8.06   |
| 5    | Physical Contingency | 4.41                | 5.00  | 9.41   |
|      | Sub-total            | 48.47               | 54.99 | 103.46 |
| 6    | Price Contingency    | 0.00                | 0.00  | 0.00   |
|      | Total                | 48.47               | 54.99 | 103.46 |

| 2002 |                      | Unit: Cols. Million |       |        |
|------|----------------------|---------------------|-------|--------|
| No.  | Specification        | I.C.                | F.C.  | Total  |
| 1    | Construction Cost    | 42.06               | 44.68 | 86.74  |
| 2    | Land Acquisition     | 4.80                | 0.00  | 4.80   |
| 3    | Administration Cost  | 4.58                | 0.00  | 4.58   |
| 4    | Engineering Fee      | 3.11                | 5.31  | 8.42   |
| 5    | Physical Contingency | 5.46                | 5.00  | 10.45  |
|      | Sub-total            | 60.01               | 54.99 | 114.99 |
| 6    | Price Contingency    | 20.30               | 8.76  | 29.06  |
|      | Total                | 80.31               | 63.75 | 144.05 |

| 2002 |                      | Unit: Cols. Million |       |        |
|------|----------------------|---------------------|-------|--------|
| No.  | Specification        | I.C.                | F.C.  | Total  |
| 1    | Construction Cost    | 33.59               | 44.68 | 78.27  |
| 2    | Land Acquisition     | 3.67                | 0.00  | 3.67   |
| 3    | Administration Cost  | 4.05                | 0.00  | 4.05   |
| 4    | Engineering Fee      | 2.75                | 5.31  | 8.06   |
| 5    | Physical Contingency | 4.41                | 5.00  | 9.41   |
|      | Sub-total            | 48.47               | 54.99 | 103.46 |
| 6    | Price Contingency    | 0.00                | 0.00  | 0.00   |
|      | Total                | 48.47               | 54.99 | 103.46 |

| 2003 |                      | Unit: Cols. Million |       |        |
|------|----------------------|---------------------|-------|--------|
| No.  | Specification        | I.C.                | F.C.  | Total  |
| 1    | Construction Cost    | 42.06               | 44.68 | 86.74  |
| 2    | Land Acquisition     | 4.80                | 0.00  | 4.80   |
| 3    | Administration Cost  | 4.58                | 0.00  | 4.58   |
| 4    | Engineering Fee      | 3.11                | 5.31  | 8.42   |
| 5    | Physical Contingency | 5.46                | 5.00  | 10.45  |
|      | Sub-total            | 60.01               | 54.99 | 114.99 |
| 6    | Price Contingency    | 25.11               | 10.67 | 35.78  |
|      | Total                | 85.12               | 65.66 | 150.77 |

| 2003 |                      | Unit: Cols. Million |       |        |
|------|----------------------|---------------------|-------|--------|
| No.  | Specification        | I.C.                | F.C.  | Total  |
| 1    | Construction Cost    | 33.59               | 44.68 | 78.27  |
| 2    | Land Acquisition     | 3.67                | 0.00  | 3.67   |
| 3    | Administration Cost  | 4.05                | 0.00  | 4.05   |
| 4    | Engineering Fee      | 2.75                | 5.31  | 8.06   |
| 5    | Physical Contingency | 4.41                | 5.00  | 9.41   |
|      | Sub-total            | 48.47               | 54.99 | 103.46 |
| 6    | Price Contingency    | 0.00                | 0.00  | 0.00   |
|      | Total                | 48.47               | 54.99 | 103.46 |

| 2004 |                      | Unit: Cols. Million |       |        |
|------|----------------------|---------------------|-------|--------|
| No.  | Specification        | I.C.                | F.C.  | Total  |
| 1    | Construction Cost    | 42.06               | 44.68 | 86.74  |
| 2    | Land Acquisition     | 0.00                | 0.00  | 0.00   |
| 3    | Administration Cost  | 4.34                | 0.00  | 4.34   |
| 4    | Engineering Fee      | 3.11                | 5.31  | 8.42   |
| 5    | Physical Contingency | 4.95                | 5.00  | 9.95   |
|      | Sub-total            | 54.46               | 54.99 | 109.45 |
| 6    | Price Contingency    | 27.43               | 12.64 | 40.07  |
|      | Total                | 81.89               | 67.63 | 149.52 |

| 2004 |                      | Unit: Cols. Million |       |       |
|------|----------------------|---------------------|-------|-------|
| No.  | Specification        | I.C.                | F.C.  | Total |
| 1    | Construction Cost    | 33.59               | 44.68 | 78.27 |
| 2    | Land Acquisition     | 0.00                | 0.00  | 0.00  |
| 3    | Administration Cost  | 3.84                | 0.00  | 3.84  |
| 4    | Engineering Fee      | 2.75                | 5.31  | 8.06  |
| 5    | Physical Contingency | 4.02                | 5.00  | 9.02  |
|      | Sub-total            | 44.20               | 54.99 | 99.19 |
| 6    | Price Contingency    | 0.00                | 0.00  | 0.00  |
|      | Total                | 44.20               | 54.99 | 99.19 |

| 2005 |                      | Unit: Cols. Million |       |        |
|------|----------------------|---------------------|-------|--------|
| No.  | Specification        | I.C.                | F.C.  | Total  |
| 1    | Construction Cost    | 42.06               | 44.68 | 86.74  |
| 2    | Land Acquisition     | 0.00                | 0.00  | 0.00   |
| 3    | Administration Cost  | 4.29                | 0.00  | 4.29   |
| 4    | Engineering Fee      | 3.11                | 5.31  | 8.42   |
| 5    | Physical Contingency | 4.95                | 5.00  | 9.95   |
|      | Sub-total            | 54.41               | 54.99 | 109.40 |
| 6    | Price Contingency    | 32.30               | 14.66 | 46.96  |
|      | Total                | 86.71               | 69.65 | 156.36 |

| 2005 |                      | Unit: Cols. Million |       |       |
|------|----------------------|---------------------|-------|-------|
| No.  | Specification        | I.C.                | F.C.  | Total |
| 1    | Construction Cost    | 33.59               | 44.68 | 78.27 |
| 2    | Land Acquisition     | 0.00                | 0.00  | 0.00  |
| 3    | Administration Cost  | 3.80                | 0.00  | 3.80  |
| 4    | Engineering Fee      | 2.75                | 5.31  | 8.06  |
| 5    | Physical Contingency | 4.01                | 5.00  | 9.01  |
|      | Sub-total            | 44.15               | 54.99 | 99.14 |
| 6    | Price Contingency    | 0.00                | 0.00  | 0.00  |
|      | Total                | 44.15               | 54.99 | 99.14 |

TABLE O3.4 (2/2) ESTIMATE OF ECONOMIC COST

Priority Project-Mt. I (O+J+U)-2-year Flood Control Plan

(1) Financial Cost

| Total | No. | Specification        | Unit: Cols Million |        | Total          |
|-------|-----|----------------------|--------------------|--------|----------------|
|       |     |                      | I. C.              | F.C.   |                |
|       | 1   | Construction Cost    | 210.30             | 223.40 | 433.70         |
|       | 2   | Land Acquisition     | 19.20              | 0.00   | 19.20          |
|       | 3   | Administration Cost  | 22.61              | 0.00   | 22.61          |
|       | 4   | Engineering Fee      | 25.09              | 42.81  | 67.90          |
|       | 5   | Physical Contingency | 27.72              | 26.62  | 54.34          |
|       |     | Sub-total            | 304.92             | 292.83 | 597.75         |
|       | 6   | Price Contingency    | 123.39             | 54.84  | 178.23         |
|       |     | Total                | 428.31             | 347.67 | 775.98         |
|       |     |                      |                    |        | OM Cost<br>403 |

(2) Economic Cost

| Total | No. | Specification        | Unit: Cols Million |        | Total          |
|-------|-----|----------------------|--------------------|--------|----------------|
|       |     |                      | I. C.              | F.C.   |                |
|       | 1   | Construction Cost    | 167.94             | 223.40 | 391.34         |
|       | 2   | Land Acquisition     | 14.68              | 0.00   | 14.68          |
|       | 3   | Administration Cost  | 20.01              | 0.00   | 20.01          |
|       | 4   | Engineering Fee      | 22.20              | 42.81  | 65.01          |
|       | 5   | Physical Contingency | 22.48              | 26.62  | 49.10          |
|       |     | Sub-total            | 247.32             | 292.83 | 540.15         |
|       | 6   | Price Contingency    | 0.00               | 0.00   | 0.00           |
|       |     | Total                | 247.32             | 292.83 | 540.15         |
|       |     |                      |                    |        | OM Cost<br>215 |

TABLE O3.5 (1/2) ESTIMATE OF ECONOMIC COST

Priority Project-Alt II (1/1)

(1) Financial Cost

| 1999 |                      | Unit : Cols. Million |      |       |
|------|----------------------|----------------------|------|-------|
| No.  | Specification        | I.C.                 | F.C. | Total |
| 1    | Construction Cost    | 0.00                 | 0.00 | 0.00  |
| 2    | Land Acquisition     | 0.00                 | 0.00 | 0.00  |
| 3    | Administration Cost  | 0.00                 | 0.00 | 0.00  |
| 4    | Engineering Fee      | 2.97                 | 5.04 | 8.01  |
| 5    | Physical Contingency | 0.30                 | 0.50 | 0.80  |
|      | Sub-total            | 3.27                 | 5.54 | 8.81  |
| 6    | Price Contingency    | 0.49                 | 0.34 | 0.74  |
|      | Total                | 3.67                 | 5.88 | 9.55  |

OM Cost  
0.00

| 2000 |                      | Unit : Cols. Million |      |       |
|------|----------------------|----------------------|------|-------|
| No.  | Specification        | I.C.                 | F.C. | Total |
| 1    | Construction Cost    | 0.00                 | 0.00 | 0.00  |
| 2    | Land Acquisition     | 2.63                 | 0.00 | 2.63  |
| 3    | Administration Cost  | 0.13                 | 0.00 | 0.13  |
| 4    | Engineering Fee      | 0.79                 | 1.34 | 2.13  |
| 5    | Physical Contingency | 0.36                 | 0.13 | 0.49  |
|      | Sub-total            | 3.91                 | 1.47 | 5.38  |
| 6    | Price Contingency    | 0.75                 | 0.14 | 0.89  |
|      | Total                | 4.66                 | 1.61 | 6.27  |

OM Cost  
0.00

| 2001 |                      | Unit : Cols. Million |       |       |
|------|----------------------|----------------------|-------|-------|
| No.  | Specification        | I.C.                 | F.C.  | Total |
| 1    | Construction Cost    | 16.36                | 17.18 | 33.54 |
| 2    | Land Acquisition     | 2.63                 | 0.00  | 2.63  |
| 3    | Administration Cost  | 1.81                 | 0.00  | 1.81  |
| 4    | Engineering Fee      | 1.23                 | 2.08  | 3.31  |
| 5    | Physical Contingency | 2.20                 | 1.93  | 4.13  |
|      | Sub-total            | 24.23                | 21.19 | 45.42 |
| 6    | Price Contingency    | 6.36                 | 2.66  | 9.02  |
|      | Total                | 30.59                | 23.85 | 54.44 |

OM Cost  
0.00

| 2002 |                      | Unit : Cols. Million |       |       |
|------|----------------------|----------------------|-------|-------|
| No.  | Specification        | I.C.                 | F.C.  | Total |
| 1    | Construction Cost    | 16.36                | 17.18 | 33.54 |
| 2    | Land Acquisition     | 2.63                 | 0.00  | 2.63  |
| 3    | Administration Cost  | 1.81                 | 0.00  | 1.81  |
| 4    | Engineering Fee      | 1.23                 | 2.08  | 3.31  |
| 5    | Physical Contingency | 2.20                 | 1.93  | 4.13  |
|      | Sub-total            | 24.23                | 21.19 | 45.42 |
| 6    | Price Contingency    | 8.19                 | 3.38  | 11.57 |
|      | Total                | 32.42                | 24.57 | 56.99 |

OM Cost  
0.25

| 2003 |                      | Unit : Cols. Million |       |       |
|------|----------------------|----------------------|-------|-------|
| No.  | Specification        | I.C.                 | F.C.  | Total |
| 1    | Construction Cost    | 16.36                | 17.18 | 33.54 |
| 2    | Land Acquisition     | 2.63                 | 0.00  | 2.63  |
| 3    | Administration Cost  | 1.81                 | 0.00  | 1.81  |
| 4    | Engineering Fee      | 1.23                 | 2.08  | 3.31  |
| 5    | Physical Contingency | 2.20                 | 1.93  | 4.13  |
|      | Sub-total            | 24.23                | 21.19 | 45.42 |
| 6    | Price Contingency    | 10.14                | 4.11  | 14.25 |
|      | Total                | 34.37                | 25.30 | 59.67 |

OM Cost  
0.52

| 2004 |                      | Unit : Cols. Million |       |       |
|------|----------------------|----------------------|-------|-------|
| No.  | Specification        | I.C.                 | F.C.  | Total |
| 1    | Construction Cost    | 16.36                | 17.18 | 33.54 |
| 2    | Land Acquisition     | 0.00                 | 0.00  | 0.00  |
| 3    | Administration Cost  | 1.68                 | 0.00  | 1.68  |
| 4    | Engineering Fee      | 1.23                 | 2.08  | 3.31  |
| 5    | Physical Contingency | 1.93                 | 1.93  | 3.85  |
|      | Sub-total            | 21.20                | 21.19 | 42.38 |
| 6    | Price Contingency    | 10.67                | 4.87  | 15.54 |
|      | Total                | 31.87                | 26.06 | 57.92 |

OM Cost  
0.83

| 2005 |                      | Unit : Cols. Million |       |       |
|------|----------------------|----------------------|-------|-------|
| No.  | Specification        | I.C.                 | F.C.  | Total |
| 1    | Construction Cost    | 16.36                | 17.18 | 33.54 |
| 2    | Land Acquisition     | 0.00                 | 0.00  | 0.00  |
| 3    | Administration Cost  | 1.67                 | 0.00  | 1.67  |
| 4    | Engineering Fee      | 1.23                 | 2.08  | 3.31  |
| 5    | Physical Contingency | 1.93                 | 1.93  | 3.85  |
|      | Sub-total            | 21.19                | 21.19 | 42.37 |
| 6    | Price Contingency    | 12.57                | 5.66  | 18.23 |
|      | Total                | 33.76                | 26.85 | 60.60 |

OM Cost  
1.18

(2) Economic Cost

| 1999 |                      | Unit : Cols. Million |      |       |
|------|----------------------|----------------------|------|-------|
| No.  | Specification        | I.C.                 | F.C. | Total |
| 1    | Construction Cost    | 0.00                 | 0.00 | 0.00  |
| 2    | Land Acquisition     | 0.00                 | 0.00 | 0.00  |
| 3    | Administration Cost  | 0.00                 | 0.00 | 0.00  |
| 4    | Engineering Fee      | 2.63                 | 5.04 | 7.67  |
| 5    | Physical Contingency | 0.26                 | 0.50 | 0.77  |
|      | Sub-total            | 2.89                 | 5.54 | 8.44  |
| 6    | Price Contingency    | 0.00                 | 0.00 | 0.00  |
|      | Total                | 2.89                 | 5.54 | 8.44  |

OM Cost  
0.00

| 2000 |                      | Unit : Cols. Million |      |       |
|------|----------------------|----------------------|------|-------|
| No.  | Specification        | I.C.                 | F.C. | Total |
| 1    | Construction Cost    | 0.00                 | 0.00 | 0.00  |
| 2    | Land Acquisition     | 2.01                 | 0.00 | 2.01  |
| 3    | Administration Cost  | 0.12                 | 0.00 | 0.12  |
| 4    | Engineering Fee      | 0.70                 | 1.34 | 2.04  |
| 5    | Physical Contingency | 0.28                 | 0.13 | 0.42  |
|      | Sub-total            | 3.11                 | 1.47 | 4.58  |
| 6    | Price Contingency    | 0.00                 | 0.00 | 0.00  |
|      | Total                | 3.11                 | 1.47 | 4.58  |

OM Cost  
0.00

| 2001 |                      | Unit : Cols. Million |       |       |
|------|----------------------|----------------------|-------|-------|
| No.  | Specification        | I.C.                 | F.C.  | Total |
| 1    | Construction Cost    | 13.06                | 17.18 | 30.24 |
| 2    | Land Acquisition     | 2.01                 | 0.00  | 2.01  |
| 3    | Administration Cost  | 1.60                 | 0.00  | 1.60  |
| 4    | Engineering Fee      | 1.09                 | 2.08  | 3.17  |
| 5    | Physical Contingency | 1.78                 | 1.93  | 3.70  |
|      | Sub-total            | 19.54                | 21.19 | 40.73 |
| 6    | Price Contingency    | 0.00                 | 0.00  | 0.00  |
|      | Total                | 19.54                | 21.19 | 40.73 |

OM Cost  
0.00

| 2002 |                      | Unit : Cols. Million |       |       |
|------|----------------------|----------------------|-------|-------|
| No.  | Specification        | I.C.                 | F.C.  | Total |
| 1    | Construction Cost    | 13.06                | 17.18 | 30.24 |
| 2    | Land Acquisition     | 2.01                 | 0.00  | 2.01  |
| 3    | Administration Cost  | 1.60                 | 0.00  | 1.60  |
| 4    | Engineering Fee      | 1.09                 | 2.08  | 3.17  |
| 5    | Physical Contingency | 1.78                 | 1.93  | 3.70  |
|      | Sub-total            | 19.54                | 21.19 | 40.73 |
| 6    | Price Contingency    | 0.00                 | 0.00  | 0.00  |
|      | Total                | 19.54                | 21.19 | 40.73 |

OM Cost  
0.17

| 2003 |                      | Unit : Cols. Million |       |       |
|------|----------------------|----------------------|-------|-------|
| No.  | Specification        | I.C.                 | F.C.  | Total |
| 1    | Construction Cost    | 13.06                | 17.18 | 30.24 |
| 2    | Land Acquisition     | 2.01                 | 0.00  | 2.01  |
| 3    | Administration Cost  | 1.60                 | 0.00  | 1.60  |
| 4    | Engineering Fee      | 1.09                 | 2.08  | 3.17  |
| 5    | Physical Contingency | 1.78                 | 1.93  | 3.70  |
|      | Sub-total            | 19.54                | 21.19 | 40.73 |
| 6    | Price Contingency    | 0.00                 | 0.00  | 0.00  |
|      | Total                | 19.54                | 21.19 | 40.73 |

OM Cost  
0.33

| 2004 |                      | Unit : Cols. Million |       |       |
|------|----------------------|----------------------|-------|-------|
| No.  | Specification        | I.C.                 | F.C.  | Total |
| 1    | Construction Cost    | 13.06                | 17.18 | 30.24 |
| 2    | Land Acquisition     | 0.00                 | 0.00  | 0.00  |
| 3    | Administration Cost  | 1.49                 | 0.00  | 1.49  |
| 4    | Engineering Fee      | 1.09                 | 2.08  | 3.17  |
| 5    | Physical Contingency | 1.56                 | 1.93  | 3.49  |
|      | Sub-total            | 17.20                | 21.19 | 38.39 |
| 6    | Price Contingency    | 0.00                 | 0.00  | 0.00  |
|      | Total                | 17.20                | 21.19 | 38.39 |

OM Cost  
0.50

| 2005 |                      | Unit : Cols. Million |       |       |
|------|----------------------|----------------------|-------|-------|
| No.  | Specification        | I.C.                 | F.C.  | Total |
| 1    | Construction Cost    | 13.06                | 17.18 | 30.24 |
| 2    | Land Acquisition     | 0.00                 | 0.00  | 0.00  |
| 3    | Administration Cost  | 1.48                 | 0.00  | 1.48  |
| 4    | Engineering Fee      | 1.09                 | 2.08  | 3.17  |
| 5    | Physical Contingency | 1.56                 | 1.93  | 3.49  |
|      | Sub-total            | 17.19                | 21.19 | 38.38 |
| 6    | Price Contingency    | 0.00                 | 0.00  | 0.00  |
|      | Total                | 17.19                | 21.19 | 38.38 |

OM Cost  
0.67

TABLE 03.5(2-2) ESTIMATE OF ECONOMIC COST

Priority Project-Alt. II (J+U)

(1) Financial Cost

| Total |                      | Unit: Cols. Million |        |                 |
|-------|----------------------|---------------------|--------|-----------------|
| No.   | Specification        | I.C.                | F.C.   | Total           |
| 1     | Construction Cost    | 81.80               | 85.90  | 167.70          |
| 2     | Land Acquisition     | 10.52               | 0.00   | 10.52           |
| 3     | Administration Cost  | 3.91                | 0.00   | 3.91            |
| 4     | Engineering Fee      | 9.91                | 16.78  | 26.69           |
| 5     | Physical Contingency | 11.11               | 10.27  | 21.38           |
|       | Sub-total            | 122.25              | 112.95 | 235.20          |
| 6     | Price Contingency    | 49.08               | 21.16  | 70.24           |
|       | Total                | 171.33              | 134.11 | 305.44          |
|       |                      |                     |        | OM Cost<br>1.56 |

(2) Economic Cost

| Total |                      | Unit: Cols. Million |        |                 |
|-------|----------------------|---------------------|--------|-----------------|
| No.   | Specification        | I.C.                | F.C.   | Total           |
| 1     | Construction Cost    | 65.32               | 85.90  | 151.22          |
| 2     | Land Acquisition     | 8.04                | 0.00   | 8.04            |
| 3     | Administration Cost  | 7.88                | 0.00   | 7.88            |
| 4     | Engineering Fee      | 8.77                | 16.78  | 25.55           |
| 5     | Physical Contingency | 9.00                | 10.27  | 19.27           |
|       | Sub-total            | 99.02               | 112.95 | 211.97          |
| 6     | Price Contingency    | 0.00                | 0.00   | 0.00            |
|       | Total                | 99.02               | 112.95 | 211.97          |
|       |                      |                     |        | OM Cost<br>0.83 |



TABLE O3.6 (1/2) ESTIMATE OF ECONOMIC COST

Priority Project-Ah. III (U)

(1) Financial Cost

| 1999 |                      | Unit : Cols. Million |      |       |
|------|----------------------|----------------------|------|-------|
| No.  | Specification        | L.C.                 | F.C. | Total |
| 1    | Construction Cost    | 0.00                 | 0.00 | 0.00  |
| 2    | Land Acquisition     | 0.00                 | 0.00 | 0.00  |
| 3    | Administration Cost  | 0.00                 | 0.00 | 0.00  |
| 4    | Engineering Fee      | 0.87                 | 1.50 | 2.37  |
| 5    | Physical Contingency | 0.09                 | 0.15 | 0.24  |
|      | Sub-total            | 0.96                 | 1.65 | 2.61  |
| 6    | Price Contingency    | 0.12                 | 0.10 | 0.22  |
|      | Total                | 1.08                 | 1.75 | 2.83  |

OM Cost  
0.00

| 2000 |                      | Unit : Cols. Million |      |       |
|------|----------------------|----------------------|------|-------|
| No.  | Specification        | L.C.                 | F.C. | Total |
| 1    | Construction Cost    | 0.00                 | 0.00 | 0.00  |
| 2    | Land Acquisition     | 1.60                 | 0.00 | 1.60  |
| 3    | Administration Cost  | 0.08                 | 0.00 | 0.08  |
| 4    | Engineering Fee      | 0.23                 | 0.40 | 0.63  |
| 5    | Physical Contingency | 0.19                 | 0.04 | 0.23  |
|      | Sub-total            | 2.10                 | 0.44 | 2.54  |
| 6    | Price Contingency    | 0.40                 | 0.04 | 0.44  |
|      | Total                | 2.50                 | 0.48 | 2.98  |

OM Cost  
0.00

| 2001 |                      | Unit : Cols. Million |      |       |
|------|----------------------|----------------------|------|-------|
| No.  | Specification        | L.C.                 | F.C. | Total |
| 1    | Construction Cost    | 4.32                 | 4.90 | 9.22  |
| 2    | Land Acquisition     | 1.60                 | 0.00 | 1.60  |
| 3    | Administration Cost  | 0.54                 | 0.00 | 0.54  |
| 4    | Engineering Fee      | 0.36                 | 0.62 | 0.98  |
| 5    | Physical Contingency | 0.68                 | 0.55 | 1.23  |
|      | Sub-total            | 7.50                 | 6.07 | 13.57 |
| 6    | Price Contingency    | 1.97                 | 0.76 | 2.73  |
|      | Total                | 9.47                 | 6.83 | 16.30 |

OM Cost  
0.00

| 2002 |                      | Unit : Cols. Million |      |       |
|------|----------------------|----------------------|------|-------|
| No.  | Specification        | L.C.                 | F.C. | Total |
| 1    | Construction Cost    | 4.32                 | 4.90 | 9.22  |
| 2    | Land Acquisition     | 1.60                 | 0.00 | 1.60  |
| 3    | Administration Cost  | 0.54                 | 0.00 | 0.54  |
| 4    | Engineering Fee      | 0.36                 | 0.62 | 0.98  |
| 5    | Physical Contingency | 0.68                 | 0.55 | 1.23  |
|      | Sub-total            | 7.50                 | 6.07 | 13.57 |
| 6    | Price Contingency    | 2.54                 | 0.97 | 3.51  |
|      | Total                | 10.04                | 7.04 | 17.08 |

OM Cost  
0.07

| 2003 |                      | Unit : Cols. Million |      |       |
|------|----------------------|----------------------|------|-------|
| No.  | Specification        | L.C.                 | F.C. | Total |
| 1    | Construction Cost    | 4.32                 | 4.90 | 9.22  |
| 2    | Land Acquisition     | 1.60                 | 0.00 | 1.60  |
| 3    | Administration Cost  | 0.54                 | 0.00 | 0.54  |
| 4    | Engineering Fee      | 0.36                 | 0.62 | 0.98  |
| 5    | Physical Contingency | 0.68                 | 0.55 | 1.23  |
|      | Sub-total            | 7.50                 | 6.07 | 13.57 |
| 6    | Price Contingency    | 3.14                 | 1.18 | 4.32  |
|      | Total                | 10.64                | 7.25 | 17.89 |

OM Cost  
0.14

| 2004 |                      | Unit : Cols. Million |      |       |
|------|----------------------|----------------------|------|-------|
| No.  | Specification        | L.C.                 | F.C. | Total |
| 1    | Construction Cost    | 4.32                 | 4.90 | 9.22  |
| 2    | Land Acquisition     | 0.00                 | 0.00 | 0.00  |
| 3    | Administration Cost  | 0.46                 | 0.00 | 0.46  |
| 4    | Engineering Fee      | 0.35                 | 0.62 | 0.98  |
| 5    | Physical Contingency | 0.51                 | 0.55 | 1.07  |
|      | Sub-total            | 5.65                 | 6.07 | 11.73 |
| 6    | Price Contingency    | 2.85                 | 1.40 | 4.25  |
|      | Total                | 8.50                 | 7.47 | 15.98 |

OM Cost  
0.23

| 2005 |                      | Unit : Cols. Million |      |       |
|------|----------------------|----------------------|------|-------|
| No.  | Specification        | L.C.                 | F.C. | Total |
| 1    | Construction Cost    | 4.32                 | 4.90 | 9.22  |
| 2    | Land Acquisition     | 0.00                 | 0.00 | 0.00  |
| 3    | Administration Cost  | 0.44                 | 0.00 | 0.44  |
| 4    | Engineering Fee      | 0.35                 | 0.62 | 0.98  |
| 5    | Physical Contingency | 0.51                 | 0.55 | 1.06  |
|      | Sub-total            | 5.63                 | 6.07 | 11.70 |
| 6    | Price Contingency    | 3.37                 | 1.61 | 4.98  |
|      | Total                | 9.00                 | 7.68 | 16.68 |

OM Cost  
0.32

(2) Economic Cost

| 1999 |                      | Unit : Cols. Million |      |       |
|------|----------------------|----------------------|------|-------|
| No.  | Specification        | L.C.                 | F.C. | Total |
| 1    | Construction Cost    | 0.00                 | 0.00 | 0.00  |
| 2    | Land Acquisition     | 0.00                 | 0.00 | 0.00  |
| 3    | Administration Cost  | 0.00                 | 0.00 | 0.00  |
| 4    | Engineering Fee      | 0.77                 | 1.50 | 2.27  |
| 5    | Physical Contingency | 0.08                 | 0.15 | 0.23  |
|      | Sub-total            | 0.85                 | 1.65 | 2.50  |
| 6    | Price Contingency    | 0.00                 | 0.00 | 0.00  |
|      | Total                | 0.85                 | 1.65 | 2.50  |

OM Cost  
0.00

| 2000 |                      | Unit : Cols. Million |      |       |
|------|----------------------|----------------------|------|-------|
| No.  | Specification        | L.C.                 | F.C. | Total |
| 1    | Construction Cost    | 0.00                 | 0.00 | 0.00  |
| 2    | Land Acquisition     | 1.22                 | 0.00 | 1.22  |
| 3    | Administration Cost  | 0.07                 | 0.00 | 0.07  |
| 4    | Engineering Fee      | 0.20                 | 0.40 | 0.60  |
| 5    | Physical Contingency | 0.15                 | 0.04 | 0.19  |
|      | Sub-total            | 1.65                 | 0.44 | 2.09  |
| 6    | Price Contingency    | 0.00                 | 0.00 | 0.00  |
|      | Total                | 1.65                 | 0.44 | 2.09  |

OM Cost  
0.00

| 2001 |                      | Unit : Cols. Million |      |       |
|------|----------------------|----------------------|------|-------|
| No.  | Specification        | L.C.                 | F.C. | Total |
| 1    | Construction Cost    | 3.45                 | 4.90 | 8.35  |
| 2    | Land Acquisition     | 1.22                 | 0.00 | 1.22  |
| 3    | Administration Cost  | 0.48                 | 0.00 | 0.48  |
| 4    | Engineering Fee      | 0.32                 | 0.62 | 0.94  |
| 5    | Physical Contingency | 0.55                 | 0.55 | 1.10  |
|      | Sub-total            | 6.02                 | 6.07 | 12.09 |
| 6    | Price Contingency    | 0.00                 | 0.00 | 0.00  |
|      | Total                | 6.02                 | 6.07 | 12.09 |

OM Cost  
0.00

| 2002 |                      | Unit : Cols. Million |      |       |
|------|----------------------|----------------------|------|-------|
| No.  | Specification        | L.C.                 | F.C. | Total |
| 1    | Construction Cost    | 3.45                 | 4.90 | 8.35  |
| 2    | Land Acquisition     | 1.22                 | 0.00 | 1.22  |
| 3    | Administration Cost  | 0.48                 | 0.00 | 0.48  |
| 4    | Engineering Fee      | 0.32                 | 0.62 | 0.94  |
| 5    | Physical Contingency | 0.55                 | 0.55 | 1.10  |
|      | Sub-total            | 6.02                 | 6.07 | 12.09 |
| 6    | Price Contingency    | 0.00                 | 0.00 | 0.00  |
|      | Total                | 6.02                 | 6.07 | 12.09 |

OM Cost  
0.05

| 2003 |                      | Unit : Cols. Million |      |       |
|------|----------------------|----------------------|------|-------|
| No.  | Specification        | L.C.                 | F.C. | Total |
| 1    | Construction Cost    | 3.45                 | 4.90 | 8.35  |
| 2    | Land Acquisition     | 1.22                 | 0.00 | 1.22  |
| 3    | Administration Cost  | 0.48                 | 0.00 | 0.48  |
| 4    | Engineering Fee      | 0.32                 | 0.62 | 0.94  |
| 5    | Physical Contingency | 0.55                 | 0.55 | 1.10  |
|      | Sub-total            | 6.02                 | 6.07 | 12.09 |
| 6    | Price Contingency    | 0.00                 | 0.00 | 0.00  |
|      | Total                | 6.02                 | 6.07 | 12.09 |

OM Cost  
0.09

| 2004 |                      | Unit : Cols. Million |      |       |
|------|----------------------|----------------------|------|-------|
| No.  | Specification        | L.C.                 | F.C. | Total |
| 1    | Construction Cost    | 3.45                 | 4.90 | 8.35  |
| 2    | Land Acquisition     | 0.00                 | 0.00 | 0.00  |
| 3    | Administration Cost  | 0.41                 | 0.00 | 0.41  |
| 4    | Engineering Fee      | 0.32                 | 0.62 | 0.94  |
| 5    | Physical Contingency | 0.42                 | 0.55 | 0.97  |
|      | Sub-total            | 4.59                 | 6.07 | 10.67 |
| 6    | Price Contingency    | 0.00                 | 0.00 | 0.00  |
|      | Total                | 4.59                 | 6.07 | 10.67 |

OM Cost  
0.14

| 2005 |                      | Unit : Cols. Million |      |       |
|------|----------------------|----------------------|------|-------|
| No.  | Specification        | L.C.                 | F.C. | Total |
| 1    | Construction Cost    | 3.45                 | 4.90 | 8.35  |
| 2    | Land Acquisition     | 0.00                 | 0.00 | 0.00  |
| 3    | Administration Cost  | 0.39                 | 0.00 | 0.39  |
| 4    | Engineering Fee      | 0.32                 | 0.62 | 0.94  |
| 5    | Physical Contingency | 0.42                 | 0.55 | 0.97  |
|      | Sub-total            | 4.57                 | 6.07 | 10.65 |
| 6    | Price Contingency    | 0.00                 | 0.00 | 0.00  |
|      | Total                | 4.57                 | 6.07 | 10.65 |

OM Cost  
0.18

TABLE O3.6 (2-2) ESTIMATE OF ECONOMIC COST

Priority Project-Alt. III (U)

(1) Financial Cost

| Total |                      | Unit: Cols. Million |       |                 |
|-------|----------------------|---------------------|-------|-----------------|
| No.   | Specification        | I. C.               | F. C. | Total           |
| 1     | Construction Cost    | 21.60               | 24.50 | 46.10           |
| 2     | Land Acquisition     | 6.40                | 0.00  | 6.40            |
| 3     | Administration Cost  | 2.60                | 0.00  | 2.60            |
| 4     | Engineering Fee      | 2.90                | 5.00  | 7.90            |
| 5     | Physical Contingency | 3.35                | 2.95  | 6.30            |
|       | Sub-total            | 36.85               | 32.45 | 69.30           |
| 6     | Price Contingency    | 14.39               | 6.06  | 20.45           |
|       | Total                | 51.24               | 38.51 | 89.75           |
|       |                      |                     |       | OM Cost<br>0.43 |

(2) Economic Cost

| Total |                      | Unit: Cols. Million |       |                 |
|-------|----------------------|---------------------|-------|-----------------|
| No.   | Specification        | I. C.               | F. C. | Total           |
| 1     | Construction Cost    | 17.25               | 24.50 | 41.75           |
| 2     | Land Acquisition     | 4.89                | 0.00  | 4.89            |
| 3     | Administration Cost  | 2.30                | 0.00  | 2.30            |
| 4     | Engineering Fee      | 2.57                | 5.00  | 7.57            |
| 5     | Physical Contingency | 2.70                | 2.95  | 5.65            |
|       | Sub-total            | 29.71               | 32.45 | 62.16           |
| 6     | Price Contingency    | 0.00                | 0.00  | 0.00            |
|       | Total                | 29.71               | 32.45 | 62.16           |
|       |                      |                     |       | OM Cost<br>0.23 |

**TABLE O3.7 ECONOMIC ANALYSIS**

| Priority Project-Alt.1 (O+J+U) |               |               |              | Unit : Cols. Million |                     |                 |
|--------------------------------|---------------|---------------|--------------|----------------------|---------------------|-----------------|
| Year                           | Economic Cost |               |              | Economic Benefit (B) | Net Benefit (B)-(C) |                 |
|                                | Construction  | OM            | Total (C)    |                      |                     |                 |
| 1                              | 1999          | 21.45         | 0.00         | 21.45                | 0.00                | -21.45          |
| 2                              | 2000          | 9.99          | 0.00         | 9.99                 | 0.00                | -9.99           |
| 3                              | 2001          | 103.46        | 0.00         | 103.46               | 0.00                | -103.46         |
| 4                              | 2002          | 103.46        | 0.43         | 103.89               | 21.08               | -82.81          |
| 5                              | 2003          | 103.46        | 0.86         | 104.32               | 42.17               | -62.15          |
| 6                              | 2004          | 99.19         | 1.29         | 100.48               | 63.25               | -37.23          |
| 7                              | 2005          | 99.14         | 1.72         | 100.86               | 84.34               | -16.52          |
| 8                              | 2006          | 0.00          | 2.15         | 2.15                 | 105.42              | 103.27          |
| 9                              | 2007          | 0.00          | 2.15         | 2.15                 | 105.42              | 103.27          |
| 10                             | 2008          | 0.00          | 2.15         | 2.15                 | 105.42              | 103.27          |
| 11                             | 2009          | 0.00          | 2.15         | 2.15                 | 105.42              | 103.27          |
| 12                             | 2010          | 0.00          | 2.15         | 2.15                 | 105.42              | 103.27          |
| 13                             | 2011          | 0.00          | 2.15         | 2.15                 | 105.42              | 103.27          |
| 14                             | 2012          | 0.00          | 2.15         | 2.15                 | 105.42              | 103.27          |
| 15                             | 2013          | 0.00          | 2.15         | 2.15                 | 105.42              | 103.27          |
| 16                             | 2014          | 0.00          | 2.15         | 2.15                 | 105.42              | 103.27          |
| 17                             | 2015          | 0.00          | 2.15         | 2.15                 | 105.42              | 103.27          |
| 18                             | 2016          | 0.00          | 2.15         | 2.15                 | 105.42              | 103.27          |
| 19                             | 2017          | 0.00          | 2.15         | 2.15                 | 105.42              | 103.27          |
| 20                             | 2018          | 0.00          | 2.15         | 2.15                 | 105.42              | 103.27          |
| 21                             | 2019          | 0.00          | 2.15         | 2.15                 | 105.42              | 103.27          |
| 22                             | 2020          | 0.00          | 2.15         | 2.15                 | 105.42              | 103.27          |
| 23                             | 2021          | 0.00          | 2.15         | 2.15                 | 105.42              | 103.27          |
| 24                             | 2022          | 0.00          | 2.15         | 2.15                 | 105.42              | 103.27          |
| 25                             | 2023          | 0.00          | 2.15         | 2.15                 | 105.42              | 103.27          |
| 26                             | 2024          | 0.00          | 2.15         | 2.15                 | 105.42              | 103.27          |
| 27                             | 2025          | 0.00          | 2.15         | 2.15                 | 105.42              | 103.27          |
| 28                             | 2026          | 0.00          | 2.15         | 2.15                 | 105.42              | 103.27          |
| 29                             | 2027          | 0.00          | 2.15         | 2.15                 | 105.42              | 103.27          |
| 30                             | 2028          | 0.00          | 2.15         | 2.15                 | 105.42              | 103.27          |
| 31                             | 2029          | 0.00          | 2.15         | 2.15                 | 105.42              | 103.27          |
| 32                             | 2030          | 0.00          | 2.15         | 2.15                 | 105.42              | 103.27          |
| 33                             | 2031          | 0.00          | 2.15         | 2.15                 | 105.42              | 103.27          |
| 34                             | 2032          | 0.00          | 2.15         | 2.15                 | 105.42              | 103.27          |
| 35                             | 2033          | 0.00          | 2.15         | 2.15                 | 105.42              | 103.27          |
| 36                             | 2034          | 0.00          | 2.15         | 2.15                 | 105.42              | 103.27          |
| 37                             | 2035          | 0.00          | 2.15         | 2.15                 | 105.42              | 103.27          |
| 38                             | 2036          | 0.00          | 0.00         | 0.00                 | 0.00                | 0.00            |
| 39                             | 2037          | 0.00          | 0.00         | 0.00                 | 0.00                | 0.00            |
| 40                             | 2038          | 0.00          | 0.00         | 0.00                 | 0.00                | 0.00            |
| 41                             | 2039          | 0.00          | 0.00         | 0.00                 | 0.00                | 0.00            |
| 42                             | 2040          | 0.00          | 0.00         | 0.00                 | 0.00                | 0.00            |
| <b>Total</b>                   |               | <b>540.15</b> | <b>68.80</b> | <b>608.95</b>        | <b>3,373.44</b>     | <b>2,764.49</b> |

| Discount Rate (%) | B/C  | EIRR (%)          |          | NPV (Cols Million) |
|-------------------|------|-------------------|----------|--------------------|
|                   |      | 18.11             |          |                    |
|                   |      | PV(Cols. Million) |          |                    |
|                   |      | Cost              | Benefit  |                    |
| 20                | 0.90 | 241.50            | 218.32   | -23.18             |
| 15                | 1.21 | 292.16            | 352.29   | 60.13              |
| 12                | 1.49 | 330.34            | 491.65   | 161.31             |
| 10                | 1.75 | 360.10            | 629.53   | 269.44             |
| 5                 | 2.87 | 456.22            | 1,309.23 | 853.01             |

**TABLE O3.8 ECONOMIC ANALYSIS**

| Year  | Priority Project-Alt.II(J+U) | Unit : Cols. Million |       |           |                      |                     |
|-------|------------------------------|----------------------|-------|-----------|----------------------|---------------------|
|       |                              | Economic Cost        |       |           | Economic Benefit (B) | Net Benefit (B)-(C) |
|       |                              | Construction         | OM    | Total (C) |                      |                     |
| 1     | 1999                         | 8.44                 | 0.00  | 8.44      | 0.00                 | -8.44               |
| 2     | 2000                         | 4.58                 | 0.00  | 4.58      | 0.00                 | -4.58               |
| 3     | 2001                         | 40.73                | 0.00  | 40.73     | 0.00                 | -40.73              |
| 4     | 2002                         | 40.73                | 0.17  | 40.90     | 12.52                | -28.38              |
| 5     | 2003                         | 40.73                | 0.33  | 41.06     | 24.30                | -16.76              |
| 6     | 2004                         | 38.39                | 0.50  | 38.89     | 36.83                | -2.06               |
| 7     | 2005                         | 38.38                | 0.67  | 39.05     | 49.35                | 10.30               |
| 8     | 2006                         | 0.00                 | 0.83  | 0.83      | 61.13                | 60.30               |
| 9     | 2007                         | 0.00                 | 0.83  | 0.83      | 61.13                | 60.30               |
| 10    | 2008                         | 0.00                 | 0.83  | 0.83      | 61.13                | 60.30               |
| 11    | 2009                         | 0.00                 | 0.83  | 0.83      | 61.13                | 60.30               |
| 12    | 2010                         | 0.00                 | 0.83  | 0.83      | 61.13                | 60.30               |
| 13    | 2011                         | 0.00                 | 0.83  | 0.83      | 61.13                | 60.30               |
| 14    | 2012                         | 0.00                 | 0.83  | 0.83      | 61.13                | 60.30               |
| 15    | 2013                         | 0.00                 | 0.83  | 0.83      | 61.13                | 60.30               |
| 16    | 2014                         | 0.00                 | 0.83  | 0.83      | 61.13                | 60.30               |
| 17    | 2015                         | 0.00                 | 0.83  | 0.83      | 61.13                | 60.30               |
| 18    | 2016                         | 0.00                 | 0.83  | 0.83      | 61.13                | 60.30               |
| 19    | 2017                         | 0.00                 | 0.83  | 0.83      | 61.13                | 60.30               |
| 20    | 2018                         | 0.00                 | 0.83  | 0.83      | 61.13                | 60.30               |
| 21    | 2019                         | 0.00                 | 0.83  | 0.83      | 61.13                | 60.30               |
| 22    | 2020                         | 0.00                 | 0.83  | 0.83      | 61.13                | 60.30               |
| 23    | 2021                         | 0.00                 | 0.83  | 0.83      | 61.13                | 60.30               |
| 24    | 2022                         | 0.00                 | 0.83  | 0.83      | 61.13                | 60.30               |
| 25    | 2023                         | 0.00                 | 0.83  | 0.83      | 61.13                | 60.30               |
| 26    | 2024                         | 0.00                 | 0.83  | 0.83      | 61.13                | 60.30               |
| 27    | 2025                         | 0.00                 | 0.83  | 0.83      | 61.13                | 60.30               |
| 28    | 2026                         | 0.00                 | 0.83  | 0.83      | 61.13                | 60.30               |
| 29    | 2027                         | 0.00                 | 0.83  | 0.83      | 61.13                | 60.30               |
| 30    | 2028                         | 0.00                 | 0.83  | 0.83      | 61.13                | 60.30               |
| 31    | 2029                         | 0.00                 | 0.83  | 0.83      | 61.13                | 60.30               |
| 32    | 2030                         | 0.00                 | 0.83  | 0.83      | 61.13                | 60.30               |
| 33    | 2031                         | 0.00                 | 0.83  | 0.83      | 61.13                | 60.30               |
| 34    | 2032                         | 0.00                 | 0.83  | 0.83      | 61.13                | 60.30               |
| 35    | 2033                         | 0.00                 | 0.83  | 0.83      | 61.13                | 60.30               |
| 36    | 2034                         | 0.00                 | 0.83  | 0.83      | 61.13                | 60.30               |
| 37    | 2035                         | 0.00                 | 0.83  | 0.83      | 61.13                | 60.30               |
| 38    | 2036                         | 0.00                 | 0.00  | 0.00      | 0.00                 | 0.00                |
| 39    | 2037                         | 0.00                 | 0.00  | 0.00      | 0.00                 | 0.00                |
| 40    | 2038                         | 0.00                 | 0.00  | 0.00      | 0.00                 | 0.00                |
| 41    | 2039                         | 0.00                 | 0.00  | 0.00      | 0.00                 | 0.00                |
| 42    | 2040                         | 0.00                 | 0.00  | 0.00      | 0.00                 | 0.00                |
| Total |                              | 211.98               | 26.57 | 238.55    | 1,956.90             | 1,718.35            |

| Discount Rate (%) | B/C  | EIRR (%)          |         | NPV (Cols. Million) |
|-------------------|------|-------------------|---------|---------------------|
|                   |      | PV(Cols. Million) |         |                     |
|                   |      | Cost              | Benefit |                     |
| 20                | 1.33 | 95.09             | 126.85  | 31.77               |
| 15                | 1.78 | 114.92            | 204.61  | 89.68               |
| 12                | 2.20 | 129.86            | 285.47  | 155.61              |
| 10                | 2.58 | 141.50            | 365.47  | 223.97              |
| 5                 | 4.24 | 179.04            | 759.73  | 580.70              |

**TABLE O3.9 ECONOMIC ANALYSIS**

| Priority Project-Alt. III(U) |               | Unit : Cols. Million |             |                      |                     |               |
|------------------------------|---------------|----------------------|-------------|----------------------|---------------------|---------------|
| Year                         | Economic Cost |                      |             | Economic Benefit (B) | Net Benefit (B)-(C) |               |
|                              | Construction  | OM                   | Total (C)   |                      |                     |               |
| 1                            | 1999          | 2.50                 | 0.00        | 2.50                 | 0.00                | -2.50         |
| 2                            | 2000          | 2.09                 | 0.00        | 2.09                 | 0.00                | -2.09         |
| 3                            | 2001          | 12.09                | 0.00        | 12.09                | 0.00                | -12.09        |
| 4                            | 2002          | 12.09                | 0.05        | 12.14                | 2.58                | -9.56         |
| 5                            | 2003          | 12.09                | 0.09        | 12.18                | 4.65                | -7.53         |
| 6                            | 2004          | 10.67                | 0.14        | 10.81                | 7.23                | -3.58         |
| 7                            | 2005          | 10.65                | 0.18        | 10.83                | 9.30                | -1.53         |
| 8                            | 2006          | 0.00                 | 0.23        | 0.23                 | 11.88               | 11.65         |
| 9                            | 2007          | 0.00                 | 0.23        | 0.23                 | 11.88               | 11.65         |
| 10                           | 2008          | 0.00                 | 0.23        | 0.23                 | 11.88               | 11.65         |
| 11                           | 2009          | 0.00                 | 0.23        | 0.23                 | 11.88               | 11.65         |
| 12                           | 2010          | 0.00                 | 0.23        | 0.23                 | 11.88               | 11.65         |
| 13                           | 2011          | 0.00                 | 0.23        | 0.23                 | 11.88               | 11.65         |
| 14                           | 2012          | 0.00                 | 0.23        | 0.23                 | 11.88               | 11.65         |
| 15                           | 2013          | 0.00                 | 0.23        | 0.23                 | 11.88               | 11.65         |
| 16                           | 2014          | 0.00                 | 0.23        | 0.23                 | 11.88               | 11.65         |
| 17                           | 2015          | 0.00                 | 0.23        | 0.23                 | 11.88               | 11.65         |
| 18                           | 2016          | 0.00                 | 0.23        | 0.23                 | 11.88               | 11.65         |
| 19                           | 2017          | 0.00                 | 0.23        | 0.23                 | 11.88               | 11.65         |
| 20                           | 2018          | 0.00                 | 0.23        | 0.23                 | 11.88               | 11.65         |
| 21                           | 2019          | 0.00                 | 0.23        | 0.23                 | 11.88               | 11.65         |
| 22                           | 2020          | 0.00                 | 0.23        | 0.23                 | 11.88               | 11.65         |
| 23                           | 2021          | 0.00                 | 0.23        | 0.23                 | 11.88               | 11.65         |
| 24                           | 2022          | 0.00                 | 0.23        | 0.23                 | 11.88               | 11.65         |
| 25                           | 2023          | 0.00                 | 0.23        | 0.23                 | 11.88               | 11.65         |
| 26                           | 2024          | 0.00                 | 0.23        | 0.23                 | 11.88               | 11.65         |
| 27                           | 2025          | 0.00                 | 0.23        | 0.23                 | 11.88               | 11.65         |
| 28                           | 2026          | 0.00                 | 0.23        | 0.23                 | 11.88               | 11.65         |
| 29                           | 2027          | 0.00                 | 0.23        | 0.23                 | 11.88               | 11.65         |
| 30                           | 2028          | 0.00                 | 0.23        | 0.23                 | 11.88               | 11.65         |
| 31                           | 2029          | 0.00                 | 0.23        | 0.23                 | 11.88               | 11.65         |
| 32                           | 2030          | 0.00                 | 0.23        | 0.23                 | 11.88               | 11.65         |
| 33                           | 2031          | 0.00                 | 0.23        | 0.23                 | 11.88               | 11.65         |
| 34                           | 2032          | 0.00                 | 0.23        | 0.23                 | 11.88               | 11.65         |
| 35                           | 2033          | 0.00                 | 0.23        | 0.23                 | 11.88               | 11.65         |
| 36                           | 2034          | 0.00                 | 0.23        | 0.23                 | 11.88               | 11.65         |
| 37                           | 2035          | 0.00                 | 0.23        | 0.23                 | 11.88               | 11.65         |
| 38                           | 2036          | 0.00                 | 0.00        | 0.00                 | 0.00                | 0.00          |
| 39                           | 2037          | 0.00                 | 0.00        | 0.00                 | 0.00                | 0.00          |
| 40                           | 2038          | 0.00                 | 0.00        | 0.00                 | 0.00                | 0.00          |
| 41                           | 2039          | 0.00                 | 0.00        | 0.00                 | 0.00                | 0.00          |
| 42                           | 2040          | 0.00                 | 0.00        | 0.00                 | 0.00                | 0.00          |
| <b>Total</b>                 |               | <b>62.18</b>         | <b>7.36</b> | <b>69.54</b>         | <b>380.16</b>       | <b>310.62</b> |

| Discount Rate (%) | B/C  | EIRR (%)          |         | NPV (Cols Million) |
|-------------------|------|-------------------|---------|--------------------|
|                   |      | 17.52             |         |                    |
|                   |      | PV(Cols. Million) |         |                    |
|                   |      | Cost              | Benefit |                    |
| 20                | 0.87 | 28.24             | 24.64   | -3.61              |
| 15                | 1.17 | 34.01             | 39.73   | 5.72               |
| 12                | 1.45 | 38.34             | 55.44   | 17.09              |
| 10                | 1.70 | 41.71             | 70.97   | 29.26              |
| 5                 | 2.81 | 52.53             | 147.56  | 95.03              |

**Table O.3.10 REPAYMENT SCHEDULE OF  
EXTERNAL DEBT**

Unit : US\$ Million

| Year<br>in<br>Order | Year | External Debt  |                    | Repayment |          |        |
|---------------------|------|----------------|--------------------|-----------|----------|--------|
|                     |      | Annual<br>Debt | Cumulative<br>Debt | Principal | Interest | Total  |
| 1                   | 1999 | 2.08           | 2.08               |           | 0.12     | 0.12   |
| 2                   | 2000 | 1.14           | 3.22               |           | 0.19     | 0.19   |
| 3                   | 2001 | 11.80          | 15.02              |           | 0.90     | 0.90   |
| 4                   | 2002 | 12.35          | 27.37              |           | 1.64     | 1.64   |
| 5                   | 2003 | 12.92          | 40.29              |           | 2.42     | 2.42   |
| 6                   | 2004 | 12.82          | 53.11              |           | 3.19     | 3.19   |
| 7                   | 2005 | 13.39          | 66.50              |           | 3.99     | 3.99   |
| 8                   | 2006 |                | 66.50              |           | 3.99     | 3.99   |
| 9                   | 2007 |                | 66.50              |           | 3.99     | 3.99   |
| 10                  | 2008 |                | 66.50              |           | 3.99     | 3.99   |
| 11                  | 2009 |                | 66.50              | 3.33      | 3.99     | 7.32   |
| 12                  | 2010 |                | 63.18              | 3.33      | 3.79     | 7.12   |
| 13                  | 2011 |                | 59.85              | 3.33      | 3.59     | 6.92   |
| 14                  | 2012 |                | 56.53              | 3.33      | 3.39     | 6.72   |
| 15                  | 2013 |                | 53.20              | 3.33      | 3.19     | 6.52   |
| 16                  | 2014 |                | 49.88              | 3.33      | 2.99     | 6.32   |
| 17                  | 2015 |                | 46.55              | 3.33      | 2.79     | 6.12   |
| 18                  | 2016 |                | 43.23              | 3.33      | 2.59     | 5.92   |
| 19                  | 2017 |                | 39.90              | 3.33      | 2.39     | 5.72   |
| 20                  | 2018 |                | 36.58              | 3.33      | 2.19     | 5.52   |
| 21                  | 2019 |                | 33.25              | 3.33      | 2.00     | 5.32   |
| 22                  | 2020 |                | 29.93              | 3.33      | 1.80     | 5.12   |
| 23                  | 2021 |                | 26.60              | 3.33      | 1.60     | 4.92   |
| 24                  | 2022 |                | 23.28              | 3.33      | 1.40     | 4.72   |
| 25                  | 2023 |                | 19.95              | 3.33      | 1.20     | 4.52   |
| 26                  | 2024 |                | 16.63              | 3.33      | 1.00     | 4.32   |
| 27                  | 2025 |                | 13.30              | 3.33      | 0.80     | 4.12   |
| 28                  | 2026 |                | 9.97               | 3.33      | 0.60     | 3.92   |
| 29                  | 2027 |                | 6.65               | 3.33      | 0.40     | 3.72   |
| 30                  | 2028 |                | 3.32               | 3.33      | 0.20     | 3.52   |
| 31                  | 2029 |                | 0.00               |           |          |        |
| Total               |      | 66.50          | -                  | 66.50     | 66.32    | 132.82 |

note: interest 6%

**Table O.3.11 REDUCTION IN AVERAGE ANNUAL FLOOD DAMAGE EXPECTED BY IMPLEMENTING THE PRIORITY PROJECT**

Unit : Cols. 1,000

| Item                | Assets    |                   |           |                    |                   |                     | Total   |
|---------------------|-----------|-------------------|-----------|--------------------|-------------------|---------------------|---------|
|                     | Buildings | Household Effects | Livestock | Agricultural Crops | Public Facilities | Business Activities |         |
| Reduction in Damage | 36,351    | 19,013            | 4,516     | 23,392             | 18,824            | 3,322               | 105,418 |
| Ratio (%)           | 34.5      | 18.0              | 4.3       | 22.2               | 17.9              | 3.2                 | 100.1   |

**Table O.3.12 AVERAGE ANNUAL FLOOD DAMAGE**

Unit : Cols. 1,000

| Year | Without-Project<br>(A) | Priority Project    |                                    |
|------|------------------------|---------------------|------------------------------------|
|      |                        | With-Project<br>(B) | Reduction in Damage<br>(C)=(A)-(B) |
| 2010 | 155,165                | 49,749              | 105,416                            |
| 1996 | 114,243                | 35,955              | 78,288                             |