JAPAN INTERNATIONAL COOPERATION AGENCY

MINISTRY OF HOUSING & PLANTATION INFRASTRUCTURE
SRI LANKA LAND RECLAMATION & DEVELOPMENT CORPORATION

THE STUDY

ON

STORM WATER DRAINAGE PLAN

FOR THE COLOMBO METROPOLITAN REGION

IN

THE DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA

FINAL REPORT

VOLUME IV : SUPPORTING REPORT (2) (FEASIBILITY STUDY)

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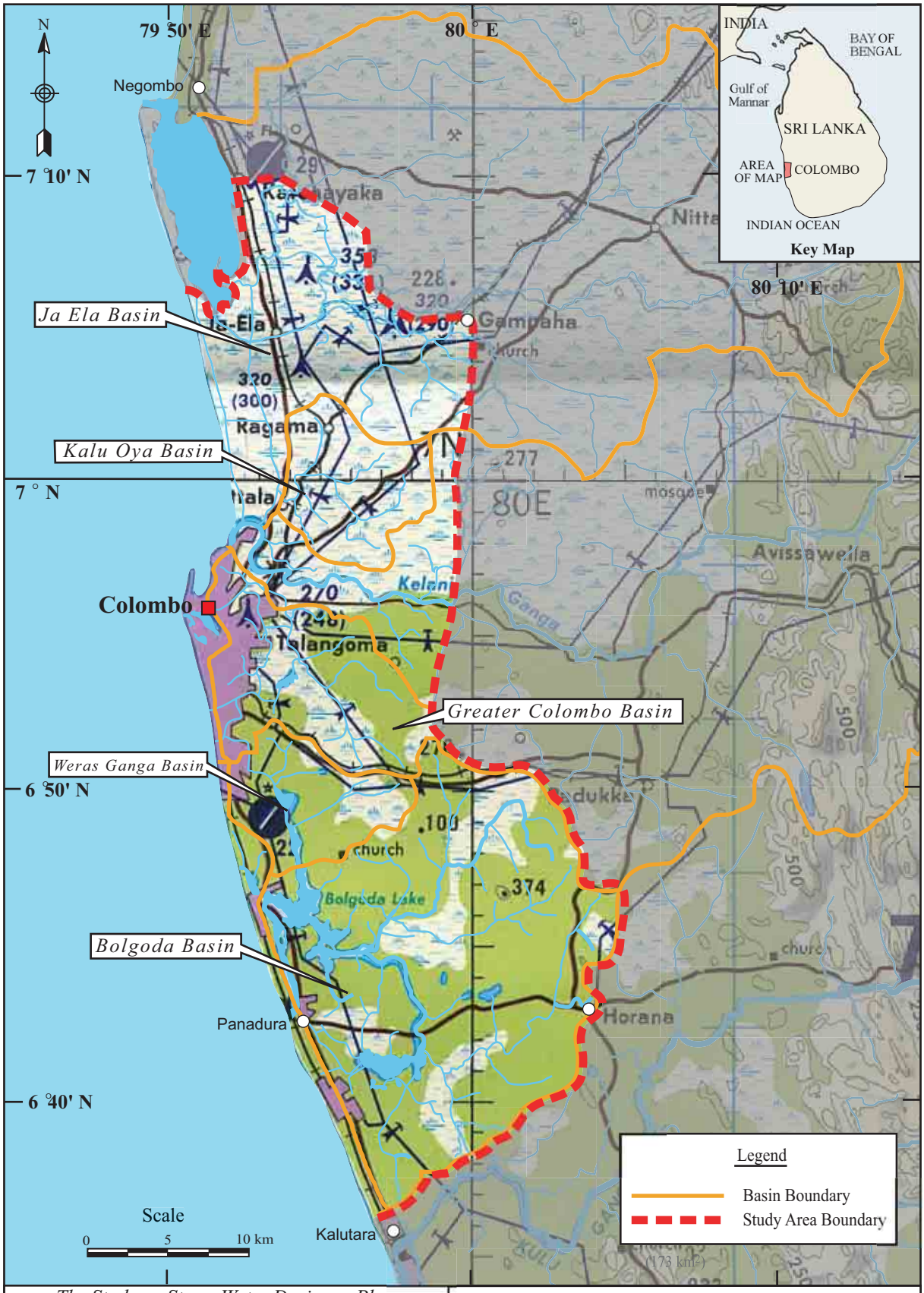

The Study on Storm Water Drainage Plan for the Colombo Metropolitan Region in the Democratic Socialist Republic of Sri Lanka

JAPAN INTERNATIONAL COOPERATION AGENCY

Location Map

THE STUDY ON STORM WATER DRAINAGE PLAN FOR THE COLOMBO METROPOLITAN REGION IN THE DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA

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CHAPTER 1 PRESENT CONDITIONS OF WERAS GANGA BASIN

1.1 General Characteristics of Weras Ganga Basin

Weras Ganga Basin (feasibility study area), with the area of 55.5 km^2, is located in the southeast part of Colombo District which borders on Kalutara District on south, Galle Road on west, High Level Road on north, and covering northwest half of Kesbewa PS. It is characterized as one of fast growing areas in CMR (Colombo Metropolitan Region) and strategically important for the development of CMR. A northwest part of Weras Ganga Basin is designated as a Core Area in the CMRSP (Colombo Metropolitan Regional Structure Plan) prepared by UDA (Urban Development Authority) where population is highly concentrated and a large scale urban development is expected.

Weras Ganga Basin plays an important role as a center of the economic and social activity and provision of housing for the people of CMR. Dehiwala - Mount Lavinia, Ratmalana, and Moratuwa are centers of industrial and commercial activities where sawmill and garment factories are operating. Service activities are concentrated mainly along Galle Road. Maharagama and Kesbewa are characterized mainly as a residential area, and the potential for residential development is high due to urban sprawl phenomena from Colombo and migration from the other areas of Sri Lanka. The area surrounding Weras Ganga provides a waterfront environment and is a popular area for recreational activities as well as residential development.

1.2 Administrative Division

1.2.1 Administrative Unit Coverage for Weras Ganga Basin

Weras Ganga Basin is composed of parts of six DS Divisions, Dehiwala - Mount Lavinia DS Division, Ratmalana DS Division, Moratuwa DS Division, Sri Jayawardenapura Kotte DS Division, Maharagama DS Division, and Kesbewa DS Division. Six Local Authorities are in the Weras Ganga Basin, Dehiwala - Mount Lavinia MC, Moratuwa MC, Sri Jayawardenapura Kotte MC, Maharagama UC, Homagama PS, and Kesbewa PS. Administrative units of DS Divisions and Local Authorities are shown in table below.

DS Division and Local Authorities

DS Divisions	Local Authorities
Dehiwala - Mount Lavinia	Dehiwala - Mount Lavinia MC
Ratmalana	Dehiwala - Mount Lavinia MC
Moratuwa	Moratuwa MC
Sri Jayawardenapura Kotte	Sri Jayawardenapura Kotte MC
Maharagama	Maharagama UC Homagama PS (a part of Kottawa South GN)
Kesbewa	Kesbewa PS

1.2.2 Administrative Unit in Weras Ganga Basin

Since the Weras Ganga Basin boundary and administrative boundaries do not always match, the administrative units that have area both within and outside Weras Ganga Basin need to be separated based on GN Division boundary. There are 85 GN Divisions in Weras Ganga Basin. The coverage within Weras Ganga Basin is estimated as shown in the table below.

Number of GN Divisions

(Unit: Number)

Administrative Units (DS Divisions)	Total Number of GN Division	Number of GN Division in Weras Ganga Basin
Dehiwala - Mount Lavinia	14	6
Ratmalana	13	8
Moratuwa	42	9
Sri Jayawardenapura Kotte	20	5
Maharagama	41	12
Kesbewa	69	45
Total	183	85

1.3 Population

The population of Weras Ganga Basin, based on the GN division boundary, is estimated at 382,000 which accounts for 7.1% of the population of CMR (5.4 million) and 2% of the population of Sri Lanka (19 million, Central Bank estimates). Estimated population in Weras Ganga Basin by DS Division is shown in the table below. List of GN Divisions and population is summarized in Table 1.3.1.

Estimated Population in Weras Ganga Basin

Administrative Units (DS Divisions)	Population of DS Division	**Weras Ganga Basin Population**	Population Density (Persons/ha)
Dehiwala - Mount Lavinia	102,000	**48,000**	132
Ratmalana	108,000	**69,000**	87
Moratuwa	177,000	**48,000**	106
Sri Jayawardenapura Kotte	115,000	**30,000**	49
Maharagama	180,000	**54,000**	69
Kesbewa	207,000	**134,000**	52
Total	878,000	**382,000**	69

Source: Prepared by JICA Study Team based on 2001 Census and data from Local Authorities

Weras Ganga Basin is considered as one of the more densely populated areas in Colombo district and the population continues to increase. Average population density in Weras Ganga Basin is estimated to be 69 persons per ha, which is higher than the Colombo district average of 51 persons per ha. (Total Sri Lanka average is 3 persons/ha). Population concentration is high particularly in the Weras Ganga west due to high urbanization along Galle Road with mixture of commercial area, industry area, and residential area. Population density of Dehiwala - Mount Lavinia is 132 persons/ha, and population density of Moratuwa is 106 persons/ha. In some areas, population density exceeds 200 persons/ha. Even though population density in the Weras Ganga east, which is characterized as mainly residential area with some commercial areas, is low compared with Weras Ganga west, it is still high in Colombo District. Population density in Kesbewa is low with 52 persons/ha, and population density of Maharagama is 69 persons/ha.

Since the land price of Weras Ganga east is still low compared with Dehiwala - Mount Lavinia and Moratuwa, low income people tend to move to the area, and they tend to reside in low land area (marsh and abandoned paddy).

Weras Ganga Basin, which is the bed town of nearby urban centers and also a base of economic activity, is also located in one of high population growth areas in the CMR with the growth rate of 2.1%, which is higher than the average population growth rate for CMR (1.7% in 1990s). Moratuwa and Kesbewa shows high population increase rate of 2.9% and 2.3%, respectively.

1.4 Economic Conditions

1.4.1 General Characteristics of Economic Activities

Distribution of economic activities of Weras Ganga Basin can be characterized as high concentration of industrial activities in the west part of Weras Ganga Basin (Dehiwala - Mount Lavinia, Moratuwa) and some agricultural activity and limited

industrial activities in the east part of Weras Ganga Basin. Wood processing (Sawmill) factories and garment factories are located mainly in Ratmalana and Moratuwa.

Most commercial activities are located along the Galle Road and small scale commercial activities are scattered along the major road and urban centers (intersection of major roads) throughout Weras Ganga Basin.

Commuting pattern also differs depending on the location in the area. In Dehiwala - Mount Lavinia and Moratuwa, employment is available from industry and commercial sectors, so some local residents work within their area (city), but many people still commute to Colombo where more jobs are available. Local residents in Maharagama and Kesbewa, on the other hand, have to commute to economic centers such as Colombo and Dehiwala - Mount Lavinia because there is not sufficient industry to provide employment.

1.4.2 Regional Production (GRDP)

GRDP for Weras Ganga Basin is estimated from GRDP for Western Province, employment for Colombo District, population allocation of Weras Ganga Basin, with some adjustments made based on the economic activities of the area. Estimated GRDP for Weras Ganga Basin is approximately Rs. 36.3 billion, which accounts for 7.5% of GRDP for CMR. Manufacturing sector has the highest share with 31.5% of GRDP followed by commercial/hotel & restaurant for 29.4%. Agriculture is limited to 1.1% of GRDP in the area. Per capita GRDP for Weras Ganga Basin is estimated to be Rs. 95,129 which is higher than the national average of Rs. 64,855.

Estimated GRDP for Weras Ganga Basin in 2000

Sector	GRDP (million Rs.)	Sector Share (%)
Agriculture, Forestry	410	1.1
Mining	61	0.2
Manufacturing	11,443	31.5
Electricity & Gas	1,079	3.0
Construction	1,777	4.9
Commercial/Hotel & Restaurant	10,673	29.4
Transport	3,977	10.9
Insurance & Banking Services	3,347	9.2
Government Services	2,368	6.5
Others	1,214	3.3
GRDP	36,349	100.0
Per Capita GRDP (Rs.)	95,129	64,855*

Source: Estimated by JICA Study team from GRDP data from Ministry of Planning and District Profile of Labor Force by Department of Census and Statistics
* Per Capita GDP for Sri Lanka 2000 estimated by Central Bank of Sri Lanka

(1) Agriculture

Agricultural activity is limited in Kesbewa where rubber and cinnamon are grown. Many farmers are giving up agricultural activities because some paddy land can not be used due to disease caused by rats. Income from agricultural activity is low.

(2) Industry

Industrial activity is concentrated mainly in Dehiwala - Mount Lavinia and Moratuwa. Wood processing and garment manufacture are major industrial activities in the area. Sawdust from sawmill factories is often dumped into channels which blocks the channels and causes flood. There are some ceramic factories in Tumbowila. Since the environmental concern in the area is becoming an important issue, new factories are not likely to be established, and large scale factories are allowed to operate only in industrial estates. Some factories will be relocated to other places designated by CMRSP.

(3) Service

Commercial activities include shops, hotels and some financial activity. The demand for service sector is increasing due to shift in the urban function from Colombo to Dehiwala - Mount Lavinia and Moratuwa. Service sector is expected to grow as population increases.

1.5 Household Income in Weras Ganga Basin

Since the household income in DS Division level is not available, the income level of the Weras Ganga Basin is measured by the income of Colombo and by poverty condition by assessing the share of social welfare recipients such as Samurdhi, Food stamp, etc. Generally speaking, income in Weras Ganga Basin is expected to be high.

Monthly household income of Colombo District is the highest in Sri Lanka (Rs. 11,107), with the Western Province average at Rs. 9,230, also higher than the national average of Rs. 6,476. Since Weras Ganga belongs to Colombo District and economy is active, income level is expected to fall between Rs. 9,230 and Rs. 11,107.

For Samurdhi program, a subsidy is paid to the family with monthly family income of less than Rs. 1,500. The amount, which ranges from Rs. 140 to Rs. 1,000, is determined by the number and composition of family members. The incidence of poverty in Weras Ganga Basin is relatively low compared with the country as a whole, but worse than in Colombo District. The percentage of household receiving

social welfare in Weras Ganga Basin is estimated to be 13.3% which is lower than the national average but higher than the Colombo District average.

Poverty Measures

Regions	Number of Household Receiving Welfare*	Percentage of Household Receiving Social Welfare (%)
Sri Lanka	1,243,390	39.1
West Province	248,315	26.0
Colombo	47,369	12.0
Weras Ganga Basin	**n.a.**	**13.3**

Source: Statistical Abstract 2000, Department of Census and Statistics, Local Authorities
*estimated from total household from Demographic Survey 1994

CHAPTER 2 SOCIO-ECONOMIC FRAMEWORK IN WERAS GANGA BASIN

2.1 Prospect of Sri Lanka and Importance of Weras Ganga Basin for the Development of CMR

2.1.1 Upward Trend of Sri Lanka

Twenty years of civil conflict between the Government and LTTE (Liberation Tigers of Tamil Eelam) is moving towards peace and bringing a hope to the people of Sri Lanka. People are optimistic about the upward trend of the country, which is expected to regain the previous economy level. Tourists are already returning to Sri Lanka and tourist arrivals are expected to increase compared with last the year's figures.

2.1.2 Importance of Weras Ganga Basin for the Development of CMR

Weras Ganga Basin plays a major role in social and economic activities and is strategically important area for the development of CMR. According to the CMRSP, a part of Weras Ganga Basin is included in Core Area Development, and there is a strong demand for the development from both public and private sectors.

According to CMRSP, Weras Ganga is designated as urban area and the northwest part of the area belongs to Core Area, which is considered as a center of development in CMR. The Vision of the Core Area Development plan is to create a city which is functionally efficient, economically viable, environmentally sustainable and socially integrated to address the challenges, with the improvement of quality of life and to act as the engine of the national economic development of Sri Lanka. Through the vision of the Core Area Development, residential development, recreational development, commercial development, and related infrastructure development are expected.

The Prime Minister recently announced the development of the western region by building four modern cities in Greater Colombo, namely Colombo, Sri Jayawardenapura, Mount Lavinia, and Moratuwa. One of major strategies for the development of CMR is "urban regeneration" in which legal reform for easy land transaction is proposed so that the housing development will be promoted.

The interest of general public for the development of the area is high, which includes the demand of new land for housing development and recreational development. Despite the fact that UDA prohibits the reclamation of low land (paddy, abandoned paddy, and marsh), illegal filling continues and some of low land in the Weras Ganga Basin has already been filled. This trend is expected to continue, and will further

reduce the retention area functioning as flood damage mitigation, and will increase the flood damage in the future.

Thus, the storm water drainage project is important not only as flood damage mitigation measure but also important as basic infrastructure necessary for the development of the Weras Ganga Basin.

For setting the macro frame, the past trend of the area, development policy in the CMRSP, and as well as a new national development strategy are considered.

2.2 Population Framework

2.2.1 Basic Assumption (Basic Condition)

Population framework is formulated based on the development strategy in the CMRSP and detailed strategy for specific areas set by UDA after publication of the CMRSP. The urban population growth rate estimated in the CMRSP is 2.4% which is higher than the CMR average of 1.4%.

Target population in selected urban areas, such as Core Area and Growth Center is proposed in the CMRSP. Basic strategy for population planning is to reduce the population density pressure in Colombo by diverting the population to growth centers and newly emerging urban areas surrounding existing urban areas.

Migration from Colombo and from other areas of Sri Lanka is expected and urbanization continues, but the population increase rate in Weras Ganga Basin is not likely to exceed the growth rate for CMR because most population growth is expected to take place in growth centers which are outside Weras Ganga Basin.

The area along Galle Road (Dehiwala - Mount Lavinia, Moratuwa) continues to grow with an inflow of people due to more commercial activities. Maharagama and Kesbewa will be developed as residential areas. Weras Ganga east tends to have high growth rate due mainly to availability of land and low land price compared with those for Weras Ganga west.

2.2.2 Projected Population Density

In the CMRSP, the target for the future population density is proposed. Proposed population density for the Core Area is 120 persons per ha, and for high density areas, the population density allowed is set as high as 300 persons per ha. Based on the strategy specified in CMRSP, UDA is currently preparing development plans for Local Authorities, which include proposed population density.

2.2.3 Population Framework

Based on the basic assumption and projected population density of Weras Ganga Basin, population for 2010 is estimated. Total population of Weras Ganga Basin is estimated to be 483,000, which is 1.26 times larger than 2001 level. The population density will be 87 persons/ha.

Estimated Population of the Project Area in 2010

DS Divisions	Population (2001)	Projected Population (2010)	Estimated Annual Increase Rate (%)
Dehiwala - Mount Lavinia	48,000	57,000	1.88
Ratmalana	69,000	83,000	1.88
Moratuwa	48,000	60,000	2.38
Sri Jayawardenapura Kotte	30,000	39,000	2.68
Maharagama	54,000	71,000	2.68
Kesbewa	134,000	173,000	2.87
Weras Ganga Basin	382,000	483,000	2.37

Note: Prepared by JICA Study Team based on CMRSP

Projected Population Density

(Unit: Persons/ha)

DS Divisions	Population Density (2001)	Projected Population Density (2010)
Dehiwala - Mount Lavinia	132	159
Ratmalana	87	105
Moratuwa	106	135
Sri Jayawardenapura Kotte	49	64
Maharagama	69	89
Kesbewa	52	68
Weras Ganga Basin	69	87

Note: Estimated by JICA Study Team

2.3 Economic Framework

2.3.1 Economic Framework of Sri Lanka

Sri Lanka economy recorded -1.3% growth rate in 2001 due mainly to high oil price and droughts. In 2002, the economy showed some sign of recovery, and economic growth rate is expected to show positive growth. Together with the progress of the peace process, outlook of the economy is positive.

Since a National Development Plan does not exist in Sri Lanka, under the previous government, "Vision 2010 Sri Lanka"(2001) was prepared by the Ministry of Finance and Planning to illustrate the future vision of Sri Lanka. After the new Government took the office in January 2002, the Government tried to prepare the economic development plan under Parliamentary initiative. Even though the strategy shown in the Vision 2010 is officially not valid anymore, the basic strategy in the Vision 2010 is expected to be adopted by the new development plan.

According to "Vision 2010 Sri Lanka", Sri Lanka's GDP growth rate is targeted between 7% and 8% during the decade up to 2010. The leading growth sectors will be manufacturing and services-related activities such as information technology, electronics, communications, transshipment and financial and business services. The emphasis of a macro perspective will be on increasing value addition, together with the efficient utilization and processing of domestic resources. The following table shows macro economic indicators set in the Vision 2010.

Macro Economic Indicators, 2000-2010

Item	2000	2003	2006	2008	2010
GDP Growth Rate (%)	6.0	6.3	7.4	7.6	8.2
Unemployment Rate (%)	7.4	6.3	5.1	3.8	3.0
Inflation (%)	6.2	5.9	3.9	3.5	3.5
Per Capita Income (US$)	897	1,100	1,380	1,945	2,490

Sources: Vision 2010 Sri Lanka, National Planning Department, Ministry of Finance and Planning

The new Government is optimistic and enthusiastic about reforming Sri Lanka economy by trying to set the target growth rate of 8 to 10%, which is expected to be achieved by creating more jobs, reforming public finance, reconstructing resources, and increasing productivity and investment.

2.3.2 Economic Framework of Weras Ganga Basin

The economic framework set for the Master Plan is used as the base for setting the economic framework for Weras Ganga Basin. Additional information concerning the economic activities of the area is also used to analyze the trend of economic activities.

The basic conditions and the economic framework for the Master Plan (study area) are summarized below.

1) GRDP growth rate for the study area tends to be higher than the rate for GDP because the study area is considered as a center of economic activity.
2) The growth rate of agriculture sector is slow and continues to be slow due to decrease in agricultural land.
3) The growth rate for industry sector and service sector is high.

4) GRDP growth rate of the study area is estimated to be 7.2% up to 2005 and 7.9% up to 2010.

The expected trends of economic activities in Weras Ganga Basin are summarized below.

1) Agricultural activity will decrease due to decrease in agricultural area and decrease in the number of farmers.
2) Manufacturing will still be one of major economic activities, but because of the restriction of industrial activities proposed in the CMRSP, manufacturing is limited in designated industrial estate such as Ratmalana. Only small scale factories and environmentally friendly factories are allowed outside the estate.
3) Commercial activities will be developed to accommodate increased population and to replace some industrial activities to be relocated to outside Weras Ganga Basin.
4) Housing development will be accelerated to supply housing for increased population from Colombo and from other areas of Sri Lanka.
5) Tourism will be developed and contribute to the economy of the area. The Government is trying to provide recreational facilities similar to Galle Face in Colombo. UDA is planning recreational development along Weras Ganga, and other recreational activities will emerge after the flood is controlled. Facilities like parks and restaurants are expected to be constructed.

Economic Framework of Weras Ganga Basin

Sector	Growth Rate (2001-05) (%)	Growth Rate (2006-10) (%)	GRDP (million Rs.)	Sector Share (%)
Agriculture	1.6	1.6	481	0.6
Industry	6.3	7.0	27,335	31.8
Service	9.9	10.9	58,034	67.6
Weras Ganga Basin	8.4	9.5	*85,851	100.0

Note: Estimated by JICA Study Team
* The figure may not match the target in "Vision 2010" because of different source and different method of calculation.

2.4 Future Properties

Property value in the Weras Ganga Basin is considered to be one of the highest in Sri Lanka due to high population density and high concentration of economic activity, and continue to be high. The basic information on property value is collected from Local Authorities.

2.4.1 Land Value

Land value is determined by the location and the condition of land such as primary area, secondary area, and tertiary area. Average land value is calculated from the information provided by Local Authorities. The land value of highly urbanized area such as Dehiwala - Mount Lavinia is high, which is close to three times higher than land values in not so urbanized areas such as Kesbewa. The condition of the land also is an important factor of determination of the land value. The difference between high value area and low value area is as large as three times . The average land value is summarized in the table below.

Average Land Value by Land Use in 2001

(Unit: Rs./m^2)

DS Division	Land Use (Land Condition)		
	High Area	Medium Area	Low Area
Dehiwala - Mount Lavinia	8,880	5,798	2,969
Ratmalana	6,054	4,804	3,824
Moratuwa	5,954	3,498	2,549
Sri Jayawardenapura Kotte	6,981	5,056	2,621
Maharagama	5,082	4,314	n.a.
Kesbewa	3,028	2,113	1,551

Source: Local Authorities

In the past 10 years, the rate of land value increase was high in the early 1990s and low in late 1990s. The average increase rate for the period of 1990 to 1995 was 5% and the rate for the period of 1996 to 2001 was 4%.

The Government intends to stimulate land transaction by changing laws to promote of housing development as one of the measures for the economic reform plan and active land transaction is expected. In addition, the demand for housing in Weras Ganga Basin is expected to be high due to migration from other areas of Sri Lanka.

Based on the condition mentioned above, the land value in Weras Ganga Basin continues to be high even though the Government has tried to lower the inflation rate to 3.5%. The annual increase rate for the land value is set as 4%. The table below shows the expected land value in 2010.

Average Land Value by Land Use in 2010

(Unit: Rs./m^2)

DS Division	Land Use (Land Condition)		
	High Area	Medium Area	Low Area
Dehiwala - Mount Lavinia	12,639	8,252	4,226
Ratmalana	8,617	6,838	5,443
Moratuwa	8,558	4,979	3,628
Sri Jayawardenapura Kotte	9,936	7,196	3,731
Maharagama	7,233	6,140	n.a.
Kesbewa	4,310	3,007	2,208

Note: Estimated by JICA Study Team

2.4.2 Building Value

Building value is summarized from the registered value to the Local Authority. Building value also shows the same trend as land value. Weras Ganga west tends to show high value compared with the value in Weras Ganga east. Building value is summarized in the table below.

Average Building Value by Utilization in 2001

(Unit: Rs./m^2)

DS Division	Property Utilization			
	Residential	(unit value)	Commercial	Factory
Dehiwala - Mount Lavinia	9,132	(1,753,344)	15,350	10,000
Ratmalana	5,956	(1,143,552)	11,348	9,804
Moratuwa*	5,956	(1,143,552)	11,348	9,804
Sri Jayawardenapura Kotte	6,846	(1,314,432)	10,535	9,412
Maharagama	4,559	(875,328)	5,719	8,824
Kesbewa	3,028	(581,376)	3,028	3,208

Source: Local Authority
Unit value is calculated based on the average size of building the area, 192 m^2
* Same value is used for Ratmalana and Moratuwa

The values in 2010 are estimated based on economic growth for which 8.4% is applied.

Average Building Value by Utilization in 2010

(Unit: Rs./m^2)

DS Division	Property Utilization			
	Residential	(unit value)	Commercial	Factory
Dehiwala - Mount Lavinia	18,873	(3,623,616)	31,723	20,666
Ratmalana	12,309	(2,363,328)	23,452	20,261
Moratuwa	12,309	(2,363,328)	23,452	20,261
Sri Jayawardenapura Kotte	14,147	(2,716,224)	21,771	19,451
Maharagama	9,422	(1,809,024)	11,819	18,236
Kesbewa	6,258	(1,201,536)	6,258	6,630

Note: Estimated by JICA Study Team
Unit value is calculated based on the average size of building of the area, 192 m^2

CHAPTER 3 ECONOMIC EVALUATION FOR WERAS GANGA STORM WATER DRAINGE PROJECT

3.1 Methodology

The economic viability of the project is evaluated based on the estimated project cost and flood control benefit. The economic cost is obtained by deducting the transfer payment from the financial cost and multiplying conversion factors to some local costs. The economic benefit is defined as the impact of flood control measures which is composed of the flood damage reduction impact and the efficient land utilization by the flood free condition. The economic evaluation is conducted by calculating the Economic Internal Rate of Return (EIRR) and cost benefit analysis (B/C and B-C) on the basis of the economic cost and the estimated flood control benefit.

3.2 Economic Cost

For the economic evaluation, the project cost of the proposed storm water drainage plan, which is estimated in financial cost, is converted to the economic cost. In order to derive the economic cost from the financial cost, transfer payments such as taxes, compensation, and price escalation are deducted. In addition to subtracting transfer payments, the local portion of financial costs are adjusted due to foreign exchange premium, overvalued labor costs, and land acquisition cost, etc. The conversion factors are taken from the Phase III of Greater Colombo Flood Control and Environmental Improvement Project and applied to this study. Conversion factors applied for calculation of economic cost is shown below.

1) Construction cost 0.90
2) Engineering service 0.90
3) Land acquisition cost 0.90
4) Administration cost 0.90

3.3 Economic Benefit

3.3.1 Types of Project Benefits

Three types of project benefits are estimated: 1) flood damage reduction benefit, 2) land enhancement benefit, and 3) economic activity acceleration benefit.

1) Flood damage reduction benefit is characterized as flood damage reduced by implementation of the storm water drainage plan, which includes

damage to property, damage to infrastructure and disturbance to economic activities.

2) Land enhancement benefit is characterized as a value added and efficient utilization of the land generated from the flood free environment. The Weras Ganga Basin plays an important role in the development of CMR, and shortage of land is one of the major constraints of the development. Converting the flood prone area to the flood free area will accelerate utilization of the land for residential, commercial and recreational use. The land enhancement benefit is measured in terms of increase of the land value.
3) Economic activity acceleration benefit is characterized as impact of the drainage project to the economic activity of the basin. Since storm water drainage is important infrastructure for the development, implementation of the drainage project will attract more investment and promote economic activities.

3.3.2 Flood Damage Reduction Benefit

The flood damage reduction benefit expected from the storm water drainage project is estimated by the following procedure.

1) Estimation of unit value of assets
2) Estimation of damage by inundation depth
3) Estimation of probable flood damage
4) Conversion to annual average flood damage
5) Calculation of flood damage reduction benefit

(1) Estimation of Unit Value of Assets

The expected flood damage is estimated by analyzing values of the assets by land use in the flood prone area. The value of the assets is estimated for the unit building value and goods value. Paddy area is measured by the productivity of paddy.

The method of estimating the values of assets is summarized below.

1) The values of assets are estimated based mainly on the survey to the Local Authorities and DS Divisions in Weras Ganga Basin, which is summarized in Supporting Report (1). The value is converted for each sub-basin.
2) Average size of the buildings in the Weras Ganga Basin is estimated to be 192 m^2 from aerial photograph and GIS analysis, except for shanty which is estimated to be 77 m^2.
3) Unit value of the asset is estimated based by selected category of land use in 2010 such as high density area, homestead area, garden/grassland area,

shanty, and factory, which is determined by building intensity and analysis of aerial photograph.

4) The table below shows the estimated land use distribution in 2010. The flood damage is estimated based on the property value and the land use distribution for each sub-basin.
5) The value of paddy is estimated separately based on the productivity and price of rice. The productivity of 3,856 kg/ha and the rice price of Rs. 27/kg were applied for estimation of the value of paddy.

Land Use Distribution in 2010

(Unit: ha)

No.	Land Use	1. Nugegoda-Rattanapitiya	2. Bolgoda Canal	3. Boralesgamuwa North	4. Boralesgamuwa South	5. Maha Ela	6. Ratmalana-Moratuwa	7. Thumbowila	Weras Ganga Basin Total
1	High-density	256.1	370.0	131.9	79.4	174.6	203.4	4.8	1,220.1
2	Homestead	262.2	166.7	105.0	146.5	1,121.6	132.0	151.3	2,085.3
3	Factory	0.0	26.5	0.0	2.3	16.5	78.8	3.1	127.1
4	Airport	0.0	22.2	0.0	7.5	0.0	147.6	0.0	177.3
5	Very High Density	0.0	0.0	0.0	0.0	0.0	21.5	0.0	21.5
6	Paddy	2.4	0.0	45.0	15.1	291.3	0.0	3.4	357.1
7	Garden	120.4	23.8	91.9	54.2	138.2	95.3	5.1	528.9
8	Vegetation	10.7	8.3	5.6	24.2	27.8	5.3	4.1	85.9
9	Grassland	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	Dumping Site	0.0	4.7	0.0	0.0	0.7	2.7	0.2	8.2
11	Marsh	55.7	37.6	39.9	30.0	81.2	24.7	7.5	276.5
12	Vacant	7.2	27.8	2.4	5.3	24.6	5.7	0.3	73.4
13	Water	0.3	15.4	10.3	32.1	7.8	31.1	23.7	120.6
14	Others (Road)	92.1	66.3	48.0	27.7	154.6	64.3	15.2	468.1
	Total Area	**807.0**	**769.3**	**479.8**	**424.3**	**2,038.7**	**812.3**	**218.6**	**5,550.0**

Source: Estimated by JICA Study Team

a) Value of building (house and shop)

Since most area in Weras Ganga Basin is characterized as residential area or a mixture of residential area and commercial area, building value is estimated based on residential value except for factories whose value is higher than the residential value. Commercial value is assumed to have same value as residential area. The asset value in Weras Ganga west tends to be high compared with the asset value in Weras Ganga east. Estimated value by sub-basin is summarized in the table below.

Average Property Value by Utilization in 2001

Sub-Basin	House		Factory	
	(Rs./m^2)	(Rs./unit)	(Rs./m^2)	(Rs./unit)
Nugedoda-Rattanapitiya	4,559	875,328	8,824	4,412,000
Boralesgamuwa North	4,559	875,328	8,824	4,412,000
Boralesgamuwa South	3,992	753,024	3,922	1,961,000
Maha Ela	2,941	564,672	2,941	1,470,500
Tumbowila	2,353	451,776	2,353	1,176,500
Bolgoda Canal	9,132	1,753,344	10,545	5,272,500
Ratmalana-Moratuwa	5,956	1,143,552	9,804	4,902,000

Source: Local Authorities
Unit value is calculated based on the average size of house in the area, 192m^2

b) Value of goods (household property, machinery and equipment)

The value of goods is estimated by the ratio to the average value of building. The value of household property is estimated to be 30% of building value, and the value of machinery and equipment is estimated to be 60% of building value as shown in the table below.

Average Value of Goods

Sub-Basin	Value of Goods	
	Residential (Rs./unit)	Factory (Rs./unit)
Nugedoda-Rattanapitiya	262,598	2,647,200
Boralesgamuwa North	262,598	2,647,200
Boralesgamuwa South	225,907	1,176,600
Maha Ela	169,402	882,300
Tumbowila	135,533	705,900
Bolgoda Canal	526,003	3,163,500
Ratmalana-Moratuwa	343,066	2,941,200

Source: Estimated by JICA Study Team

(2) Estimation of Flood Damage by Inundation Depth

The relationship between inundation depth and damage rate prepared by the Ministry of Land, Infrastructure and Transport, Japan is utilized for estimation of the flood damage by inundation depth. The flood damage per hectare of inundation area for the respective land uses (high density, homestead, grassland/garden, shanty, factory and paddy) is calculated from the value of assets per hectare and the flood damage rate (Table 3.3.1). The inundation area and depth by land use of high density, homestead, grassland/garden, shanty, factory and paddy are given by hydrological analysis.

(3) Estimation of Probable Flood Damage

The probable flood damage, which includes direct damage (damage to property), interruption to business operation and damage to infrastructure, is calculated under the various magnitude of flood events. The inundation area and the flood

probabilities of 2, 5, 10, 25 and 50 years are set for calculating the probable flood damages (Table 3.3.2). Damage to interruption to business operation and infrastructure is estimated based on the ratio set by the Ministry of Land, Infrastructure and Transport, Japan. The interruption to business operation is estimated at 6% of the property value, and the damage to infrastructure (roads, bridges) is estimated at 28% of the property value (Table 3.3.3). The following table shows the estimated probable damages for sub-basins.

Probable Flood Damage

(Unit: million Rs.)

Flood Return Period	1. Nugegoda-Rattanapitiya	2. Boralesgamuwa North	3. Boralesgamuwa South	4. Maha Ela	5. Thumbowila	6. Bolgoda Canal	7. Ratmalana-Moratuwa*
2 years	47	17	10	79	6	34	27/138
5 years	65	23	12	96	12	155	37/195
10 years	73	26	14	103	13	169	46/202
25 years	87	31	19	113	23	203	61/197
50 years	97	33	20	121	22	223	69/165

Note: * Left: damage caused from Weras Ganga, Right: damage caused by insufficient urban drainage

(4) Conversion of Probable Flood Damage to Annual Average Flood Damage

Based on the probable flood damage, the annual average flood damage is calculated by applying average occurrence probability to the corresponding probable flood damage. The table below shows the annual average flood damage for seven sub-basins. The estimated annual average flood damage is considered as a base for the flood reduction benefits (Table 3.3.4).

Annual Average Flood Damage

(Unit: million Rs.)

Flood Return Period	1. Nugegoda-Rattanapitiya	2. Boralesgamuwa North	3. Boralesgamuwa South	4. Maha Ela	5. Thumbowila	6. Bolgoda Canal	7. Ratmalana-Moratuwa*	Weras Ganga Basin**
2 years	12	4	2	20	2	9	7/35	67/102
5 years	17	6	3	26	3	28	10/50	101/151
10 years	7	2	1	10	1	16	4/20	42/62
25 years	5	2	1	6	1	11	3/12	29/41
50 years	2	1	0	2	0	4	1/3	11/14
Annual Damage	**42**	**15**	**9**	**65**	**7**	**69**	**25/120**	**251/371**

Note: * Left: damage caused from Weras Ganga, Right: damage caused by insufficient urban drainage

**The number on right includes the damage caused by insufficient urban drainage

(5) Calculation of Flood Damage Reduction Benefit

The flood damage reduction benefit is derived from the annual average flood damage and the effect of the flood control measures measured by the difference of flood damage with and without the project, which is calculated for seven sub-basins plus Weras Ganga Scheme alone. Since Thumbowila sub-basin does not have any measures, the benefit is the impact of Weras Ganga scheme and Bolgoda Canal (Table 3.3.5). The result is shown in the table below.

Flood Damage Reduction Benefit

(Unit: million Rs.)

Flood Return Period	1. Nugegoda-Rattanapitiya	2. Boralesgamuwa North	3. Boralesgamuwa South	4. Maha Ela	5. Thumbowila	6. Bolgoda Canal	7. Ratmalana-Moratuwa*	8. Weras Ganga Scheme**
2 years	6.83	1.30	0.77	2.44	0.08	0.82	3.98/23.80	3.85/27.65
5 years	10.07	1.80	1.11	9.74	0.54	1.84	3.92/23.37	6.41/29.78
10 years	4.22	0.75	0.49	5.60	0.24	0.45	1.11/4.06	2.18/6.24
25 years	1.92	0.41	0.38	2.42	0.28	0.16	0.93/2.40	1.95/4.35
50 years	0.39	0.12	0.14	0.48	0.12	0.11	0.42/0.73	0.93/1.66
Benefit	**23.44**	**4.83**	**2.89**	**20.68**	**1.26**	**3.37**	**10.35/51.35**	**15.32/66.67**

Note: * Left: damage caused from Weras Ganga, Right: damage caused by insufficient urban drainage
**The number on right includes the damage caused by insufficient urban drainage

3.3.3 Land Enhancement Benefit

(1) Basic Assumption

The land enhancement benefit is estimated as increase of land value by the flood free condition created from the storm water drainage project. The flood free condition is expected to contribute to the high utilization of the flood prone areas.

The conditions for estimating the land enhancement benefit are set as follows.

1) The land enhancement benefit is produced by intensive utilization of the flood prone areas.
2) The rent value is applied to measure the land enhancement benefits assuming that the rent represents the economic activities of the land based on the fact that the value of the land is usually determined by the productivity or projected profit of the land.
3) Difference of the price in high value area and low value area is considered as incremental value of the project assuming that the flood free condition will increase the value of land.
4) Marsh, paddy, water areas designated in the future land use are left untouched, that is, no utilization of those areas is expected.

(2) Methodology

Based on the basic assumption mentioned above, the land enhancement benefit is estimated as follows.

1) Area to be utilized

The area to be utilized with the flood free condition is estimated from the future land use. Reduced inundation area is the difference of inundation area with and without project for 10 year return period, except for Weras Ganga Scheme for which 50 year return period is applied. The available land for development is sum of high density, homestead, garden/grassland, shanty and factory, which is considered as potential area for development. The table below shows the area available for development.

Percentage of Potential Area to be Developed in Open Area

Sub-Basin/Scheme*	Reduced Inundation Area (ha)	Available Land for Development (ha)	Availability Ratio (%)
Nugedoda-Rattanapitiya	54.7	44.2	80.7
Boralesgamuwa North	39.5	9.8	24.7
Boralesgamuwa South	35.7	7.3	20.3
Maha Ela	105.5	71.3	67.6
Tumbowila	1.4	1.2	84.9
Bolgoda Canal	1.0	0.0	0.0
Ratmalana-Moratuwa	18.6	14.7	79.2
Weras Ganga Scheme*	48.4	27.7	57.2

Note: Estimated by JICA Study Team

2) Estimation of economic value of land

The economic value of the land is measured by the difference in the land price (rent value) between high value area and low value area by sub-basin assuming that the value of land increases after the flood is controlled. The estimated value is shown in the table below.

Rent Price by Sub-Basin

(Unit: Rs./m^2/year)

Sub-Basin/Scheme*	Incremental Rent Value
Nugedoda-Rattanapitiya	409.4
Boralesgamuwa North	409.4
Boralesgamuwa South	200.5
Maha Ela	140.4
Tumbowila	120.3
Bolgoda Canal	604.5
Weras Ganga Scheme*	298.1

Note: Estimated by JICA Study Team

(3) Land Enhancement Benefit

Based on the estimated area to be utilized under the flood free condition and respective rent price, the land enhancement benefit is calculated for each sub-basin. The land enhancement benefit is shown in the table below.

Land Enhancement Benefit

(Unit: million Rs.)

Sub-Basin/Scheme*	Land Enhancement Benefit
Nugegoda-Rattanapitiya	180.9
Boralesgamuwa North	40.0
Boralesgamuwa South	14.5
Maha Ela	100.2
Tumbowila	1.4
Bolgoda Canal	0.0
Ratmalana-Moratuwa	33.6
Weras Ganga Scheme*	82.4

Note: Estimated by JICA Study Team

3.3.4 Economic Activity Acceleration Benefit

Flood condition is causing some investors to hesitate to invest in Weras Ganga Basin. Since the storm water drainage project is considered as basic infrastructure needed for development of Weras Ganga Basin, implementation of the drainage project will promote development of the area. Recreational activities, housing development, commercial development are among the developments expected. For economic activity acceleration benefit, the expected impact of recreational development and housing development for Weras Ganga Basin as a whole is assessed.

(1) Recreational Development

Impact of recreational development is assessed by construction of recreational facility and tourist expenditure in the area. The UDA is planning a Theme Park Boralesgamuwa by the bank of Weras Ganga. The facility includes restaurants, museum, community hall, and open area. Flood control condition will promote the interests of investor. The expected cost of the Theme Park Boralesgamuwa is Rs. 200 million to Rs. 400 million, which is considered as construction aspect of recreational development.

The number of tourists (visitors) is expected to increase after the recreational facility is available, and they will consume in the area. Tourism expenditure, created by new consumption, is estimated based on following condition.

1) Tourist expenditure per person per visit is estimated to be Rs. 40 (targeting local tourists only).

2) The target of average number of visitors per day is estimated to be 2,000 persons.
3) Total tourism expenditure in Weras Ganga Basin is estimated to be Rs. 29.2 million a year (Rs. 40 a day × 2,000 people × 365 days).

The impact of tourism development in Weras Ganga Basin is estimated to be Rs. 200 million to Rs. 400 million for construction of facilities and Rs. 29.2 million a year from tourism expenditure.

(2) Housing Development

Impact of housing development is assessed by demand for new houses based on the difference of 2010 population with and without the project. Basic assumption of estimating the housing development is shown below.

1) The population growth rate of 2.3% used for population framework will be achieved with the project. Trend population growth rate of 2.1% (average population growth rate of Weras Ganga Basin), which is lower than planned population, will continue without the project.
2) The difference of the population in 2010 between two growth rates is 12,448 persons.
3) Assuming that the number of family members for a household is 4.6, and half of the demand of houses needs to be newly built to accommodate new families, the new housing construction potential is estimated to be 1,347 houses.
4) Average cost of a house is Rs. 1.2 million based on average construction cost and the size of houses.
5) Based on assumption mentioned above, housing development potential is estimated to be Rs. 1,616 million after the project is implemented.

3.4 Intangible Benefit

In addition to the quantitative benefits discussed and estimated in the previous sections, it should be noted that the proposed storm water drainage project will produce a lot of intangible benefits that can not be measured quantitatively. The following intangible benefits can be expected through the implementation of the storm water drainage projects.

(1) Promotion of Economic Development

The storm water drainage project creates the flood free land and the flood free land can be utilized for industry, commercial, recreational and residential purposes. Recreational need is particularly high in Weras Ganga Basin. Consequently, the

economic development of the region is promoted, creating more jobs, and eventually increased income level.

(2) Improvement of People's Living Conditions

In the project area, there are many people and some of them will be subject to relocation for project implementation. Some are low-income or poor people. If the project pays attention to the living conditions of the people affected, the project will contribute to improvement of the people's living conditions and poverty reduction.

Some infrastructure built for the construction can be used by the local people after the completion of drainage work. Road built for construction or for O&M road can be used by local people if mutually agreed by the local people and the O&M agency, which will improve the access for their daily lives.

(3) Alleviation of Inconvenience of People's Life

The flooding usually affects the people's life and causes inconvenience. In some cases, poor people reside in low land area where is high risk of flood since the value of land is low, and they can not protect their property from flood by themselves. As the storm water drainage project aims at reducing flooding in space and time, the inconveniences to people's life will become much reduced.

(4) Improvement of Hygienic Environment

The flooding causes health hazards such as breeding of mosquitoes, contaminating the water and spread of the intestinal diseases which are identified as one of the major causes of death among children and elderly. Ratmalana has high concentration of factories and flooding of contaminated water from those factories will cause health hazards. The storm water drainage project will improve the hygienic environment in urban areas and realize the people's healthy life. It eventually contributes to saving of the health care cost.

(5) Elimination of Menace of Flooding

The people living in the lowland are exposed to the menace of flooding. The storm water drainage project will eliminate menace of flooding from the people by reducing flooding or protecting them from flood.

(6) Improvement of Water Environment

The storm water drainage project is implemented primarily aiming at improving the storm water drainage system, but it also will contribute to improvement of the water environment by clearing of river bank, cleaning of channel, provision of recreational facilities, improvement of landscape, etc.

3.5 Economic Evaluation for Proposed Weras Ganga Storm Water Drainage Project

(1) Basic Conditions

On the basis of the estimated construction cost, operation and maintenance cost (O&M cost) and estimated economic benefit, the Economic Internal Rate of Return (EIRR), B-C and B/C are calculated on the following assumptions.

1) Project life of 40 years
2) Discount rate of 10%
3) Project cost is disbursed for five years as follows:
   - Year 1: 10% (detailed design)
   - Year 2: 8% (procurement)
   - Year 3: 28% (construction)
   - Year 4: 30% (construction)
   - Year 5: 24% (construction)
4) The O&M cost is assumed to be disbursed for the entire project life time from the year following completion of the project works.
5) Benefit is produced from the entire project life from the year following completion of the project works.
6) The benefit is expected to increase by 5% per annum based on the economic growth and change in life style.

(2) Economic Evaluation for Proposed Project

The proposed project in Weras Ganga Basin consists of Nugedoda-Rattanapitiya Scheme, Bolgoda Canal Scheme, Urban Drainage part of Ratmalana-Moratuwa Scheme and, Weras Ganga Scheme. The flood control benefit for the project is composed of the flood damage reduction benefit and land enhancement benefit, and is calculated based on the annual average flood damage and the impact of the project measured by the difference of inundation area with and without the project. The impact of the project is calculated by the size of reduction of the expected inundation area with the project.

The result of economic evaluation shows that EIRR is 18.9%, B-C Rs. 3,032 million, and B/C is 2.09, which is considered above the feasible level. Cost benefit stream for proposed project is shown in Table 3.5.1

(3) Sensitivity Analysis

Sensitivity analysis is conducted to analyze the effect of slow urbanization process and slow economic growth, which will decrease the project benefit by reducing the value of assets and reducing the value of land, and an increase in project cost.

Sensitivity analysis is conducted for three cases.

Case 1: Decrease of benefit by 10%

Case 2: Increase of cost by 10%

Case 3: Combination of Case 1 and Case 2

The table below shows the result of the sensitivity analysis.

Results of Sensitivity Analysis

Case	B-C (million Rs.)	B/C	EIRR (%)
Base	3,043	2.09	18.8
Case 1	2,459	1.88	17.2
Case 2	2,764	1.90	17.4
Case 3	2,180	1.71	16.0

Tables

Table 1.3.1 Population of Weras Ganga Basin by GN Divisions in 2001 (1/4)

No.	DS Name	GN Name	MC/UC/PS	Population (2001)	Male	Female	GN Number
1	Dehiwala-Mt. Lavinia	Sri Saranankara	Dehiwala-M. L.	7,009	3,371	3,638	538C
2	Dehiwala-Mt. Lavinia	Vilawala	Dehiwala-M. L.	8,236	4,008	4,228	537
3	Dehiwala-Mt. Lavinia	Dutugemunu	Dehiwala-M. L.	5,893	3,150	2,743	537A
4	**Dehiwala-Mt. Lavinia**	**Kohuwala**	**Dehiwala-M. L.**	**7,288**	**3,606**	**3,682**	**537B**
5	**Dehiwala-Mt. Lavinia**	**Kalubovila**	**Dehiwala-M. L.**	**5,720**	**2,771**	**2,949**	**538**
6	Dehiwala-Mt. Lavinia	Hathbodhiya	Dehiwala-M. L.	6,779	3,475	3,304	538B
7	Dehiwala-Mt. Lavinia	Galwala	Dehiwala-M. L.	6,275	3,195	3,080	538A
8	Dehiwala-Mt. Lavinia	Dehiwala West	Dehiwala-M. L.	6,242	3,337	2,905	540A
9	Dehiwala-Mt. Lavinia	Dehiwala East	Dehiwala-M. L.	6,998	3,463	3,535	540
10	**Dehiwala-Mt. Lavinia**	**Udyanaya**	**Dehiwala-M. L.**	**6,228**	**3,011**	**3,217**	**536A**
11	**Dehiwala-Mt. Lavinia**	**Nedimala**	**Dehiwala-M. L.**	**9,387**	**4,559**	**4,828**	**536**
12	**Dehiwala-Mt. Lavinia**	**Malwatta**	**Dehiwala-M. L.**	**4,607**	**2,302**	**2,305**	**539/4**
13	Dehiwala-Mt. Lavinia	Jayathilaka	Dehiwala-M. L.	6,433	3,480	2,953	540B
14	**Dehiwala-Mt. Lavinia**	**Kawdana East**	**Dehiwala-M. L.**	**14,491**	**7,106**	**7,385**	**539/4**
	Dehiwala-Mt. Lavinia Total			**101,586**			
1	Ratmalana	Mount Lavinia	Dehiwala-M. L.	11,188	5,821	5,367	541
2	**Ratmalana**	**Kawdana West**	**Dehiwala-M. L.**	**7,024**	**3,481**	**3,543**	**539/42C**
3	**Ratmalana**	**Watarappala**	**Dehiwala-M. L.**	**7,002**	**3,498**	**3,504**	**544**
4	**Ratmalana**	**Wathumulla**	**Dehiwala-M. L.**	**6,130**	**3,073**	**3,057**	**544A**
5	**Ratmalana**	**Katukurunduwatta**	**Dehiwala-M. L.**	**11,756**	**5,590**	**6,166**	**545A**
6	**Ratmalana**	**Attidiya North**	**Dehiwala-M. L.**	**8,625**	**4,140**	**4,485**	**543**
7	**Ratmalana**	**Attidiya South**	**Dehiwala-M. L.**	**10,440**	**4,873**	**5,567**	**543B**
8	**Ratmalana**	**Piriwena**	**Dehiwala-M. L.**	**6,312**	**3,133**	**3,179**	**545**
9	Ratmalana	Wedikanda	Dehiwala-M. L.	8,733	4,227	4,506	546A
10	Ratmalana	Vihara	Dehiwala-M. L.	7,965	3,871	4,094	546B
11	Ratmalana	Ratmalana West	Dehiwala-M. L.	5,660	2,694	2,966	546
12	Ratmalana	Ratmalana East	Dehiwala-M. L.	6,109	3,095	3,014	546C
13	**Ratmalana**	**Kandawala**	**Dehiwala-M. L.**	**11,257**	**5,977**	**5,280**	**543A**
	Ratmalana Total			**108,201**			
1	Moratuwa	Angulana North	Moratuwa MC	3,613	1,765	1,848	547
2	Moratuwa	Kaldemulla	Moratuwa MC	4,946	2,330	2,616	548
3	Moratuwa	Soysapura North	Moratuwa MC	4,451	2,043	2,408	548A
4	Moratuwa	Soysapura South	Moratuwa MC	3,274	1,548	1,726	548B
5	Moratuwa	Dahampura	Moratuwa MC	3,285	1,411	1,874	548C
6	**Moratuwa**	**Thelawala North**	**Moratuwa MC**	**5,627**	**2,674**	**2,953**	**549B**
7	**Moratuwa**	**Borupana**	**Moratuwa MC**	**6,879**	**3,339**	**3,540**	**549A**
8	**Moratuwa**	**Thelawala South**	**Moratuwa MC**	**3,571**	**1,771**	**1,800**	**549**
9	Moratuwa	Lakshapathiya North	Moratuwa MC	5,453	2,421	3,032	550A
10	Moratuwa	Lakshapathiya Centre	Moratuwa MC	2,947	1,443	1,504	550B
11	Moratuwa	Angulana South	Moratuwa MC	3,459	1,710	1,749	547A
12	Moratuwa	Uyana South	Moratuwa MC	4,313	2,125	2,188	552A
13	Moratuwa	Uyana North	Moratuwa MC	3,822	1,893	1,929	552B
14	**Moratuwa**	**Rawathawatta South**	**Moratuwa MC**	**2,255**	**1,051**	**1,204**	**557B**
15	**Moratuwa**	**Rawathawatta East**	**Moratuwa MC**	**4,460**	**2,085**	**2,375**	**557**
16	Moratuwa	Lakshapathiya South	Moratuwa MC	5,687	2,652	3,035	550
17	**Moratuwa**	**Kuduwamulla**	**Moratuwa MC**	**3,067**	**1,517**	**1,550**	**551B**
18	**Moratuwa**	**Katubedda**	**Moratuwa MC**	**10,257**	**5,359**	**4,898**	**551**
19	**Moratuwa**	**Molpe**	**Moratuwa MC**	**6,237**	**3,113**	**3,124**	**551A**
20	**Moratuwa**	**Moratumulla North**	**Moratuwa MC**	**3,372**	**1,707**	**1,665**	**551C**
21	Moratuwa	Kadalana	Moratuwa MC	3,622	1,766	1,856	558A
22	Moratuwa	Rawathawatta West	Moratuwa MC	3,759	1,813	1,946	557A

Source: Census 2001 Department of Census and Statistics

Note: GN Division in bold is within Weras Ganga Basin

Table 1.3.1 Population of Weras Ganga Basin by GN Divisions in 2001 (2/4)

No.	DS Name	GN Name	MC/UC/PS	Population (2001)	Male	Female	GN Number
23	Moratuwa	Idama	Moratuwa MC	3,282	1,593	1,689	552
24	Moratuwa	Uswatta	Moratuwa MC	2,584	1,186	1,398	553C
25	Moratuwa	Moratuwella South	Moratuwa MC	4,757	2,311	2,446	553
26	Moratuwa	Indibedda West	Moratuwa MC	4,080	2,041	2,039	559
27	Moratuwa	Moratumulla East	Moratuwa MC	4,139	2,085	2,054	558
28	Moratuwa	Moratumulla West	Moratuwa MC	3,504	1,758	1,746	558B
29	Moratuwa	Villorawatta East	Moratuwa MC	3,629	1,857	1,772	560/6
30	Moratuwa	Villorawatta West	Moratuwa MC	4,290	2,168	2,122	560/6
31	Moratuwa	Indibedda East	Moratuwa MC	3,560	1,775	1,785	559A
32	Moratuwa	Moratuwella North	Moratuwa MC	2,940	1,563	1,377	553A
33	Moratuwa	Moratuwella West	Moratuwa MC	2,693	1,343	1,350	553B
34	Moratuwa	Koralawella North	Moratuwa MC	5,837	2,821	3,016	554
35	Moratuwa	Koralawella East	Moratuwa MC	2,200	1,076	1,124	554B
36	Moratuwa	Koralawella West	Moratuwa MC	3,913	1,943	1,970	554C
37	Moratuwa	Koralawella South	Moratuwa MC	4,059	2,010	2,049	554A
38	Moratuwa	Katukurunda North	Moratuwa MC	4,033	1,960	2,073	555
39	Moratuwa	Katukurunda South	Moratuwa MC	4,893	2,400	2,493	555A
40	Moratuwa	Egoda Uyana North	Moratuwa MC	5,118	2,521	2,597	556
41	Moratuwa	Egoda Uyana Central	Moratuwa MC	3,228	1,648	1,580	556A
42	Moratuwa	Egoda Uyana South	Moratuwa MC	6,095	2,988	3,107	556B
	Moratuwa Total			**177,190**			
1	Sri Jayawardenapura Kotte	Obsekarapura	Sri Jayawar. Ko	11,629	5,824	5,805	514C
2	Sri Jayawardenapura Kotte	Welikada West	Sri Jayawar. Ko	7,002	3,332	3,670	514A
3	Sri Jayawardenapura Kotte	Welikada East	Sri Jayawar. Ko	5,752	2,738	3,014	514
4	Sri Jayawardenapura Kotte	Rajagiriya	Sri Jayawar. Ko	4,194	2,322	1,872	514B
5	Sri Jayawardenapura Kotte	Welikada North	Sri Jayawar. Ko	5,116	2,937	2,179	514D
6	Sri Jayawardenapura Kotte	Nawala West	Sri Jayawar. Ko	4,483	2,230	2,253	520
7	Sri Jayawardenapura Kotte	Koswatta	Sri Jayawar. Ko	6,220	3,119	3,101	520A
8	Sri Jayawardenapura Kotte	Ethulkotte West	Sri Jayawar. Ko	3,515	1,754	1,761	521A
9	Sri Jayawardenapura Kotte	Ethulkotte	Sri Jayawar. Ko	6,392	3,316	3,076	521
10	Sri Jayawardenapura Kotte	Pitakotte East	Sri Jayawar. Ko	4,127	2,056	2,071	522A
11	Sri Jayawardenapura Kotte	Pitakotte	Sri Jayawar. Ko	3,768	1,949	1,819	522B
12	Sri Jayawardenapura Kotte	Pitakotte West	Sri Jayawar. Ko	5,343	2,550	2,793	522
13	Sri Jayawardenapura Kotte	Nawala East	Sri Jayawar. Ko	5,821	3,000	2,821	520B
14	Sri Jayawardenapura Kotte	Nugegoda West	Sri Jayawar. Ko	6,163	3,113	3,050	519B
15	Sri Jayawardenapura Kotte	Pagoda	Sri Jayawar. Ko	6,455	3,337	3,118	519A
16	**Sri Jayawardenapura Kotte**	**Nugegoda**	**Sri Jayawar. Ko**	**5,511**	**3,267**	**2,244**	**519**
17	**Sri Jayawardenapura Kotte**	**Pagoda East**	**Sri Jayawar. Ko**	**5,879**	**2,756**	**3,123**	**519C**
18	**Sri Jayawardenapura Kotte**	**Gangodavila North**	**Sri Jayawar. Ko**	**6,227**	**3,112**	**3,115**	**526**
19	**Sri Jayawardenapura Kotte**	**Gangodavila South**	**Sri Jayawar. Ko**	**8,276**	**4,270**	**4,006**	**526A**
20	**Sri Jayawardenapura Kotte**	**Gangodavila East**	**Sri Jayawar. Ko**	**3,953**	**2,102**	**1,851**	**526C**
	Sri Jayawardenapura Kotte Total			**115,826**			
1	Maharagama	Mirihana South	Maharagama PS	5,578	2,689	2,889	523A
2	Maharagama	Mirihana North	Maharagama PS	6,256	2,970	3,286	523
3	Maharagama	Madiwela	Maharagama PS	6,296	3,201	3,095	524
4	Maharagama	Thalawathugoda West	Homagama PS	5,381	2,679	2,702	493A
5	Maharagama	Thalawathugoda East	Homagama PS	4,830	2,394	2,436	493B
6	Maharagama	Kalalgoda	Homagama PS	3,685	1,862	1,823	493
7	Maharagama	Kottawa East	Homagama PS	3,888	1,872	2,016	496A
8	Maharagama	Rukmale West	Homagama PS	3,510	1,745	1,765	497
9	Maharagama	Rukmale East A	Homagama PS	1,051	512	539	497A
10	Maharagama	Rukmale East B	Homagama PS	2,578	1,159	1,419	497B
11	Maharagama	Liyanagoda	Homagama PS	3,502	1,676	1,826	496E
12	Maharagama	Kottawa North	Homagama PS	2,189	1,086	1,103	496C

Source: Census 2001 Department of Census and Statistics

Note: GN Division in bold is within Weras Ganga Basin

Table 1.3.1 Population of Weras Ganga Basin by GN Divisions in 2001 (3/4)

No.	DS Name	GN Name	MC/UC/PS	Population (2001)	Male	Female	GN Number
13	Maharagama	Depanama	Maharagama UC	6,610	3,277	3,333	529A
14	Maharagama	Polwatta	Maharagama UC	2,443	1,196	1,247	529
15	Maharagama	Pamunuwa	Maharagama UC	4,107	1,987	2,120	528
16	Maharagama	Thalapathpitiya	Maharagama UC	5,505	2,740	2,765	525
17	Maharagama	Pragathipura	Maharagama UC	5,228	2,576	2,652	524A
18	Maharagama	Udahamulla East	Maharagama UC	6,010	3,020	2,990	525A
19	Maharagama	Udahamulla West	Maharagama UC	4,202	2,062	2,140	525B
20	Maharagama	Pathiragoda	Maharagama UC	6,216	3,017	3,199	527A
21	**Maharagama**	**Maharagama East**	**Maharagama UC**	**3,567**	**1,795**	**1,772**	**527B**
22	**Maharagama**	**Maharagama West**	**Maharagama UC**	**2,419**	**1,228**	**1,191**	**527C**
23	Maharagama	Dambahena	Maharagama UC	5,049	2,425	2,624	528A
24	**Maharagama**	**Pannipitiya North**	**Maharagama UC**	**3,741**	**1,854**	**1,887**	**531**
25	Maharagama	Kottawa West	Homagama PS	2,410	1,195	1,215	496D
26	**Maharagama**	**Kottawa South**	**Homagama PS**	**6,170**	**2,993**	**3,177**	**496**
27	Maharagama	Malapalla West	Homagama PS	2,464	1,196	1,268	498B
28	Maharagama	Malapalla East	Homagama PS	2,669	1,273	1,396	498
29	Maharagama	Makumbura North	Homagama PS	3,006	1,457	1,549	498A
30	Maharagama	Makumbura South	Homagama PS	1,703	897	806	498C
31	Maharagama	Kottawa Town	Homagama PS	5,616	2,920	2,696	496B
32	**Maharagama**	**Pannipitiya South**	**Maharagama UC**	**2,107**	**1,036**	**1,071**	**531A**
33	Maharagama	Maharagama Town	Maharagama UC	6,024	3,294	2,730	530
34	**Maharagama**	**Godigamuwa South**	**Maharagama UC**	**5,302**	**2,583**	**2,719**	**532A**
35	**Maharagama**	**Godigamuwa South B**	**Maharagama UC**	**6,063**	**2,699**	**3,364**	**532B**
36	**Maharagama**	**Godigamuwa North**	**Maharagama UC**	**4,703**	**2,200**	**2,503**	**532**
37	Maharagama	Wattegedara	Maharagama UC	7,804	3,920	3,884	532C
38	**Maharagama**	**Navinna**	**Maharagama UC**	**5,161**	**2,514**	**2,647**	**527**
39	**Maharagama**	**Wijerama**	**Maharagama UC**	**3,569**	**2,099**	**1,470**	**526C**
40	**Maharagama**	**Gangodavila South B**	**Maharagama UC**	**6,730**	**2,814**	**3,916**	**526B**
41	**Maharagama**	**Jambugasmulla**	**Maharagama UC**	**4,770**	**2,246**	**2,524**	**526D**
	Maharagama Total			**180,112**			
1	**Kesbewa**	**Bellanvila**	**Kesbewa PS**	**3,498**	**1,734**	**1,764**	**535A**
2	**Kesbewa**	**Boralesgamuwa West**	**Kesbewa PS**	**4,198**	**2,007**	**2,191**	**533B**
3	**Kesbewa**	**Boralesgamuwa West**	**Kesbewa PS**	**1,648**	**740**	**908**	**533F**
4	**Kesbewa**	**Rattanapitiya**	**Kesbewa PS**	**4,024**	**1,899**	**2,125**	**533A**
5	**Kesbewa**	**Egodawatta**	**Kesbewa PS**	**2,606**	**1,206**	**1,400**	**533C**
6	**Kesbewa**	**Boralesgamuwa East**	**Kesbewa PS**	**5,028**	**2,617**	**2,411**	**533**
7	**Kesbewa**	**Boralesgamuwa West**	**Kesbewa PS**	**2,374**	**1,135**	**1,239**	**533E**
8	**Kesbewa**	**Werahera North**	**Kesbewa PS**	**2,017**	**1,079**	**938**	**577**
9	**Kesbewa**	**Boralesgamuwa East**	**Kesbewa PS**	**4,669**	**2,000**	**2,669**	**533D**
10	**Kesbewa**	**Neelammahara**	**Kesbewa PS**	**2,854**	**1,356**	**1,498**	**579**
11	**Kesbewa**	**Katuwawala North**	**Kesbewa PS**	**3,001**	**1,480**	**1,521**	**578**
12	**Kesbewa**	**Vishwakalawa**	**Kesbewa PS**	**1,870**	**899**	**971**	**574B**
13	**Kesbewa**	**Werahera South**	**Kesbewa PS**	**4,191**	**2,139**	**2,052**	**577A**
14	**Kesbewa**	**Katuwawala South**	**Kesbewa PS**	**1,401**	**695**	**706**	**578A**
15	**Kesbewa**	**Niwanthidiya**	**Kesbewa PS**	**2,350**	**1,159**	**1,191**	**580A**
16	**Kesbewa**	**Erewwala West**	**Kesbewa PS**	**5,274**	**2,525**	**2,749**	**581A**
17	**Kesbewa**	**Erewwala North**	**Kesbewa PS**	**3,266**	**1,635**	**1,631**	**581D**
18	**Kesbewa**	**Erewwala East**	**Kesbewa PS**	**1,919**	**963**	**956**	**581**
19	**Kesbewa**	**Rathmaldeniya**	**Kesbewa PS**	**4,425**	**2,022**	**2,403**	**581C**
20	**Kesbewa**	**Mahalwarawa**	**Kesbewa PS**	**2,586**	**1,280**	**1,306**	**581E**
21	**Kesbewa**	**Bangalawatta**	**Kesbewa PS**	**2,279**	**1,070**	**1,209**	**581B**
22	**Kesbewa**	**Pelenwatta East**	**Kesbewa PS**	**3,413**	**1,633**	**1,780**	**582B**

Source: Census 2001 Department of Census and Statistics

Note: GN Division in bold is within Weras Ganga Basin

Table 1.3.1 Population of Weras Ganga Basin by GN Divisions in 2001 (4/4)

No.	DS Name	GN Name	MC/UC/PS	Population (2001)	Male	Female	GN Number
23	**Kesbewa**	**Pelenwatta North**	**Kesbewa PS**	**3,473**	**1,687**	**1,786**	**582**
24	**Kesbewa**	**Pelenwatta West**	**Kesbewa PS**	**4,316**	**2,096**	**2,220**	**582A**
25	**Kesbewa**	**Paligedara**	**Kesbewa PS**	**2,666**	**1,292**	**1,374**	**583A**
26	**Kesbewa**	**Kaliyammahara**	**Kesbewa PS**	**2,142**	**1,049**	**1,093**	**580**
27	**Kesbewa**	**Bokundara**	**Kesbewa PS**	**3,504**	**1,766**	**1,738**	**575**
28	**Kesbewa**	**Thumbovila South**	**Kesbewa PS**	**2,890**	**1,370**	**1,520**	**576B**
29	**Kesbewa**	**Thumbovila North**	**Kesbewa PS**	**2,565**	**1,241**	**1,324**	**576A**
30	**Kesbewa**	**Wewala West**	**Kesbewa PS**	**4,198**	**2,073**	**2,125**	**562B**
31	**Kesbewa**	**Wewala East**	**Kesbewa PS**	**1,956**	**898**	**1,058**	**562**
32	**Kesbewa**	**Thumbovila West**	**Kesbewa PS**	**2,546**	**1,301**	**1,245**	**576**
33	**Kesbewa**	**Mampe North**	**Kesbewa PS**	**3,168**	**1,633**	**1,535**	**574A**
34	**Kesbewa**	**Makuludoowa**	**Kesbewa PS**	**2,769**	**1,347**	**1,422**	**583**
35	Kesbewa	Gorakapitiya	Kesbewa PS	1,322	604	718	584
36	**Kesbewa**	**Nampamunuwa**	**Kesbewa PS**	**2,751**	**1,359**	**1,392**	**584A**
37	Kesbewa	Mavittara North	Kesbewa PS	2,038	981	1,057	586A
38	**Kesbewa**	**Mampe East**	**Kesbewa PS**	**1,786**	**907**	**879**	**574D**
39	**Kesbewa**	**Bodhirajapura**	**Kesbewa PS**	**2,042**	**1,002**	**1,040**	**577B**
40	**Kesbewa**	**Mampe West**	**Kesbewa PS**	**4,563**	**2,240**	**2,323**	**574**
41	**Kesbewa**	**Mampe South**	**Kesbewa PS**	**1,765**	**818**	**947**	**574C**
42	Kesbewa	Kolamunna	Kesbewa PS	3,386	1,700	1,686	563/7
43	**Kesbewa**	**Suwarapola East**	**Kesbewa PS**	**2,537**	**1,223**	**1,314**	**562A**
44	**Kesbewa**	**Suwarapola West**	**Kesbewa PS**	**1,373**	**697**	**676**	**562C**
45	Kesbewa	Hedigama	Kesbewa PS	3,404	1,680	1,724	563/7
46	Kesbewa	Batakettara North	Kesbewa PS	4,456	2,289	2,167	565
47	Kesbewa	Kesbewa North	Kesbewa PS	3,915	1,886	2,029	572
48	Kesbewa	Kesbewa East	Kesbewa PS	1,824	932	892	572B
49	Kesbewa	Mavittara South	Kesbewa PS	1,533	736	797	586
50	Kesbewa	Honnanthara North	Kesbewa PS	2,870	1,389	1,481	585
51	Kesbewa	Honnanthara South	Kesbewa PS	3,680	1,756	1,924	585A
52	Kesbewa	Makandana East	Kesbewa PS	3,796	1,881	1,915	569
53	Kesbewa	Kesbewa South	Kesbewa PS	5,353	2,666	2,687	572A
54	Kesbewa	Batakettara South	Kesbewa PS	5,293	2,573	2,720	565A
55	Kesbewa	Madapatha	Kesbewa PS	2,924	1,452	1,472	567
56	Kesbewa	Delthara West	Kesbewa PS	1,866	960	906	564
57	Kesbewa	Delthara East	Kesbewa PS	1,347	670	677	564A
58	Kesbewa	Dampe	Kesbewa PS	3,098	1,533	1,565	566
59	Kesbewa	Makandana West	Kesbewa PS	2,753	1,371	1,382	569A
60	Kesbewa	Nivungama	Kesbewa PS	1,812	864	948	568A
61	Kesbewa	Halpita	Kesbewa PS	3,973	1,923	2,050	570/5
62	Kesbewa	Horathuduwa	Kesbewa PS	1,391	714	677	570/7
63	Kesbewa	Morenda	Kesbewa PS	1,137	586	551	568
64	Kesbewa	Batuwandara North	Kesbewa PS	1,239	601	638	596
65	Kesbewa	Batuwandara South	Kesbewa PS	1,168	557	611	596A
66	Kesbewa	Jamburaliya	Kesbewa PS	2,431	1,182	1,249	597
67	Kesbewa	Polhena	Kesbewa PS	1,555	740	815	598B
68	Kesbewa	Regidel Watta	Kesbewa PS	1,132	564	568	598A
69	Kesbewa	Kahapola	Kesbewa PS	2,647	1,307	1,340	598
	Kesbewa Total			**195,244**			
	Grand Total			**878,159**			

Source: Census 2001 Department of Census and Statistics

Note: GN Division in bold is within Weras Ganga Basin

Table 3.3.1 Flood Damage per ha in Weras Ganga Basin (1/2)

Weras Ganga Basin (Unit: Rs./ha)

Area	Item	Unit Value (ha)	Inundation Depth (m)									
			Shallower than 0.2		0.2 to 0.5		0.5 to 1.0		1.0 to 2.0		Deeper than 2.0	
			Damage Rate	Damage	Damage Rate	Damage	Damage Rate	Damage	Damage Rate	Damage	Damage Rate	Damage
High density	High density (building)	16,500,919	0.03	495,028	0.053	874,549	0.072	1,188,066	0.109	1,798,600	0.152	2,508,140
	High density (goods)	4,950,276		0	0.086	425,724	0.191	945,503	0.331	1,638,541	0.499	2,470,188
	High density total	21,451,195		495,028		1,300,272		2,133,569		3,437,141		4,978,327
Homestead	Homestead (building)	11,917,330	0.03	357,520	0.053	631,619	0.072	858,048	0.109	1,298,989	0.152	1,811,434
	Homestead (goods)	3,575,199		0	0.086	307,467	0.191	682,863	0.331	1,183,391	0.499	1,784,024
	Homestead total	15,492,529		357,520		939,086		1,540,911		2,482,380		3,595,459
Garden/grassland	Garden/grassland (building)	7,333,742	0.03	220,012	0.053	388,688	0.072	528,029	0.109	799,378	0.152	1,114,729
	Garden/grassland (goods)	2,200,123		0	0.086	189,211	0.191	420,223	0.331	728,241	0.499	1,097,861
	Garden/grassland total	9,533,864		220,012		577,899		948,253		1,527,618		2,212,590
Very High Density	Very High Density (building)	7,333,742	0.03	220,012	0.053	388,688	0.072	528,029	0.109	799,378	0.152	1,114,729
	Very High Density (goods)	2,200,123		0	0.086	189,211	0.191	420,223	0.331	728,241	0.499	1,097,861
	Very High Density total	9,533,864		220,012		577,899		948,253		1,527,618		2,212,590
Factory	Factory (building)	23,606,500		0	0.180	4,249,170	0.314	7,412,441	0.419	9,891,124	0.539	12,723,904
	Factory (goods)	14,163,900		0	0.127	1,798,815	0.276	3,909,236	0.379	5,368,118	0.479	6,784,508
	Factory total	37,770,400		0		6,047,985		11,321,677		15,259,242		19,508,412

Nugedoda-Rattanapitiya Sub-basin (Unit: Rs./ha)

Area	Item	Unit Value (ha)	Inundation Depth (m)									
			Shallower than 0.2		0.2 to 0.5		0.5 to 1.0		1.0 to 2.0		Deeper than 2.0	
			Damage Rate	Damage	Damage Rate	Damage	Damage Rate	Damage	Damage Rate	Damage	Damage Rate	Damage
High density	High density (building)	15,755,904	0.03	472,677	0.053	835,063	0.072	1,134,425	0.109	1,717,394	0.152	2,394,897
	High density (goods)	4,726,771		0	0.086	406,502	0.191	902,813	0.331	1,564,561	0.499	2,358,659
	High density total	20,482,675		472,677		1,241,565		2,037,238		3,281,955		4,753,556
Homestead	Homestead (building)	11,379,264	0.03	341,378	0.053	603,101	0.072	819,307	0.109	1,240,340	0.152	1,729,648
	Homestead (goods)	3,413,779		0	0.086	293,585	0.191	652,032	0.331	1,129,961	0.499	1,703,476
	Homestead total	14,793,043		341,378		896,686		1,471,339		2,370,301		3,433,124
Garden/grassland	Garden/grassland (building)	7,002,624	0.03	210,079	0.053	371,139	0.072	504,189	0.109	763,286	0.152	1,064,399
	Garden/grassland (goods)	2,100,787		0	0.086	180,668	0.191	401,250	0.331	695,361	0.499	1,048,293
	Garden/grassland total	9,103,411		210,079		551,807		905,439		1,458,647		2,112,692
Very High Density	Very High Density (building)	7,002,624	0.03	210,079	0.053	371,139	0.072	504,189	0.109	763,286	0.152	1,064,399
	Very High Density (goods)	2,100,787		0	0.086	180,668	0.191	401,250	0.331	695,361	0.499	1,048,293
	Very High Density total	9,103,411		210,079		551,807		905,439		1,458,647		2,112,692
Factory	Factory (building)	30,884,000		0	0.180	5,559,120	0.314	9,697,576	0.419	12,940,396	0.539	16,646,476
	Factory (goods)	18,530,400		0	0.127	2,353,361	0.276	5,114,390	0.379	7,023,022	0.479	8,876,062
	Factory total	49,414,400		0		7,912,481		14,811,966		19,963,418		25,522,538

Boralesgamuwa North Sub-basin (Unit: Rs./ha)

Area	Item	Unit Value (ha)	Inundation Depth (m)									
			Shallower than 0.2		0.2 to 0.5		0.5 to 1.0		1.0 to 2.0		Deeper than 2.0	
			Damage Rate	Damage	Damage Rate	Damage	Damage Rate	Damage	Damage Rate	Damage	Damage Rate	Damage
High density	High density (building)	15,755,904	0.03	472,677	0.053	835,063	0.072	1,134,425	0.109	1,717,394	0.152	2,394,897
	High density (goods)	4,726,771		0	0.086	406,502	0.191	902,813	0.331	1,564,561	0.499	2,358,659
	High density total	20,482,675		472,677		1,241,565		2,037,238		3,281,955		4,753,556
Homestead	Homestead (building)	11,379,264	0.03	341,378	0.053	603,101	0.072	819,307	0.109	1,240,340	0.152	1,729,648
	Homestead (goods)	3,413,779		0	0.086	293,585	0.191	652,032	0.331	1,129,961	0.499	1,703,476
	Homestead total	14,793,043		341,378		896,686		1,471,339		2,370,301		3,433,124
Garden/grassland	Garden/grassland (building)	7,002,624	0.03	210,079	0.053	371,139	0.072	504,189	0.109	763,286	0.152	1,064,399
	Garden/grassland (goods)	2,100,787		0	0.086	180,668	0.191	401,250	0.331	695,361	0.499	1,048,293
	Garden/grassland total	9,103,411		210,079		551,807		905,439		1,458,647		2,112,692
Very High Density	Very High Density (building)	7,002,624	0.03	210,079	0.053	371,139	0.072	504,189	0.109	763,286	0.152	1,064,399
	Very High Density (goods)	2,100,787		0	0.086	180,668	0.191	401,250	0.331	695,361	0.499	1,048,293
	Very High Density total	9,103,411		210,079		551,807		905,439		1,458,647		2,112,692
Factory	Factory (building)	30,884,000		0	0.180	5,559,120	0.314	9,697,576	0.419	12,940,396	0.539	16,646,476
	Factory (goods)	18,530,400		0	0.127	2,353,361	0.276	5,114,390	0.379	7,023,022	0.479	8,876,062
	Factory total	49,414,400		0		7,912,481		14,811,966		19,963,418		25,522,538

Boralesgamuwa South Sub-basin (Unit: Rs./ha)

Area	Item	Unit Value (ha)	Inundation Depth (m)									
			Shallower than 0.2		0.2 to 0.5		0.5 to 1.0		1.0 to 2.0		Deeper than 2.0	
			Damage Rate	Damage	Damage Rate	Damage	Damage Rate	Damage	Damage Rate	Damage	Damage Rate	Damage
High density	High density (building)	13,554,432	0.03	406,633	0.053	718,385	0.072	975,919	0.109	1,477,433	0.152	2,060,274
	High density (goods)	4,066,330		0	0.086	349,704	0.191	776,669	0.331	1,345,955	0.499	2,029,098
	High density total	17,620,762		406,633		1,068,089		1,752,588		2,823,388		4,089,372
Homestead	Homestead (building)	9,789,312	0.03	293,679	0.053	518,834	0.072	704,830	0.109	1,067,035	0.152	1,487,975
	Homestead (goods)	2,936,794		0	0.086	252,564	0.191	560,928	0.331	972,079	0.499	1,465,460
	Homestead total	12,726,106		293,679		771,398		1,265,758		2,039,114		2,953,435
Garden/grassland	Garden/grassland (building)	6,024,192	0.03	180,726	0.053	319,282	0.072	433,742	0.109	656,637	0.152	915,677
	Garden/grassland (goods)	1,807,258		0	0.086	155,424	0.191	345,186	0.331	598,202	0.499	901,822
	Garden/grassland total	7,831,450		180,726		474,706		778,928		1,254,839		1,817,499
Very High Density	Very High Density (building)	6,024,192	0.03	180,726	0.053	319,282	0.072	433,742	0.109	656,637	0.152	915,677
	Very High Density (goods)	1,807,258		0	0.086	155,424	0.191	345,186	0.331	598,202	0.499	901,822
	Very High Density total	7,831,450		180,726		474,706		778,928		1,254,839		1,817,499
Factory	Factory (building)	13,727,000		0	0.180	2,470,860	0.314	4,310,278	0.419	5,751,613	0.539	7,398,853
	Factory (goods)	8,236,200		0	0.127	1,045,997	0.276	2,273,191	0.379	3,121,520	0.479	3,945,140
	Factory total	21,963,200		0		3,516,857		6,583,469		8,873,133		11,343,993

Table 3.3.1 Flood Damage per ha in Weras Ganga Basin (2/2)

Maha Ela Sub-basin (Unit: Rs./ha)

Area	Item	Unit Value (ha)	Inundation Depth (m)									
			Shallower than 0.2		0.2 to 0.5		0.5 to 1.0		1.0 to 2.0		Deeper than 2.0	
			Damage Rate	Damage	Damage Rate	Damage	Damage Rate	Damage	Damage Rate	Damage	Damage Rate	Damage
High density	High density (building)	10,164,096	0.03	304,923	0.053	538,697	0.072	731,815	0.109	1,107,886	0.152	1,544,943
	High density (goods)	3,049,229		0	0.086	262,234	0.191	582,403	0.331	1,009,295	0.499	1,521,565
	High density total	13,213,325		304,923		800,931		1,314,218		2,117,181		3,066,508
Homestead	Homestead (building)	7,340,736	0.03	220,222	0.053	389,059	0.072	528,533	0.109	800,140	0.152	1,115,792
	Homestead (goods)	2,202,221		0	0.086	189,391	0.191	420,624	0.331	728,935	0.499	1,098,908
	Homestead total	9,542,957		220,222		578,450		949,157		1,529,075		2,214,700
Garden/grassland	Garden/grassland (building)	4,517,376	0.03	135,521	0.053	239,421	0.072	325,251	0.109	492,394	0.152	686,641
	Garden/grassland (goods)	1,355,213		0	0.086	116,548	0.191	258,846	0.331	448,575	0.499	676,251
	Garden/grassland total	5,872,589		135,521		355,969		584,097		940,969		1,362,892
Very High Density	Very High Density (building)	4,517,376	0.03	135,521	0.053	239,421	0.072	325,251	0.109	492,394	0.152	686,641
	Very High Density (goods)	1,355,213		0	0.086	116,548	0.191	258,846	0.331	448,575	0.499	676,251
	Very High Density total	5,872,589		135,521		355,969		584,097		940,969		1,362,892
Factory	Factory (building)	10,293,500		0	0.180	1,852,830	0.314	3,232,159	0.419	4,312,977	0.539	5,548,197
	Factory (goods)	6,176,100		0	0.127	784,365	0.276	1,704,604	0.379	2,340,742	0.479	2,958,352
	Factory total	16,469,600		0		2,637,195		4,936,763		6,653,718		8,506,548

Tumbowila Sub-basin (Unit: Rs./ha)

Area	Item	Unit Value (ha)	Inundation Depth (m)									
			Shallower than 0.2		0.2 to 0.5		0.5 to 1.0		1.0 to 2.0		Deeper than 2.0	
			Damage Rate	Damage	Damage Rate	Damage	Damage Rate	Damage	Damage Rate	Damage	Damage Rate	Damage
High density	High density (building)	8,131,968	0.03	243,959	0.053	430,994	0.072	585,502	0.109	886,385	0.152	1,236,059
	High density (goods)	2,439,590		0	0.086	209,805	0.191	465,962	0.331	807,504	0.499	1,217,356
	High density total	10,571,558		243,959		640,799		1,051,463		1,693,889		2,453,415
Homestead	Homestead (building)	5,873,088	0.03	176,193	0.053	311,274	0.072	422,862	0.109	640,167	0.152	892,709
	Homestead (goods)	1,761,926		0	0.086	151,526	0.191	336,528	0.331	583,198	0.499	879,201
	Homestead total	7,635,014		176,193		462,799		759,390		1,223,364		1,771,911
Garden/grassland	Garden/grassland (building)	3,614,208	0.03	108,426	0.053	191,553	0.072	260,223	0.109	393,949	0.152	549,360
	Garden/grassland (goods)	1,084,262		0	0.086	93,247	0.191	207,094	0.331	358,891	0.499	541,047
	Garden/grassland total	4,698,470		108,426		284,800		467,317		752,840		1,090,407
Very High Density	Very High Density (building)	3,614,208	0.03	108,426	0.053	191,553	0.072	260,223	0.109	393,949	0.152	549,360
	Very High Density (goods)	1,084,262		0	0.086	93,247	0.191	207,094	0.331	358,891	0.499	541,047
	Very High Density total	4,698,470		108,426		284,800		467,317		752,840		1,090,407
Factory	Factory (building)	8,235,500		0	0.180	1,482,390	0.314	2,585,947	0.419	3,450,675	0.539	4,438,935
	Factory (goods)	4,941,300		0	0.127	627,545	0.276	1,363,799	0.379	1,872,753	0.479	2,366,883
	Factory total	13,176,800		0		2,109,935		3,949,746		5,323,427		6,805,817

Bolgoda Canal Sub-basin (Unit: Rs./ha)

Area	Item	Unit Value (ha)	Inundation Depth (m)									
			Shallower than 0.2		0.2 to 0.5		0.5 to 1.0		1.0 to 2.0		Deeper than 2.0	
			Damage Rate	Damage	Damage Rate	Damage	Damage Rate	Damage	Damage Rate	Damage	Damage Rate	Damage
High density	High density (building)	31,560,192	0.03	946,806	0.053	1,672,690	0.072	2,272,334	0.109	3,440,061	0.152	4,797,149
	High density (goods)	9,468,058		0	0.086	814,253	0.191	1,808,399	0.331	3,133,927	0.499	4,724,561
	High density total	41,028,250		946,806		2,486,943		4,080,733		6,573,988		9,521,710
Homestead	Homestead (building)	22,793,472	0.03	683,804	0.053	1,208,054	0.072	1,641,130	0.109	2,484,488	0.152	3,464,608
	Homestead (goods)	6,838,042		0	0.086	588,072	0.191	1,306,066	0.331	2,263,392	0.499	3,412,183
	Homestead total	29,631,514		683,804		1,796,126		2,947,196		4,747,880		6,876,791
Garden/grassland	Garden/grassland (building)	14,026,752	0.03	420,803	0.053	743,418	0.072	1,009,926	0.109	1,528,916	0.152	2,132,066
	Garden/grassland (goods)	4,208,026		0	0.086	361,890	0.191	803,733	0.331	1,392,856	0.499	2,099,805
	Garden/grassland total	18,234,778		420,803		1,105,308		1,813,659		2,921,772		4,231,871
Very High Density	Very High Density (building)	14,026,752	0.03	420,803	0.053	743,418	0.072	1,009,926	0.109	1,528,916	0.152	2,132,066
	Very High Density (goods)	4,208,026		0	0.086	361,890	0.191	803,733	0.331	1,392,856	0.499	2,099,805
	Very High Density total	18,234,778		420,803		1,105,308		1,813,659		2,921,772		4,231,871
Factory	Factory (building)	36,907,500		0	0.180	6,643,350	0.314	11,588,955	0.419	15,464,243	0.539	19,893,143
	Factory (goods)	22,144,500		0	0.127	2,812,352	0.276	6,111,882	0.379	8,392,766	0.479	10,607,216
	Factory total	59,052,000		0		9,455,702		17,700,837		23,857,008		30,500,358

Ratmalana-Moratuwa Sub-basin (Unit: Rs./ha)

Area	Item	Unit Value (ha)	Inundation Depth (m)									
			Shallower than 0.2		0.2 to 0.5		0.5 to 1.0		1.0 to 2.0		Deeper than 2.0	
			Damage Rate	Damage	Damage Rate	Damage	Damage Rate	Damage	Damage Rate	Damage	Damage Rate	Damage
High density	High density (building)	20,583,936	0.03	617,518	0.053	1,090,949	0.072	1,482,043	0.109	2,243,649	0.152	3,128,758
	High density (goods)	6,175,181		0	0.086	531,066	0.191	1,179,460	0.331	2,043,985	0.499	3,081,415
	High density total	26,759,117		617,518		1,622,014		2,661,503		4,287,634		6,210,173
Homestead	Homestead (building)	14,866,176	0.03	445,985	0.053	787,907	0.072	1,070,365	0.109	1,620,413	0.152	2,259,659
	Homestead (goods)	4,459,853		0	0.086	383,547	0.191	851,832	0.331	1,476,211	0.499	2,225,467
	Homestead total	19,326,029		445,985		1,171,455		1,922,197		3,096,624		4,485,125
Garden/grassland	Garden/grassland (building)	9,148,416	0.03	274,452	0.053	484,866	0.072	658,686	0.109	997,177	0.152	1,390,559
	Garden/grassland (goods)	2,744,525		0	0.086	236,029	0.191	524,204	0.331	908,438	0.499	1,369,518
	Garden/grassland total	11,892,941		274,452		720,895		1,182,890		1,905,615		2,760,077
Very High Density	Very High Density (building)	9,148,416	0.03	274,452	0.053	484,866	0.072	658,686	0.109	997,177	0.152	1,390,559
	Very High Density (goods)	2,744,525		0	0.086	236,029	0.191	524,204	0.331	908,438	0.499	1,369,518
	Very High Density total	11,892,941		274,452		720,895		1,182,890		1,905,615		2,760,077
Factory	Factory (building)	34,314,000		0	0.180	6,176,520	0.314	10,774,596	0.419	14,377,566	0.539	18,495,246
	Factory (goods)	20,588,400		0	0.127	2,614,727	0.276	5,682,398	0.379	7,803,004	0.479	9,861,844
	Factory total	54,902,400		0		8,791,247		16,456,994		22,180,570		28,357,090

Table 3.3.2 Direct Flood Damage per ha with Inundation Depth without Project (1/8)

Weras Ganga Basin (1/2)

Area	Item	Inundation Depth (m)				
		Shallower than 0.2	0.2 to 0.5	0.5 to 1.0	1.0 to 2.0	Deeper than 2.0
High Density	Unit Damage (Rs./ha)	495,028	1,300,272	2,133,569	3,437,141	4,978,327
	Area (ha)	13.58	8.58	2.04	1.07	0.00
	Direct Damage (Rs.)	6,722,474	11,156,337	4,352,480	3,677,741	0
Homestead	Unit Damage (Rs./ha)	357,520	939,086	1,540,911	2,482,380	3,595,459
	Area (ha)	73.06	88.48	8.68	0.46	0.05
	Direct Damage (Rs.)	26,120,405	83,090,296	13,375,106	1,141,895	179,773
Garden/grassland	Unit Damage (Rs./ha)	220,012	577,899	948,253	1,527,618	2,212,590
	Area (ha)	25.82	28.80	3.73	0.43	0.02
	Direct Damage (Rs.)	5,680,716	16,643,487	3,536,983	656,876	44,252
Very High Density	Unit Damage (Rs./ha)	220,012	577,899	948,253	1,527,618	2,212,590
	Area (ha)	2.12	3.30	0.00	0.00	0.00
	Direct Damage (Rs.)	466,426	1,907,066	0	0	0
Factory	Unit Damage (Rs./ha)	0	6,047,985	11,321,677	15,259,242	19,508,412
	Area (ha)	0.19	3.04	0.00	0.00	0.03
	Direct Damage (Rs.)	0	18,385,875	0	0	585,252
Total		38,990,021	131,183,062	21,264,569	5,476,512	809,277

Weras Ganga Basin (1/5)

Area	Item	Inundation Depth (m)				
		Shallower than 0.2	0.2 to 0.5	0.5 to 1.0	1.0 to 2.0	Deeper than 2.0
High Density	Unit Damage (Rs./ha)	495,028	1,300,272	2,133,569	3,437,141	4,978,327
	Area (ha)	32.80	19.28	6.32	1.60	0.00
	Direct Damage (Rs.)	16,236,904	25,069,252	13,484,155	5,499,426	0
Homestead	Unit Damage (Rs./ha)	357,520	939,086	1,540,911	2,482,380	3,595,459
	Area (ha)	83.57	125.50	15.93	2.64	0.10
	Direct Damage (Rs.)	29,877,939	117,855,246	24,546,709	6,553,483	359,546
Garden/grassland	Unit Damage (Rs./ha)	220,012	577,899	948,253	1,527,618	2,212,590
	Area (ha)	28.05	38.10	7.68	0.85	0.05
	Direct Damage (Rs.)	6,171,344	22,017,946	7,282,582	1,298,476	110,629
Very High Density	Unit Damage (Rs./ha)	220,012	577,899	948,253	1,527,618	2,212,590
	Area (ha)	2.22	4.22	0.01	0.00	0.00
	Direct Damage (Rs.)	488,427	2,438,733	9,483	0	0
Factory	Unit Damage (Rs./ha)	0	6,047,985	11,321,677	15,259,242	19,508,412
	Area (ha)	0.53	3.10	0.00	0.00	0.03
	Direct Damage (Rs.)	0	18,748,754	0	0	585,252
Total		52,774,614	186,129,932	45,322,928	13,351,385	1,055,428

Weras Ganga Basin (1/10)

Area	Item	Inundation Depth (m)				
		Shallower than 0.2	0.2 to 0.5	0.5 to 1.0	1.0 to 2.0	Deeper than 2.0
High Density	Unit Damage (Rs./ha)	495,028	1,300,272	2,133,569	3,437,141	4,978,327
	Area (ha)	33.04	21.20	7.53	1.49	0.00
	Direct Damage (Rs.)	16,355,711	27,565,775	16,065,773	5,121,341	0
Homestead	Unit Damage (Rs./ha)	357,520	939,086	1,540,911	2,482,380	3,595,459
	Area (ha)	83.36	142.10	18.09	3.07	0.08
	Direct Damage (Rs.)	29,802,860	133,444,068	27,875,076	7,620,906	287,637
Garden/grassland	Unit Damage (Rs./ha)	220,012	577,899	948,253	1,527,618	2,212,590
	Area (ha)	28.04	42.29	10.68	0.96	0.02
	Direct Damage (Rs.)	6,169,144	24,439,342	10,127,340	1,466,514	44,252
Very High Density	Unit Damage (Rs./ha)	220,012	577,899	948,253	1,527,618	2,212,590
	Area (ha)	2.63	3.66	1.26	0.00	0.00
	Direct Damage (Rs.)	578,632	2,115,110	1,194,799	0	0
Factory	Unit Damage (Rs./ha)	0	6,047,985	11,321,677	15,259,242	19,508,412
	Area (ha)	0.89	3.14	0.01	0.00	0.01
	Direct Damage (Rs.)	0	18,990,674	113,217	0	195,084
Total		52,906,346	206,554,968	55,376,205	14,208,761	526,973

Weras Ganga Basin (1/25)

Area	Item	Inundation Depth (m)				
		Shallower than 0.2	0.2 to 0.5	0.5 to 1.0	1.0 to 2.0	Deeper than 2.0
High Density	Unit Damage (Rs./ha)	495,028	1,300,272	2,133,569	3,437,141	4,978,327
	Area (ha)	37.10	24.89	9.44	1.55	0.00
	Direct Damage (Rs.)	18,365,523	32,363,780	20,140,890	5,327,569	0
Homestead	Unit Damage (Rs./ha)	357,520	939,086	1,540,911	2,482,380	3,595,459
	Area (ha)	83.43	158.57	32.74	5.89	0.12
	Direct Damage (Rs.)	29,827,886	148,910,808	50,449,420	14,621,218	431,455
Garden/grassland	Unit Damage (Rs./ha)	220,012	577,899	948,253	1,527,618	2,212,590
	Area (ha)	28.79	46.52	15.17	2.15	0.39
	Direct Damage (Rs.)	6,334,153	26,883,854	14,384,995	3,284,380	862,910
Very High Density	Unit Damage (Rs./ha)	220,012	577,899	948,253	1,527,618	2,212,590
	Area (ha)	3.13	3.26	3.07	0.00	0.00
	Direct Damage (Rs.)	688,638	1,883,950	2,911,136	0	0
Factory	Unit Damage (Rs./ha)	0	6,047,985	11,321,677	15,259,242	19,508,412
	Area (ha)	1.03	3.24	0.01	0.00	0.01
	Direct Damage (Rs.)	0	19,595,472	113,217	0	195,084
Total		55,216,200	229,637,865	87,999,657	23,233,166	1,489,449

Weras Ganga Basin (1/50)

Area	Item	Inundation Depth (m)				
		Shallower than 0.2	0.2 to 0.5	0.5 to 1.0	1.0 to 2.0	Deeper than 2.0
High Density	Unit Damage (Rs./ha)	495,028	1,300,272	2,133,569	3,437,141	4,978,327
	Area (ha)	38.60	28.18	10.55	1.70	0.00
	Direct Damage (Rs.)	19,108,064	36,641,676	22,509,151	5,843,140	0
Homestead	Unit Damage (Rs./ha)	357,520	939,086	1,540,911	2,482,380	3,595,459
	Area (ha)	86.21	167.85	35.93	7.00	0.11
	Direct Damage (Rs.)	30,821,791	157,625,522	55,364,925	17,376,659	395,500
Garden/grassland	Unit Damage (Rs./ha)	220,012	577,899	948,253	1,527,618	2,212,590
	Area (ha)	30.64	48.83	18.41	2.58	0.36
	Direct Damage (Rs.)	6,741,175	28,218,801	17,457,334	3,941,255	796,532
Very High Density	Unit Damage (Rs./ha)	220,012	577,899	948,253	1,527,618	2,212,590
	Area (ha)	3.69	3.18	3.65	0.00	0.00
	Direct Damage (Rs.)	811,845	1,837,718	3,461,123	0	0
Factory	Unit Damage (Rs./ha)	0	6,047,985	11,321,677	15,259,242	19,508,412
	Area (ha)	1.20	3.30	0.02	0.00	0.01
	Direct Damage (Rs.)	0	19,958,351	226,434	0	195,084
Total		57,482,876	244,282,069	99,018,967	27,161,055	1,387,117

Table 3.3.2 Direct Flood Damage per ha with Inundation Depth without Project (2/8)

Nugedoda-Rattanapitiya Sub-basin (1/2)

		Inundation Depth (m)				
Area	Item	Shallower than 0.2	0.2 to 0.5	0.5 to 1.0	1.0 to 2.0	Deeper than 2.0
High Density	Unit Damage (Rs./ha)	472,677	1,241,565	2,037,238	3,281,955	4,753,556
	Area (ha)	4.59	2.67	1.06	0.22	0.00
	Direct Damage (Rs.)	2,169,588	3,314,979	2,159,473	722,030	0
Homestead	Unit Damage (Rs./ha)	341,378	896,686	1,471,339	2,370,301	3,433,124
	Area (ha)	10.53	7.52	3.20	0.33	0.00
	Direct Damage (Rs.)	3,594,709	6,743,079	4,708,284	782,199	0
Garden/grassland	Unit Damage (Rs./ha)	210,079	551,807	905,439	1,458,647	2,112,692
	Area (ha)	9.34	10.78	3.01	0.32	0.00
	Direct Damage (Rs.)	1,962,135	5,948,477	2,725,372	466,767	0
Very High Density	Unit Damage (Rs./ha)	210,079	551,807	905,439	1,458,647	2,112,692
	Area (ha)	0.00	0.00	0.00	0.00	0.00
	Direct Damage (Rs.)	0	0	0	0	0
Factory	Unit Damage (Rs./ha)	0	7,912,481	14,811,966	19,963,418	25,522,538
	Area (ha)	0.00	0.00	0.00	0.00	0.00
	Direct Damage (Rs.)	0	0	0	0	0
Total		7,726,433	16,006,535	9,593,129	1,970,996	0

Nugedoda-Rattanapitiya Sub-basin (1/5)

		Inundation Depth (m)				
Area	Item	Shallower than 0.2	0.2 to 0.5	0.5 to 1.0	1.0 to 2.0	Deeper than 2.0
High Density	Unit Damage (Rs./ha)	472,677	1,241,565	2,037,238	3,281,955	4,753,556
	Area (ha)	5.88	3.27	2.02	0.30	0.00
	Direct Damage (Rs.)	2,779,341	4,059,918	4,115,222	984,586	0
Homestead	Unit Damage (Rs./ha)	341,378	896,686	1,471,339	2,370,301	3,433,124
	Area (ha)	12.80	10.45	4.11	0.69	0.00
	Direct Damage (Rs.)	4,369,637	9,370,369	6,047,203	1,635,507	0
Garden/grassland	Unit Damage (Rs./ha)	210,079	551,807	905,439	1,458,647	2,112,692
	Area (ha)	10.07	12.17	5.88	0.51	0.00
	Direct Damage (Rs.)	2,115,493	6,715,488	5,323,983	743,910	0
Very High Density	Unit Damage (Rs./ha)	210,079	551,807	905,439	1,458,647	2,112,692
	Area (ha)	0.00	0.00	0.00	0.00	0.00
	Direct Damage (Rs.)	0	0	0	0	0
Factory	Unit Damage (Rs./ha)	0	7,912,481	14,811,966	19,963,418	25,522,538
	Area (ha)	0.00	0.00	0.00	0.00	0.00
	Direct Damage (Rs.)	0	0	0	0	0
Total		9,264,472	20,145,775	15,486,407	3,364,004	0

Nugedoda-Rattanapitiya Sub-basin (1/10)

		Inundation Depth (m)				
Area	Item	Shallower than 0.2	0.2 to 0.5	0.5 to 1.0	1.0 to 2.0	Deeper than 2.0
High Density	Unit Damage (Rs./ha)	472,677	1,241,565	2,037,238	3,281,955	4,753,556
	Area (ha)	6.53	3.58	2.11	0.38	0.00
	Direct Damage (Rs.)	3,086,582	4,444,804	4,298,573	1,247,143	0
Homestead	Unit Damage (Rs./ha)	341,378	896,686	1,471,339	2,370,301	3,433,124
	Area (ha)	12.90	12.34	4.76	0.99	0.00
	Direct Damage (Rs.)	4,403,775	11,065,105	7,003,573	2,346,598	0
Garden/grassland	Unit Damage (Rs./ha)	210,079	551,807	905,439	1,458,647	2,112,692
	Area (ha)	10.19	11.91	7.61	0.77	0.00
	Direct Damage (Rs.)	2,140,702	6,572,019	6,890,393	1,123,158	0
Very High Density	Unit Damage (Rs./ha)	210,079	551,807	905,439	1,458,647	2,112,692
	Area (ha)	0.00	0.00	0.00	0.00	0.00
	Direct Damage (Rs.)	0	0	0	0	0
Factory	Unit Damage (Rs./ha)	0	7,912,481	14,811,966	19,963,418	25,522,538
	Area (ha)	0.00	0.00	0.00	0.00	0.00
	Direct Damage (Rs.)	0	0	0	0	0
Total		9,631,059	22,081,927	18,192,539	4,716,898	0

Nugedoda-Rattanapitiya Sub-basin (1/25)

		Inundation Depth (m)				
Area	Item	Shallower than 0.2	0.2 to 0.5	0.5 to 1.0	1.0 to 2.0	Deeper than 2.0
High Density	Unit Damage (Rs./ha)	472,677	1,241,565	2,037,238	3,281,955	4,753,556
	Area (ha)	7.52	4.25	2.38	0.45	0.00
	Direct Damage (Rs.)	3,554,532	5,276,652	4,848,627	1,476,880	0
Homestead	Unit Damage (Rs./ha)	341,378	896,686	1,471,339	2,370,301	3,433,124
	Area (ha)	11.46	13.84	6.65	1.50	0.04
	Direct Damage (Rs.)	3,912,191	12,410,134	9,784,403	3,555,451	137,325
Garden/grassland	Unit Damage (Rs./ha)	210,079	551,807	905,439	1,458,647	2,112,692
	Area (ha)	8.79	11.05	10.15	1.58	0.37
	Direct Damage (Rs.)	1,846,592	6,097,465	9,190,209	2,304,662	781,696
Very High Density	Unit Damage (Rs./ha)	210,079	551,807	905,439	1,458,647	2,112,692
	Area (ha)	0.00	0.00	0.00	0.00	0.00
	Direct Damage (Rs.)	0	0	0	0	0
Factory	Unit Damage (Rs./ha)	0	7,912,481	14,811,966	19,963,418	25,522,538
	Area (ha)	0.00	0.00	0.00	0.00	0.00
	Direct Damage (Rs.)	0	0	0	0	0
Total		9,313,315	23,784,251	23,823,239	7,336,992	919,021

Nugedoda-Rattanapitiya Sub-basin (1/50)

		Inundation Depth (m)				
Area	Item	Shallower than 0.2	0.2 to 0.5	0.5 to 1.0	1.0 to 2.0	Deeper than 2.0
High Density	Unit Damage (Rs./ha)	472,677	1,241,565	2,037,238	3,281,955	4,753,556
	Area (ha)	8.90	5.02	2.71	0.47	0.00
	Direct Damage (Rs.)	4,206,826	6,232,657	5,520,916	1,542,519	0
Homestead	Unit Damage (Rs./ha)	341,378	896,686	1,471,339	2,370,301	3,433,124
	Area (ha)	11.05	14.20	8.29	1.83	0.00
	Direct Damage (Rs.)	3,772,226	12,732,941	12,197,399	4,337,650	0
Garden/grassland	Unit Damage (Rs./ha)	210,079	551,807	905,439	1,458,647	2,112,692
	Area (ha)	8.49	10.40	12.10	2.01	0.33
	Direct Damage (Rs.)	1,783,568	5,738,790	10,955,815	2,931,880	697,188
Very High Density	Unit Damage (Rs./ha)	210,079	551,807	905,439	1,458,647	2,112,692
	Area (ha)	0.00	0.00	0.00	0.00	0.00
	Direct Damage (Rs.)	0	0	0	0	0
Factory	Unit Damage (Rs./ha)	0	7,912,481	14,811,966	19,963,418	25,522,538
	Area (ha)	0.00	0.00	0.00	0.00	0.00
	Direct Damage (Rs.)	0	0	0	0	0
Total		9,762,621	24,704,389	28,674,130	8,812,049	697,188

Table 3.3.2 Direct Flood Damage per ha with Inundation Depth without Project (3/8)

Boralesgamuwa North Sub-basin (1/2)

Area	Item	Inundation Depth (m)				
		Shallower than 0.2	0.2 to 0.5	0.5 to 1.0	1.0 to 2.0	Deeper than 2.0
High Density	Unit Damage (Rs./ha)	472,677	1,241,565	2,037,238	3,281,955	4,753,556
	Area (ha)	1.06	1.12	0.22	0.00	0.00
	Direct Damage (Rs.)	501,038	1,390,553	448,192	0	0
Homestead	Unit Damage (Rs./ha)	341,378	896,686	1,471,339	2,370,301	3,433,124
	Area (ha)	8.00	6.14	0.18	0.00	0.01
	Direct Damage (Rs.)	2,731,023	5,505,652	264,841	0	34,331
Garden/grassland	Unit Damage (Rs./ha)	210,079	551,807	905,439	1,458,647	2,112,692
	Area (ha)	2.54	1.47	0.49	0.11	0.01
	Direct Damage (Rs.)	533,600	811,156	443,665	160,451	21,127
Very High Density	Unit Damage (Rs./ha)	210,079	551,807	905,439	1,458,647	2,112,692
	Area (ha)	0.00	0.00	0.00	0.00	0.00
	Direct Damage (Rs.)	0	0	0	0	0
Factory	Unit Damage (Rs./ha)	0	7,912,481	14,811,966	19,963,418	25,522,538
	Area (ha)	0.00	0.00	0.00	0.00	0.00
	Direct Damage (Rs.)	0	0	0	0	0
Total		3,765,661	7,707,361	1,156,699	160,451	55,458

Boralesgamuwa North Sub-basin (1/5)

Area	Item	Inundation Depth (m)				
		Shallower than 0.2	0.2 to 0.5	0.5 to 1.0	1.0 to 2.0	Deeper than 2.0
High Density	Unit Damage (Rs./ha)	472,677	1,241,565	2,037,238	3,281,955	4,753,556
	Area (ha)	1.29	1.36	0.42	0.04	0.00
	Direct Damage (Rs.)	609,753	1,688,529	855,640	131,278	0
Homestead	Unit Damage (Rs./ha)	341,378	896,686	1,471,339	2,370,301	3,433,124
	Area (ha)	8.49	8.18	0.71	0.00	0.01
	Direct Damage (Rs.)	2,898,299	7,334,892	1,044,651	0	34,331
Garden/grassland	Unit Damage (Rs./ha)	210,079	551,807	905,439	1,458,647	2,112,692
	Area (ha)	3.47	1.76	0.62	0.11	0.01
	Direct Damage (Rs.)	728,973	971,180	561,372	160,451	21,127
Very High Density	Unit Damage (Rs./ha)	210,079	551,807	905,439	1,458,647	2,112,692
	Area (ha)	0.00	0.00	0.00	0.00	0.00
	Direct Damage (Rs.)	0	0	0	0	0
Factory	Unit Damage (Rs./ha)	0	7,912,481	14,811,966	19,963,418	25,522,538
	Area (ha)	0.00	0.00	0.00	0.00	0.00
	Direct Damage (Rs.)	0	0	0	0	0
Total		4,237,025	9,994,600	2,461,663	291,729	55,458

Boralesgamuwa North Sub-basin (1/10)

Area	Item	Inundation Depth (m)				
		Shallower than 0.2	0.2 to 0.5	0.5 to 1.0	1.0 to 2.0	Deeper than 2.0
High Density	Unit Damage (Rs./ha)	472,677	1,241,565	2,037,238	3,281,955	4,753,556
	Area (ha)	1.17	1.47	0.49	0.00	0.00
	Direct Damage (Rs.)	553,032	1,825,101	998,247	0	0
Homestead	Unit Damage (Rs./ha)	341,378	896,686	1,471,339	2,370,301	3,433,124
	Area (ha)	8.52	9.37	0.85	0.00	0.01
	Direct Damage (Rs.)	2,908,540	8,401,948	1,250,638	0	34,331
Garden/grassland	Unit Damage (Rs./ha)	210,079	551,807	905,439	1,458,647	2,112,692
	Area (ha)	3.64	2.48	0.64	0.12	0.01
	Direct Damage (Rs.)	764,687	1,368,481	579,481	175,038	21,127
Very High Density	Unit Damage (Rs./ha)	210,079	551,807	905,439	1,458,647	2,112,692
	Area (ha)	0.00	0.00	0.00	0.00	0.00
	Direct Damage (Rs.)	0	0	0	0	0
Factory	Unit Damage (Rs./ha)	0	7,912,481	14,811,966	19,963,418	25,522,538
	Area (ha)	0.00	0.00	0.00	0.00	0.00
	Direct Damage (Rs.)	0	0	0	0	0
Total		4,226,259	11,595,530	2,828,366	175,038	55,458

Boralesgamuwa North Sub-basin (1/25)

Area	Item	Inundation Depth (m)				
		Shallower than 0.2	0.2 to 0.5	0.5 to 1.0	1.0 to 2.0	Deeper than 2.0
High Density	Unit Damage (Rs./ha)	472,677	1,241,565	2,037,238	3,281,955	4,753,556
	Area (ha)	1.37	1.39	0.69	0.04	0.00
	Direct Damage (Rs.)	647,568	1,725,776	1,405,694	131,278	0
Homestead	Unit Damage (Rs./ha)	341,378	896,686	1,471,339	2,370,301	3,433,124
	Area (ha)	8.34	10.55	2.11	0.01	0.01
	Direct Damage (Rs.)	2,847,092	9,460,037	3,104,525	23,703	34,331
Garden/grassland	Unit Damage (Rs./ha)	210,079	551,807	905,439	1,458,647	2,112,692
	Area (ha)	3.81	3.02	0.70	0.14	0.01
	Direct Damage (Rs.)	800,400	1,666,456	633,807	204,211	21,127
Very High Density	Unit Damage (Rs./ha)	210,079	551,807	905,439	1,458,647	2,112,692
	Area (ha)	0.00	0.00	0.00	0.00	0.00
	Direct Damage (Rs.)	0	0	0	0	0
Factory	Unit Damage (Rs./ha)	0	7,912,481	14,811,966	19,963,418	25,522,538
	Area (ha)	0.00	0.00	0.00	0.00	0.00
	Direct Damage (Rs.)	0	0	0	0	0
Total		4,295,059	12,852,269	5,144,027	359,192	55,458

Boralesgamuwa North Sub-basin (1/50)

Area	Item	Inundation Depth (m)				
		Shallower than 0.2	0.2 to 0.5	0.5 to 1.0	1.0 to 2.0	Deeper than 2.0
High Density	Unit Damage (Rs./ha)	472,677	1,241,565	2,037,238	3,281,955	4,753,556
	Area (ha)	1.26	1.40	0.79	0.00	0.00
	Direct Damage (Rs.)	595,573	1,738,191	1,609,418	0	0
Homestead	Unit Damage (Rs./ha)	341,378	896,686	1,471,339	2,370,301	3,433,124
	Area (ha)	8.59	10.35	3.13	0.00	0.01
	Direct Damage (Rs.)	2,932,436	9,280,700	4,605,291	0	34,331
Garden/grassland	Unit Damage (Rs./ha)	210,079	551,807	905,439	1,458,647	2,112,692
	Area (ha)	3.91	3.32	0.80	0.15	0.01
	Direct Damage (Rs.)	821,408	1,831,998	724,351	218,797	21,127
Very High Density	Unit Damage (Rs./ha)	210,079	551,807	905,439	1,458,647	2,112,692
	Area (ha)	0.00	0.00	0.00	0.00	0.00
	Direct Damage (Rs.)	0	0	0	0	0
Factory	Unit Damage (Rs./ha)	0	7,912,481	14,811,966	19,963,418	25,522,538
	Area (ha)	0.00	0.00	0.00	0.00	0.00
	Direct Damage (Rs.)	0	0	0	0	0
Total		4,349,417	12,850,890	6,939,060	218,797	55,458

Table 3.3.2 Direct Flood Damage per ha with Inundation Depth without Project (4/8)

Boralesgamuwa South Sub-basin (1/2)

		Inundation Depth (m)				
Area	Item	Shallower than 0.2	0.2 to 0.5	0.5 to 1.0	1.0 to 2.0	Deeper than 2.0
High Density	Unit Damage (Rs./ha)	406,633	1,068,089	1,752,588	2,823,388	4,089,372
	Area (ha)	2.16	0.78	0.04	0.00	0.00
	Direct Damage (Rs.)	878,327	833,110	70,104	0	0
Homestead	Unit Damage (Rs./ha)	293,679	771,398	1,265,758	2,039,114	2,953,435
	Area (ha)	7.38	2.80	0.36	0.00	0.00
	Direct Damage (Rs.)	2,167,354	2,159,914	455,673	0	0
Garden/grassland	Unit Damage (Rs./ha)	180,726	474,706	778,928	1,254,839	1,817,499
	Area (ha)	2.91	0.58	0.02	0.00	0.00
	Direct Damage (Rs.)	525,912	275,330	15,579	0	0
Very High Density	Unit Damage (Rs./ha)	180,726	474,706	778,928	1,254,839	1,817,499
	Area (ha)	0.00	0.00	0.00	0.00	0.00
	Direct Damage (Rs.)	0	0	0	0	0
Factory	Unit Damage (Rs./ha)	0	3,516,857	6,583,469	8,873,133	11,343,993
	Area (ha)	0.00	0.00	0.00	0.00	0.00
	Direct Damage (Rs.)	0	0	0	0	0
Total		3,571,593	3,268,353	541,355	0	0

Boralesgamuwa South Sub-basin (1/5)

		Inundation Depth (m)				
Area	Item	Shallower than 0.2	0.2 to 0.5	0.5 to 1.0	1.0 to 2.0	Deeper than 2.0
High Density	Unit Damage (Rs./ha)	406,633	1,068,089	1,752,588	2,823,388	4,089,372
	Area (ha)	2.60	0.96	0.11	0.00	0.00
	Direct Damage (Rs.)	1,057,246	1,025,366	192,785	0	0
Homestead	Unit Damage (Rs./ha)	293,679	771,398	1,265,758	2,039,114	2,953,435
	Area (ha)	7.81	3.70	0.50	0.00	0.00
	Direct Damage (Rs.)	2,293,636	2,854,172	632,879	0	0
Garden/grassland	Unit Damage (Rs./ha)	180,726	474,706	778,928	1,254,839	1,817,499
	Area (ha)	3.58	0.72	0.04	0.00	0.00
	Direct Damage (Rs.)	646,998	341,789	31,157	0	0
Very High Density	Unit Damage (Rs./ha)	180,726	474,706	778,928	1,254,839	1,817,499
	Area (ha)	0.00	0.00	0.00	0.00	0.00
	Direct Damage (Rs.)	0	0	0	0	0
Factory	Unit Damage (Rs./ha)	0	3,516,857	6,583,469	8,873,133	11,343,993
	Area (ha)	0.00	0.00	0.00	0.00	0.00
	Direct Damage (Rs.)	0	0	0	0	0
Total		3,997,880	4,221,326	856,821	0	0

Boralesgamuwa South Sub-basin (1/10)

		Inundation Depth (m)				
Area	Item	Shallower than 0.2	0.2 to 0.5	0.5 to 1.0	1.0 to 2.0	Deeper than 2.0
High Density	Unit Damage (Rs./ha)	406,633	1,068,089	1,752,588	2,823,388	4,089,372
	Area (ha)	2.78	1.20	0.14	0.00	0.00
	Direct Damage (Rs.)	1,130,440	1,281,707	245,362	0	0
Homestead	Unit Damage (Rs./ha)	293,679	771,398	1,265,758	2,039,114	2,953,435
	Area (ha)	8.68	4.51	0.58	0.00	0.00
	Direct Damage (Rs.)	2,549,137	3,479,004	734,140	0	0
Garden/grassland	Unit Damage (Rs./ha)	180,726	474,706	778,928	1,254,839	1,817,499
	Area (ha)	4.30	1.02	0.07	0.00	0.00
	Direct Damage (Rs.)	777,121	484,200	54,525	0	0
Very High Density	Unit Damage (Rs./ha)	180,726	474,706	778,928	1,254,839	1,817,499
	Area (ha)	0.00	0.00	0.00	0.00	0.00
	Direct Damage (Rs.)	0	0	0	0	0
Factory	Unit Damage (Rs./ha)	0	3,516,857	6,583,469	8,873,133	11,343,993
	Area (ha)	0.00	0.00	0.00	0.00	0.00
	Direct Damage (Rs.)	0	0	0	0	0
Total		4,456,697	5,244,912	1,034,027	0	0

Boralesgamuwa South Sub-basin (1/25)

		Inundation Depth (m)				
Area	Item	Shallower than 0.2	0.2 to 0.5	0.5 to 1.0	1.0 to 2.0	Deeper than 2.0
High Density	Unit Damage (Rs./ha)	293,679	771,398	1,265,758	2,039,114	2,953,435
	Area (ha)	3.05	1.35	0.19	0.00	0.00
	Direct Damage (Rs.)	895,722	1,041,387	240,494	0	0
Homestead	Unit Damage (Rs./ha)	357,520	939,086	1,540,911	2,482,380	3,595,459
	Area (ha)	9.27	5.70	0.78	0.00	0.00
	Direct Damage (Rs.)	3,314,210	5,352,788	1,201,910	0	0
Garden/grassland	Unit Damage (Rs./ha)	180,726	474,706	778,928	1,254,839	1,817,499
	Area (ha)	4.57	2.30	0.14	0.00	0.00
	Direct Damage (Rs.)	825,917	1,091,825	109,050	0	0
Very High Density	Unit Damage (Rs./ha)	180,726	474,706	778,928	1,254,839	1,817,499
	Area (ha)	0.00	0.00	0.00	0.00	0.00
	Direct Damage (Rs.)	0	0	0	0	0
Factory	Unit Damage (Rs./ha)	0	3,516,857	6,583,469	8,873,133	11,343,993
	Area (ha)	0.00	0.00	0.00	0.00	0.00
	Direct Damage (Rs.)	0	0	0	0	0
Total		5,035,848	7,486,000	1,551,454	0	0

Boralesgamuwa South Sub-basin (1/50)

		Inundation Depth (m)				
Area	Item	Shallower than 0.2	0.2 to 0.5	0.5 to 1.0	1.0 to 2.0	Deeper than 2.0
High Density	Unit Damage (Rs./ha)	406,633	1,068,089	1,752,588	2,823,388	4,089,372
	Area (ha)	3.08	1.60	0.19	0.00	0.00
	Direct Damage (Rs.)	1,252,430	1,708,943	332,992	0	0
Homestead	Unit Damage (Rs./ha)	293,679	771,398	1,265,758	2,039,114	2,953,435
	Area (ha)	9.17	6.56	1.07	0.00	0.00
	Direct Damage (Rs.)	2,693,040	5,060,369	1,354,361	0	0
Garden/grassland	Unit Damage (Rs./ha)	180,726	474,706	778,928	1,254,839	1,817,499
	Area (ha)	4.17	2.85	0.32	0.00	0.00
	Direct Damage (Rs.)	753,626	1,352,913	249,257	0	0
Very High Density	Unit Damage (Rs./ha)	180,726	474,706	778,928	1,254,839	1,817,499
	Area (ha)	0.00	0.00	0.00	0.00	0.00
	Direct Damage (Rs.)	0	0	0	0	0
Factory	Unit Damage (Rs./ha)	0	3,516,857	6,583,469	8,873,133	11,343,993
	Area (ha)	0.00	0.00	0.00	0.00	0.00
	Direct Damage (Rs.)	0	0	0	0	0
Total		4,699,096	8,122,225	1,936,610	0	0

Table 3.3.2 Direct Flood Damage per ha with Inundation Depth without Project (5/8)

Maha Ela Sub-basin (1/2)

Area	Item	Inundation Depth (m)				
		Shallower than 0.2	0.2 to 0.5	0.5 to 1.0	1.0 to 2.0	Deeper than 2.0
High Density	Unit Damage (Rs./ha)	304,923	800,931	1,314,218	2,117,181	3,066,508
	Area (ha)	0.91	2.00	0.00	0.00	0.00
	Direct Damage (Rs.)	277,480	1,601,862	0	0	0
Homestead	Unit Damage (Rs./ha)	220,222	578,450	949,157	1,529,075	2,214,700
	Area (ha)	30.45	62.70	0.00	0.00	0.00
	Direct Damage (Rs.)	6,705,762	36,268,815	0	0	0
Garden/grassland	Unit Damage (Rs./ha)	135,521	355,969	584,097	940,969	1,362,892
	Area (ha)	3.98	12.40	0.00	0.00	0.00
	Direct Damage (Rs.)	539,375	4,414,018	0	0	0
Very High Density	Unit Damage (Rs./ha)	135,521	355,969	584,097	940,969	1,362,892
	Area (ha)	0.00	0.00	0.00	0.00	0.00
	Direct Damage (Rs.)	0	0	0	0	0
Factory	Unit Damage (Rs./ha)	0	2,637,195	4,936,763	6,653,718	8,506,548
	Area (ha)	0.00	3.00	0.00	0.00	0.02
	Direct Damage (Rs.)	0	7,911,584	0	0	170,131
Total		7,522,617	50,196,279	0	0	170,131

Maha Ela Sub-basin (1/5)

Area	Item	Inundation Depth (m)				
		Shallower than 0.2	0.2 to 0.5	0.5 to 1.0	1.0 to 2.0	Deeper than 2.0
High Density	Unit Damage (Rs./ha)	304,923	800,931	1,314,218	2,117,181	3,066,508
	Area (ha)	0.84	2.40	0.00	0.00	0.00
	Direct Damage (Rs.)	256,135	1,922,234	0	0	0
Homestead	Unit Damage (Rs./ha)	220,222	578,450	949,157	1,529,075	2,214,700
	Area (ha)	28.64	80.70	0.00	0.00	0.00
	Direct Damage (Rs.)	6,307,160	46,680,915	0	0	0
Garden/grassland	Unit Damage (Rs./ha)	135,521	355,969	584,097	940,969	1,362,892
	Area (ha)	3.55	17.10	0.00	0.00	0.00
	Direct Damage (Rs.)	481,101	6,087,074	0	0	0
Very High Density	Unit Damage (Rs./ha)	135,521	355,969	584,097	940,969	1,362,892
	Area (ha)	0.00	0.00	0.00	0.00	0.00
	Direct Damage (Rs.)	0	0	0	0	0
Factory	Unit Damage (Rs./ha)	0	2,637,195	4,936,763	6,653,718	8,506,548
	Area (ha)	0.00	3.00	0.00	0.00	0.02
	Direct Damage (Rs.)	0	7,911,584	0	0	170,131
Total		7,044,396	62,601,806	0	0	170,131

Maha Ela Sub-basin (1/10)

Area	Item	Inundation Depth (m)				
		Shallower than 0.2	0.2 to 0.5	0.5 to 1.0	1.0 to 2.0	Deeper than 2.0
High Density	Unit Damage (Rs./ha)	304,923	800,931	1,314,218	2,117,181	3,066,508
	Area (ha)	0.86	2.50	0.00	0.00	0.00
	Direct Damage (Rs.)	262,234	2,002,327	0	0	0
Homestead	Unit Damage (Rs./ha)	220,222	578,450	949,157	1,529,075	2,214,700
	Area (ha)	28.90	88.40	0.00	0.00	0.00
	Direct Damage (Rs.)	6,364,418	51,134,980	0	0	0
Garden/grassland	Unit Damage (Rs./ha)	135,521	355,969	584,097	940,969	1,362,892
	Area (ha)	3.65	19.20	0.00	0.00	0.00
	Direct Damage (Rs.)	494,653	6,834,609	0	0	0
Very High Density	Unit Damage (Rs./ha)	135,521	355,969	584,097	940,969	1,362,892
	Area (ha)	0.00	0.00	0.00	0.00	0.00
	Direct Damage (Rs.)	0	0	0	0	0
Factory	Unit Damage (Rs./ha)	0	2,637,195	4,936,763	6,653,718	8,506,548
	Area (ha)	0.00	3.00	0.00	0.00	0.00
	Direct Damage (Rs.)	0	7,911,584	0	0	0
Total		7,121,304	67,883,500	0	0	0

Maha Ela Sub-basin (1/25)

Area	Item	Inundation Depth (m)				
		Shallower than 0.2	0.2 to 0.5	0.5 to 1.0	1.0 to 2.0	Deeper than 2.0
High Density	Unit Damage (Rs./ha)	304,923	800,931	1,314,218	2,117,181	3,066,508
	Area (ha)	0.89	2.60	0.00	0.00	0.00
	Direct Damage (Rs.)	271,381	2,082,420	0	0	0
Homestead	Unit Damage (Rs./ha)	220,222	578,450	949,157	1,529,075	2,214,700
	Area (ha)	30.14	99.90	0.00	0.00	0.00
	Direct Damage (Rs.)	6,637,493	57,787,155	0	0	0
Garden/grassland	Unit Damage (Rs./ha)	135,521	355,969	584,097	940,969	1,362,892
	Area (ha)	3.93	21.60	0.00	0.00	0.00
	Direct Damage (Rs.)	532,599	7,688,935	0	0	0
Very High Density	Unit Damage (Rs./ha)	135,521	355,969	584,097	940,969	1,362,892
	Area (ha)	0.00	0.00	0.00	0.00	0.00
	Direct Damage (Rs.)	0	0	0	0	0
Factory	Unit Damage (Rs./ha)	0	2,637,195	4,936,763	6,653,718	8,506,548
	Area (ha)	0.00	3.00	0.00	0.00	0.00
	Direct Damage (Rs.)	0	7,911,584	0	0	0
Total		7,441,473	75,470,094	0	0	0

Maha Ela Sub-basin (1/50)

Area	Item	Inundation Depth (m)				
		Shallower than 0.2	0.2 to 0.5	0.5 to 1.0	1.0 to 2.0	Deeper than 2.0
High Density	Unit Damage (Rs./ha)	304,923	800,931	1,314,218	2,117,181	3,066,508
	Area (ha)	0.99	2.70	0.00	0.00	0.00
	Direct Damage (Rs.)	301,874	2,162,513	0	0	0
Homestead	Unit Damage (Rs./ha)	220,222	578,450	949,157	1,529,075	2,214,700
	Area (ha)	31.81	106.40	0.00	0.00	0.00
	Direct Damage (Rs.)	7,005,264	61,547,080	0	0	0
Garden/grassland	Unit Damage (Rs./ha)	135,521	355,969	584,097	940,969	1,362,892
	Area (ha)	5.94	23.70	0.00	0.00	0.00
	Direct Damage (Rs.)	804,996	8,436,471	0	0	0
Very High Density	Unit Damage (Rs./ha)	135,521	355,969	584,097	940,969	1,362,892
	Area (ha)	0.00	0.00	0.00	0.00	0.00
	Direct Damage (Rs.)	0	0	0	0	0
Factory	Unit Damage (Rs./ha)	0	2,637,195	4,936,763	6,653,718	8,506,548
	Area (ha)	0.00	3.00	0.00	0.00	0.00
	Direct Damage (Rs.)	0	7,911,584	0	0	0
Total		8,112,134	80,057,648	0	0	0

Table 3.3.2 Direct Flood Damage per ha with Inundation Depth without Project (6/8)

Tumbowila Sub-basin (1/2)

		Inundation Depth (m)				
Area	Item	Shallower than 0.2	0.2 to 0.5	0.5 to 1.0	1.0 to 2.0	Deeper than 2.0
High Density	Unit Damage (Rs./ha)	243,959	640,799	1,051,463	1,693,889	2,453,415
	Area (ha)	0.00	0.00	0.00	0.00	0.00
	Direct Damage (Rs.)	0	0	0	0	0
Homestead	Unit Damage (Rs./ha)	176,193	462,799	759,390	1,223,364	1,771,911
	Area (ha)	8.53	5.04	1.07	0.04	0.00
	Direct Damage (Rs.)	1,502,923	2,332,509	812,548	48,935	0
Garden/grassland	Unit Damage (Rs./ha)	108,426	284,800	467,317	752,840	1,090,407
	Area (ha)	0.09	0.00	0.00	0.00	0.00
	Direct Damage (Rs.)	9,758	0	0	0	0
Very High Density	Unit Damage (Rs./ha)	108,426	284,800	467,317	752,840	1,090,407
	Area (ha)	0.00	0.00	0.00	0.00	0.00
	Direct Damage (Rs.)	0	0	0	0	0
Factory	Unit Damage (Rs./ha)	0	2,109,935	3,949,746	5,323,427	6,805,817
	Area (ha)	0.00	0.00	0.00	0.00	0.00
	Direct Damage (Rs.)	0	0	0	0	0
Total		1,512,682	2,332,509	812,548	48,935	0

Tumbowila Sub-basin (1/5)

		Inundation Depth (m)				
Area	Item	Shallower than 0.2	0.2 to 0.5	0.5 to 1.0	1.0 to 2.0	Deeper than 2.0
High Density	Unit Damage (Rs./ha)	243,959	640,799	1,051,463	1,693,889	2,453,415
	Area (ha)	0.00	0.00	0.00	0.00	0.00
	Direct Damage (Rs.)	0	0	0	0	0
Homestead	Unit Damage (Rs./ha)	176,193	462,799	759,390	1,223,364	1,771,911
	Area (ha)	6.13	8.08	4.38	0.40	0.00
	Direct Damage (Rs.)	1,080,061	3,739,419	3,326,129	489,346	0
Garden/grassland	Unit Damage (Rs./ha)	108,426	284,800	467,317	752,840	1,090,407
	Area (ha)	0.15	0.00	0.00	0.00	0.00
	Direct Damage (Rs.)	16,264	0	0	0	0
Very High Density	Unit Damage (Rs./ha)	108,426	284,800	467,317	752,840	1,090,407
	Area (ha)	0.00	0.00	0.00	0.00	0.00
	Direct Damage (Rs.)	0	0	0	0	0
Factory	Unit Damage (Rs./ha)	0	2,109,935	3,949,746	5,323,427	6,805,817
	Area (ha)	0.00	0.00	0.00	0.00	0.00
	Direct Damage (Rs.)	0	0	0	0	0
Total		1,096,325	3,739,419	3,326,129	489,346	0

Tumbowila Sub-basin (1/10)

		Inundation Depth (m)				
Area	Item	Shallower than 0.2	0.2 to 0.5	0.5 to 1.0	1.0 to 2.0	Deeper than 2.0
High Density	Unit Damage (Rs./ha)	243,959	640,799	1,051,463	1,693,889	2,453,415
	Area (ha)	0.00	0.00	0.00	0.00	0.00
	Direct Damage (Rs.)	0	0	0	0	0
Homestead	Unit Damage (Rs./ha)	176,193	462,799	759,390	1,223,364	1,771,911
	Area (ha)	6.21	9.49	5.07	0.09	0.00
	Direct Damage (Rs.)	1,094,156	4,391,966	3,850,109	110,103	0
Garden/grassland	Unit Damage (Rs./ha)	108,426	284,800	467,317	752,840	1,090,407
	Area (ha)	0.18	0.00	0.00	0.00	0.00
	Direct Damage (Rs.)	19,517	0	0	0	0
Very High Density	Unit Damage (Rs./ha)	108,426	284,800	467,317	752,840	1,090,407
	Area (ha)	0.00	0.00	0.00	0.00	0.00
	Direct Damage (Rs.)	0	0	0	0	0
Factory	Unit Damage (Rs./ha)	0	2,109,935	3,949,746	5,323,427	6,805,817
	Area (ha)	0.00	0.00	0.00	0.00	0.00
	Direct Damage (Rs.)	0	0	0	0	0
Total		1,113,673	4,391,966	3,850,109	110,103	0

Tumbowila Sub-basin (1/25)

		Inundation Depth (m)				
Area	Item	Shallower than 0.2	0.2 to 0.5	0.5 to 1.0	1.0 to 2.0	Deeper than 2.0
High Density	Unit Damage (Rs./ha)	243,959	640,799	1,051,463	1,693,889	2,453,415
	Area (ha)	0.00	0.00	0.00	0.00	0.00
	Direct Damage (Rs.)	0	0	0	0	0
Homestead	Unit Damage (Rs./ha)	176,193	462,799	759,390	1,223,364	1,771,911
	Area (ha)	4.33	7.82	14.05	1.42	0.00
	Direct Damage (Rs.)	762,914	3,619,091	10,669,433	1,737,177	0
Garden/grassland	Unit Damage (Rs./ha)	108,426	284,800	467,317	752,840	1,090,407
	Area (ha)	0.21	0.05	0.00	0.00	0.00
	Direct Damage (Rs.)	22,770	14,240	0	0	0
Very High Density	Unit Damage (Rs./ha)	108,426	284,800	467,317	752,840	1,090,407
	Area (ha)	0.00	0.00	0.00	0.00	0.00
	Direct Damage (Rs.)	0	0	0	0	0
Factory	Unit Damage (Rs./ha)	0	2,109,935	3,949,746	5,323,427	6,805,817
	Area (ha)	0.00	0.00	0.00	0.00	0.00
	Direct Damage (Rs.)	0	0	0	0	0
Total		785,684	3,633,331	10,669,433	1,737,177	0

Tumbowila Sub-basin (1/50)

		Inundation Depth (m)				
Area	Item	Shallower than 0.2	0.2 to 0.5	0.5 to 1.0	1.0 to 2.0	Deeper than 2.0
High Density	Unit Damage (Rs./ha)	243,959	640,799	1,051,463	1,693,889	2,453,415
	Area (ha)	0.00	0.00	0.00	0.00	0.00
	Direct Damage (Rs.)	0	0	0	0	0
Homestead	Unit Damage (Rs./ha)	176,193	462,799	759,390	1,223,364	1,771,911
	Area (ha)	4.53	8.20	12.46	1.68	0.00
	Direct Damage (Rs.)	798,153	3,794,955	9,462,003	2,055,252	0
Garden/grassland	Unit Damage (Rs./ha)	108,426	284,800	467,317	752,840	1,090,407
	Area (ha)	0.23	0.06	0.00	0.00	0.00
	Direct Damage (Rs.)	24,938	17,088	0	0	0
Very High Density	Unit Damage (Rs./ha)	108,426	284,800	467,317	752,840	1,090,407
	Area (ha)	0.00	0.00	0.00	0.00	0.00
	Direct Damage (Rs.)	0	0	0	0	0
Factory	Unit Damage (Rs./ha)	0	2,109,935	3,949,746	5,323,427	6,805,817
	Area (ha)	0.00	0.00	0.00	0.00	0.00
	Direct Damage (Rs.)	0	0	0	0	0
Total		823,091	3,812,043	9,462,003	2,055,252	0

Table 3.3.2 Direct Flood Damage per ha with Inundation Depth without Project (7/8)

Bolgoda Canal Sub-basin (1/2)

		Inundation Depth (m)				
Area	Item	Shallower than 0.2	0.2 to 0.5	0.5 to 1.0	1.0 to 2.0	Deeper than 2.0
High Density	Unit Damage (Rs./ha)	946,806	2,486,943	4,080,733	6,573,988	9,521,710
	Area (ha)	1.08	0.47	0.64	0.85	0.00
	Direct Damage (Rs.)	1,022,550	1,168,863	2,611,669	5,587,890	0
Homestead	Unit Damage (Rs./ha)	683,804	1,796,126	2,947,196	4,747,880	6,876,791
	Area (ha)	1.71	1.25	3.40	0.08	0.00
	Direct Damage (Rs.)	1,169,305	2,245,157	10,020,466	379,830	0
Garden/grassland	Unit Damage (Rs./ha)	420,803	1,105,308	1,813,659	2,921,772	4,231,871
	Area (ha)	1.63	0.36	0.18	0.00	0.00
	Direct Damage (Rs.)	685,908	397,911	326,459	0	0
Very High Density	Unit Damage (Rs./ha)	420,803	1,105,308	1,813,659	2,921,772	4,231,871
	Area (ha)	0.00	0.00	0.00	0.00	0.00
	Direct Damage (Rs.)	0	0	0	0	0
Factory	Unit Damage (Rs./ha)	0	9,455,702	17,700,837	23,857,008	30,500,358
	Area (ha)	0.00	0.00	0.00	0.00	0.00
	Direct Damage (Rs.)	0	0	0	0	0
Total		2,877,764	3,811,931	12,958,594	5,967,720	0

Bolgoda Canal Sub-basin (1/5)

		Inundation Depth (m)				
Area	Item	Shallower than 0.2	0.2 to 0.5	0.5 to 1.0	1.0 to 2.0	Deeper than 2.0
High Density	Unit Damage (Rs./ha)	946,806	2,486,943	4,080,733	6,573,988	9,521,710
	Area (ha)	17.28	9.31	3.59	1.26	0.00
	Direct Damage (Rs.)	16,360,804	23,153,441	14,649,831	8,283,225	0
Homestead	Unit Damage (Rs./ha)	683,804	1,796,126	2,947,196	4,747,880	6,876,791
	Area (ha)	11.70	9.33	5.18	1.54	0.05
	Direct Damage (Rs.)	8,000,509	16,757,852	15,266,475	7,311,736	343,840
Garden/grassland	Unit Damage (Rs./ha)	420,803	1,105,308	1,813,659	2,921,772	4,231,871
	Area (ha)	1.95	1.71	0.81	0.23	0.03
	Direct Damage (Rs.)	820,565	1,890,077	1,469,064	672,008	126,956
Very High Density	Unit Damage (Rs./ha)	420,803	1,105,308	1,813,659	2,921,772	4,231,871
	Area (ha)	0.00	0.00	0.00	0.00	0.00
	Direct Damage (Rs.)	0	0	0	0	0
Factory	Unit Damage (Rs./ha)	0	9,455,702	17,700,837	23,857,008	30,500,358
	Area (ha)	0.20	0.06	0.00	0.00	0.00
	Direct Damage (Rs.)	0	567,342	0	0	0
Total		25,181,877	42,368,711	31,385,370	16,266,968	470,796

Bolgoda Canal Sub-basin (1/10)

		Inundation Depth (m)				
Area	Item	Shallower than 0.2	0.2 to 0.5	0.5 to 1.0	1.0 to 2.0	Deeper than 2.0
High Density	Unit Damage (Rs./ha)	946,806	2,486,943	4,080,733	6,573,988	9,521,710
	Area (ha)	16.17	10.19	4.59	1.11	0.00
	Direct Damage (Rs.)	15,309,849	25,341,950	18,730,564	7,297,127	0
Homestead	Unit Damage (Rs./ha)	683,804	1,796,126	2,947,196	4,747,880	6,876,791
	Area (ha)	10.39	11.91	5.00	1.97	0.03
	Direct Damage (Rs.)	7,104,725	21,391,856	14,735,980	9,353,324	206,304
Garden/grassland	Unit Damage (Rs./ha)	420,803	1,105,308	1,813,659	2,921,772	4,231,871
	Area (ha)	0.82	2.81	1.31	0.07	0.00
	Direct Damage (Rs.)	345,058	3,105,916	2,375,893	204,524	0
Very High Density	Unit Damage (Rs./ha)	420,803	1,105,308	1,813,659	2,921,772	4,231,871
	Area (ha)	0.00	0.00	0.00	0.00	0.00
	Direct Damage (Rs.)	0	0	0	0	0
Factory	Unit Damage (Rs./ha)	0	9,455,702	17,700,837	23,857,008	30,500,358
	Area (ha)	0.30	0.06	0.00	0.00	0.00
	Direct Damage (Rs.)	0	567,342	0	0	0
Total		22,759,632	50,407,064	35,842,437	16,854,975	206,304

Bolgoda Canal Sub-basin (1/25)

		Inundation Depth (m)				
Area	Item	Shallower than 0.2	0.2 to 0.5	0.5 to 1.0	1.0 to 2.0	Deeper than 2.0
High Density	Unit Damage (Rs./ha)	946,806	2,486,943	4,080,733	6,573,988	9,521,710
	Area (ha)	17.96	12.35	5.71	1.06	0.00
	Direct Damage (Rs.)	17,004,631	30,713,748	23,300,984	6,968,427	0
Homestead	Unit Damage (Rs./ha)	683,804	1,796,126	2,947,196	4,747,880	6,876,791
	Area (ha)	10.47	13.04	6.56	2.89	0.03
	Direct Damage (Rs.)	7,159,430	23,421,478	19,333,605	13,721,374	206,304
Garden/grassland	Unit Damage (Rs./ha)	420,803	1,105,308	1,813,659	2,921,772	4,231,871
	Area (ha)	0.88	3.07	1.63	0.43	0.00
	Direct Damage (Rs.)	370,306	3,393,296	2,956,264	1,256,362	0
Very High Density	Unit Damage (Rs./ha)	420,803	1,105,308	1,813,659	2,921,772	4,231,871
	Area (ha)	0.00	0.00	0.00	0.00	0.00
	Direct Damage (Rs.)	0	0	0	0	0
Factory	Unit Damage (Rs./ha)	0	9,455,702	17,700,837	23,857,008	30,500,358
	Area (ha)	0.33	0.14	0.00	0.00	0.00
	Direct Damage (Rs.)	0	1,323,798	0	0	0
Total		24,534,367	58,852,319	45,590,854	21,946,163	206,304

Bolgoda Canal Sub-basin (1/50)

		Inundation Depth (m)				
Area	Item	Shallower than 0.2	0.2 to 0.5	0.5 to 1.0	1.0 to 2.0	Deeper than 2.0
High Density	Unit Damage (Rs./ha)	946,806	2,486,943	4,080,733	6,573,988	9,521,710
	Area (ha)	18.35	13.73	6.30	1.23	0.00
	Direct Damage (Rs.)	17,373,886	34,145,729	25,708,617	8,086,005	0
Homestead	Unit Damage (Rs./ha)	683,804	1,796,126	2,947,196	4,747,880	6,876,791
	Area (ha)	10.92	13.37	7.79	3.39	0.06
	Direct Damage (Rs.)	7,467,141	24,014,199	22,958,656	16,095,314	412,607
Garden/grassland	Unit Damage (Rs./ha)	420,803	1,105,308	1,813,659	2,921,772	4,231,871
	Area (ha)	0.87	2.74	2.21	0.42	0.01
	Direct Damage (Rs.)	366,098	3,028,544	4,008,186	1,227,144	42,319
Very High Density	Unit Damage (Rs./ha)	420,803	1,105,308	1,813,659	2,921,772	4,231,871
	Area (ha)	0.00	0.00	0.00	0.00	0.00
	Direct Damage (Rs.)	0	0	0	0	0
Factory	Unit Damage (Rs./ha)	0	9,455,702	17,700,837	23,857,008	30,500,358
	Area (ha)	0.42	0.16	0.00	0.00	0.00
	Direct Damage (Rs.)	0	1,512,912	0	0	0
Total		25,207,125	62,701,385	52,675,460	25,408,464	454,926

Table 3.3.2 Direct Flood Damage per ha with Inundation Depth without Project (8/8)

Ratmalana-Moratuwa Sub-basin (1/2)

Area	Item	Inundation Depth (m)				
		Shallower than 0.2	0.2 to 0.5	0.5 to 1.0	1.0 to 2.0	Deeper than 2.0
High Density	Unit Damage (Rs./ha)	617,518	1,622,014	2,661,503	4,287,634	6,210,173
	Area (ha)	3.78	1.54	0.08	0.00	0.00
	Direct Damage (Rs.)	2,334,218	2,497,902	212,920	0	0
Homestead	Unit Damage (Rs./ha)	445,985	1,171,455	1,922,197	3,096,624	4,485,125
	Area (ha)	6.46	3.03	0.47	0.01	0.04
	Direct Damage (Rs.)	2,881,065	3,549,508	903,432	30,966	179,405
Garden/grassland	Unit Damage (Rs./ha)	274,452	720,895	1,182,890	1,905,615	2,760,077
	Area (ha)	5.33	3.21	0.03	0.00	0.01
	Direct Damage (Rs.)	1,462,832	2,314,074	35,487	0	27,601
Very High Density	Unit Damage (Rs./ha)	274,452	720,895	1,182,890	1,905,615	2,760,077
	Area (ha)	2.12	3.30	0.00	0.00	0.00
	Direct Damage (Rs.)	581,839	2,378,954	0	0	0
Factory	Unit Damage (Rs./ha)	0	8,791,247	16,456,994	22,180,570	28,357,090
	Area (ha)	0.19	0.04	0.00	0.00	0.01
	Direct Damage (Rs.)	0	351,650	0	0	283,571
Total		7,259,954	11,092,087	1,151,839	30,966	490,577

Ratmalana-Moratuwa Sub-basin (1/5)

Area	Item	Inundation Depth (m)				
		Shallower than 0.2	0.2 to 0.5	0.5 to 1.0	1.0 to 2.0	Deeper than 2.0
High Density	Unit Damage (Rs./ha)	617,518	1,622,014	2,661,503	4,287,634	6,210,173
	Area (ha)	4.91	1.98	0.18	0.00	0.00
	Direct Damage (Rs.)	3,032,014	3,211,588	479,071	0	0
Homestead	Unit Damage (Rs./ha)	445,985	1,171,455	1,922,197	3,096,624	4,485,125
	Area (ha)	8.00	5.06	1.05	0.01	0.04
	Direct Damage (Rs.)	3,567,882	5,927,561	2,018,306	30,966	179,405
Garden/grassland	Unit Damage (Rs./ha)	274,452	720,895	1,182,890	1,905,615	2,760,077
	Area (ha)	5.28	4.64	0.33	0.00	0.01
	Direct Damage (Rs.)	1,449,109	3,344,954	390,354	0	27,601
Very High Density	Unit Damage (Rs./ha)	274,452	720,895	1,182,890	1,905,615	2,760,077
	Area (ha)	2.22	4.22	0.01	0.00	0.00
	Direct Damage (Rs.)	609,285	3,042,178	11,829	0	0
Factory	Unit Damage (Rs./ha)	0	8,791,247	16,456,994	22,180,570	28,357,090
	Area (ha)	0.33	0.04	0.00	0.00	0.01
	Direct Damage (Rs.)	0	351,650	0	0	283,571
Total		8,658,290	15,877,930	2,899,560	30,966	490,577

Ratmalana-Moratuwa Sub-basin (1/10)

Area	Item	Inundation Depth (m)				
		Shallower than 0.2	0.2 to 0.5	0.5 to 1.0	1.0 to 2.0	Deeper than 2.0
High Density	Unit Damage (Rs./ha)	617,518	1,622,014	2,661,503	4,287,634	6,210,173
	Area (ha)	5.53	2.26	0.20	0.00	0.00
	Direct Damage (Rs.)	3,414,875	3,665,752	532,301	0	0
Homestead	Unit Damage (Rs./ha)	445,985	1,171,455	1,922,197	3,096,624	4,485,125
	Area (ha)	7.76	6.08	1.83	0.02	0.04
	Direct Damage (Rs.)	3,460,846	7,122,444	3,517,620	61,932	179,405
Garden/grassland	Unit Damage (Rs./ha)	274,452	720,895	1,182,890	1,905,615	2,760,077
	Area (ha)	5.26	4.87	1.05	0.00	0.01
	Direct Damage (Rs.)	1,443,620	3,510,760	1,242,035	0	27,601
Very High Density	Unit Damage (Rs./ha)	274,452	720,895	1,182,890	1,905,615	2,760,077
	Area (ha)	2.63	3.66	1.26	0.00	0.00
	Direct Damage (Rs.)	721,810	2,638,476	1,490,442	0	0
Factory	Unit Damage (Rs./ha)	0	8,791,247	16,456,994	22,180,570	28,357,090
	Area (ha)	0.59	0.08	0.01	0.00	0.01
	Direct Damage (Rs.)	0	703,300	164,570	0	283,571
Total		9,041,151	17,640,732	6,946,967	61,932	490,577

Ratmalana-Moratuwa Sub-basin (1/25)

Area	Item	Inundation Depth (m)				
		Shallower than 0.2	0.2 to 0.5	0.5 to 1.0	1.0 to 2.0	Deeper than 2.0
High Density	Unit Damage (Rs./ha)	617,518	1,622,014	2,661,503	4,287,634	6,210,173
	Area (ha)	6.31	2.95	0.47	0.00	0.00
	Direct Damage (Rs.)	3,896,539	4,784,942	1,250,906	0	0
Homestead	Unit Damage (Rs./ha)	445,985	1,171,455	1,922,197	3,096,624	4,485,125
	Area (ha)	9.42	7.72	2.59	0.07	0.04
	Direct Damage (Rs.)	4,201,181	9,043,630	4,978,489	216,764	179,405
Garden/grassland	Unit Damage (Rs./ha)	274,452	720,895	1,182,890	1,905,615	2,760,077
	Area (ha)	6.60	5.43	2.55	0.00	0.01
	Direct Damage (Rs.)	1,811,386	3,914,461	3,016,370	0	27,601
Very High Density	Unit Damage (Rs./ha)	274,452	720,895	1,182,890	1,905,615	2,760,077
	Area (ha)	3.13	3.26	3.07	0.00	0.00
	Direct Damage (Rs.)	859,036	2,350,118	3,631,473	0	0
Factory	Unit Damage (Rs./ha)	0	8,791,247	16,456,994	22,180,570	28,357,090
	Area (ha)	0.70	0.10	0.01	0.00	0.01
	Direct Damage (Rs.)	0	879,125	164,570	0	283,571
Total		10,768,143	20,972,276	13,041,808	216,764	490,577

Ratmalana-Moratuwa Sub-basin (1/50)

Area	Item	Inundation Depth (m)				
		Shallower than 0.2	0.2 to 0.5	0.5 to 1.0	1.0 to 2.0	Deeper than 2.0
High Density	Unit Damage (Rs./ha)	617,518	1,622,014	2,661,503	4,287,634	6,210,173
	Area (ha)	6.02	3.73	0.56	0.00	0.00
	Direct Damage (Rs.)	3,717,459	6,050,113	1,490,442	0	0
Homestead	Unit Damage (Rs./ha)	445,985	1,171,455	1,922,197	3,096,624	4,485,125
	Area (ha)	10.14	8.77	3.19	0.10	0.04
	Direct Damage (Rs.)	4,522,291	10,273,657	6,131,807	309,662	179,405
Garden/grassland	Unit Damage (Rs./ha)	274,452	720,895	1,182,890	1,905,615	2,760,077
	Area (ha)	7.03	5.76	2.98	0.00	0.01
	Direct Damage (Rs.)	1,929,401	4,152,356	3,525,013	0	27,601
Very High Density	Unit Damage (Rs./ha)	274,452	720,895	1,182,890	1,905,615	2,760,077
	Area (ha)	3.69	3.18	3.65	0.00	0.00
	Direct Damage (Rs.)	1,012,730	2,292,447	4,317,549	0	0
Factory	Unit Damage (Rs./ha)	0	8,791,247	16,456,994	22,180,570	28,357,090
	Area (ha)	0.78	0.14	0.02	0.00	0.01
	Direct Damage (Rs.)	0	1,230,775	329,140	0	283,571
Total		11,181,880	23,999,348	15,793,950	309,662	490,577

Table 3.3.3 Probable Flood Damage in Weras Ganga Basin

(Unit: Rs.)

Basin	Return Period	General Assets						Total of Direct Damage	Disturbance to Business Activities	Damage to Infrastructure	Total of Probable Damage
		High Density	Homestead	Garden/ grassland	Very High Density	Factory	Paddy				
Weras Ganga Basin	2	25,909,033	123,907,474	26,562,314	2,373,492	18,971,128	3,122,956	200,846,397	11,863,406	55,362,564	268,072,367
	5	60,289,737	179,192,923	36,880,976	2,936,643	19,334,007	3,662,474	302,296,760	17,918,057	83,617,600	403,832,417
	10	65,108,600	199,030,547	42,246,591	3,888,541	19,298,975	3,993,856	333,567,109	19,774,395	92,280,511	445,622,014
	25	76,197,762	244,240,786	51,750,292	5,483,725	19,903,773	3,773,075	401,349,413	23,854,580	111,321,374	536,525,368
	50	84,102,032	261,584,399	57,155,098	6,110,686	20,379,869	4,585,898	433,917,982	25,759,925	120,212,983	579,890,890
Nugedoda-Rattanapitiya Sub-basin	2	8,366,070	15,828,272	11,102,751	0	0	17,685	35,314,778	2,117,826	9,883,186	47,315,790
	5	11,939,068	21,422,716	14,898,874	0	0	19,616	48,280,273	2,895,639	13,512,984	64,688,897
	10	13,077,101	24,819,051	16,726,272	0	0	18,981	54,641,404	3,277,345	15,294,279	73,213,028
	25	15,156,691	29,799,504	20,220,623	0	0	19,823	65,196,642	3,910,609	18,249,509	87,356,760
	50	17,502,919	33,040,216	22,107,242	0	0	19,555	72,669,932	4,359,023	20,342,106	97,371,060
Boralesgamuwa North Sub-basin	2	2,339,783	8,535,848	1,969,999	0	0	254,484	13,100,114	770,738	3,596,776	17,467,628
	5	3,285,201	11,312,172	2,443,103	0	0	309,361	17,349,837	1,022,429	4,771,333	23,143,599
	10	3,376,380	12,595,457	2,908,813	0	0	337,368	19,218,018	1,132,839	5,286,582	25,637,439
	25	3,910,316	15,469,688	3,326,001	0	0	371,624	23,077,630	1,362,360	6,357,682	30,797,672
	50	3,943,183	16,852,758	3,617,682	0	0	383,794	24,797,417	1,464,817	6,835,814	33,098,049
Boralesgamuwa South Sub-basin	2	1,781,540	4,782,940	816,820	0	0	92,818	7,474,118	442,878	2,066,764	9,983,761
	5	2,275,396	5,780,687	1,019,944	0	0	98,544	9,174,571	544,562	2,541,287	12,260,420
	10	2,657,509	6,762,281	1,315,846	0	0	103,584	10,839,220	644,138	3,005,978	14,489,336
	25	2,177,603	9,868,908	2,026,791	0	0	108,883	14,182,185	844,398	3,940,525	18,967,108
	50	3,294,364	9,107,770	2,355,796	0	0	110,930	14,868,861	885,476	4,132,221	19,886,557
Maha Ela Sub-basin	2	1,879,341	42,974,577	4,953,393	0	8,081,715	1,728,421	59,617,448	3,473,342	16,208,927	79,299,717
	5	2,178,369	52,988,075	6,568,174	0	8,081,715	1,982,685	71,799,019	4,188,980	19,548,573	95,536,572
	10	2,264,561	57,499,398	7,329,262	0	7,911,584	2,130,920	77,135,724	4,500,288	21,001,345	102,637,358
	25	2,353,801	64,424,648	8,221,534	0	7,911,584	2,061,354	84,972,922	4,974,694	23,215,239	113,162,855
	50	2,464,387	68,552,344	9,241,467	0	7,911,584	2,363,551	90,533,333	5,290,187	24,687,539	120,511,059
Tumbowila Sub-basin	2	0	4,696,914	9,758	0	0	18,592	4,725,264	282,400	1,317,868	6,325,533
	5	0	8,634,955	16,264	0	0	24,578	8,675,796	519,073	2,422,341	11,617,211
	10	0	9,446,333	19,517	0	0	25,938	9,491,788	567,951	2,650,438	12,710,177
	25	0	16,788,616	37,009	0	0	28,465	16,854,090	1,009,538	4,711,175	22,574,802
	50	0	16,110,362	42,026	0	0	28,478	16,180,865	969,143	4,522,669	21,672,677
Bolgoda Canal Sub-basin	2	10,390,972	13,814,759	1,410,278	0	0	0	25,616,009	1,536,961	7,172,482	34,325,452
	5	62,447,300	47,680,410	4,978,669	0	567,342	0	115,673,722	6,940,423	32,388,642	155,002,787
	10	66,679,490	52,792,188	6,031,391	0	567,342	0	126,070,412	7,564,225	35,299,715	168,934,352
	25	77,987,791	63,842,190	7,976,228	0	1,323,798	0	151,130,008	9,067,800	42,316,402	202,514,210
	50	85,314,237	70,947,918	8,672,292	0	1,512,912	0	166,447,359	9,986,842	46,605,261	223,039,461
Ratmalana-Moratuwa Sub-basin	2	5,045,040	7,544,376	3,839,993	2,960,793	635,221	0	20,025,423	1,201,525	5,607,119	26,834,067
	5	6,722,672	11,724,121	5,212,017	3,663,291	635,221	0	27,957,322	1,677,439	7,828,050	37,462,811
	10	7,612,928	14,342,247	6,224,015	4,850,728	1,151,441	0	34,181,359	2,050,882	9,570,780	45,803,020
	25	9,932,387	18,619,469	8,769,818	6,840,627	1,327,266	0	45,489,567	2,729,374	12,737,079	60,956,020
	50	11,258,013	21,416,823	9,634,371	7,622,726	1,843,485	0	51,775,418	3,106,525	14,497,117	69,379,059

Table 3.3.4 Annual Average Flood Damage in Weras Ganga Basin without Project

Basin	Return Period	Exceedance	Difference of Exceedance	Damage (million Rs.)		Annual Damage (million Rs.)	
				Amount	Average	Segment	Cumulative
Weras Ganga Basin		1.00					
	2	0.50	0.50	268	134	67	67
	5	0.20	0.30	404	336	101	168
	10	0.10	0.10	446	425	42	210
	25	0.04	0.06	537	491	29	240
	50	0.02	0.02	580	558	11	251
Nugedoda-Rattanapitiya Sub-basin		1.00					
	2	0.50	0.50	47	24	12	12
	5	0.20	0.30	65	56	17	29
	10	0.10	0.10	73	69	7	36
	25	0.04	0.06	87	80	5	40
	50	0.02	0.02	97	92	2	42
Boralesgamuwa North Sub-basin		1.00					
	2	0.50	0.50	17	9	4	4
	5	0.20	0.30	23	20	6	10
	10	0.10	0.10	26	24	2	13
	25	0.04	0.06	31	28	2	15
	50	0.02	0.02	33	32	1	15
Boralesgamuwa South Sub-basin		1.00					
	2	0.50	0.50	10	5	2	2
	5	0.20	0.30	12	11	3	6
	10	0.10	0.10	14	13	1	7
	25	0.04	0.06	19	17	1	8
	50	0.02	0.02	20	19	0	9
Maha Ela Sub-basin		1.00					
	2	0.50	0.50	79	40	20	20
	5	0.20	0.30	96	87	26	46
	10	0.10	0.10	103	99	10	56
	25	0.04	0.06	113	108	6	62
	50	0.02	0.02	121	117	2	65
Tumbowila Sub-basin		1.00					
	2	0.50	0.50	6	3	2	2
	5	0.20	0.30	12	9	3	4
	10	0.10	0.10	13	12	1	5
	25	0.04	0.06	23	18	1	7
	50	0.02	0.02	22	22	0	7
Bolgoda Canal Sub-basin		1.00					
	2	0.50	0.50	34	17	9	9
	5	0.20	0.30	155	95	28	37
	10	0.10	0.10	169	162	16	53
	25	0.04	0.06	203	186	11	64
	50	0.02	0.02	223	213	4	69
Ratmalana-Moratuwa Sub-basin		1.00					
	2	0.50	0.50	27	13	7	7
	5	0.20	0.30	37	32	10	16
	10	0.10	0.10	46	42	4	21
	25	0.04	0.06	61	53	3	24
	50	0.02	0.02	69	65	1	25

Table 3.3.5 Flood Damage Reduction Benefit

Basin	Return Period	Exceedance	Difference of Exceedance	Damage (million Rs.)		Annual Damage (million Rs.)	
				Amount	Average	Segment	Cumulative
Weras Ganga Basin		1.00					
	2	0.50	0.50	76.12	38.06	19.03	19.03
	5	0.20	0.30	170.56	123.34	37.00	56.03
	10	0.10	0.10	174.04	172.30	17.23	73.26
	25	0.04	0.06	105.65	139.85	8.39	81.65
	50	0.02	0.02	103.62	104.63	2.09	83.75
Nugedoda-Rattanapitiya Sub-basin		1.00					
	2	0.50	0.50	27.33	13.67	6.83	6.83
	5	0.20	0.30	39.78	33.56	10.07	16.90
	10	0.10	0.10	44.61	42.19	4.22	21.12
	25	0.04	0.06	19.50	32.05	1.92	23.04
	50	0.02	0.02	19.92	19.71	0.39	23.44
Boralesgamuwa North Sub-basin		1.00					
	2	0.50	0.50	5.22	2.61	1.30	1.30
	5	0.20	0.30	6.78	6.00	1.80	3.10
	10	0.10	0.10	8.18	7.48	0.75	3.85
	25	0.04	0.06	5.57	6.88	0.41	4.27
	50	0.02	0.02	6.34	5.96	0.12	4.38
Boralesgamuwa South Sub-basin		1.00					
	2	0.50	0.50	3.08	1.54	0.77	0.77
	5	0.20	0.30	4.35	3.71	1.11	1.88
	10	0.10	0.10	5.40	4.87	0.49	2.37
	25	0.04	0.06	7.29	6.35	0.38	2.75
	50	0.02	0.02	6.22	6.76	0.14	2.89
Maha Ela Sub-basin		1.00					
	2	0.50	0.50	9.75	4.87	2.44	2.44
	5	0.20	0.30	55.21	32.48	9.74	12.18
	10	0.10	0.10	56.81	56.01	5.60	17.78
	25	0.04	0.06	23.83	40.32	2.42	20.20
	50	0.02	0.02	24.03	23.93	0.48	20.68
Tumbowila Sub-basin		1.00					
	2	0.50	0.50	0.33	0.17	0.08	0.08
	5	0.20	0.30	3.29	1.81	0.54	0.63
	10	0.10	0.10	1.57	2.43	0.24	0.87
	25	0.04	0.06	7.61	4.59	0.28	1.15
	50	0.02	0.02	4.28	5.94	0.12	1.26
Bolgoda Canal Sub-basin		1.00					
	2	0.50	0.50	3.29	1.64	0.82	0.82
	5	0.20	0.30	8.97	6.13	1.84	2.66
	10	0.10	0.10	0.00	4.48	0.45	3.11
	25	0.04	0.06	5.38	2.69	0.16	3.27
	50	0.02	0.02	5.13	5.25	0.11	3.37
Bolgoda Canal Sub-basin (Weras Ganga Scheme & Bolgoda Canal)		1.00					
	2	0.50	0.50	8.66	4.33	2.17	2.17
	5	0.20	0.30	34.38	21.52	6.46	8.62
	10	0.10	0.10	32.38	33.38	3.34	11.96
	25	0.04	0.06	43.52	37.95	2.28	14.24
	50	0.02	0.02	47.66	45.59	0.91	15.15
Ratmalana-Moratuwa Sub-basin		1.00					
	2	0.50	0.50	15.93	7.97	3.98	3.98
	5	0.20	0.30	10.18	13.05	3.92	7.90
	10	0.10	0.10	11.95	11.06	1.11	9.01
	25	0.04	0.06	18.93	15.44	0.93	9.93
	50	0.02	0.02	22.74	20.83	0.42	10.35
Weras Ganga Scheme Alone		1.00					
	2	0.50	0.50	15.41	7.70	3.85	3.85
	5	0.20	0.30	27.34	21.37	6.41	10.26
	10	0.10	0.10	16.16	21.75	2.18	12.44
	25	0.04	0.06	48.79	32.48	1.95	14.39
	50	0.02	0.02	44.59	46.69	0.93	15.32

Table 3.5.1 Cost Benefit Stream of F/S Project

(Unit: million Rs.)

Year	Cost	O&M	Total Cost	Flood	Land	Benefit	B-C
1	353.07		353.07			0.00	-353.07
2	282.45		282.45			0.00	-282.45
3	988.59		988.59			0.00	-988.59
4	1,059.20		1,059.20			0.00	-1,059.20
	847.36		847.36			0.00	-847.36
5		40.00	40.00	115.60	760.94	876.54	836.54
6		40.00	40.00	121.38	760.94	882.32	842.32
7		40.00	40.00	127.45	760.94	888.39	848.39
8		40.00	40.00	133.82	760.94	894.76	854.76
9		40.00	40.00	140.51	760.94	901.45	861.45
10		40.00	40.00	147.54	760.94	908.48	868.48
11		40.00	40.00	154.92	760.94	915.86	875.86
12		40.00	40.00	162.66	760.94	923.60	883.60
13		40.00	40.00	170.79	760.94	931.73	891.73
14		40.00	40.00	179.33	760.94	940.27	900.27
15		40.00	40.00	188.30	760.94	949.24	909.24
16		40.00	40.00	197.72	760.94	958.66	918.66
17		40.00	40.00	207.60	760.94	968.54	928.54
18		40.00	40.00	217.98	760.94	978.92	938.92
19		40.00	40.00	228.88	760.94	989.82	949.82
20		40.00	40.00	240.32	760.94	1,001.26	961.26
21		40.00	40.00	252.34	760.94	1,013.28	973.28
22		40.00	40.00	264.96	760.94	1,025.90	985.90
23		40.00	40.00	278.21	760.94	1,039.15	999.15
24		40.00	40.00	292.12	760.94	1,053.06	1,013.06
25		40.00	40.00	306.72	760.94	1,067.66	1,027.66
26		40.00	40.00	322.06	760.94	1,083.00	1,043.00
27		40.00	40.00	338.16	760.94	1,099.10	1,059.10
28		40.00	40.00	355.07	760.94	1,116.01	1,076.01
29		40.00	40.00	372.82	760.94	1,133.76	1,093.76
30		40.00	40.00	391.46	760.94	1,152.40	1,112.40
31		40.00	40.00	411.04	760.94	1,171.98	1,131.98
32		40.00	40.00	431.59	760.94	1,192.53	1,152.53
33		40.00	40.00	453.17	760.94	1,214.11	1,174.11
34		40.00	40.00	475.83	760.94	1,236.77	1,196.77
35		40.00	40.00	499.62	760.94	1,260.56	1,220.56
36		40.00	40.00	524.60	760.94	1,285.54	1,245.54
37		40.00	40.00	550.83	760.94	1,311.77	1,271.77
38		40.00	40.00	578.37	760.94	1,339.31	1,299.31
39		40.00	40.00	607.29	760.94	1,368.23	1,328.23
40		40.00	40.00	637.65	760.94	1,398.59	1,358.59
41		40.00	40.00	669.53	760.94	1,430.47	1,390.47
42		40.00	40.00	703.01	760.94	1,463.95	1,423.95
43		40.00	40.00	738.16	760.94	1,499.10	1,459.10
44		40.00	40.00	775.07	760.94	1,536.01	1,496.01
Net Present Value			2,789.62			5,832.71	

IRR	18.8%
B-C (million Rs.)	3,043.09
B/C	2.09