

# Water for Basic Needs, Water Supply and Water Quality

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## Abbreviations

ADB	-	Asian Development Bank
BOI	-	Board of Investment
CBO	-	Community Based Organization
CWSSP	-	Community Water Supply and Sanitation Project
DHS	-	Department of Health Services
DS	-	Divisional Secretary
GOSL	-	Government of Sri Lanka
HH	-	Households
JABIC	-	Japanese Bank of International Cooperation
JICA	-	Japanese International Cooperation Agency
LA	-	Local Authority
MCM	-	Million Cubic Meters per Year
MHPI	-	Ministry of Housing and Plantation Infrastructure
NORAD	-	Norwegian Agency for Development ?????
NGO	-	Non Governmental Organisation
NRW	-	Non-Revenue Water
NWSDB	-	National Water Supply and Drainage Board
O&M	-	Operation and Maintenance
PHSWT	-	Plantation Housing and Social Welfare Trust
PVC	-	Polyvinyl Chloride
RSC	-	Regional Support Centre (of NWSDB)
RWSS Division	-	Rural Water Supply and Sanitation Division
SLS	-	Sri Lanka Standards
TWSSP	-	Third Water Supply and Sanitation Project
WSS	-	Water Supply Scheme

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# 1. Introduction

## 1.1 Background

Under World Water Assessment Programme, Ruhunu river basins have been selected from Sri Lanka for the study, namely, Walawe Ganga, Kirindi Oya, Malala Oya and Menik Ganga. (Ref. Map 1)

This paper focuses on the water for basic needs, water supply and water quality. The terms of reference of the study included the following:

1. Identify main sources of domestic water supply in the Basins;
2. Main service providers and percent served (National Water Supply and Drainage Board, local authorities);
3. Assess the supply to main towns; adequacy, duration of supply per day, percent served;
4. Assess the access to safe water and sanitation;
5. Assess the constraints to improve the service; water quality, quantity, competition from other sectors such as agriculture, etc.;
6. Cost of water supply, capital investment, O&M cost, tariff structure and percent cost recovered from users;
7. Assess the main management issues and approaches to address the issues;
8. Identify the main water related and water borne diseases;
9. Identify major water quality issues; and
10. Identify major concerns and threats, especially for the future.

## 2. Water Supply Policies in Sri Lanka

There are several policies that are important and relevant in the aspect of the provision of drinking water and sanitation in Sri Lanka. A brief detail of some important policies is indicated below:

To guide the growth of water and sanitation sector, the Ministry of Housing and Plantation Infrastructure (MHPI) is developing an overarching policy framework, which is at present in draft stage, called "Policy Statement – Water Supply and Sanitation". This document is supposed to provide guidance for government agencies including provincial councils, and local authorities, lending institutions, community based organisations, non governmental organisations involved in water supply and sanitation services, in the design and implementation of programmes and investment strategies to achieve coverage, service quality and cost recovery objectives of the GOSL. The Policy Statement reflects the contents of the various policies that have already been developed by the MHPI, the NWSDB and other relevant ministries and government agencies.

In the document, the sector vision is stated as *"The Government of Sri Lanka is committed to improving the standard of living, promoting economic prosperity and preserving the environment by providing access to safe drinking water and adequate sanitation facilities to the people of Sri Lanka"*.

The goals in the water supply are defined as:

- Access to sufficient and safe drinking water is provided to 85% of the population of Sri Lanka by 2010 and 100% by 2025;

- Piped water supply is provided to 100% of the urban population by 2010; and
- Service levels and the quality of water achieve national standards in urban and rural areas.

The goals in sanitation are defined as:

- Access to adequate sanitation is available to 70% of the population of Sri Lanka by 2010 and 100% by 2025;
- Piped sewerage systems are provided in the major urban areas; and
- Standard on-site sanitation is available to all those not connected to a sewerage system or other sanitation scheme.

The document states that the sector structure for provision of services will be reformed to provide incentives for efficiency, attract private sector participation, improve accountability and support community involvement while ensuring adequate provision for low-income and rural communities.

Regarding institutional and regulatory structure, the document suggests to establish a regulatory and institutional framework that sets out clear roles and responsibilities among government agencies and service providers, and creates a transparent, fair and stable regulatory environment based on clear principles and procedures. Under this, an important step will be the establishment of an independent, financially sustainable regulatory commission, to regulate tariffs, service quality, water quality and consumer protection for both public and private sector service providers in urban and rural areas.

The document also outlines the aspects of tariffs, operational costs and subsidies; investments; source protection and water conservation; quality assurance and capacity building; research and development and role of key stakeholders in water supply and sanitation sector. The relevant aspects in these and the other policy documents are stated in the appropriate sections in this paper.

Some of the important policies that have been established are; Urban Water Supply Policy (by NWSDB, undated), National Policy for Rural Water Supply and Sanitation Sector (MHPI, July 2001), Tariff Policy on Drinking Water (NWSDB, December 2001) and National Policy on Private Sector Participation in Water Supply and Sanitation (MHPI, October 1999). There are some other document in preparation, among which are, Policy Statement for Investment in Water Supply and Sewerage Sectors (January 2002) and Sewerage Tariff Policy.

National Water Resources Policy and Institutional Arrangements (Water Resource Council and Secretariat, April 2000) is another important policy document adopted by the Government. The policy objective is to ensure the use of water resources in an effective, efficient and equitable manner, consistent with the social, economic and environmental needs of present and future generations.

### **3. Water Supply in Ruhunu Basin**

#### ***3.1 Water Users in the Basin***

The major water users in the Ruhunu basin were found to be irrigation and agriculture sectors, power generation, industrial sector, commercial sector and domestic consumers. However, comparative usage of water by these sectors were not assessed. The focus of the study was made on the usage of water for basic needs.

### ***3.2 Usage of Water for Basic Needs***

The usage of water for basic needs in the Ruhunu basin was found to be similar to that of elsewhere in the country. The domestic water usage was found to be mainly for drinking, cooking meals, washing utensils, bathing, usage in the toilets, washing clothes, gardening and watering animals. These usages were not assessed quantitatively, but observed to vary depending on the social status of the users, type of household, geographical area and climate.

Water source used for different type of usage also was observed to vary within the study area, depending on several factors, the main being the availability of different sources. For example, in town areas, water for all the above uses were obtained mainly from public water supply systems, whereas in rural areas, water from wells are used for drinking and cooking purposes. Rivers, streams, canals or tanks are used for bathing, washing clothes or watering animals.

Usage of water for purposes other than for basic needs were also observed from public water supply systems, which however are accounted as domestic use. These include gardening for commercial purposes (especially in hill country, for tea plant nurseries) and small cottage type industries.

Among the non-domestic usage, the basic needs of water are found to be mainly in schools, (mainly for drinking and cleaning purposes), hospitals and other medical institutions, (drinking, cooking, cleaning, washing, toilet flushing), religious institutions, and other government and public institutions.

Public water supplies are used for industries and commercial purposes too (including hotel industry). These are accounted for separately by the water supply authorities. Yet, within these water usage, there is always a component used for basic needs.

### ***3.3 Main Sources of Water***

Several different types of water sources are found to be in use within the study area for supply of water. Most commonly used sources are;

- Surface water
  - Rivers
  - Irrigation reservoirs
  - Village tanks
  - Streams
- Ground water
  - Protected shallow wells (Individual and common)
  - Unprotected shallow wells
  - Deep wells with hand pumps
  - Springs
  - Deep wells with motorised pumps
- Rain water

### ***3.4 Availability of Different Types of Sources***

#### ***3.4.1 Surface Sources/Springs***

It was observed that the water from surface sources/springs is used either directly from the source (in rural areas, sometimes for drinking purposes, but mostly for bathing, washing or watering animal) or after treatment (in pipe borne water supply systems). Sometimes, in rural pipe borne water supply systems, the water is distributed without treatment.

In pipe borne water supply systems, the water tapped from surface sources or springs are fed in to the system either by pumping or through gravity. Water is stored in storage tanks, and is distributed to the consumers through a distribution pipe system. Use of Ferro cement technology (rich cement mortar with a wire mesh) for construction of storage or break pressure tanks were observed in many rural village and small town water schemes. This technology has been effective in bringing down the capital investment remarkably.

#### ***3.4.2 Shallow Dug wells***

Shallow dug wells are the most common and early type of a source of water used in the country and the study area.

There are basically two types of shallow dug wells observed in the study area base on the features, i.e., protected wells and unprotected wells. The protected wells have the typical and characteristic feature of the well stein, the inner lining and the apron around the well. These are regarded to provide adequate protection from external contaminations. The unprotected well may be just an open hole dug in the ground, where seepage or the inflow of surface drainage is possible into the well. The existence of unprotected wells was observed especially in lower parts of the basins in the study area, in rural villages.

The wells could either be individual or common. Common wells, usually provided by a public institution, are located in commonly accessible places and are used by about 5–10 households.

The most common arrangement to draw the water from shallow wells (both protected and unprotected) is the rope and bucket. In more affluent households and in institutions, water is drawn by using motorized pumps, into an overhead tank. A few instances of the usage of rope pump, introduced by a water supply project (Community Water Supply and Sanitation Project, described elsewhere) was also observed.

#### ***3.4.3 Deep Wells with Hand Pump***

The deep wells with hand pumps are a relatively a new type of water supply, first introduced by the National Water Supply and Drainage Board about 25 years ago. Wells are drilled by using a mechanical drilling rig, and overburden is lined with a PVC casing (125 mm diameter) and installed with a hand pump. These are provided in villages in the lower reaches of the basin. This is provided as a common facility, to be shared by 12-20 households.

#### ***3.4.4 Deep Wells with Motorised Pumps***

Deep wells of larger diameters (about 200mm), with motorised pumps installed are used in a few instances to provide water in pipe borne water supply schemes. Locations where these exist are given elsewhere in the report.

### **3.4.5 Rain Water Harvesting**

Rainwater harvesting is commonly used in Hambantota and Badulla districts in the locations where other water sources are scarce. Rainwater is collected from the roofs of individual households, and lead to either brick or Ferrocement tanks. This method is used for individual household water supply.

### **3.4.6 Usage of Different Types of Sources**

The usage of different sources within the study area by domestic households is presented in the Table 3.1, based on the data collected by the Department of Census and Statistics (1994). Although the data has been given on the basis of the Divisional Secretary (DS) Area, the data was presented in relation to the river basins, by adopting the percentage areas covered within the basin, and assuming homogeneous distribution within each DS Division.

Accordingly, the type of water supply facilities used predominantly in the entire study area is the piped water supply from public mains (30.7%) followed by unprotected shallow dug wells (23.0%), and protected dug wells (22.7%).

*Table 3.1. Main Sources of Water for Domestic Purposes.*

Category	No. of House Holds	Percentage
Users of piped supply (public mains)	57,386	30.7
Users of piped supply (private, protected)	2,961	1.6
Users of piped supply (private, unprotected)	964	0.5
Users of wells (protected)	42,458	22.7
Users of wells (unprotected)	43,107	23.0
Users of tube wells	9,113	4.9
Users of other sources	31,234	16.7
Total	187,223	100.0

## **3.5 Provision of Drinking Water Service**

### **3.5.1 Implementation of Projects**

Several large-scale rural water supply projects have been implemented covering parts of the area within the basin during the last decade. Rehabilitation and augmentation of some urban water supply schemes have also been implemented in major towns. Some of them are augmentation of Hambantota – Ambalantota water supply scheme (in 1995), construction of Kirindi Oya (Lunugamvehera) water supply scheme (1992) and Sooriyawewa water supply scheme (1997).

There have also been district based water supply projects during the recent past. World Bank assisted Community Water Supply and Sanitation Project (CWSSP), implemented from 1991 to 1995 covered the districts of Ratnapura and Badulla, parts of which are included in the basins. The Third Water Supply and Sanitation (Sector) Project (TWSSP), assisted by ADB is presently being implemented (from 1999 to 2005) in six districts including Hambantota and Moneragala Districts, which also cover parts of the basins. Further, there have also been water supply

components in previously implemented Integrated Rural Development Projects of the districts of Hambantota, Moneragala, Badulla and Ratnapura.

### ***3.5.2 Stakeholders***

The sector stakeholders who are actively involved in the provision of drinking water in the area are:

- Ministry of Housing Plantation and Infrastructure ( MHPI)
- Rural Water Supply and Sanitation Division (RWSS Division)
- National Water Supply and Drainage Board (NWSDB)
- Community Based Organizations (CBO)
- Plantation Housing and Social Welfare Trust (PHSWT)
- Local Authorities (LA)
- Other Agencies

#### ***Ministry of Housing and Plantation Infrastructure (MHPI )***

Provision of water supply is the statutory responsibility of the Ministry of Housing and Plantation Infrastructure at present. Within the study area, ministry is executing this responsibility through National Water Supply and Drainage Board and Rural Water Supply and Sanitation Division, which are under the administrative set up of the Ministry.

#### ***Rural Water Supply and Sanitation Division (RWSS Division)***

The recently formed Rural Water Supply and Sanitation Division (RWSS Division) is the national level authority for policy formulation, regulation, sector development planning and monitoring in rural water supply and sanitation sub sector. This Division is expected to play a major role in future implementations of rural water supply in the country.

#### ***National Water Supply and Drainage Board (NWSDB)***

NWSDB is the main national organisation responsible for provision of water supply and sewerage services to urban areas. This is responsible to plan, operate and control water supply and distribution systems for public, domestic, industrial and commercial purposes.

The management of water supply schemes in the country is carried out through Regional Support Centres (RSC) and district offices of the NWSDB. The districts in which the river basins are situated are covered by the RSC (Southern) and RSC (Central).

NWSDB implements water schemes through national funds as well as through donor funds. World Bank, Asian Development Bank, JICA, JABIC (formerly OECF) and NORAD are the main international funding agencies for NWSDB.

NWSDB functions as a commercial agency as well as a service provider. NWSDB applies a national tariff structure to all the schemes managed by the organization.

Within the study area, NWSDB is currently managing 27 water schemes (ref. Annex 1), which are mainly for the major towns. (Ref. Maps 2, 3, 4 and 5)

### ***Community Based Organisations***

The concept of managing the rural water supply schemes (i.e, schemes serving a population of 6,000 or less) by Community Based Organisations has been established in the recent past, in order to ensure the sustainability of the facilities. It has been realised that managing the facilities provided in rural areas, which are relatively small and dispersed within a wide area is difficult by a central body, and that it is more appropriate to involve the beneficiary communities actively in the management of the schemes. On this concept, the recently implemented rural water supply projects have formed the CBOs entrusting the responsibility of implementing and managing the facilities.

The Community Water Supply and Sanitation Project (CWSSP) which was implemented with the financial assistance of the World Bank, has thus established CBOs to manage rural water supply schemes in Ratnapura , Badulla and Matara districts.

Of these districts, parts of Ratnapura and Badulla districts fall within Walawe Basin, while parts of Badulla district fall within Kirindi Oya and Menik Ganga Basins.

CWSSP has implemented 131 water schemes within the study area. (Ref. Annex 1)

There is another rural water supply project, - Third Water Supply and Sanitation Project (TWSSP) - which is being implemented in six districts (Hambantota, Monaragala, Anuradhapura, Puttalam, Kegalle and Kalutara) with the financial assistance of the ADB. Of these districts, parts of Monaragala and Hambantota are situated within the study area. This project is also based on similar concept of implementation and management by CBOs, and adopts similar strategies to involve CBOs.

Community Based Organisations, which are voluntary organisations, manage these schemes through a tariff structure formulated for the particular individual scheme. These water supplies are for the small towns (with served population of about 6,000 to 2,000) and villages (with served population of less than 2,000) in the study area.

Third Water Supply and Sanitation Project has implemented 58 water schemes within the study area at present. (Ref Annex - 1).

### ***Plantation Housing and Social Welfare Trust***

Plantation Housing and Social Welfare Trust (PHSWT) is making a dynamic effort in provision of water supply and sanitation to the resident plantation communities in the government owned estates.

PHSWT also adopts an approach similar to CWSSP in designing water supply facilities to estate communities. But the level of community participation is not as high as in the CWSSP and TWSSP. This innovative programme is attempting to change the attitudes of the estate communities from being fully dependant into a self-standing group. PHSWT is presently operating in seven districts. Out of these, Ratnapura and Badulla districts are within the study area.

PHSWT has implemented 23 water schemes within the study area at present. (Ref Annex - 1)



### ***Local Authorities***

Local Authorities in the study area also play a vital role in provision of drinking water facilities. There are three Urban Councils and 17 Pradeshiya Sabhas within the study area.

The water supply to Urban Council areas are from NWSDB schemes, which are being operated and managed by the NWSDB.

Within the study area, 78 water schemes are owned and operated by local authorities.(Ref Annex 1) These local authority supplies are mainly for the small towns.

### ***Other Agencies***

Several other agencies also have implemented water supply schemes within the study area. National Housing Development Authority has implemented 12 water supply schemes, which are currently operated by respective local authorities. (Ref Annex 1)

Various plantation sector companies also have implemented water schemes for the estate sector. Within the study area, there are 43 such schemes. At present the estates are managed by private sector agencies. (Ref Annex 1)

The water supply facilities to the hospitals and other medical institutions in rural areas and schools are provided by the Department of Health and Department of Education respectively.

### ***3.6 Water Supply to Main Towns***

NWSDB is the agency providing water to all main towns in the study area except for Wellawaya and Rakwana. Wellawaya is being provided with water by the Pradesiya Sabha, while Rakwana by a CBO.

Following table presents the basic details of water supplies to the main towns in the Ruhunu basin.

*Table 3.2 – Water Supply to Main Towns.*

<i>Name of the town</i>	<i>Water Scheme</i>	<i>Name of the source</i>	<i>Scheme Operator</i>
Ambalantota	Ambalantota/Hambantota water supply scheme	Walawe Ganga	NWSDB
Hambantota	Ambalantota/Hambantota water supply scheme	Walawe Ganga	NWSDB
Sooriyawewa	Sooriyawewa water supply scheme	Reservoir	NWSDB
Tissamaharama	Tissamaharama water supply scheme	Kirindi Oya	NWSDB
Kataragama	Kataragama water supply scheme	Menik Ganga	NWSDB
Buttala	Buttala water supply scheme	-	NWSDB
Thanamalwila	Thanamalwila	Kirindi Oya	NWSDB
Balangoda	Balangoda water supply scheme	Walawe ganga and Pettigala reservoir	NWSDB
Embilipitiya	Embilipitiya water supply scheme	Chandrikawewa	NWSDB
Udawalawe	Udawalawe water supply scheme	Udawalawe right bank canal	NWSDB
Haputale	Diyatalawa water supply scheme	Stream & springs	NWSDB
Bandarawela	Bandarawela water supply scheme	Kirindi oya and a stream	NWSDB
Wellawaya	Ice Pihilla water supply scheme	Stream	LA (Implemented by NWSDB)
Kirinda	Kirinda water supply scheme	Bore hole	NWSDB
Lunugamwehera	Kirindi Oya water supply scheme	Lunugamvehera reservoir	NWSDB
Rakwana	Rakwana water supply scheme	Stream	CBO (Implemented by CWSSP)
Godakawela	Godakawela water supply scheme	Rakwan Ganga	NWSDB
Kahawatta	Kahawatta water supply scheme	Walawe Ganga	NWSDB

As seen from the table, the majority of the town supplies use surface water sources to abstract water.

Most of them are with full or partial treatment facilities. In terms of supply hours there are limitations and most of the town supplies have not been able to provide water for 24 hours a day. (Ref Annex 2)

Information gathered on above town supplies has revealed that water is used for the domestic, industrial, commercial and institutional usage.

Discussions with the consumers on sample basis, and NWSDB officials revealed that above schemes are not capable of supplying the total demand of the town dwellers due to several limitations, which are discussed under chapter 7. However, the percentages of Non Revenue Water (NRW) are high in main town supplies compared to the village and small town supplies.

Percentage of Non-Revenue Water (NRW) in the above schemes varies from 10% to 50%, which can be considered a fairly high figure. (Ref. Annex 2)

### 3.7 Access to Safe Water and Sanitation

#### 3.7.1 Access to safe drinking water

Safe drinking water could be regarded generally as:

- the water extracted from a protected dug well (a well with protection walls, an apron around the well, proper drainage facilities and having safe means of drawing water is regarded as a “protected well”);
- water from protected springs;
- water from a tube well with hand pump; or
- water from a pipe borne water system from an uncontaminated source or after treatment

Unsafe drinking water could thus be regarded as the water consumed directly from a river, streams, unprotected springs, lakes, reservoirs and tanks and water from unprotected wells.

#### 3.7.2 Assessment of Population Served by Safe Drinking Water

Following table illustrates the number of persons served by safe water sources and un-protected sources in the study area.

*Table 3.3. Population Served with Safe Drinking Water.*

Divisional Secretary Division	Population within the study area	Population served by protected sources		Population served by un-protected sources
		Piped supplies	Dug wells and Hand pump wells	
Ambalantota	50,316	21,000	28,359	957
Hambantota	53,985	36,518	14,905	2,562
Lunugamvehera	35,072	27,364	378	7,330
Sooriyawewa	40,502	7,446	8,240	24,816
Tissamaharama	75,500	13,583	10,477	51,440
Badalkumbura	32,020	2,300	8,545	21,175
Buttala and Kataragama	56,920	7,581	13,480	35,859
Sevanagala	39,450	0	9,840	29,610
Thanamalwila	23,152	4,580	8,245	10,327
Wellaway	63,450	15,500	15,635	32,315
Haldummulla	37,666	24,142	2,857	10,667
Embilipitiya	118,307	26,937	33,140	58,230
Kolonna	54,932	20,445	19,835	14,652
Imbulpe	60,430	12,656	892	46,882
Balangoda	77,026	21,388	26,650	28,988
Bandarawela	42,044	23,690	6,845	11,509
Ella	21,808	14,804	4,934	2,070
Haputale	20,118	11,870	3,226	5,022
Godakawela	54,318	33,097	669	20,552
Weligepola	30,500	2,352	13,238	14,910
TOTAL	98,7516	32,7253	230,390	429,873
		(33%)	(23%)	(44%)

As it is seen, the percentage of population served by protected sources is 56%, while the balance 44% of the population still consume water from unprotected sources.

### 3.7.3 Access to Adequate Sanitation

Adequate sanitation could be regarded as having means for disposal of excreta in a safe manner, without causing any pollution of environment or contamination of water sources.

Thus, adequate sanitary facilities would be:

- Latrines with septic tanks
- Off set pit latrines (single or dual pit)
- Direct pit latrines with water seal
- Pipe borne sewage disposal systems.

Thus, inadequate sanitary facilities could mean the direct pit latrines without water seal, improvised latrines or having no latrines.

Data collected on sanitation coverage reveals that within the study area, following methods of excreta disposal are used.

- Direct pit latrines without water seal
- Pour flush pit latrines (direct and off set)
- Latrines with septic tanks
- Defecation on ground
- Piped sewerage scheme (in Kataragama town)

### 3.7.4 Assessment of Population with Adequate Sanitation

Following table illustrates the population served by adequate sanitation facilities in the study area.

*Table 3.4. Population Served with Safe Sanitation.*

Divisional Secretary Division	Population within the study area	Population served by safe sanitation facilities	Population having Unsafe Facilities
Ambalantota	50,316	48,267	2,049
Hambantota	53,985	44,552	9,433
Lunugamvehera	35,072	18,517	16,555
Sooriyawewa	40,502	20,688	19,814
Tissamaharama	75,500	37,182	38,318
Badalkumbura	32,020	203,46	11,674
Buttala and Kataragama	56,920	26,555	30,365
Sevanagala	39,450	16,865	22,585
Thanamalwila	23,152	9,460	13,692
Wellawaya	63,450	21,974	41,476
Haldummulla	37,666	27,594	10,072
Embilipitiya	118,307	66,748	51,559
Kolonna	54,932	49,646	5,286
Imbulpe	60,430	39,540	20,890
Balangoda	77,026	26,438	50,588
Bandarawela	42,044	31,907	10,137
Ella	21,808	16,932	4,876
Haputale	20,118	16,080	4,038
Godakawela	54,318	28,158	26,160
Weligepola	30,500	19,245	11,255
TOTAL	98,7516	586,607 (59%)	4009,06 (41%)

Hence, the percentage of population within the study area having adequate sanitation facilities is 59%, and the balance 41% still do not have adequate facilities.

### **3.8 Water Borne and Water Related Diseases**

#### **3.8.1 Deceases and Water**

The water and sanitation related infections can be classified into two categories:

- a) Water Borne Diseases  
Wen the pathogens are in water, which is drunk by a person (or animal) who may become infected.
- b) Water Related Diseases  
This could further be divided into three groups:
  - i. Water washed deceases  
When the infections can be controlled by higher personal hygiene and increased use of water
  - ii. Water based deceases  
When the pathogens spend a part of their life cycle in aquatic animals such as water snails
  - iii. Insect vector diseases  
When the pathogens are spread by insects which either bread in water or bite near water
  - iv. Faecal disposal diseases  
Where the pathogens are spread with faeces mainly on land, i.e, due to pollution of soil

In the districts in which the study area is situated, the statistics of some water borne and water related diseases over the last 5 years are given in Table 3.5.

The selected diseases for this data collection were as follows:

Water Borne diseases:

Cholera, typhoid and paratyphoid, shigellosis, amoebiasis with liver infection, amoebiasis (other), diarrhoea and gastroenteritis of presumed infectious origin, other intestinal diseases, acute hepatitis A, B and chorinc, other acute and unspecified hepatitis.

Water related diseases:

Dengue fever, dengue heamorrhagic fever, malaria, filariasis, helminiasis, sequelea of infectious and parasitic diseases, other infectious and parasitic diseases.

*Table 3.5. Incidence of Some Selected Water Borne and Water Related Diseases - Hospital Statistics.*

Category of Disease \ Year	Hambantota District		Badulla District		Moneragala District		Ratnapura District		Sri Lanka	
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
<b>Water Borne Diseases</b>										
1996	4,631	3	8,164	11	5,756	7	9,622	8	152,847	248
1997	4,594	0	10,674	16	6,267	3	8,862	5	168,929	402
1998	4,611	0	8,944	19	7,310	2	8,708	6	180,317	372
1999	3,323	1	9,974	19	6,616	9	10,772	26	159,798	243
2000	2,246	0	8,364	3	5,806	3	8,141	54	143,122	190
<b>Water Related Diseases</b>										
1996	1,330	0	1,906	7	4,464	2	2,795	0	57,706	99
1997	824	0	2,374	6	5,630	0	2,576	1	71,978	390
1998	1,083	0	2,294	2	7,098	0	2,223	1	69,129	232
1999	1,138	0	3,874	3	11,900	2	2,713	4	70,338	128
2000	1,144	1	3,865	4	12,401	10	2,730	7	67,888	177

The details of the statistics are presented in Annex 3.

The statistics shown above are based on the reported hospital cases and deaths. However, the actual cases may be more, as the patients could seek medical assistance from other private medical institutions and doctors or could take indigenous treatments, which do not get reported.

The above reported cases are for the entire district, and hence are not strictly related to the study area. However, this indicates the general pattern and trend of the water borne diseases in the study area, and in the whole country.

As it could be observed from the table above, although the water borne and water related diseases in the country as a whole has declined over the years under consideration, within the four districts, there is no appreciable reduction of the occurrence.

## **4. Cost of Water Supply**

### **4.1 Capital Investment**

Information gathered on water schemes located within the basin reveals that the investment on drinking water supply in the study area has significantly been increased over the past 10 years, the main reasons being:

- increased demand for safe water due to the population increase and the other developments in the area;
- introduction of community based rural water supply projects; and
- investments made in improvement of water supply facilities by the government.

Capital investments on the water schemes have been borne/shared by the following key agencies.

- International funding agencies (eg. World Bank, Asian Development Bank etc.) mobilized through the Government of Sri Lanka;
- Funds from the Government of Sri Lanka; and
- Contributions made by the beneficiary communities by way of labour and (sometimes) cash.

Out of the 373 schemes listed in Annex 1, the beneficiary communities have contributed for the capital investment in 212 schemes, setting an example for the other communities in the country on contributing to their own water supplies without being fully dependant on the government. The amounts that the communities have thus contributed vary from 20% to 35% of the capital cost of each individual scheme.

Following table illustrates the investment required for provision of drinking water through different technology options.

*Table 4.1. Average Capital Investment Needed for Different Water Supply Facilities.*

Technology Option	Average Capital Investment/Person (Rs)
Hand dug wells (House hold)	4,000.00
Hand dug wells (Shared by 5 families on average)	1,300.00
Hand Pump Tube wells (Shared by 15 families on average)	1,600.00
Village gravity piped schemes with basic components and chlorination for treatment	3,500.00
House hold Rain water tanks	3,000.00
Village pumping piped schemes with basic components and chlorination for treatment	4,000.00
Small town gravity piped schemes with basic components and partial treatment (aeration, filtration and chlorination)	4,250.00
Small town pumping piped schemes with basic components and partial treatment (aeration, filtration and chlorination)	4,800.00
Town water supply schemes with full treatment facilities	7,000.00

## **4.2 Operation & Maintenance Cost**

Operation and Maintenance play a vital role in drinking water supply. Water supply schemes constructed with a considerable capital investments, particularly those in rural areas, have fully or partially failed in the past due to poor attention on operation and maintenance.

Discussions conducted with the water supply authorities in the basin revealed that this aspect has been given due consideration. Ministry of Housing and Plantation Infrastructure, Rural Water Supply Division and Water Supply and Drainage Board have already formulated several strategies and methodologies aiming at smooth functioning of the water schemes.

Cost of operation and maintenance depends largely on the technology and the type of expenditure items related to the scheme. Following table illustrates approximate monthly operation and maintenance cost for different technologies existing in the water facilities within Ruhunu Basin.

*Table 4.2. Cost of Operation and Maintenance of Water Supply Facilities.*

Type of Technology	Average Number of User HH per facility	Type of expenditure items	Average monthly Operation and Maintenance Cost / House Hold (Rs)
Hand dug wells operated and maintained by individual house holds	One HH	Cleaning, Replacement of rope and bucket, Repairs to the masonry works in the walls and apron	10/= – 15/=
Rain water systems (House hold) operated and maintained by individual house holds	One HH	Cleaning, Replacement of filters, repairs to the roof gutters and down pipes	5/= – 10/=
Hand dug wells operated and maintained by the families sharing the well.	5 HH	Cleaning, Replacement of rope and bucket. Repairs to the masonry works in the walls and apron.	5/= – 10/=
Hand Pump Tube wells operated by the families attached to the well and maintained jointly by the user community, Pradeshiya Sabha and NWSDB	15 HH	Cleaning the surrounding, Lubricating the chain, Repairs to the masonry works in the apron, Replacement of spare parts.	10/= – 15/=
Village gravity piped schemes with basic components, having chlorination as treatment, operated and maintained by CBOs	50 – 100 HH	Payment to the care taker, Periodic inspections on all components, Repairs to leaks, Cleaning, Repairs to masonry works, Chlorinating, Replacement of pipes and other fittings, Water quality testing, Water source protection, Replacement of the whole system in several years of operation.	100/=
Village pumping piped schemes with basic components, having chlorination as treatment, operated and maintained by CBOs.	Less than 200 HH	All the above, and in addition, expenses on electricity consumption, or any other power supply, servicing of pumps and motors, repairs to pump, pump house and the related pipes, and attending to the breakdowns / repairs in the power supply.	250/= – 300/=
	More than 200 HH		200/= – 250/=
Small town gravity piped schemes with basic components and partial treatment (aeration, filtration and chlorination) operated and maintained by Pradeshiya Sabhas.	500 HH	Payment to the operator/ care taker, other staff (meter reader, clerk etc), Periodic inspections on all components, Repairs to leaks, Cleaning, Repairs to masonry works, Cleaning the filters, Replacing the filter materials, Chlorinating, Replacement of pipes and other fittings, Water quality testing, Water source protection.  Replacement of the whole system in several years of operation.	150/=



Type of Technology	Average Number of User HH per facility	Type of expenditure items	Average monthly Operation and Maintenance Cost / House Hold (Rs)
Small town pumping piped schemes with basic components and partial treatment (aeration, filtration and chlorination) operated and maintained by Pradeshiya Sabhas.	Less than 500	All above and the expenses for electricity consumption, repairs to pump, accessories and the pump house.	335/= – 350/=
	More than 500		250/= – 300/=
Urban water supply schemes with full treatment facilities operated and maintained by NWSDB		Periodic inspections on all components, Attending to all repairs and breakdowns. Cleaning, Repairs of masonry works, Water quality monitoring, sampling, water source monitoring, Replacement of pipes and other fittings, Water source protection. Repairs to pumps and other accessories. Payment for consumption of electricity. Replacement of the whole system in several years of operation.	150/= – 250/=

### 4.3 Tariff Structure and Recovery of Costs

There are different cost recovery systems adopted by different O&M authorities.

In the main towns, where NWSDB provides water to the consumers through pipe borne water supply schemes, the system nationally adopted is a cost recovery through a tariff based on volume of consumption (generally, all the consumers are metered, except for stand posts). The tariff structure adopted has different slabs of tariff rates, which increases when the consumption is higher. This has been formulated aiming at providing relief to less affluent persons consuming less water, and also to discourage high water consumption and wastage.

There are different tariff rates for different consumer categories, such as domestic users, commercial users, industrial user, institutional users etc.

The presently adopted tariff structure by the NWSDB is presented in Annex 3, together with previous revisions.

Although this tariff structure is applied to all the water supply schemes in the country, revenue of a smaller scheme is generally inadequate to cover the O&M cost of that particular scheme. In larger schemes, the situation is usually the other way. Hence, as there is cross subsidising taking place within the NWSDB which has small as well as very large schemes, this is not a course of concern. However, with the proposed policy of decentralisation and privatisation of management of the larger schemes, this will cause smaller schemes become unviable.

In case of the water supply schemes operated and managed by the local authorities, the situation is different. There are some town schemes where the consumers are metered, and the cost recovery is made based on a tariff structure similar to that adopted by the NWSDB, with

variations. There are other schemes where the charges are levied on flat rate per month, allowing any amount of water consumption. There are also schemes where there is no cost recovery from the consumers, but the O&M is being done with the earnings of the organisation by other means.

Within the few LAs visited in the study area on sample basis, no scheme was found to be in operation where sufficient revenue is earned to cover the O&M costs. Due to the same reason, any possibility of cross-subsidising among water supply schemes does not exist. Hence, the schemes operated and maintained by PSs are found to run with the revenue earned from other avenues.

Some of the CBO managed pipe borne water supply schemes investigated on sample basis have adopted good cost recovery records through tariff systems based on consumption. This was more evident where the scheme is a gravity fed schemes for which the cost of operation is quite small. However, in some schemes, it was found that the revenue collected is sufficient only to cover the routine operation and maintenance cost, but not for future developments or major repairs.

In case of hand pumps, a regular collection of a fee from each consumer household is expected to be deposited in the relevant Pradesiya Sabha. However, this does not seem to be in practice in many PSs. Yet, when there is a breakdown of a hand pump, consumers tend to collect the required amount to cover the cost of the particular repair and get it done on ad hoc basis.

It was also found that in case of common shallow wells, there is some collection of revenue from the consumers in recently constructed facilities by the rural water supply projects. However, for the facilities which have been in existence for some time, any such regular collections have not been recorded.

Other organisations does not adopt cost recovery systems from the consumers. In case of state plantations, the O&M cost is usually borne by the management of the estate. In case of hospitals and schools who have their individual supplies, the cost is borne by the respective departments.

## **5. Water Quality**

### ***5.1 Drinking Water Quality Standards***

Quality of water is a key factor in drinking water supply schemes since water quality directly relates to the health of the consumers. Therefore status of water quality monitoring, and quality of drinking water in the water schemes were considered as important factors in the study.

### ***5.2 Status of Water Quality Monitoring***

Even though several agencies have implemented water supply schemes within the basin, NWSDB managed schemes are at an advantage with respect to periodic water quality monitoring. All other schemes, including local authority managed schemes have not included water quality monitoring in their routine operation and maintenance activities. However, they have recognized the importance of this aspect but not implemented due to several limitations, which are discussed in chapter 7.

Water quality monitoring system of the NWSDB is based on the Sri Lanka Drinking Water Quality Standards, which is presented in the following table.

*Table 5.1. Sri Lanka Drinking Water Quality Standards.*

Substance or Characteristic (unit)	Sri Lanka Standards	
	Maximum Desirable	Maximum Permissible
Colour	5	30
Turbidity NTU	2	8
PH	7-8.5	6.5-9
Electrical conductivity us/cm	750	3500
Chloride (as Cl) mg/l	200	1200
Free residual chlorine (as Cl <sub>2</sub> ) mg/l	-	0.2
Total alkalinity (as CaCO <sub>3</sub> ) mg/l	200	400
Free Ammonia mg/l	-	0.06
Albuminoidal Ammonia mg/l	-	0.15
Nitrates (as N) mg/l	-	10
Nitrites (as N) mg/l	-	0.01
Total phosphates (as PO <sub>4</sub> ) mg/l	-	2
Fluorides (as F) mg/l	0.6	1.5
Total dissolved solids mg/l	500	2000
Total hardness mg/l	250	600
Calcium mg/l	100	240
Total iron as Fe mg/l	0.3	1
Sulphate as SO <sub>4</sub> mg/l	200	400

The Regional laboratories of NWSDB measure treated water quality and the raw water quality of their major water supply schemes at following intervals:

- Full test (testing all above parameters) – once a month
- Turbidity – every 6 hours
- Free residual chlorine – 4 times a day
- Bacteriological tests – On suspicion

Copies of the test reports are submitted to the relevant Regional Support Centers, district offices and to the officer in charge of the relevant scheme enabling them to take prompt action if there is any problem related to the water quality.

Water quality monitoring does not take place in other schemes managed by other authorities in regular manner. However, when there is an outbreak of an epidemic or a suspicion of contamination, the public health authorities (Public Health Inspectors and Medical Officer of Health) take action to check the water quality in public water supplies and disinfect the water sources. These tests are being carried out at the Medical Research Institute situated in Colombo.

### ***5.3 Quality of Drinking Water in the Study Area***

Quality of drinking water of the water sources in some of the major schemes, selected to represent different geographical areas within the study area, are given in the following table.

*Table 5.2. Quality of Raw Water in Some Selected Schemes.*

Water Quality Parameter	Water Quality					
	Ambalantota WSS		Kataragama WSS		Balangoda WSS	
	Wet Season	Dry Season	Wet Season	Dry Season	Wet Season	Dry Season
Colour (Hazen)	70	60	40	30	7.5	2.5
Turbidity NTU	100	23	6.8	6.8	7.5	2.7
PH	7.2	7.4	7.4	7.4	6.6	7.3
Electrical conductivity us/cm	289	369	470	470	40.3	82.7
Chloride (as Cl) mg/l	28	3	48	48	-	-
Free residual chlorine (as Cl <sub>2</sub> ) mg/l	-	-	-	-	-	-
Total alkalinity (as CaCO <sub>3</sub> ) mg/l	132	156	212	212	42	46
Free Ammonia mg/l	-	-	-	-		
Albuminoidal Ammonia mg/l	-	-	-	-		
Nitrates (as N) mg/l	less than 0.001	less than 0.001	less than 0.001	less than 0.001		
Nitrites (as N) mg/l	-	-	-	-		
Total phosphates (as PO <sub>4</sub> ) mg/l	-	less than 0.001		less than 0.001		
Fluorides (as F) mg/l	less than 0.001	-	less than 0.001	-		
Total dissolved solids mg/l	145	185	235	235		
Total hardness mg/l	128	140	180	180	68	84
Calcium mg/l	64	80	92	92		
Total iron as Fe mg/l	2.0	1.8	0.48	0.48	-	0.2
Sulphate as SO <sub>4</sub> mg/l	-	-	-	-	-	0.2

As it is seen from the above table, certain parameters change during the wet season and dry season.

#### **5.4 Issues Related to Drinking Water Quality**

There are some issues and major concerns related to drinking water quality which are presented below:

- High iron concentration in ground water (Hambantota, Buttala, Kataragama areas)
- High electrical conductivity in ground water (especially close to the sea)
- Occurrence of high Hardness in water (in Hambantota area)
- High salinity in coastal areas
- Unavailability of water treatment in the schemes other than those operated by NWSDB (Eg. Treatment in PHSWT schemes and CWSSP schemes extracting water from surface sources are limited to mostly boiling at household level and occasionally chlorinating.)
- Discharging of solid wastes into or close to the water bodies.
- Discharging effluents from industries to surface water bodies.

(Eg. Discharging effluents of Embilipitiya paper mill into Walawe River, discharging water from service stations into streams and rivers, discharging effluents from small scale paddy processing industries to surface water streams)

- High Fluoride contents in ground water (Tanamalwila, Tissamaharama and northern parts of Hambantota and Ambalantota)
- Contamination of water with agrochemicals.

These aspects are further discussed in Chapter 7.

## **6. Future Development Plans**

There are several development activities taking place or planned within the study area, which are of relevance to the water supply situation in the study area.

- Urban Development authority of Sri Lanka, the organisation which is responsible in the planning of urban areas in the country is currently in the process of preparation of several development plans for the country. Southern region development is one of them.

### ***6.1 Development Activities Proposed in Southern Region***

Under southern region development plan, several activities are proposed within the study area which include;

- Ruhunupura Development consisting of nine industrial areas
- Harbour at Hambantota
- BOI Industrial Park at Walawa
- Local Industrial site in Hambantota DS Division
- Human settlement activities in Hambantota DS Division
- Airport in Lunugamvehera
- Railway up to Kataragama from Matara
- Leather processing and waste water treatment plant at Bataatha
- Rakwana oya diversion to Chandrika wewa
- Model village for 100 families
- Fisheries village

### ***6.2 Proposed Water Supply Facilities for the Study Area***

In order to cater to the above developments following water supply schemes are proposed for the study area, which are planned for implementation within next five years.

#### ***6.2.1 Ruhunupura Water Supply***

Ruhunupura water supply is a large-scale water supply project proposed to cater to the development activities that are planned under Ruhunupura Development programme.

Project is still in the planning stage. According to the current assessments, the total demand will be about 267,890 m<sup>3</sup>/day (approx. 98 MCM). Approximate estimated cost of the scheme is Rs 325,000 Million.

**6.2.2 Proposed project will utilise surface water as well as ground water sources located within the basin**

#### **6.2.2 Hambantota – Ambalantota Expansion Scheme**

Under JICA assistance expansion of Ambalatota/Hambantota water supply scheme is proposed to produce another 43,000 m<sup>3</sup>/day with appropriate transmission and distribution improvements. Estimated cost of the scheme is Rs 20,000 million.

#### **6.2.3 Expansion to Sooriyawewa Water Supply Scheme**

Sooriyawewa water supply scheme expansions are proposed in order to serve a population of another 63,000 in the area. Estimated cost of the scheme is Rs 400 million.

#### **6.2.4 Proposed Water Supply Scheme for Sevanagala**

A new water supply scheme is proposed for Sevanagala to serve a population of nearly 5,500. The estimated cost is Rs 220 million. Abstraction of water from Walawe Ganga for this scheme is proposed.

#### **6.2.5 Expansion of Tissamaharama Water Supply Scheme**

Construction work is already commenced in the augmentation of Tissamaharama water supply scheme to produce another 6,000 m<sup>3</sup>/day. This expansion scheme will serve a further population of 10,000 in the study area. The estimated cost of the scheme is Rs 100 million.

#### **6.2.6 Expansion to Kirindi Oya Water Supply Scheme**

Proposed expansions to Kirindi Oya scheme will enhance the production by another 6000m<sup>3</sup>/day serving an additional population of 10,000. Capital cost of the scheme will be Rs 500 million

#### **6.2.7 Expansion Wellawaya Water Supply Scheme**

Proposed expansions to Wellawaya scheme will enhance the production to serve an additional population of 48,000.00 Cost estimates are still under preparation. It has been decided to abstract water from Kirindi oya for proposed scheme.

#### **6.2.8 Expansions Kirinda Water Supply Scheme**

Proposed expansions to Kirinda scheme will enhance the population served by another 5000. It has been decided to draw water for the proposed scheme from a bore hole.

#### **6.2.9 Augmentation of Kataragama Water Supply Scheme**

Kataragama water supply scheme, which has originally been constructed long time ago, is presently undergoing severe water shortage during certain months of the year, usually in July – August. Although the design capacity is 5,400 m<sup>3</sup>/day and the usual daily demand does not reach this (which varies between 4,000 to 4,800 m<sup>3</sup>/day), during the cultivation period, farmers upstream extract water from the river causing it to go dry. There are two diversion anicuts in Buttala, which extract water for the cultivation in this area. The scheme (with beneficiaries of

about 22,000 inhabitants and about 10,000 seasonal visitors), which has 3,400 connections (including 2800 domestic, 245 commercial and 43 religious places) do not get a satisfactory supply during this period.

As an immediate action to remedy this, several bore holes are being drilled at present to connect it into the system. As a long term plan, and also to augment the scheme to cater for the future, NWSDB expects funds from ADB in the near future.

#### ***6.2.10 Augmentation of Kataragama Sewerage Scheme***

Another relevant scheme is the Kataragama Sewerage Scheme, which is the only such scheme in the study area. It has been constructed in late 70s, and serves only the Old Town area, having only 195 connections. The existing oxidation pond is also reportedly reaching the design capacity. The NWSDB has commenced the process for augmentation of the scheme recently.

All above schemes will be implemented by NWSDB

#### ***6.2.11 Proposed Rural Water Supply Projects for the Study Area***

There are two rural water supply programmes, which are planned to be implemented in the near future.

##### ***Round 2 of the Third Water Supply and Sanitation Project***

The Round 2 of the TWSSP Project, which is currently being implemented under ADB assistance by the NWSDB will commence in mid 2002. Nearly 30,000 persons will be provided with safe drinking water and sanitation in the study area under this.

##### ***Plantation Social Welfare Trust***

Nearly 12,000 estate workers living in the study area will be provided with safe water and sanitation facilities under this project.

## **7. Management Issues, Concerns and Threats**

Several issues and problems were identified in this exercise pertaining to the drinking water supply in the Ruhunu basin, which are discussed below.

### ***7.1 Investment in Improvement of Water Supply***

The capital investment needed for providing drinking water supply is considerably high. As the development of the basin are planned for a certain time period, the capital investment and the implementation of construction will need to meet these time targets. Finding necessary funds and implementation of the water supply scheme will be a major challenge for intended development plan.

### ***7.2 Users of Unprotected Water Sources***

Information gathered has revealed that the population consuming water from un-protected sources is nearly 45% which is a fairly significant figure. This clearly indicates that achieving the

National target of providing safe and adequate drinking water to all citizens in Sri Lanka in 2015 will not be an easy task.

### ***7.3 Persons having Inadequate Sanitation Facilities***

Population having inadequate sanitation facilities in the basin is more than 40% which is also a fairly high percentage. Unsafe disposal of excreta can pollute environment including drinking water sources, affecting the health conditions of the people. This is a major threat, which needs urgent attention of all parties concerned.

### ***7.4 Non Revenue Water***

Occurrence of high rates of non-revenue water is due to technical deficiency in plant operation and distribution systems. NWSDB has already taken several measures to overcome the situation and reduce or minimize Non-revenue water in the schemes operated by them. However, more effort by the NWSDB and initiative by other O&M authorities are needed to address this issue effectively.

### ***7.5 Lack of Inter-sectoral Co-ordination***

Study revealed that various agencies have implemented water schemes in the area. But there is no properly arranged co-ordination mechanism between such agencies.

Non-Government organisations also have contributed to the water supply within the basin. But no records on such efforts in any of the Government agencies related to water supply in the basin.

### ***7.6 Water Allocation Issues***

Discussions held with the water users revealed that there are conflicts between the potable water users and irrigation users when sharing common sources. One of the major causes for such competitions is the lack of awareness on the quantities each sector is using. With further development taking place in all sectors, and with the trend of the sources getting depleted, this competition could become acute in time to come.

### ***7.7 Insufficient Supply in the Water Supply Schemes***

Following were revealed in terms of insufficient supply in the major water schemes in the basin at present.

- Hambantota scheme, which abstracts water from Walawe Ganga, is in a very poor state in terms of water supply. Certain areas are supplied once in four days while some other areas receive water once in two days. Few more areas are supplied with water bowsers. Production is highly insufficient to meet the demand.
- Kataragama scheme, extracting water from Menik Ganga, undergo severe water shortage during a certain period of the year. This is mainly due to the water usage upstream for agricultural purposes. Usually, the condition is aggravated due to the fact that this shortage occurs during the festival season of Kataragama, where large number of devotees visit the area.



- Water production in Udawalawe water supply scheme is also insufficient especially during Udawalawe right bank canal maintenance.
- Balangoda scheme intake has been affected by sand mining in Walawe ganga, which causes insufficient flow into the system.
- Consumers of Wellawaya scheme are unsatisfied regarding the services they receive, as the intake has reached its peak capacity.
- From July to September the quantity of water extracted from Kirindi oya for Tanamalwila water supply scheme is quite inadequate due to low flow in the river, and as a result the supply during this period is highly unsatisfactory

Some of the above cases are due to the problem of insufficient capacity of the source, while some others are due to the components of the systems having reached their design capacity. However, the planned expansions of some of these schemes mentioned in the previous section would solve the problem in some of these systems.

### ***7.8 Insufficient Management Capacity of Agencies Operating Village and Small Town Schemes***

Large number of rural water supply projects located within the basin are operated and maintained by the Pradeshiya Sabahs and beneficiary communities. There is a growing need for capacity building of these agencies on aspects related to operation and maintenance since sustainability of these schemes depend on their capacity to manage the schemes efficiently and in a cost effective manner.

### ***7.9 Lack of Water Quality Monitoring Systems in Village and Small Town Schemes***

No routine water quality monitoring systems available especially in village and estate water supply schemes due to technical and financial constraints. This matter has to be addressed with due attention by the concerned authorities, since quality of drinking water is highly related to the health and diseases.

### ***7.10 Lack of Source Yield Monitoring Systems in Village and Small Town Schemes***

No routine source yield monitoring systems are available especially in village and estate water supply schemes due to the technical and financial difficulties. In certain schemes sources have fully or partly dried up few years after commissioning of the scheme. This has resulted few schemes being abandoned. Timely action taken would have saved at least some of such schemes if a routine monitoring system has been in operation.

### ***7.11 Lack of Source Conservation and Protection Measures***

Many water sources used for drinking water are reported to be depleting over the past years due to lack of rain, clearing of forest cover and siltation of water sources. The quality of the water in the sources also are reported to be deteriorating due to the pollution caused by human activities. There are no remedial measures or preventive measures taken at present, which will cause the problem more acute in the future.

## References

- National policy for Rural Water Supply and Sanitation Sector - Rural Water Supply and Sanitation Division, July 2001
- Policy Statement - Water Supply and Sanitation, National Water Supply and Drainage Board, December 2001
- National Policy on Private Sector Participation in Water Supply and Sanitation, October, 1999
- Tariff Policy on Drinking Water, National Water Supply and Drainage Board, December, 2001
- Policy Statement for Investment in Water Supply and Sewerage Sectors, National Water Supply and Drainage Board, January, 2002
- Urban Water Supply Policy, National Water Supply and Drainage Board
- National Water Resource Policy and Institutional Arrangements – Water Resources Council and Secretariat, Government of Sri Lanka, April 2000
- Master Plan Study on Industrialization and Investment Promotion in Sri Lanka, Main Report – KRI International Corp., July 2000
- Follow-up Study on Industrialization and Investment Promotion in Sri Lanka, Main Report – KRI International Corp., July 2000
- Six-Year Development Programme 1999 – 2004 – Ministry of Industrial Development, 1998
- Statistical Abstract, 2000 – Department of Census and Statistics
- Demographic Survey 1994, Sri Lanka, Release 2 – Report on Housing and Basic Amenities, Department of Census and Statistics
- National Policy on Private Sector Participation in Water Supply and Sanitation – October 1999
- Policy Statement – Water Supply and Sanitation (Draft), June 2001 – National Water Supply and Drainage Board.
- Water Resources Planning, Walawe Ganga Basin, Final Report – Statkraft Groner, November 2000
- Water Resources Planning, Kirindi Oya Basin, Final Report – Statkraft Groner, November 2000
- Menikganga River Basin and Kataragama Water Scarcity – Case Study Report, ADB Assisted Third Water Supply & Sanitation Project, Moneragala District, December 1999
- Water Resource Inventory Study for Southern Area of Sri Lanka, Vol 1 – Main Report, Engineering Consultants Ltd, February 1995
- Reports on Ruhunupura Development.
- SLS No 652:1994 - Tolerance Limits for Industrial Effluents Discharged into Inland Surface Waters, Sri Lanka Standards Institution
- SLS No 614: Part 2: 1983 – Drinking Water Supply Standards
- Statistical Data from Ministry of Health (unpublished)

Data from National Water Supply and Drainage Board (unpublished)

**Annex 1. Details of Pipe Borne Water Supply Schemes within the Study Area**

Index No.	District	Divisional Secretary Area	Name of the Scheme	Implementing Agency	Operating Agency	Population served	Year of commencement
1	Hambantota	Ambalantota	Ambalantota	NWSDB	NWSDB	58,985	1975
2	Hambantota	Ambalantota	Ridiyagama	NWSDB	NWSDB	2,500	1980
3	Hambantota	Ambalantota	Athbatuwa	TWSSP of NWSDB	CBO	1,605	2002
4	Hambantota	Ambalantota	Deniya/Pingama	TWSSP of NWSDB	CBO	1,955	2002
5	Hambantota	Ambalantota	Elagada Estate	TWSSP of NWSDB	CBO	420	2002
6	Hambantota	Ambalantota	Godakagolla	TWSSP of NWSDB	CBO	2,365	2002
7	Hambantota	Ambalantota	Hadawinna	TWSSP of NWSDB	CBO	1,615	2002
8	Hambantota	Ambalantota	Handunkatuwa	TWSSP of NWSDB	CBO	1,224	2002
9	Hambantota	Ambalantota	Hatagala	TWSSP of NWSDB	CBO	320	2002
10	Hambantota	Ambalantota	Ihalagama	TWSSP of NWSDB	CBO	1,204	2002
11	Hambantota	Ambalantota	Mamadala North	TWSSP of NWSDB	CBO	1,205	2002
12	Hambantota	Ambalantota	Mamadala South	TWSSP of NWSDB	CBO	535	2002
13	Hambantota	Ambalantota	Mulana	TWSSP of NWSDB	CBO	1,550	2002
14	Hambantota	Ambalantota	Walawatta west	TWSSP of NWSDB	CBO	1,728	2002
15	Hambantota	Hambantota	Hambantota	NWSDB	NWSDB	23,500	1981
16	Hambantota	Hambantota	Hungama	NWSDB	NWSDB	11,300	1984
17	Hambantota	Hambantota	Bundala	NWSDB	NWSDB	3,000	1990
18	Hambantota	Hambantota	Hambantota -- A	NWSDB	NWSDB	13,160	2001
19	Hambantota	Kataragama	Kataragama	NWSDB	NWSDB	18,544	1975
20	Hambantota	Tissamaharama	Kirinda	NWSDB	NWSDB	9,000	1984
21	Hambantota	Tissamaharama	Tissamaharama	NWSDB	NWSDB	9,500	1956
22	Hambantota	Lunugamvehera	Kirindi oya	NWSDB	NWSDB	70,490	1992
23	Hambantota	Sooriyawewa	Sooriyawewa	NWSDB	NWSDB	8,700	1997
24	Hambantota	Sooriyawewa	Arawanamulla	TWSSP of NWSDB	CBO	1,326	2002
25	Hambantota	Sooriyawewa	Elalla	TWSSP of NWSDB	CBO	1,353	2002
26	Hambantota	Sooriyawewa	Habarathewela	TWSSP of NWSDB	CBO	4,925	2002
27	Hambantota	Sooriyawewa	Keliyapura	TWSSP of NWSDB	CBO	1,284	2002
28	Hambantota	Sooriyawewa	Ketanwewa	TWSSP of NWSDB	CBO	590	2002
29	Hambantota	Sooriyawewa	Koholankala	TWSSP of NWSDB	CBO	1,476	2002
30	Hambantota	Sooriyawewa	Abalagawila North	TWSSP of NWSDB	CBO	7,290	2002
31	Hambantota	Sooriyawewa	Suruwirugama	TWSSP of NWSDB	CBO	3,840	2002

Index No.	District	Divisional Secretary Area	Name of the Scheme	Implementing Agency	Operating Agency	Population served	Year of commencement
32	Hambantota	Sooriyawewa	Weliwewa	TWSSP of NWSDB	CBO	1,085	2002
33	Monaragala	Buttala	Buttala	NWSDB	NWSDB	5,556	1992
34	Monaragala	Thanamalwila	Thanamalwila	NWSDB	NWSDB	3,081	1992
35	Monaragala	Thanamalwila	Bodhigama	Local Authority	Local Authority	142	1996
36	Monaragala	Buttala	Buruthagolla	Local Authority	Local Authority	300	Not Known
37	Monaragala	Wellawaya	Ice Pihilla	NWSDB	Local Authority	653	1992
38	Monaragala	Thanamalwila	Kumaragama	Local Authority	Local Authority	150	Not Known
39	Monaragala	Thanamalwila	Nikawewa	Local Authority	Local Authority	100	1993
40	Monaragala	Badalkumbura	Badalkumbura	Local Authority	Local Authority	750	Not Known
41	Monaragala	Badalkumbura	Tennakumburawatta	Local Authority	Local Authority	225	Not Known
42	Monaragala	Badalkumbura	Meyandura	Local Authority	Local Authority	58	Not Known
43	Monaragala	Badalkumbura	Meyandura Narankumbura	Local Authority	Local Authority	60	Not Known
44	Monaragala	Badalkumbura	Karagaskadura	Local Authority	Local Authority	52	Not Known
45	Monaragala	Badalkumbura	Ritigahaduwa	Local Authority	Local Authority	24	Not Known
46	Monaragala	Badalkumbura	Amunumulla Udahela	Local Authority	Local Authority	38	Not Known
47	Monaragala	Badalkumbura	Kotamuduna Kaduda	Local Authority	Local Authority	45	Not Known
48	Monaragala	Badalkumbura	Alimada	Local Authority	Local Authority	27	Not Known
49	Monaragala	Badalkumbura	Babaragasdura	Local Authority	Local Authority	70	Not Known
50	Monaragala	Badalkumbura	Kotamuduna	Local Authority	Local Authority	15	Not Known
51	Monaragala	Badalkumbura	Neluwa	Local Authority	Local Authority	30	Not Known
52	Monaragala	Badalkumbura	Ranugalla	Local Authority	Local Authority	40	Not Known
53	Monaragala	Badalkumbura	Ranugalla Naluwatta	Local Authority	Local Authority	40	Not Known
54	Monaragala	Badalkumbura	Hingurankadawa Egoda	Local Authority	Local Authority	34	Not Known
55	Monaragala	Badalkumbura	Waradola watta	Local Authority	Local Authority	150	Not Known
56	Monaragala	Badalkumbura	Millakadura	Local Authority	Local Authority	60	Not Known
57	Monaragala	Badalkumbura	Angoda Dehigaslanda	Local Authority	Local Authority	308	Not Known
58	Monaragala	Badalkumbura	Waradola	Local Authority	Local Authority	72	Not Known
59	Monaragala	Badalkumbura	Walasella	Local Authority	Local Authority	49	Not Known
60	Monaragala	Badalkumbura	Wadagahakiwela	Local Authority	Local Authority	30	Not Known
61	Monaragala	Badalkumbura	Welanhinna	Local Authority	Local Authority	27	Not Known
62	Monaragala	Badalkumbura	Maylahinna	Local Authority	Local Authority	76	Not Known
63	Monaragala	Badalkumbura	S Kanuwa	Local Authority	Local Authority	125	Not Known

Index No.	District	Divisional Secretary Area	Name of the Scheme	Implementing Agency	Operating Agency	Population served	Year of commencement
64	Monaragala	Badalkumbura	Rajagala Aranya	Local Authority	Local Authority	25	Not Known
65	Monaragala	Badalkumbura	Punsisigama	Local Authority	Local Authority	40	Not Known
66	Monaragala	Badalkumbura	Punsisigama south	Local Authority	Local Authority	35	Not Known
67	Monaragala	Thanamalwila	Kaniyo Pitawewagama	Local Authority	Local Authority	124	Not Known
68	Monaragala	Thanamalwila	Odigama	Local Authority	Local Authority	112	Not Known
69	Monaragala	Wellawaya	Wellawaya	NWSDB	Local Authority	5,200	Not Known
70	Monaragala	Wellawaya	Thelulla	NHDA	Local Authority	500	1992
71	Monaragala	Badalkumbura	Punsisigama solar power	NHDA	Local Authority	500	1992
72	Monaragala	Thanamalwila	Mahapelessagama	NHDA	Local Authority	500	1992
73	Monaragala	Thanamalwila	Kandi oya	NHDA	Local Authority	500	1992
74	Monaragala	Thanamalwila	Bodhigama	NHDA	Local Authority	500	1992
75	Monaragala	Thanamalwila	Kumaragama	NHDA	Local Authority	500	1992
76	Monaragala	Thanamalwila	Uvakudaoya	NHDA	Local Authority	500	1992
77	Monaragala	Thanamalwila	Blaharuwa	NHDA	Local Authority	500	1992
78	Monaragala	Thanamalwila	Ihala Nikawewa	NHDA	Local Authority	500	1992
79	Monaragala	Thanamalwila	Hambegamuwa hospital	NHDA	Local Authority	500	1992
80	Monaragala	Buttala	Gongan ara	TWSSP of NWSDB	CBO	840	2002
81	Monaragala	Buttala	Horabokka	TWSSP of NWSDB	CBO	1,250	2002
82	Monaragala	Buttala	Koon ketiya	TWSSP of NWSDB	CBO	725	2002
83	Monaragala	Buttala	Kukurampola	TWSSP of NWSDB	CBO	858	2002
84	Monaragala	Buttala	Kumaragama	TWSSP of NWSDB	CBO	1,152	2002
85	Monaragala	Buttala	Kumarapura	TWSSP of NWSDB	CBO	403	2002
86	Monaragala	Buttala	Mahagodayaya	TWSSP of NWSDB	CBO	677	2002
87	Monaragala	Buttala	Mahasenpura	TWSSP of NWSDB	CBO	1,555	2002
88	Monaragala	Buttala	Minipuragama	TWSSP of NWSDB	CBO	564	2002
89	Monaragala	Buttala	Palwatta	TWSSP of NWSDB	CBO	2,454	2002
90	Monaragala	Buttala	Rahatangama	TWSSP of NWSDB	CBO	1,062	2002
91	Monaragala	Buttala	Udaarawa	TWSSP of NWSDB	CBO	1,560	2002
92	Monaragala	Buttala	Ulugala	TWSSP of NWSDB	CBO	1,662	2002
93	Monaragala	Buttala	Unawatuna	TWSSP of NWSDB	CBO	2,136	2002
94	Monaragala	Buttala	Weheragala	TWSSP of NWSDB	CBO	957	2002
95	Monaragala	Thanamalwila	Divulana	TWSSP of NWSDB	CBO	1,746	2002

Index No.	District	Divisional Secretary Area	Name of the Scheme	Implementing Agency	Operating Agency	Population served	Year of commencement
96	Monaragala	Thanamalwila	Ekamuthugama	TWSSP of NWSDB	CBO	1,230	2002
97	Monaragala	Thanamalwila	Habaraluwewa	TWSSP of NWSDB	CBO	474	2002
98	Monaragala	Thanamalwila	Habarattawela	TWSSP of NWSDB	CBO	1,908	2002
99	Monaragala	Thanamalwila	Hambegamuwa	TWSSP of NWSDB	CBO	1,788	2002
100	Monaragala	Thanamalwila	Indikolapelessa	TWSSP of NWSDB	CBO	888	2002
101	Monaragala	Thanamalwila	Kadurupedesa	TWSSP of NWSDB	CBO	1,058	2002
102	Monaragala	Thanamalwila	Kahakurupedesa	TWSSP of NWSDB	CBO	1,488	2002
103	Monaragala	Thanamalwila	Ketagal ara	TWSSP of NWSDB	CBO	908	2002
104	Monaragala	Thanamalwila	Koul ara	TWSSP of NWSDB	CBO	1,025	2002
105	Monaragala	Thanamalwila	Mahagama	TWSSP of NWSDB	CBO	2,087	2002
106	Monaragala	Thanamalwila	Mahawewa	TWSSP of NWSDB	CBO	1,055	2002
107	Monaragala	Thanamalwila	Mayaauragama	TWSSP of NWSDB	CBO	924	2002
108	Monaragala	Thanamalwila	Nikawewa	TWSSP of NWSDB	CBO	1,064	2002
109	Monaragala	Thanamalwila	Nugegalayaya	TWSSP of NWSDB	CBO	1,815	2002
110	Monaragala	Thanamalwila	Punchiwewa	TWSSP of NWSDB	CBO	930	2002
111	Monaragala	Thanamalwila	Samadipura	TWSSP of NWSDB	CBO	354	2002
112	Monaragala	Thanamalwila	Samagipura	TWSSP of NWSDB	CBO	1,794	2002
113	Monaragala	Thanamalwila	Seenukkuwa	TWSSP of NWSDB	CBO	498	2002
114	Monaragala	Thanamalwila	Suriya ara	TWSSP of NWSDB	CBO	2,438	2002
115	Monaragala	Thanamalwila	Usweli ara	TWSSP of NWSDB	CBO	252	2002
116	Monaragala	Thanamalwila	Weli ara	TWSSP of NWSDB	CBO	456	2002
117	Ratnapura	Balangoda	Balangoda	NWSDB	NWSDB	25,000	1982
118	Ratnapura	Embilipitiya	Embilipitiya	NWSDB	NWSDB	50,000	1985
119	Ratnapura	Embilipitiya	Uda walawe	NWSDB	NWSDB	50,000	1987
120	Ratnapura	Imbulpe	Belihuloya	Local Authority	Local Authority	1,660	1980
121	Ratnapura	Balangoda	Horaketiya	Local Authority	Local Authority	100	1988
122	Ratnapura	Embilipitiya	Kadugannapura	Local Authority	Local Authority	575	1958
123	Ratnapura	Imbulpe	Pambahinna	Local Authority	Local Authority	2,000	1983
124	Ratnapura	Imbulpe	Pinnawala	Local Authority	Local Authority	3,000	1977
125	Ratnapura	Embilipitiya	Ulpotha	Local Authority	Local Authority	650	1983
126	Ratnapura	Weligepola	Ekarella	Pickle Packers	Estate Management	170	Not Known
127	Ratnapura	Weligepola	Ilukkumbura	Pickle Packers	Estate Management	240	Not Known

Index No.	District	Divisional Secretary Area	Name of the Scheme	Implementing Agency	Operating Agency	Population served	Year of commencement
128	Ratnapura	Balangoda	Pallekanda	CWSSP-PH 1	CBO	301	1998
129	Ratnapura	Embilipitiya	Darshanagama	CWSSP-PH 1	CBO	1,015	1994
130	Ratnapura	Embilipitiya	Mudunmankada	CWSSP-PH 1	CBO	1,267	1994
131	Ratnapura	Balangoda	Detanapola	PSHWT	CBO	135	1999
132	Ratnapura	Balangoda	Pettigala lower	PSHWT	CBO	252	1999
133	Ratnapura	Balangoda	Rye Wikiliya	PSHWT	CBO	336	1999
134	Ratnapura	Balangoda	Walaboda	PSHWT	CBO	112	1999
135	Ratnapura	Balangoda	Maratam	PSHWT	CBO	273	1999
136	Ratnapura	Balangoda	Ukgalduwa	PSHWT	CBO	230	1999
137	Ratnapura	Balangoda	Culdeen	PSHWT	CBO	480	1999
138	Ratnapura	Balangoda	Pettigala	PSHWT	CBO	112	1999
139	Ratnapura	Balangoda	Rassagala	PSHWT	CBO	140	1999
140	Ratnapura	Balangoda	Medakanda 1	PSHWT	CBO	116	1999
141	Ratnapura	Balangoda	Medakanda 2	PSHWT	CBO	544	1999
142	Ratnapura	Balangoda	Nagarak	PSHWT	CBO	288	1999
143	Ratnapura	Balangoda	Pettigala upper	PSHWT	CBO	1,254	1999
144	Ratnapura	Kolonna	Heyes lower	PSHWT	CBO	464	1997
145	Ratnapura	Kolonna	Heyes Upper	PSHWT	CBO	252	1999
146	Ratnapura	Godakawela	Rakwana	CWSSP -I	CBO	1,100	1996
147	Ratnapura	Balangoda	Kaltoya	CWSSP -I	CBO	5,235	1997
148	Ratnapura	Embilipitiya	Jayathiyampiyapura	NHDA	LA	500	1999
149	Ratnapura	Balangoda	Meddekanda	Forbes Ceylon	Uva Sabaragamu	340	Not Known
150	Ratnapura	Balangoda	Welakumbura	Forbes Ceylon	Uva Sabaragamu	375	Not Known
151	Ratnapura	Balangoda	Pettigala	Forbes Ceylon	Uva Sabaragamu	1,045	Not Known
152	Ratnapura	Balangoda	Rassagala	Forbes Ceylon	Uva Sabaragamu	140	Not Known
153	Ratnapura	Balangoda	Wikiliya	Forbes Ceylon	Uva Sabaragamu	345	Not Known
154	Ratnapura	Balangoda	Agasland	Forbes Ceylon	Uva Sabaragamu	410	Not Known
155	Ratnapura	Godakawela	Spring wood upper	Finlayas	Finlay Plantation	930	Not Known
156	Ratnapura	Godakawela	Hatherleif	Finlays	Finlay Plantation	370	Not Known
157	Ratnapura	Godakawela	Opatha 1	Pickle Packers	Estate Management	965	Not Known
158	Ratnapura	Godakawela	Opatha 3	Pickle Packers	Estate Management	300	Not Known
159	Ratnapura	Godakawela	Spring wood palmcotte	Finlays	Finlay Plantation	825	Not Known
160	Ratnapura	Imbulpe	Balangoda lower	Forbes Ceylon	Finlay Plantation	515	Not Known



Index No.	District	Divisional Secretary Area	Name of the Scheme	Implementing Agency	Operating Agency	Population served	Year of commencement
161	Ratnapura	Imbulpe	Cecilton	Forbes Ceylon	Finlay Plantation	605	Not Known
162	Ratnapura	Imbulpe	Non Periyal	Forbes Ceylon	Finlay Plantation	255	Not Known
163	Ratnapura	Imbulpe	Walaboda	Forbes Ceylon	Uva Sabaragamu	240	Not Known
164	Ratnapura	Balangoda	Bulathgama	CWSSP	CBO	1,572	1998
165	Ratnapura	Balangoda	Egodawakanda	CWSSP	CBO	1,932	1998
166	Ratnapura	Balangoda	Kupdeigama	CWSSP	CBO	1,278	1998
167	Ratnapura	Balangoda	Kuragala	CWSSP	CBO	864	1998
168	Ratnapura	Balangoda		CWSSP	CBO	1,338	1998
169	Ratnapura	Balangoda	Mewale	CWSSP	CBO	339	1998
170	Ratnapura	Balangoda	Medakanda	CWSSP	CBO	2,028	1998
171	Ratnapura	Balangoda	Malgama	CWSSP	CBO	1,242	1998
172	Ratnapura	Balangoda	Pallekanda	CWSSP	CBO	1,428	1998
173	Ratnapura	Balangoda	Rajawaka	CWSSP	CBO	2,016	1998
174	Ratnapura	Balangoda	Theladeniya	CWSSP	CBO	1,020	1998
175	Ratnapura	Balangoda	Udumullagama	CWSSP	CBO	1,220	1998
176	Ratnapura	Balangoda	Vijenethkumbura	CWSSP	CBO	900	1998
177	Ratnapura	Balangoda	Vikiliya	CWSSP	CBO	2,154	1998
178	Ratnapura	Balangoda	Yahalewela	CWSSP	CBO	1,026	1998
179	Ratnapura	Embilipitiya	Katapalana	CWSSP	CBO	2,877	1998
180	Ratnapura	Embilipitiya	Kotukahwa	CWSSP	CBO	1,860	1997
181	Ratnapura	Embilipitiya	Modarawane	CWSSP	CBO	1,833	1998
182	Ratnapura	Embilipitiya	Mandumankanda	CWSSP	CBO	810	1994
183	Ratnapura	Embilipitiya	Nindayapelana	CWSSP	CBO	2,430	1998
184	Ratnapura	Embilipitiya	Pallebedda	CWSSP	CBO	1,422	1998
185	Ratnapura	Embilipitiya	Panahanduwa	CWSSP	CBO	2,016	1998
186	Ratnapura	Embilipitiya	Panamure- I	CWSSP	CBO	2,534	1998
187	Ratnapura	Embilipitiya	Panamure- II	CWSSP	CBO	2,108	1998
188	Ratnapura	Embilipitiya		CWSSP	CBO	1,984	1998
189	Ratnapura	Embilipitiya	Sankapale	CWSSP	CBO	2,820	1998
190	Ratnapura	Embilipitiya	Sudupale	CWSSP	CBO	708	1994
191	Ratnapura	Godakawela	Bibilegama	CWSSP	CBO	1,206	1996
192	Ratnapura	Godakawela	Bibilegama- West	CWSSP	CBO	1,849	1998
193	Ratnapura	Godakawela	Bibilegama -East	CWSSP	CBO	790	1998

Index No.	District	Divisional Secretary Area	Name of the Scheme	Implementing Agency	Operating Agency	Population served	Year of commencement
194	Ratnapura	Godakawela		CWSSP	CBO	701	1998
195	Ratnapura	Godakawela	Galahitiya	CWSSP	CBO	1,142	1996
196	Ratnapura	Godakawela	Mahagama -East	CWSSP	CBO	1,015	1998
197	Ratnapura	Godakawela	Mahagama -West	CWSSP	CBO	1,458	1996
198	Ratnapura	Godakawela	Malimpura	CWSSP	CBO	2,279	1998
199	Ratnapura	Godakawela	Medigama	CWSSP	CBO	905	1995
200	Ratnapura	Godakawela	Thombugamuwa- East	CWSSP	CBO	1,369	1998
201	Ratnapura	Godakawela	Thombugamuwa- West	CWSSP	CBO	1,809	1996
202	Ratnapura	Godakawela	Werawela-East	CWSSP	CBO	819	1998
203	Ratnapura	Imbulpe	Alakokela	CWSSP	CBO	2,099	1998
204	Ratnapura	Imbulpe	Atawakawale	CWSSP	CBO	2,520	1998
205	Ratnapura	Imbulpe	Belankanda	CWSSP	CBO	2,307	1998
206	Ratnapura	Imbulpe	Dewalapanagama	CWSSP	CBO	1,220	1998
207	Ratnapura	Imbulpe	Gurumbiwiila	CWSSP	CBO	1,260	1994
208	Ratnapura	Imbulpe	Hape	CWSSP	CBO	675	1998
209	Ratnapura	Imbulpe	Hatarabage	CWSSP	CBO	1,305	1998
210	Ratnapura	Imbulpe	Ihalagalagama	CWSSP	CBO	1,020	1998
211	Ratnapura	Imbulpe	Karadiyamulla	CWSSP	CBO	2,285	1998
212	Ratnapura	Imbulpe	Karagastalawa	CWSSP	CBO	1,427	1998
213	Ratnapura	Imbulpe	Kumbukmathewela	CWSSP	CBO	1,476	1998
214	Ratnapura	Imbulpe	Medathalawa	CWSSP	CBO	1,691	1998
215	Ratnapura	Imbulpe	Minuwanarawa	CWSSP	CBO	825	1998
216	Ratnapura	Imbulpe	Nallurela	CWSSP	CBO	980	1995
217	Ratnapura	Imbulpe	Pombaeolla	CWSSP	CBO	2,414	1998
218	Ratnapura	Imbulpe	Nittambuwa	CWSSP	CBO	874	1995
219	Ratnapura	Imbulpe	Pallewela	CWSSP	CBO	1,316	1998
220	Ratnapura	Imbulpe	Pandeniya	CWSSP	CBO	1,495	1998
221	Ratnapura	Imbulpe	Pannaramulla	CWSSP	CBO	1,277	1998
222	Ratnapura	Imbulpe	Pidiligamanwela	CWSSP	CBO	3,147	1998
223	Ratnapura	Imbulpe	Puwagagahawela	CWSSP	CBO	1,439	1998
224	Ratnapura	Imbulpe	Seelogama	CWSSP	CBO	1,299	1998
225	Ratnapura	Imbulpe	Thiropalle	CWSSP	CBO	1,327	1998
226	Ratnapura	Imbulpe	Udagama	CWSSP	CBO	1,316	1998

Index No.	District	Divisional Secretary Area	Name of the Scheme	Implementing Agency	Operating Agency	Population served	Year of commencement
227	Ratnapura	Imbulpe	Wellamne	CWSSP	CBO	1,546	1998
228	Ratnapura	Imbulpe	Viharuralea	CWSSP	CBO	706	1996
229	Ratnapura	Kolonne	Ambagasyaya	CWSSP	CBO	1,465	1998
230	Ratnapura	Kolonne	Boraluwageayina	CWSSP	CBO	1,345	1998
231	Ratnapura	Kolonne	Baltota	CWSSP	CBO	1,484	1998
232	Ratnapura	Kolonne	Bulathdanda	CWSSP	CBO	1,469	1998
233	Ratnapura	Kolonne	Henakgoda	CWSSP	CBO	443	1998
234	Ratnapura	Kolonne	Itakanda	CWSSP	CBO	1,799	1998
235	Ratnapura	Kolonne	Kela	CWSSP	CBO	1,534	1996
236	Ratnapura	Kolonne	Kopparakanda	CWSSP	CBO	1,190	1998
237	Ratnapura	Kolonne	Muduwanwela	CWSSP	CBO	1,546	1998
238	Ratnapura	Kolonne	Nandunnapura	CWSSP	CBO	1,299	1998
239	Ratnapura	Kolonne	Ranhotikanda	CWSSP	CBO	2,559	1998
240	Ratnapura	Kolonne	Ulundurawa	CWSSP	CBO	2,392	1998
241	Ratnapura	Kolonne	Walakkada	CWSSP	CBO	728	1998
242	Ratnapura	Kolonne	Wawulpura	CWSSP	CBO	409	1998
243	Ratnapura	Weligepola	Bambaragala	CWSSP	CBO	1,890	1998
244	Ratnapura	Weligepola	Galgodagama	CWSSP	CBO	1,299	1998
245	Ratnapura	Weligepola	Galpaya	CWSSP	CBO	2,996	1998
246	Ratnapura	Weligepola	Medayaya	CWSSP	CBO	1,210	1998
247	Ratnapura	Weligepola	Palukgeharala	CWSSP	CBO	2,257	1998
248	Ratnapura	Weligepola	Paragahannatotta	CWSSP	CBO	1,305	1998
249	Ratnapura	Weligepola	Lenwala	CWSSP	CBO	1,865	1998
250	Ratnapura	Weligepola	Udagangoda	CWSSP	CBO	1,098	1998
251	Ratnapura	Weligepola	Weligepole	CWSSP	CBO	1,467	1998
252	Badulla	Haputale	Diyatalawa- Amunukale	NWSDB	NWSDB	1,242	1983
253	Badulla	Bandarawela	Bandarawela	NWSDB	NWSDB	23,250	1978
254	Badulla	Bandarawela	Digantenna	NWSDB	NWSDB	1,364	1980
255	Badulla	Bandarawela	Diobbila	NWSDB	NWSDB	23,250	1978
256	Badulla	Hapuale	Diyatalawa	NWSDB	NWSDB	4,500	1936
266	Badulla	Haldumulla	Haldumulla	NWSDB	NWSDB	3,000	1984
267	Badulla	Bandarawela	Koktenna	NWSDB	NWSDB	2,500	1982
268	Badulla	Bandarawela	Liyangahawela	NWSDB	NWSDB	2,070	1984

Index No.	District	Divisional Secretary Area	Name of the Scheme	Implementing Agency	Operating Agency	Population served	Year of commencement
269	Badulla	Haldumulla	Seetenna	NWSDB	NWSDB	7,530	1981
270	Badulla	Bandarawela	North Kebillawela	NWSDB	NWSDB	2,600	1999
271	Badulla	Bandarawela	South Kehillawela	NWSDB	NWSDB	2,500	No Records
272	Badulla	Bandarawela	Ambadandegama	LA	NWSDB	150	1986
273	Badulla	Haldumulla	Amilagama	LA	NWSDB	640	1992
274	Badulla	Bandarawela	Beddarawa	LA	LA	445	1986
275	Badulla	Haldumulla	Beragala	LA	LA	No Records	No Records
276	Badulla	Ella	Digaradda	LA	LA	2,000	11
277	Badulla	Bandarawela	Doolgolla	LA	LA	470	1991
278	Badulla	Ella	Dowa	TWSSP	CBO	400	NR
279	Badulla	Bandarawela	Egodagama	LA	CBO	426	1988
280	Badulla	Ella	Ella	LA	CBO	3,000	1980
281	Badulla	Haldumulla	Galbandarana	LA	CBO	236	1991
282	Badulla	Bandarawela	Galhitiyawa	LA	CBO	278	1986
283	Badulla	Bandarawela	Galawaduwa	LA	CBO	284	1985
284	Badulla	Bandarawela	Galwettikumbura	LA	CBO	216	1994
285	Badulla	Haldumulla	Haldumulla	LA	CBO	37	1980
286	Badulla	Haldumulla	Hiwalkendura	LA	CBO	800	NR
287	Badulla	Haldumulla	Hiwalkendura	LA	CBO	628	NR
288	Badulla	Bandarawela	Idama	LA	CBO	150	NR
289	Badulla	Haldumulla	Katupanana	LA	CBO	270	1994
290	Badulla	Bandarawela	Karapahawela	LA	CBO	320	1993
291	Badulla	Ella	Karandayolla	LA	CBO	500	1997
292	Badulla	Bandarawela	Kirindiella	LA	CBO	218	1992
293	Badulla	Haldumulla	Koslanda	LA	CBO	1,220	NR
294	Badulla	Ella	Kohogahawatta	LA	CBO	700	1991
295	Badulla	Ella	Kumbalwewa	CWSSP	CBO	1,500	1985
296	Badulla	Bandarawela	Kurundukolle	LA	CBO	487	1985
297	Badulla	Bandarawela	Lakgiriagama	LA	LA	420	1986
298	Badulla	Bandarawela	Mokulella	LA	LA	152	1993
299	Badulla	Bandarawela	Getohakanda	LA	LA	270	1986
300	Badulla	Ella	Dehigolla	LA	LA	400	1992
301	Badulla	Ella	Millawatta	LA	LA	200	1988

Index No.	District	Divisional Secretary Area	Name of the Scheme	Implementing Agency	Operating Agency	Population served	Year of commencement
302	Badulla	Bandarawela	Millawatta	LA	LA	178	1991
303	Badulla	Bandarawela	Obedella	LA	LA	323	1998
304	Badulla	Ella	Pahala Halpe	CWSSP	CBO	1,900	1991
305	Badulla	Bandarawela	Panakeniya	LA	LA	260	1997
306	Badulla	Haldumulla	Pussala	LA	LA	285	1986
307	Badulla	Ella	Rawana ella	LA	LA	700	1995
308	Badulla	Bandarawela	Walasbedda	LA	LA	423	1992
309	Badulla	Bandarawela	South Kabillawala	LA	LA	976	1988
310	Badulla	Bandarawela	Leangawella Balangala	Framers	Uva-Weston plantation	485	No records
311	Badulla	Bandarawela	Leangawella Borugoda	Farmers	Uva-Weston plantation	290	No records
312	Badulla	Bandarawela	Leangawella Borugoda	Forbes & walker	Uva-Weston plantation	130	No records
313	Badulla	Bandarawela	Nayabedda Neiyon	EB Creasy	Creasy Plantation	650	No records
314	Badulla	Bandarawela	Chelese Lower	Magpeck	Magpeck Colombo	270	No records
315	Badulla	Bandarawela	Aislany	Magpeck	Magpeck Colombo	355	No records
316	Badulla	Bandarawela	Kurukadee	Magpeck	Magpeck Colombo	140	No records
317	Badulla	Bandarawela	Kirchyon	Magpeck	Magpeck Colombo	215	No records
318	Badulla	Bandarawela	Craig Dick Carowa	Forbes & walker	Uva - West Plantation	180	No records
319	Badulla	Ella	Hindgalla	BC Computer	BC Plant Service	345	No records
320	Badulla	Ella	Demodara Nethervilla	Finlays	Finlay Plant Management	365	No records
321	Badulla	Ella	Demodara Weyvelhinna	Finlays	Finlays Plant Management	365	No records
322	Badulla	Ella	Gowerakalle Old div	Finlays	Uva-Sabaragamuwa	285	No records
323	Badulla	Ella	Gowerakalle New	Finlays	Uva-Sabaragamuwa	575	No records
324	Badulla	Ella	Gowerakalle Old	Faber Ceylon	Uva-Sabaragamuwa	250	No records
325	Badulla	Ella	Hindagalla Galapitakanda	BC Computer	Bc Plant Services	565	No records
326	Badulla	Ella	Nanwila Factory	Finlays	Finlay Plant management	195	No records
327	Badulla	Ella	Pingarawa	BC Computers	BC Plant Services	210	No records
328	Badulla	Haldumulla	Oakwella	EB Creasy	Creasy Plant Management	415	No records
329	Badulla	Haldumulla	Mahakanda	EB Creasy	Uva-West Plantation	415	No records
330	Badulla	Haldumulla	Mahakanda Avanhall	EB Creasy	Uva-West Plantation	265	No records
331	Badulla	Haldumulla	Poonagalle Lower	EB Creasy	Uva-West Plantation	580	No records
332	Badulla	Haldumulla	Mavalandeniya	EB Creasy	Uva-West Plantation	730	No records
333	Badulla	Haldumulla	Poonagalla - I	Forbes & Walkers	Uva-West Plantation	480	No records

Index No.	District	Divisional Secretary Area	Name of the Scheme	Implementing Agency	Operating Agency	Population served	Year of commencement
334	Badulla	Haldumulla	Poonagalla-2	Forbes & Walkers	Uva-West Plantation	340	No records
335	Badulla	Haldumulla	Bambarapokuna	CWSSP	CBO	1,036	No records
336	Badulla	Haldumulla	Beragoda	CWSSP	CBO	830	No records
337	Badulla	Haldumulla	Gampona	CWSSP	CBO	1,174	No records
338	Badulla	Haldumulla	Horankahawa	CWSSP	CBO	631	No records
339	Badulla	Haldumulla	Kalupahana	CWSSP	CBO	940	No records
340	Badulla	Haldumulla	Kelipannawala	CWSSP	CBO	698	1998
341	Badulla	Haldumulla	Kitulgahawarawa	CWSSP	CBO	564	1997
342	Badulla	Haldumulla	Kolongastenna	CWSSP	CBO	875	1997
343	Badulla	Haldumulla	Kosgama	CWSSP	CBO	460	1911
344	Badulla	Haldumulla	Lenantota	CWSSP	CBO	605	1997
345	Badulla	Haldumulla	Madawela	CWSSP	CBO	680	1996
346	Badulla	Haldumulla	Moraketiya	CWSSP	CBO	790	1998
347	Badulla	Haldumulla	Renuwanguhawa	CWSSP	CBO	671	1998
348	Badulla	Haldumulla	Ranasinhagoda	CWSSP	CBO	825	1998
349	Badulla	Haldumulla	Uvatanna	CWSSP	CBO	497	1998
350	Badulla	Haldumulla	Viharagala	Walanwita	CBO	688	1998
351	Badulla	Haputale	Pitanandara	CWSSP	CBO	1,645	1998
352	Badulla	Haputale	Boddewela	CWSSP	CBO	1,008	1998
353	Badulla	Ella	Demodara	CWSSP	CBO	1,241	1996
354	Badulla	Ella	Dodampola	CWSSP	CBO	520	1997
355	Badulla	Ella	Duwa	CWSSP	CBO	927	1996
356	Badulla	Ella	Galthannahena	CWSSP	CBO	734	1998
357	Badulla	Ella	Gowaranwela	CWSSP	CBO	960	1998
358	Badulla	Ella	Gorassa	CWSSP	CBO	708	1997
359	Badulla	Ella	Hettipola	CWSSP	CBO	302	1998
360	Badulla	Ella	Idamegama	CWSSP	CBO	554	1998
361	Badulla	Ella	Kethalwela	CWSSP	CBO	1,287	1998
362	Badulla	Ella	Maduragama	CWSSP	CBO	1,217	1998
363	Badulla	Ella	Nawella	CWSSP	CBO	945	1996
364	Badulla	Ella	Nawella East	CWSSP	CBO	630	1998
365	Badulla	Ella	Piyarapanduwa	CWSSP	CBO	1,060	1998
366	Badulla	Ella	Pupula	CWSSP	CBO	1,996	1996

Index No.	District	Divisional Secretary Area	Name of the Scheme	Implementing Agency	Operating Agency	Population served	Year of commencement
367	Badulla	Ella	Pupula west	CWSSP	CBO	761	1998
368	Badulla	Ella	Ranwanella	CWSSP	CBO	490	1998
369	Badulla	Ella	Walanbedda	CWSSP	CBO	645	1995
370	Badulla	Ella	Dammeriya	PHSWT	CBO	2,100	1994
371	Badulla	Ella	Demodara	PHSWT	CBO	862	1994
372	Badulla	Ella	Nanawila	PHSWT	CBO	218	1997
373	Badulla	Ella	Rookatenna	PHSWT	CBO	1,473	1994
374	Badulla	Ella	Gonakele	PHSWT	CBO	3,068	1993
375	Badulla	Ella	Hindagalla	PHSWT	CBO	1,020	1996
376	Badulla	Ella	Kandahena	PHSWT	CBO	1,064	1998
373	Badulla	Haputale	Nybedda	PHSWT	CBO	728	1995

**Annex 2. Details of Water Supply Schemes for the Main Towns**

Name of Scheme	Year of commencement	Number of metered connections	Number of common stand post	Water Produced (m3/year)	Water Billed (m3/year)	Non revenue water	No. of House hold connection	No. of House Industrial connection	No. of Commercial	No. of Tourist Hotels	No. of Institutional connections	Des. Capacity (m3/d)	Production	Type of treatment	Supply hours per day	Samplad yes/No
Ambalantota/Hambantota	1975	4000	(06+104)	2993000	879000	24%	5437	5437	2777	7	12	7500	8200	Full	18-24	Yes
Sooriyawewa	1997	1233	2	293422	246984	12%	1029	1029	47	0	2	1200	864	Full	24	Yes
Tissamaharama	1956	1111	14	401607	306087	20%	880	880	122	1	1	6000	-	Partial		Yes
Kataragama	1975	2571	120	1305076	1019368	28%	-	-	-	-	-	-	5000	Partial	18-24	Yes
Buttala	1992	924	1	388294	246252	32%	-	-	-	-	-	1157	12000	Chlorination only	4	Yes
Thanamalwila	1992	402	8	260975	132348	53%	336	336	41	4	1	715	No Records	Full	4	Yes
Balangoda	1982	2950	2	1179735	716310	39%	2383	2383	248	65	1	4000	3100	Full	23	Yes
Embilipitiya	1985	4629	57	1751691	102619	41%	3679	3679	266	127	10	3000	4500	Full	15	Yes
Udawalawe	1987	1641	38	850021	985770	42%	1892	1892	39	28	0	3000	2600	Chlorination only	10	Yes
Diyatalawa Scheme	1983	196	0	40150	No records	10%	-	-	-	-	-	110	-	Chlorination only	0-6	Yes
Bandarawela	1978	775	0	276096	No records	22%	-	-	-	-	-	527	230	Chlorination only	18-24	Yes



**Annex 3/1. Hospital Statistics - Water Borne and Water Related Diseases - 1996**

Disease	Hambantota District		Badulla District		Moneragala District		Ratnapuara District		Sri Lanka	
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
<b>A) Water Borne Diseases</b>										
1 Cholera	0	0	0	0	0	0	0	0	0	0
2 Typhoid & para typhoid	113	0	415	0	657	1	602	0	9,313	19
3 Shigellosis	853	1	1,281	5	1,221	5	1,200	1	19,267	57
4 Amoebiasis with liver infection	25	0	73	0	1	0	18	0	653	7
5 Amoebiasis - other	15	0	164	0	15	0	36	0	1,497	2
6 Diarrhoea & gastroenteritis of presumed infectious origin	3,239	1	5,501	6	2,563	0	6,475	7	96,398	122
7 Other intestinal infectious diseases	297	1	395	0	1,230	1	1,156	0	18,690	22
8 Acute hepatitis A	76	0	130	0	53	0	73	0	3,046	4
9 Acute hepatitis B	0	0	13	0	0	0	2	0	171	3
10 Chronic, other acute & unspecified viral hepatitis	13	0	192	0	16	0	60	0	3,812	12
<b>Total</b>	<b>4,631</b>	<b>3</b>	<b>8,164</b>	<b>11</b>	<b>5,756</b>	<b>7</b>	<b>9,622</b>	<b>8</b>	<b>152,847</b>	<b>248</b>
<b>A) Water Related Diseases</b>										
11 Dengue fever	1	0	3	2	0	0	1	0	475	10
12 Dengue haemorrhagic fever	6	0	4	3	0	0	1	0	508	37
13 Malaria	1,218	0	1,647	1	4,259	1	2,551	0	52,406	47
14 Filariasis	51	0	4	0	9	0	25	0	804	0
15 Helminthiasis	53	0	239	1	163	0	130	0	2,673	1
16 Sequela of infectious and parasitic diseases	0	0	1	0	18	0	0	0	76	0
17 Other infectious and parasitic diseases	1	0	8	0	15	1	87	0	764	4
<b>Total</b>	<b>1,330</b>	<b>0</b>	<b>1,906</b>	<b>7</b>	<b>4,464</b>	<b>2</b>	<b>2,795</b>	<b>0</b>	<b>57,706</b>	<b>99</b>

Source - Statistical Section - Ministry of Health

**Annex 3/1. Hospital Statistics - Water Borne and Water Related Diseases - 1996**

Disease	Hambantota District		Badulla District		Moneragala District		Ratnapuara District		Sri Lanka	
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
<b>A) Water Borne Diseases</b>										
1 Cholera	0	0	0	0	0	0	0	0	0	0
2 Typhoid & para typhoid	113	0	415	0	657	1	602	0	9,313	19
3 Shigellosis	853	1	1,281	5	1,221	5	1,200	1	19,267	57
4 Amoebiasis with liver infection	25	0	73	0	1	0	18	0	653	7
5 Amoebiasis - other	15	0	164	0	15	0	36	0	1,497	2
6 Diarrhoea & gastroenteritis of presumed infectious origin	3,239	1	5,501	6	2,563	0	6,475	7	96,398	122
7 Other intestinal infectious diseases	297	1	395	0	1,230	1	1,156	0	18,690	22
8 Acute hepatitis A	76	0	130	0	53	0	73	0	3,046	4
9 Acute hepatitis B	0	0	13	0	0	0	2	0	171	3
10 Chronic, other acute & unspecified viral hepatitis	13	0	192	0	16	0	60	0	3,812	12
<b>Total</b>	<b>4,631</b>	<b>3</b>	<b>8,164</b>	<b>11</b>	<b>5,756</b>	<b>7</b>	<b>9,622</b>	<b>8</b>	<b>152,847</b>	<b>248</b>
<b>A) Water Related Diseases</b>										
11 Dengue fever	1	0	3	2	0	0	1	0	475	10
12 Dengue haemorrhagic fever	6	0	4	3	0	0	1	0	508	37
13 Malaria	1,218	0	1,647	1	4,259	1	2,551	0	52,406	47
14 Filariasis	51	0	4	0	9	0	25	0	804	0
15 Helminthiasis	53	0	239	1	163	0	130	0	2,673	1
16 Sequela of infectious and parasitic diseases	0	0	1	0	18	0	0	0	76	0
17 Other infectious and parasitic diseases	1	0	8	0	15	1	87	0	764	4
<b>Total</b>	<b>1,330</b>	<b>0</b>	<b>1,906</b>	<b>7</b>	<b>4,464</b>	<b>2</b>	<b>2,795</b>	<b>0</b>	<b>57,706</b>	<b>99</b>

Source - Statistical Section - Ministry of Health

**Annex 3/2. Hospital Statistics - Water Borne and Water Related Diseases - 1997**

Disease	Hambantota District		Badulla District		Moneragala District		Ratnapuara District		Sri Lanka	
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
<b>A) Water Borne Diseases</b>										
1 Cholera	0	0	20	2	42	0	2	0	451	1
2 Typhoid & para typhoid	157	0	316	0	513	1	579	0	7,310	3
3 Shigellosis	523	0	1,700	3	1,492	1	1,596	0	21,890	6
4 Amoebiasis with liver infection	0	0	26	0	7	0	10	0	539	1
5 Amoebiasis - other	39	0	168	0	9	0	72	0	1,423	
6 Diarrhoea & gastroenteritis of presumed infectious origin	3,820	0	6,921	7	2,736	0	6,213	5	114,815	23
7 Other intestinal infectious diseases	38	0	916	1	1,253	0	211	0	13,495	1
8 Acute hepatitis A	15	0	303	0	197	1	97	0	5,196	1
9 Acute hepatitis B	1	0	4	1	3	0	3	0	170	5
10 Chronic, other acute & unspecified viral hepatitis	1	0	300	2	15	0	79	0	3,640	1
<b>Total</b>	<b>4,594</b>	<b>0</b>	<b>10,674</b>	<b>16</b>	<b>6,267</b>	<b>3</b>	<b>8,862</b>	<b>5</b>	<b>168,929</b>	<b>40</b>
<b>A) Water Related Diseases</b>										
11 Dengue fever	1	0	0	0	2	0	8	1	287	6
12 Dengue haemorrhagic fever	0	0	1	1	1	0	0	0	206	1
13 Malaria	707	0	2,222	5	5,550	0	2,422	0	68,395	36
14 Filariasis	28	0	6	0	11	0	15	0	472	0
15 Helminthiasis	87	0	138	0	61	0	74	0	1,945	1
16 Sequela of infectious and parasitic diseases	0	0	1	0	2	0	1	0	38	0
17 Other infectious and parasitic diseases	1	0	6	0	3	0	56	0	635	0
<b>Total</b>	<b>824</b>	<b>0</b>	<b>2,374</b>	<b>6</b>	<b>5,630</b>	<b>0</b>	<b>2,576</b>	<b>1</b>	<b>71,978</b>	<b>39</b>

Source - Statistical Section - Ministry of Health

**Annex 3/3. Hospital Statistics - Water Borne and Water Related Diseases - 1998**

Disease	Hambantota District		Badulla District		Moneragala District		Ratnapuara District		Sri Lanka	
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
<b>A) Water Borne Diseases</b>										
1 Cholera	3	0	62	3	277	0	0	0	2,448	53
2 Typhoid & para typhoid	52	0	412	0	400	0	455	1	8,241	15
3 Shigellosis	457	0	1,660	2	1,086	1	1,405	1	20,340	43
4 Amoebiasis with liver infection	9	0	3	0	1	0	111	0	480	13
5 Amoebiasis - other	36	0	79	0	93	0	93	0	1,506	5
6 Diarrhoea & gastroenteritis of presumed infectious origin	3,939	0	6,314	13	5,210	1	6,034	4	131,656	215
7 Other intestinal infectious diseases	99	0	23	0	90	0	446	0	8,135	3
8 Acute hepatitis A	13	0	204	0	135	0	70	0	4,384	8
9 Acute hepatitis B	0	0	11	1	5	0	1	0	147	5
10 Chronic, other acute & unspecified viral hepatitis	3	0	176	0	13	0	93	0	2,980	12
<b>Total</b>	<b>4,611</b>	<b>0</b>	<b>8,944</b>	<b>19</b>	<b>7,310</b>	<b>2</b>	<b>8,708</b>	<b>6</b>	<b>180,317</b>	<b>372</b>
<b>A) Water Related Diseases</b>										
11 Dengue fever	1	0	0	0	0	0	9	1	469	5
12 Dengue haemorrhagic fever	0	0	0	0	0	0	1	0	370	13
13 Malaria	1,001	0	2,198	2	6,991	0	2,107	0	65,062	210
14 Filariasis	14	0	4	0	4	0	2	0	484	0
15 Helminthiasis	64	0	89	0	71	0	84	0	1,941	2
16 Sequela of infectious and parasitic diseases	0	0	0	0	13	0	1	0	62	1
17 Other infectious and parasitic diseases	3	0	3	0	19	0	19	0	741	1
<b>Total</b>	<b>1,083</b>	<b>0</b>	<b>2,294</b>	<b>2</b>	<b>7,098</b>	<b>0</b>	<b>2,223</b>	<b>1</b>	<b>69,129</b>	<b>232</b>

Source - Statistical Section - Ministry of Health

**Annex 3/ 4. Hospital Statistics - Water Borne and Water Related Diseases - 1999**

Disease	Hambantota District		Badulla District		Moneragala District		Ratnapuara District		Sri Lanka	
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
<b>A) Water Borne Diseases</b>										
1 Cholera	0	0	14	3	75	2	1	0	295	18
2 Typhoid & para typhoid	85	0	563	0	467	0	818	5	9,172	13
3 Shigellosis	411	0	2,311	4	895	1	1,677	2	16,167	31
4 Amoebiasis with liver infection	2	0	20	0	6	0	2	0	448	13
5 Amoebiasis - other	30	0	59	0	29	0	57	0	1,566	3
6 Diarrhoea & gastroenteritis of presumed infectious origin	2,593	1	6,782	11	4,998	6	6,136	13	118,401	135
7 Other intestinal infectious diseases	184	0	71	0	75	0	1,792	0	8,732	5
8 Acute hepatitis A	10	0	44	0	62	0	105	5	2,564	11
9 Acute hepatitis B	2	0	8	1	0	0	1	0	152	5
10 Chronic, other acute & unspecified viral hepatitis	6	0	102	0	9	0	183	1	2,301	9
<b>Total</b>	<b>3,323</b>	<b>1</b>	<b>9,974</b>	<b>19</b>	<b>6,616</b>	<b>9</b>	<b>10,772</b>	<b>26</b>	<b>159,798</b>	<b>243</b>
<b>A) Water Related Diseases</b>										
11 Dengue fever	3	0	2	0	0	0	6	0	723	5
12 Dengue haemorrhagic fever	0	0	0	0	0	0	0	0	347	5
13 Malaria	1,052	0	3,728	3	11,630	2	2,526	4	65,408	117
14 Filariasis	11	0	14	0	244	0	9	0	737	0
15 Helminthiasis	71	0	90	0	9	0	138	0	2,135	0
16 Sequela of infectious and parasitic diseases	1	0	4	0	0	0	8	0	78	0
17 Other infectious and parasitic diseases	0	0	36	0	17	0	26	0	910	1
<b>Total</b>	<b>1,138</b>	<b>0</b>	<b>3,874</b>	<b>3</b>	<b>11,900</b>	<b>2</b>	<b>2,713</b>	<b>4</b>	<b>70,338</b>	<b>128</b>

Source - Statistical Section - Ministry of Health

**Annex 3/5. Hospital Statistics - Water Borne and Water Related Diseases - 2000**

Disease	Hambantota District		Badulla District		Moneragala District		Ratnapuara District		Sri Lanka	
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
<b>A) Water Borne Diseases</b>										
1 Cholera	0	0	0	0	0	0	1	0	23	0
2 Typhoid & para typhoid	69	0	520	0	591	0	643	3	8,552	14
3 Shigellosis	361	0	1,200	0	570	0	850	3	10,342	11
4 Amoebiasis with liver infection	0	0	32	0	0	0	20	0	419	15
5 Amoebiasis - other	0	0	27	0	55	0	15	0	857	0
6 Diarrhoea & gastroenteritis of presumed infectious origin	1,705	0	5,981	3	3,966	3	5,837	9	110,501	138
7 Other intestinal infectious diseases	102	0	402	0	553	0	558	35	10,736	5
8 Acute hepatitis A	9	0	23	0	56	0	69	0	1,608	2
9 Acute hepatitis B	0	0	0	0	0	0	5	0	84	5
10 Chronic, other acute & unspecified viral hepatitis	0	0	179	0	15	0	143	4		
<b>Total</b>	<b>2,246</b>	<b>0</b>	<b>8,364</b>	<b>3</b>	<b>5,806</b>	<b>3</b>	<b>8,141</b>	<b>54</b>	<b>143,122</b>	<b>190</b>
<b>A) Water Related Diseases</b>										
11 Dengue fever	12	0	105	0	0	0	166	1	4,024	16
12 Dengue haemorrhagic fever	0	0	20	3	0	0	4	0	1,546	47
13 Malaria	1,048	1	3,594	1	12,336	10	2,401	6	58,863	111
14 Filariasis	5	0	2	0	1	0	10	0	491	0
15 Helminthiasis	78	0	79	0	24	0	118	0	1,963	0
16 Sequela of infectious and parasitic diseases	0	0	2	0	1	0	4	0	84	0
17 Other infectious and parasitic diseases	1	0	63	0	39	0	27	0	917	3
<b>Total</b>	<b>1,144</b>	<b>1</b>	<b>3,865</b>	<b>4</b>	<b>12,401</b>	<b>10</b>	<b>2,730</b>	<b>7</b>	<b>67,888</b>	<b>177</b>

Source - Statistical Section - Ministry of Health

**Table 3.5. Incidence of Some Selected Water Borne and Water Related Diseases - Hospital Statistics**

Category of Disease \Year	Hambantota District		Badulla District		Moneragala District		Ratnapura District		Sri Lanka	
	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths	Cases	Deaths
<b>Water Borne Diseases</b>										
1996	4,631	3	8,164	11	5,756	7	9,622	8	152,847	248
1997	4,594	0	10,674	16	6,267	3	8,862	5	168,929	402
1998	4,611	0	8,944	19	7,310	2	8,708	6	180,317	372
1999	3,323	1	9,974	19	6,616	9	10,772	26	159,798	243
2000	2,246	0	8,364	3	5,806	3	8,141	54	143,122	190
<b>Water Related Diseases</b>										
1996	1,330	0	1,906	7	4,464	2	2,795	0	57,706	99
1997	824	0	2,374	6	5,630	0	2,576	1	71,978	390
1998	1,083	0	2,294	2	7,098	0	2,223	1	69,129	232
1999	1,138	0	3,874	3	11,900	2	2,713	4	70,338	128
2000	1,144	1	3,865	4	12,401	10	2,730	7	67,888	177

Source - Statistical Section - Ministry of Health