

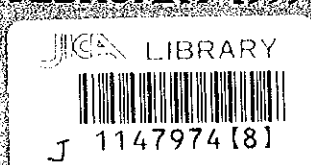
JAPAN INTERNATIONAL COOPERATION AGENCY  
MINISTRY OF HOUSING AND URBAN DEVELOPMENT  
DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA

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GREATER KANDY AND NUWARA ELIYA  
WATER SUPPLY  
AND  
ENVIRONMENTAL IMPROVEMENT PLAN  
IN  
THE DEMOCRATIC SOCIALIST REPUBLIC  
OF  
SRI LANKA

VOLUME II

GREATER KANDY  
(MAIN REPORT)

FEBRUARY 1999



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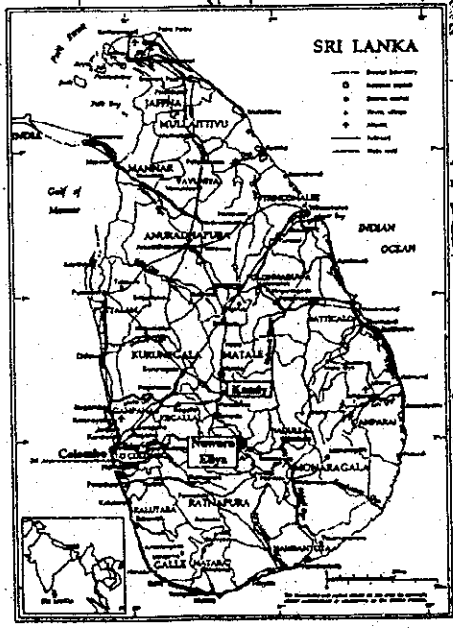
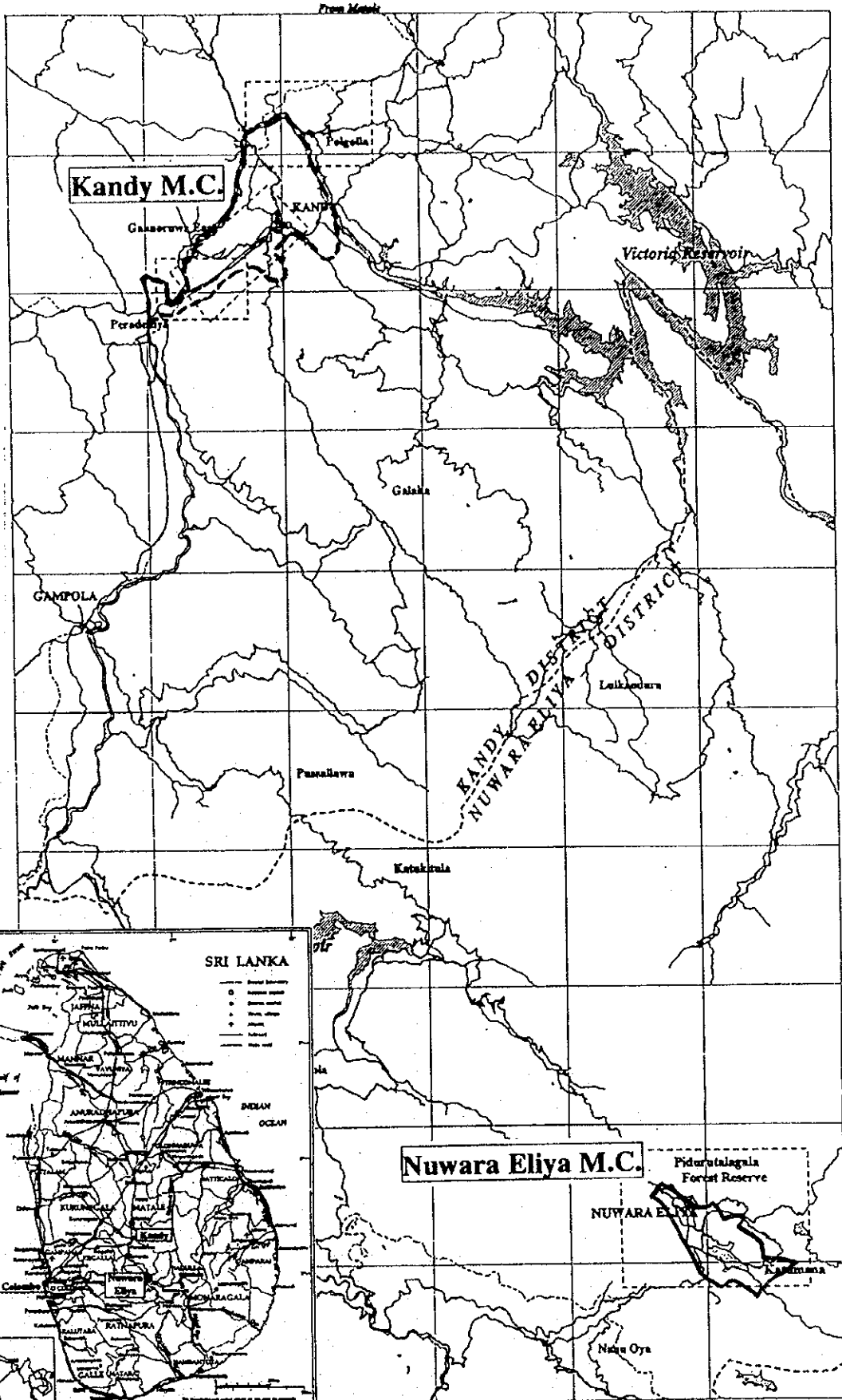
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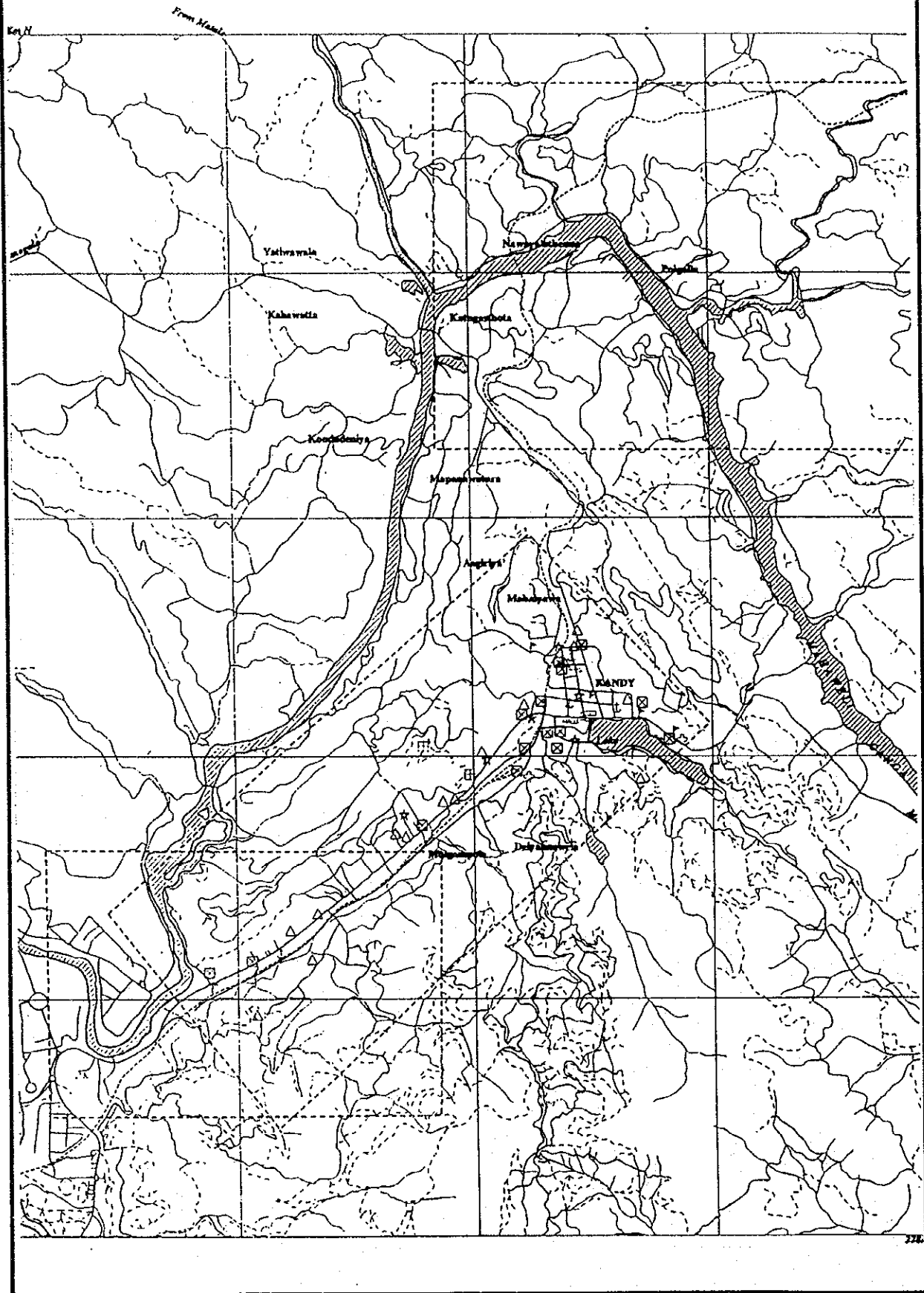


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# LOCATION MAP OF STUDY AERA



# STUDY AREA – KANDY (KMC)



**GREATER KANDY AND NUWARA ELIYA  
WATER SUPPLY AND ENVIRONMENTAL IMPROVEMENT PLAN**

**VOLUME II  
(MAIN REPORT, GREATER KANDY)**

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## ABBREVIATIONS AND ACRONYMS

### 1. Unit

|                                |  |
|--------------------------------|--|
| cm                             | centimeter                             |
| ft.                            | foot                                   |
| g                              | gram                                   |
| gpcd                           | gram per capita per day                |
| ha                             | hectare (1 ha = 10,000m <sup>2</sup> ) |
| hr                             | hour                                   |
| kg                             | kilogram                               |
| km                             | kilometer                              |
| km <sup>2</sup> , or sq.km     | square kilometer                       |
| kV                             | kilovolt                               |
| kW                             | kilowatt                               |
| kWh                            | kilowatt hour                          |
| l, or L                        | liter                                  |
| l/day, or l/d                  | liter per day                          |
| l/sec, or l/s                  | liter per second                       |
| lpcd, or Lpcd                  | liter per capita per day               |
| m                              | meter                                  |
| m/s, or m/sec                  | meters per second                      |
| m <sup>2</sup> , or sq.m       | square meter                           |
| m <sup>3</sup> , or cu.m       | cubic meter                            |
| m <sup>3</sup> /d, or cu.m/day | cubic meter per day                    |
| m <sup>3</sup> /min            | cubic meter per minute                 |
| m <sup>3</sup> /s, or cu.m/sec | cubic meter per second                 |
| MCM                            | million cubic meter                    |
| mgd                            | million gallons per day                |
| mg/l                           | milligram per liter                    |
| mm                             | millimeter                             |
| Mpa                            | megapascal                             |
| ppm                            | parts per million                      |
| Rs.                            | Sri Lankan Rupee                       |
| V                              | volt                                   |

### 2. Water Quality

|                  |  |
|------------------|--|
| BOD <sub>5</sub> | Biochemical Oxygen Demand (20°C, 5 days) |
| COD              | Chemical Oxygen Demand                   |
| DO               | Dissolved Oxygen                         |
| EC               | Electrical Conductivity                  |
| pH               | Hydrogen ion potential                   |
| SS               | Suspended Solids                         |
| TS               | Total Solids                             |

### 3. Organizations

|         |  |
|---------|--|
| ADB     | Asian Development Bank                   |
| CEA     | Central Environmental Authority          |
| CEB     | Ceylon Electricity Board                 |
| CPC     | Central Provincial Council               |
| FINNIDA | Finnish International Development Agency |

|                  |  |
|------------------|--|
| GS               | Gramasevaka Divison (local administrative unit)                    |
| IBRD             | International Bank for Reconstruction and Development (World Bank) |
| ICC              | Interagency Co-ordinating Committee                                |
| IDA              | International Development Association (soft loan facility of IBRD) |
| IMF              | International Monetary Fund  |
| JICA             | Japan International Cooperation Agency (Japan)                     |
| KMC              | Kandy Municipal Council  |
| MASL             | Mahaweli Authority of Sri Lanka                                    |
| MHUD             | Ministry of Housing and Urban Development                          |
| MOF              | Ministry of Finance  |
| MSL              | Mean Sea Level   |
| NEMC             | Nuwara Eliya Municipal Council                                     |
| NHDA             | National Housing Development Authority                             |
| NJS              | Nippon Jogesuido Sekkei Co., Ltd.                                  |
| NWSDB, or NWS&DB | National Water Supply and Drainage Board                           |
| OECD             | Organization for Economic Cooperation and Development              |
| OEFC             | Overseas Economic Cooperation Fund (Japan)                         |
| PS               | Pradeshiya Sabha (local administrative unit)                       |
| RDA              | Road Development Authority   |
| RSC              | Regional Support Center, NWSDB                                     |
| UC               | Urban Council  |
| UDA              | Urban Development Authority  |
| UNDP             | United Nations Development Program                                 |
| UNICEF           | United Nations International Children's Emergency Fund             |
| USAID            | United States Agency for International Development                 |
| WHO              | World Health Organization  |
| WRC              | Water Resources Council  |
| WRS              | Water Resources Secretariat  |

#### 4. Others

|      |                                   |
|------|-----------------------------------|
| BOT  | Build - Operate - Transfer        |
| BWL  | Bottom Water Level                |
| CED  | Central Environmental Division    |
| CPI  | Consumer Price Index              |
| EAC  | Environmental auditing Commission |
| EIA  | Environmental Impact Assessment   |
| EIRR | Economic Internal Rate of Return  |
| FIRR | Financial Internal Rate of Return |
| FY   | Fiscal Year                       |
| GDP  | Gross Domestic Product            |
| GL   | Ground Level                      |
| GNP  | Gross National Product            |
| GST  | Government Sales Tax              |
| HWL  | High Water Level                  |
| HH   | Household                         |
| IEE  | Initial Environmental Examination |
| LWL  | Low Water Level                   |
| L/S  | Lift Station                      |
| NGO  | Non-Governmental Organization     |
| NRW  | Non-revenue Water                 |
| ODA  | Official Development Assistance   |
| PEU  | Project Environmental Unit        |

|      |                                   |
|------|-----------------------------------|
| P/S  | Pumping Station                   |
| SLS  | Sri Lankan Standards              |
| STP  | Sewage Treatment Plant            |
| T.A  | Technical Assistance              |
| TWL  | Top Water Level                   |
| UFW  | Unaccounted-For-Water             |
| VAT  | Value Added Tax                   |
| WID  | Women in Development              |
| WTP  | Water Treatment Plant             |
| WWTP | Wastewater Treatment Plant (=STP) |

**PART 1**

**GENERAL**

## **CHAPTER 1**

## **INTRODUCTION**



# CHAPTER 1 INTRODUCTION

## 1.1 Preamble

The Study on Greater Kandy and Nuwara Eliya Water Supply and Environmental Improvement Plan (hereinafter referred to as "the Study") was carried out in accordance with the Scope of Work agreed between the Ministry of Housing and Urban Development (hereinafter referred to as "MHUD") and the Preparatory Study Team dispatched by the Japan International Cooperation Agency (hereinafter referred to as "JICA") on October 2, 1997. JICA had organized the Japanese Study Team (hereinafter referred to as "the Study Team") and dispatched to commence the Study from February 1998. The Study was completed on January 1999 and the entire outcome was compiled into this Report.

## 1.2 Background of the Study

The Greater Kandy area is located some 120 km from Colombo, capital of Sri Lanka. The Greater Kandy area has a population of 630,000 (1995) with an area of 460 km<sup>2</sup>. Nuwara Eliya located approximately 80 km south of the Greater Kandy area has a population of 34,000 (1995) and an area of 12.6 km<sup>2</sup>. Both areas are functioning as centers of tourism and local industries in Sri Lanka. Kandy in particular boasts cultural assets and Nuwara Eliya has famous tea plantations.

In recent years, population of the Greater Kandy area has grown rapidly to the point that water demand now exceeds that of water supply capacity. In 1994, the National Water Supply and Drainage Board (hereinafter referred to as "the NWSDB") prepared the "Water Supply Master Plan for Greater Kandy" under the financial assistance of the Finnish International Development Agency (hereinafter referred to as "FINNIDA"). However, its implementation has been suspended due to financial constraints. A pre-feasibility study of the sewerage system in the area was also prepared by the NWSDB, and although the environmental situation is not good because of the lack of a proper sewage treatment system, its implementation, however, has also been suspended.

In Nuwara Eliya, the water supply status is worse than the Greater Kandy area in general because the yield of existing water sources is much less than the present water demand in the dry season. The sanitation system in the area is also poor because of the lack of a proper

sewage treatment system.

Because of the aforementioned situation the Government of the Democratic Socialist Republic of Sri Lanka (hereinafter referred to as "the Government of Sri Lanka") requested the Government of Japan to grant technical co-operation to conduct the "Study on Greater Kandy and Nuwara Eliya Water Supply and Environmental Improvement Plan" in the Democratic Socialist Republic of Sri Lanka (hereinafter referred to as "the Study"). In response to the request of the Government of Sri Lanka the Government of Japan decided to conduct the Study.

Accordingly, the Japan International Cooperation Agency (hereinafter referred to as "JICA"), the official agency responsible for the implementation of the technical co-operation programs of the Government of Japan, commenced the Study, in close co-operation with the concerned authorities of the Government of Sri Lanka.

JICA dispatched the preparatory study team to identify the Scope of Work for the Study. On the basis of the Scope of Work agreed upon between the NWSDB and JICA on 2 October 1997 in Colombo, JICA made a contract with Nippon Jogesuido Sekkei Co., Ltd. on 30 January 1998 to conduct the Study.

### **1.3 Objectives of the Study**

The objectives of the Study are:

- a. To formulate a Water Supply and Sewerage Master Plan up to the target year of 2015.
  - to review and complement the existing Water Supply Master Plan for Greater Kandy.
  - to formulate a Master Plan for Nuwara Eliya.
- b. To conduct a Feasibility Study for the priority project/s identified in the Master Plan
- c. To enable the transfer of technology to the NWSDB personnel in the course of the Study.

### **1.4 Scope of Work**

In order to achieve the objectives outlined in Section 1.2, the Scope of Work for the Study includes the following items:

## **Phase I : Formulation of Master Plan**

Collection and analysis of existing data and information on the water supply and sewerage sector:

The National Background:

- a. Country background
- b. Socio-economic and health indicators
- c. Sector organizations and institutions
- d. Present service coverage and standards
- e. Sector goals
- f. Financial conditions
- g. Involvement of other donor agencies

The study area:

- a. Natural conditions
- b. Socio-economic and health conditions
- c. Regional development prospects
- d. Existing and future use
- e. Water resources
- f. Sector organizations and institutions
- g. Management and budget conditions of the organizations
- h. Present service coverage and standards
- i. Environment and ecosystem

Understanding of the Existing services:

- a. Existing water supply system and its service level
- b. Existing sanitation drainage and solid waste services

Field surveys and analysis:

- a. Preliminary environmental survey
- b. Survey on public consciousness on public health and sanitation
- c. Survey on willingness and affordability to pay
- d. Water and wastewater quality

Formulation of Master Plan:

- a. Determination of planning framework
- b. Determination of basic policies, goals, targets and strategies
- c. Identification of the alternatives
- d. Outline design for suggested facilities
- e. Cost estimates
- f. Evaluation of the alternative
- g. Selection of the best alternative
- h. Organizational and institutional projection
- i. Capacity building program
- j. Financial plan
- k. Staged implementation plan
- l. Identification of the priority project/s

## **Phase II: Feasibility Study on the Priority Project/s**

Collection and analysis of supplementary data and information on the Project area and beneficiaries:

Supplementary field survey/s, as necessary:

- a. Implementation of feasibility Study
- b. Preliminary design of facilities
- c. Equipment plan
- d. Operation and maintenance plans
- e. Organizational and institutional systems
- f. Tariff, charges and revenue systems for services
- g. Cost estimation
- h. Conduct of Environmental Impact Assessment (EIA)
- i. Comprehensive project evaluation including:
  - technical aspects (appropriate technology)
  - financial aspects
  - social aspects
  - economic aspects
- j. Implementation plan

## **1.5 Study Area**

The study covers the following areas:

- 1) Greater Kandy area consisting of following:
  - a. Kandy Municipal Council area
  - b. a part of Kandy Four Gravets P/S
  - c. a part of Harispattuwa P/S
  - d. a part of Akurana P/S
  - e. a part of Pujapitiya P/S
  - f. a part of Patha Dumbara P/S
  - g. a part of Udunuwara P/S
  - h. a part of Yatinuwara P/S
  - i. a part of Udapalatha P/S
  - j. a part of Kundasale P/S
  - k. a small part of Patha Hewahera
- 2) Nuwara Eliya Municipal Council area

## **1.6 Target Year**

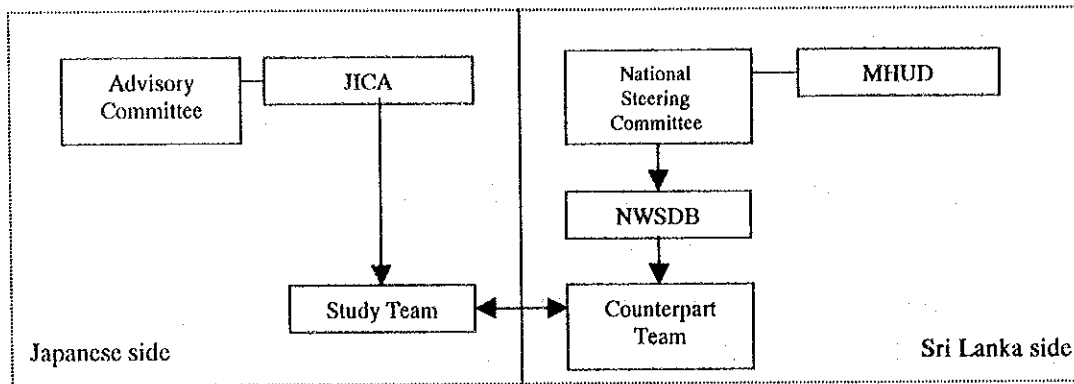
The target year of the master plans is year 2015. However, projections of served population and water demand was extended until the year 2020.

The Target year for the priority projects was set at the year 2005.

## **1.7 Formation of the Study**

### **1.7.1 General**

The Study was carried out in accordance with the Scope of Work agreed upon between the MHUD and JICA. The MHUD had organized the national steering committee and counter-part team, and accomplished the Study in close cooperation with the Study Team. The overall set-up for the implementation of the Study is as shown below.



### 1.7.2 Implementation Set-up of Japanese Side

The implementation set-up of the Japanese side consisted of the Study Team and the Advisory Committee under the general supervision of the JICA headquarters. The composition of the JICA Advisory Committee is shown below:

|                   |   |   |
|-------------------|---|---|
| Mr. Yoshiki Omura | Chairperson,                              | Development Specialist, Institute for International Cooperation, JICA                     |
| Mr. Ichiro Harada | Committee Member<br>Sewerage & Sanitation | Senior Researcher,<br>Public Works Research Institute,<br>Ministry of Construction, Japan |
| Mr. Atsushi Sato  | Committee Member<br>Water Supply          | Planner, Water Supply Bureau, Enterprise Agency, Kanagawa Pref.                           |

Composition of the Study Team is shown below.

|                        |   |
|------------------------|---|
| Mr. Takafumi Kiguchi   | Team Leader                               |
| Mr. John M. McGill     | Water Supply Planning                     |
| Mr. Shigeo Sawai       | Water Supply Facility Design - 1          |
| Mr. Masaya Goto        | Water Supply Facility Design - 2          |
| Mr. Shin-ichi Osaka    | Sewerage & Sanitation Planning            |
| Mr. Richard R. Deussen | Sewerage & Sanitation Facility Design - 1 |
| Mr. Toru Yagi          | Sewerage & Sanitation Facility Design - 2 |
| Mr. Hidemasa Sato      | Geophysical Survey                        |
| Dr. James Wilkinson    | Hydrogeology                              |
| Dr. Giovanni Crema     | Environmental Impact Assessment           |
| Mr. Wilfrido Barreiro  | Institution / Organization                |
| Mr. Kunimasa Nishigaya | Finance / Administration                  |

### 1.7.3 Implementation Set-up of Sri Lanka Side

The implementation set-up of Sri Lanka side consists of the MHUD, the NWSDB, NWSDB counterpart personnel, and the National Steering Committee for the Study composed by representatives from authorities concerned. Overall coordination of the Steering Committee was handled by the MHUD.

The Steering Committee was organized by following representatives of relevant authorities.

#### Ministry of Housing and Urban Development

|                          |                                  |
|--------------------------|----------------------------------|
| Mr. V. K. N. Nanayakkara | Secretary                        |
| Mr. C. H. de Tissera     | Additional Secretary (Technical) |
| Mr. T. B. Madugalle      | Consultant                       |
| Mr. Padmasiri Perera     | Director (Construction)          |
| Mr. K. T. P. Fernando    | Deputy Director (Construction)   |

#### Ministry of Finance

|                       |                              |
|-----------------------|------------------------------|
| Mr. J. H. J. Jayamaha | Director, External Resources |
| Ms. M. Karunaratne    | Director, National Planning  |

#### Central Provincial Council

|                    |                 |
|--------------------|-----------------|
| Mr. K. B. Sirisena | Chief Secretary |
|--------------------|-----------------|

#### Kandy Municipal Council

|                     |                        |
|---------------------|------------------------|
| Ms. J. C. Bulumulla | Municipal Commissioner |
|---------------------|------------------------|

#### Nuwara Eliya Municipal Council

|                    |                        |
|--------------------|------------------------|
| Mr. S. D. Piyadase | Municipal Commissioner |
|--------------------|------------------------|

#### National Water Supply and Drainage Board

|                          |   |
|--------------------------|---|
| Dr. N. S. K. N. de Silva | Chairman  |
| Mr. W. A. Karunaratne    | General Manager                                     |
| Mr. K. M. N. S. Fernando | Additional General Manager, Planning and Monitoring |
| Mr. S. K. H. Perera      | Deputy General Manager, Planning and Design         |
| Mr. D. N. J. Ferdinando  | Assistant General Manager, Japanese Project Unit    |
| Ms. M. K. Bandara        | Assistant General Manager, Planning and Design      |

Counterpart personnel were shown below.

|                         |  |
|-------------------------|--|
| Mr. P. H. Sarath Gamini | Project Manager/Chief Engineer, Planning and Design, NWSDB |
|-------------------------|--|

Mr. S. R. Ranasinghe      Engineer, P&D, NWSDB

Mr. H. D. J. Dharmapala      Engineering Assistant, P&D, NWSDB

## **1.8      Organization of the Reports**

The reports of the Study in the English language were compiled in the following five volumes:

- Volume 1    Summary Report
- Volume 2    Main Report (Greater Kandy)
- Volume 3    Supporting Report and Data (Greater Kandy)
- Volume 4    Main Report (Nuwara Eliya)
- Volume 5    Supporting Report and Data (Nuwara Eliya)

The Summary Report presents an abridge overview of the major study results for both study areas, while the Main Reports (Volumes 2 and 4) present the overall results of the Study for each study area. Detailed discussions, appendices, and field data are contained in the Supporting Report and Data for each study area (Volumes 3 and 5). The organizational structure of the reports requires that certain portions are repeated in different volumes.



## **CHAPTER 2**

## **DESCRIPTION OF THE STUDY AREA**

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## **CHAPTER 2 DESCRIPTION OF THE STUDY AREA**

### **2.1 General Outline of the Study Area**

#### **2.1.1 Administrative Overview and Current Sector Policies and Strategy**

The Government of Sri Lanka has adopted the "some (water) for all" global strategy recommendation follows the Water and Sanitation Decade of the 1980's. The current estimate of annual capital investments to achieve this sector's objective by 2010 is in the order of Eight Billion Ruppees. Water demand has accelerated with urbanisation and economic growth and the Government has adopted medium-term policies and strategies to address this challenge.

To improve the quality of projects, new criteria for assessing them financial viability have been formulated. Water tariffs are gradually being adjusted to reflect real production costs. To increase the operating efficiencies of the various utilities, initiatives towards reducing un-accounted-for-water have been emphasised. The Government has instituted a policy of providing a capital development grant subsidy of up to 50% of project costs in urban areas or 85% subsidy in rural areas. The loan component is provided at the rate of 10% p.a. over 24 years with a 2-year grace period (interest rate reduced from 12% p.a. in June 1998). The Government also seeks to promote and attract the participation of the private sector and community organisations in facilities construction, operation and maintenance. To improve project affordability, the Government has called for the adoption of appropriate and effective low-cost technologies and methods for service provision.

#### **2.1.2 Relevant Sector Legislation**

The **National Water Supply and Drainage Board Law (Act No 2 of 1974)**, as amended, established and directed the NWSDB to develop and manage a co-ordinated national program for water supply and sewerage for the entire country. Significantly, the Law empowers the NWSDB to take over existing systems from local authorities under voluntary or compulsory transfer orders. The NWSDB is also authorised to operate as a water and sewerage utility, providing services either directly to customers or through bulk supplies to local authorities, government agencies or any other organisation, who can manage the distribution of water. Many of the poorly managed and deteriorated water systems were transferred to the NWSDB, thus increasing its utility management, operation and maintenance responsibilities. The NWSDB has become the lead agency for planning, design and implementation of urban and rural water supplies, providing technical assistance and services to local authorities.

The **National Environmental Act (Act No. 47 of 1980)**, as amended, created the Central Environmental Authority (CEA). The CEA is mandated to protect, manage and enhance the environment; regulate, maintain and control the quality of the environment; and prevent, abate and control pollution. The Act vests broad powers and authority to the CEA and the inter-ministerial Environment Council. The CEA is responsible for formulating policy recommendations affecting natural resources, fisheries, wildlife, forestry and soil conservation. Licenses and permits are required from the CEA for discharging wastes to the environment. The CEA reviews and approves all projects.

### 2.1.3 Key Sector Agencies

The **Ministry of Housing and Urban Development** has the overall responsibility for promoting, guiding and co-ordinating the development of human settlements, land reclamation and the construction industry. The development of urban centres and the required urban infrastructure, including water and wastewater facilities, is a critical function. There are several authorities under its administrative control, including the *National Water Supply and Drainage Board*. The NWSDB, described in the preceding section, has decentralised its operations to five (5) Regional Support Centres and several regional and district offices. Also under the Ministry are: the *National Housing Development Authority* which is tasked with developing housing projects; the *Urban Development Authority* which is entrusted with the responsibility for integrated planning and development of socio-economic and physical infrastructure; and the *Town and Country Planning Department*, which plans (and implements) new town development schemes.

The **Ministry of Health and Women's Affairs** is responsible for the national health policy including the implementation of sanitation and hygiene education programs. The Ministry also exercises regulatory functions over water supply provision, solid waste management and pollution abatement, insofar as they affect environmental health conditions. The Ministry, through its provincial offices, undertakes a national sanitation program in co-ordination with the health departments of the various local authorities. The Ministry provides incentives for households to construct hygienic sanitary facilities.

The *Mahaweli Authority of Sri Lanka* under the **Ministry of Irrigation** administers the Mahaweli Development Program. It is tasked to lead the integrated development within the river basin. It is developing several irrigation and hydroelectric power generation projects

through dams and barrages along the Mahaweli River. The Authority monitors the quality and flow of the river and regulates the withdrawal and discharge of water.

The *Central Environmental Authority* of the **Ministry of the Environment** is responsible for, among others, water pollution control policies and standards. It undertakes a quality surveillance program for regulation and enforcement of policies and standards.

The *Department of External Resources* of the **Ministry of Finance** assesses the foreign exchange requirements; co-ordinates with external support agencies and negotiates for grant and loan financing facilities for priority projects of the various ministries. It also reviews the utilisation of external assistance funds. The principal sources of multilateral loans for water supply and sanitation in Sri Lanka are the IDA/World Bank and the ADB. The governments of France, Finland and Japan have provided significant grant funds and loans for capital improvements, rehabilitation and technical assistance.

In 1993-94, ADB and USAID assisted a project to assess and prepare an institutional strengthening and capacity building plan for the entire water resources sector. This project produced a "*Strategic Framework and an Action Plan for Comprehensive Water Resources Management*". A high-level *Water Resources Council (WRC)* was organised to oversee the Action Plan implementation and to co-ordinate resolution of inter-sectoral and intra-sectoral issues. The Council consists of six (6) Cabinet Secretaries, two (2) representatives each from the private sector and the NGO sector, one (1) representative each from the academe, from farmers' groups and from the National Planning Department of the Ministry of Finance. A *Water Resources Secretariat (WRS)* was established to support the work of the WRC. In addition, an *Interagency Co-ordinating Committee (ICC)*, consisting of selected water agency heads, was also organised to ensure the technical soundness of the decisions and actions taken. The expected final outputs of this initiative are:

- a national policy for comprehensive water resources management;
- recommendations for improved information systems for the water sector;
- a model for integrated river basin planning;
- an institutional framework for co-ordination within the water sector;
- improved skills through capacity building programs; and
- a framework for public participation in planning, implementation and monitoring.

## 2.1.4 Local Administrative Overview

In Sri Lanka, the general administrative or executive structure may be described through three (3) administrative structures.

### (1) Central Structure.

The elected *President* appoints *Cabinet Ministers* (including the Prime Minister) from among the members of Parliament, to head the various ministries. For each of the ministries, a senior official is designated as *Secretary* to manage its activities. The ministries have departments, semi-government corporations and/or public enterprises under them to perform their functions. In most instances, the departments and corporations may even have offices located at the lower levels – up to divisional levels.

### (2) Provincial Structure.

The President is also empowered to appoint *Governors* for each province. The 13<sup>th</sup> Amendment to the present Constitution calls for the *devolution* of powers and responsibilities to the lower levels of government. The powers and responsibilities devolved include: education, police, law and order, housing and construction, health, irrigation, land development, plan implementation and local government. *Provincial Council* members are elected for 4-year terms to oversee these devolved functions. Following the central-level structure, the Governor appoints Provincial Ministers, including a Chief Minister, from among the Provincial Council members.

### (3) Local Government Structure.

- 1) Pradeshiya Sabha (PS's) or rural local authorities were established by law in 1987. Headed by an elected Chairman, the PS has broad powers and service functions. The PS can levy fees, raise taxes and adopt regulations.
- 2) Municipal Councils (MC's) and Urban Councils (UC's), also established by law, function in urban areas and have similar powers and responsibilities as the PS's. The Mayor is the chief executive of the MC, assisted by a Municipal Commissioner; while the UC has a Chairman, assisted by a Secretary.

The *Divisional Secretary (DS)* is the key link among the three administrative structures. The DS functions as the Additional Government Agent under the central Ministry of Public Administration, Provincial Councils and Home Affairs. The functions of the Provincial Departments at the Divisional Level are all (with few exceptions) performed by the DS. At the same time, the DS acts as the Assistant Commissioner of Local Government. At the village

level, the *Grama Niladhari* assists the DS in co-ordinating and delivering the services in one or more villages.

### **2.1.5 Administrative Composition of the Greater Kandy Study Area**

The Study Area is located within the Kandy District and the Nuwara Eliya District of the Central Province. The term *Greater Kandy* is not an officially recognised administrative entity. However, it is gaining wide usage among planners and policymakers. First introduced by the NWSDB in its Master Plan, the term *Greater Kandy* has since been redefined by the Urban Development Authority to refer to the Kandy Municipal Council area and other ten (10) PS's areas under the oversight of the Division Secretary. The 10 PS's and an estimate of the PS population included in this study are; Udunuwara 75%; Yatinuwara 60%; Kandy Four Gravets 98%; Harispatuwa 93%; Patha Dumbara 80%; Kundasale 90%; Akurana 98%; Pujapitiya 72%; Patha Hewaheta 20%, and Udapalatha 3%. It should also be noted that the Study Area is within the concern of the Mahaveli Development Authority, which is designated as special "government agent" to oversee water resources utilisation and conservation in the area.

For the purposes of this Study, the key administrative bodies involved are the Kandy Municipal Council and the NWSDB. Information sharing, consultations and other administrative co-ordination will be carried out through the NWSDB, the lead Project counterpart.

## **2.2 Physical Characteristics of the Study Area**

### **(1) Location**

As noted above, the Kandy District is situated in the Central Province of Sri Lanka. The other two districts in the Central Province are Matale and Nuwara Eliya. The Districts surrounding Kandy are Matale (to the North), Badulla, Nuwara Eliya, Kegalle and Kurunegala respectively. Kandy District has a land area of about 1,900 km<sup>2</sup>.

The main city of the District is also named Kandy. The other major towns in the District are Gampola and Nawalapitiya. Wattedagama, Pussellawa, Teldeniya and Kadugannawa are smaller towns in the Kandy District.

### **(2) Topography**

The entire Kandy District is comprised of hilly terrain, with elevation varying from 300m to 2,000m above mean sea level (MSL). The major perennial river, the Mahaweli Ganga

(River), crosses the district from a South-West to a North-East direction, up to the centre of Kandy and then flows northwards. The lowest land elevations in the district are along the Mahaweli valley. The major tributaries of the Mahaweli River in the district are Kotmale Oya, Atabage Oya, Nilambe Oya, Pinga Oya, Hulu Ganga, Maha Oya, Hasalaka Oya and Heen Ganga.

(3) Geology

The main soil type found in the Kandy District is made up of reddish brown latosolic soil and immature brown loam. The underlying bedrock is mainly pre-Cambrian crystalline rocks of the highland series.

(4) Climate

Most of Kandy District is in Sri Lanka's wet zone. The District receives an annual rainfall of 1,600 - 2,000 mm. A summary of the precipitation, relative humidity, sunshine, and temperature data during 1987 to 1997 available for the district is presented in Table 2.1. The average temperature varies between 23.6°C and 26.5°C, and the mean relative humidity varies between 72.2% and 85.8%. The monthly average precipitation varies between 54.7 mm in March and 298.0 mm in November. Monthly precipitation less than 100 mm usually occurs in February and March while there is normally above 300 mm in October and November. Daily sunshine hours varies between 4.3 hours and 8.2 hours.



**Table 2.1 Meteorological Data of Kandy**

STATION NAME : KATUGASTOTA  
 LAT: 7.33N LON: 80.63E ELEV: 477.0M  
 ELEMENT : Precipitation, Monthly in Millimeters

| Year     | Jan   | Feb   | Mar   | Apr   | May   | Jun   | Jul   | Aug   | Sep   | Oct   | Nov   | Dec   | Total   |
|----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|---------|
| 1987     | 82.4  | 7.3   | 59.1  | 193.0 | 159.0 | 134.0 | 1.1   | 111.5 | 191.4 | 304.1 | 199.9 | 186.2 | 1,629.0 |
| 1988     | 13.2  | 104.1 | 57.1  | 267.0 | 82.8  | 89.2  | 185.7 | 226.0 | 171.0 | 30.2  | 350.4 | 108.9 | 1,685.6 |
| 1989     | 102.4 | 15.9  | 62.7  | 121.7 | 77.2  | 225.5 | 255.3 | 149.2 | 150.0 | 273.6 | 391.1 | 23.8  | 1,848.4 |
| 1990     | 242.9 | 118.6 | 136.3 | 134.9 | 267.8 | 94.6  | 99.5  | 94.4  | 50.3  | 307.4 | 283.7 | 204.2 | 2,034.6 |
| 1991     | 194.0 | 11.8  | 62.6  | 208.6 | 83.7  | 235.7 | 128.1 | 90.5  | 64.2  | 285.2 | 206.8 | 196.9 | 1,768.1 |
| 1992     | 20.4  | 0.0   | 1.4   | 243.6 | 80.3  | 104.8 | 190.5 | 167.2 | 101.0 | 249.2 | 280.9 | 76.3  | 1,515.6 |
| 1993     | 15.6  | 52.9  | 50.4  | 80.3  | 229.3 | 287.9 | 165.3 | 73.1  | 43.4  | 422.1 | 385.9 | 351.6 | 2,157.8 |
| 1994     | 140.7 | 152.1 | 31.3  | 161.2 | 128.7 | 64.9  | 88.2  | 78.5  | 100.4 | 425.2 | 346.9 | 113.9 | 1,832.0 |
| 1995     | 142.8 | 120.4 | 79.4  | 220.1 | 273.0 | 107.8 | 49.0  | 78.8  | 136.3 | 402.8 | 176.9 | 52.5  | 1,839.8 |
| 1996     | 78.9  | 86.4  | 6.4   | 237.1 | 1.3   | 95.0  | 141.5 | 91.3  | 181.7 | 271.0 | 357.3 | 156.1 | 1,704.0 |
| 1997     | 0.0   | 85.9  | 42.6  | 191.9 | 127.2 | 45.9  | 112.3 | 39.3  | 287.1 | 438.9 | 326.7 | 214.4 | 1,912.2 |
| Mo. Avg. | 103.3 | 66.9  | 54.7  | 186.8 | 138.3 | 143.9 | 130.4 | 116.1 | 119.0 | 297.1 | 298.0 | 147.0 | 1,801.5 |

STATION NAME : KATUGASTOTA  
 ELEMENT : Mean Relative Humidity in Percent - the average of Rel Humidity at 03 and 12 hrs GMT

| Year     | Jan  | Feb  | Mar  | Apr  | May  | Jun  | Jul  | Aug  | Sep  | Oct  | Nov  | Dec  | Yr. Avg. |
|----------|------|------|------|------|------|------|------|------|------|------|------|------|----------|
| 1987     | 80.3 | 69.4 | 70.1 | 77.4 | 79.6 | 78.2 | 71.4 | 78.9 | 78.5 | 87.7 | 84.5 | 84.2 | 78.4     |
| 1988     | 76.6 | 74.3 | 77.9 | 84.0 | 79.7 | 78.9 | 81.3 | 83.5 | 82.8 | 78.7 | 85.1 | 83.0 | 80.5     |
| 1989     | 79.7 | 69.9 | 68.6 | 74.1 | 82.4 | 83.4 | 84.4 | 80.6 | 82.6 | 84.4 | 85.4 | 77.6 | 79.4     |
| 1990     | 76.4 | 75.6 | 80.9 | 81.6 | 82.3 | 79.9 | 81.4 | 78.5 | 73.8 | 81.9 | 84.6 | 85.8 | 80.2     |
| 1991     | 81.5 | 71.6 | 75.6 | 83.3 | 80.6 | 82.6 | 81.3 | 80.3 | 76.7 | 86.0 | 85.7 | 84.3 | 80.8     |
| 1992     | 77.0 | 66.1 | 58.7 | 76.0 | 81.5 | 80.3 | 81.9 | 81.5 | 82.1 | 84.7 | 88.8 | 83.3 | 78.5     |
| 1993     | 76.2 | 71.9 | 73.3 | 78.0 | 82.5 | 81.1 | 81.6 | 80.8 | 79.0 | 87.7 | 87.2 | 87.8 | 80.6     |
| 1994     | 84.2 | 80.0 | 74.8 | 82.0 | 78.1 | 77.9 | 78.4 | 78.0 | 79.8 | 89.0 | 86.3 | 82.5 | 80.9     |
| 1995     | 80.8 | 79.7 | 72.0 | 86.1 | 83.2 | 83.3 | 80.4 | 81.0 | 80.9 | 84.7 | 86.3 | 79.6 | 81.5     |
| 1996     | 79.5 | 79.0 | 69.7 | 88.2 | 73.9 | 82.8 | 80.4 | 81.4 | 85.7 | 85.5 | 84.3 | 84.4 | 81.2     |
| Mo. Avg. | 79.2 | 73.8 | 72.2 | 81.1 | 80.4 | 80.8 | 80.2 | 80.4 | 80.2 | 85.0 | 85.8 | 83.2 | 80.2     |

STATION NAME : PERADENIYA AGMET  
 LAT: 7.25N LON: 80.60E ELEV: 488.0M  
 ELEMENT : Sunshine, Monthly in Hours

| Year     | Jan   | Feb     | Mar   | Apr   | May   | Jun   | Jul   | Aug   | Sep     | Oct   | Nov   | Dec   | Total  |
|----------|-------|---------|-------|-------|-------|-------|-------|-------|---------|-------|-------|-------|--------|
| 1987     | 205.4 | 263.0   | 263.2 | 200.7 | 230.2 | 137.0 | 252.1 | 151.0 | 186.9   | 145.2 | 130.8 | 165.2 | 2330.5 |
| 1988     | 218.8 | 230.8   | 204.3 | 168.9 | 177.5 | 176.6 | 120.0 | 129.8 | 139.2   | 266.6 | 185.0 | 155.4 | 2172.8 |
| 1989     | 191.6 | (228.3) | 261.5 | 190.2 | 126.3 | 131.1 | 99.2  | 120.0 | 118.0   | 140.1 | 167.7 | 215.6 | 1989.6 |
| 1990     | 224.9 | 239.2   | 221.3 | 190.8 | 162.8 | 110.9 | 147.6 | 148.3 | 186.1   | 150.3 | 148.1 | 137.8 | 2068.1 |
| 1991     | 168.9 | 235.8   | 220.3 | 210.8 | 222.3 | 137.4 | 180.1 | 139.6 | (158.8) | 127.5 | 176.8 | 170.6 | 2149.0 |
| 1992     | 210.1 | 251.7   | 287.8 | 182.5 | 139.6 | 125.8 | 131.6 | 148.8 | 133.1   | 145.6 | 156.5 | 151.0 | 2064.1 |
| 1993     | 237.6 | 240.2   | 256.2 | 237.0 | 206.4 | 81.0  | 110.1 | 179.3 | 186.3   | 129.1 | 155.6 | 142.6 | 2161.3 |
| 1994     | 169.3 | 190.6   | 271.1 | 221.0 | 226.7 | 142.6 | 134.6 | 151.0 | 205.0   | 116.3 | 133.3 | 187.7 | 2149.2 |
| 1995     | 213.2 | 219.3   | 280.6 | 171.4 | 119.7 | 126.3 | 162.2 | 137.4 | 187.1   | 163.9 | 137.4 | 217.2 | 2135.7 |
| 1996     | 229.0 | 183.9   | 289.6 | 158.0 | 267.4 | 124.8 | 64.2  | 123.6 | 87.9    | 147.5 | 141.5 | 155.4 | 1972.8 |
| Mo. Avg. | 206.9 | 228.3   | 255.6 | 193.1 | 187.9 | 129.3 | 140.2 | 142.9 | 158.8   | 153.2 | 153.3 | 169.8 | 2119.3 |
| Day Avg. | 6.7   | 8.2     | 8.2   | 6.4   | 6.1   | 4.3   | 4.5   | 4.6   | 5.3     | 4.9   | 5.1   | 5.5   | 5.8    |

Note: Figures in ( ) are monthly average and are used for calculation of yearly average instead of lacking data.

STATION NAME : KATUGASTOTA  
 ELEMENT : Temperature, Monthly mean in Degrees C, Avg. of (Daily Max Temp + Daily Min Temp)/2

| Year     | Jan  | Feb  | Mar  | Apr  | May  | Jun  | Jul  | Aug  | Sep  | Oct  | Nov  | Dec  | Yr. Avg. |
|----------|------|------|------|------|------|------|------|------|------|------|------|------|----------|
| 1987     | 23.9 | 23.7 | 26.6 | 26.9 | 26.2 | 25.5 | 24.8 | 24.7 | 25.0 | 25.3 | 24.8 | 24.5 | 25.2     |
| 1988     | 23.9 | 24.9 | 26.4 | 26.3 | 26.2 | 25.0 | 24.9 | 24.7 | 24.6 | 25.2 | 24.1 | 23.6 | 25.0     |
| 1989     | 23.5 | 23.6 | 25.5 | 26.7 | 25.6 | 24.0 | 24.3 | 24.4 | 24.3 | 24.6 | 24.8 | 24.3 | 24.6     |
| 1990     | 23.1 | 26.0 | 26.0 | 26.4 | 25.7 | 25.1 | 24.2 | 24.7 | 25.0 | 25.2 | 24.3 | 23.8 | 25.0     |
| 1991     | 23.6 | 23.8 | 26.2 | 26.0 | 26.6 | 24.9 | 24.6 | 24.7 | 24.9 | 23.9 | 24.4 | 23.4 | 24.8     |
| 1992     | 23.6 | 23.7 | 26.2 | 27.2 | 25.7 | 24.7 | 24.2 | 24.5 | 24.1 | 24.2 | 24.5 | 23.2 | 24.6     |
| 1993     | 23.1 | 24.4 | 25.5 | 26.6 | 25.7 | 24.8 | 24.4 | 24.3 | 24.6 | 24.6 | 24.6 | 23.9 | 24.7     |
| 1994     | 23.5 | 23.9 | 25.1 | 26.1 | 26.2 | 25.2 | 24.8 | 24.4 | 24.8 | 24.6 | 24.5 | 23.7 | 24.7     |
| 1995     | 24.2 | 23.9 | 25.1 | 26.4 | 25.7 | 25.2 | 24.9 | 24.8 | 24.8 | 24.7 | 24.4 | 23.4 | 24.8     |
| 1996     | 23.4 | 24.4 | 25.9 | 26.0 | 26.2 | 25.0 | 24.6 | 24.9 | 24.3 | 24.3 | 24.4 | 23.4 | 24.7     |
| 1997     | 23.9 | 23.7 | 26.1 | 26.3 | 25.9 | 25.6 | 25.2 | 25.3 | 25.0 | 25.5 | 25.4 | 25.1 | 25.2     |
| Mo. Avg. | 23.6 | 24.2 | 25.9 | 26.5 | 26.0 | 24.9 | 24.6 | 24.6 | 24.6 | 24.7 | 24.5 | 23.7 | 24.8     |

## **2.3 Socio-Economic Perspective**

### **2.3.1 National Overview**

#### **(1) General**

With its strong human resource base and natural endowments, Sri Lanka could have achieved the growth records of its East Asian neighbours had it not been for a history of ethnic conflict, political unrest, and stop-and-go economic policies, often associated with election cycles.

Since Independence, nation-building has been strained by hostilities between the majority Sinhalese and minority Tamils. A civil war waged by Tamil separatists in the country's north and east since 1983 has exacted a heavy toll on human lives and the economy.

Sri Lanka's long-term growth rate in per capita terms compares favourably with most of the developing world, averaging 3.5 percent per year since 1960, in part reflecting its strong social indicators. But this growth performance falls short of the rates achieved by the high-performing East Asian economies such as Korea, Malaysia, Thailand, and Indonesia, because policies were less supportive of economic growth. Problems with macro-economic management have constrained domestic savings and investment and fuelled inflation. Inward-looking trade policies, excessive regulation of investment, intervention in the labour market, have impeded export growth. Pervasive controls on land ownership and use, trade, and pricing have constrained the agriculture sector's performance. Inefficient state-owned industries have burdened Government resources.

Since 1977, Sri Lanka has been trying to bring its economic policies more in line with those of the most successful Asian economies. It is seeking to increase the role of markets and the private sector by reducing restrictions on pricing, investment, and external trade and payments. However, the reform program faltered in the 1980s when Sri Lanka became immersed in civil conflict. The war destroyed infrastructure, disrupted delivery of social services, reduced private sector confidence and investment, and diminished agricultural productivity and tourist revenues. It also led to large-scale emigration. Over the past decade, military expenditure has grown by some 3 percent to 6 percent of GDP, placing a strain on the Government's budget.

Sri Lanka's economy strengthened in the early 1990s. Private sector activity and investment was encouraged by improved macroeconomic management, the dismantling of prices, investment, and foreign exchange controls, trade reforms, and privatisation. Fuelled by the private sector, real per capita GDP has increased at an average rate of 4.3 percent during 1989-94. Both savings and investment as a ratio to GDP have also increased above their long-run trend. Privatisation, especially of small and medium firms, has been initiated. Plantation companies, which were nationalised in the 1970s, are being privatised by giving long-term land leases.

Sri Lanka's main exports are tea, rubber, garments, industrial products, and coconut products. Exports, led by garments, expanded at about 12 percent a year, and official reserves rose to 4.6 months of imports by the end of 1994. Foreign direct investment and portfolio investment roughly doubled each year, reaching about \$187 million in 1994. The overall budget deficit declined from 16 percent of GDP in 1988 to about 8 percent in 1993. In 1994, however, excessive spending prior to the election increased the fiscal deficit to 10.5 percent; it remained at about that level in 1995. Prior momentum pushed real output to about 5.5 percent in 1995 while inflation increased to 7.7 percent. The external current account deficit, which averaged just over 6 percent during 1990-93, deteriorated to 8.0 percent of GDP in 1994 and 6.8 percent in 1995, despite a strong export performance. The overall balance of payments swung into deficit in 1995 for the first time in more than five years, and the import coverage of gross official reserves dropped to 4 months by year-end.

Sri Lanka's medium-term prospects depend on the Government's ability to reverse the slippage in short-term economic management which has led to a slowdown in growth and private investment, as well as to address the longer-term development constraints. The fiscal deficit is a concern and could hinder the government's poverty alleviation objectives.

The Government's medium-term goal to sustain economic growth of 7 percent by 1998 will be far easier to reach with an end to hostilities, which place a continuing damper on the Sri Lankan economy. Achieving this pattern of growth should ensure progress in reducing unemployment and poverty. Continued strong growth of exports, if sustained over the medium-term at the annual 12 percent average achieved in 1989-1994, would continue to provide the impetus for growth. This will require further diversification, as tea still accounts for more than 20 percent of total exports, and garments account for close to another 50 percent. Tourism, which experienced a major rebound in the early 1990s,

can also continue to contribute significantly to growth, especially if Sri Lanka can upgrade its facilities and services to attract tourism with higher value added.

## (2) Human Capital

Sri Lanka faces new "second generation" issues that are more typical of middle-income countries. For example, growing demand for higher education has become an increasing burden for already over-stretched resources, and an aging population is creating pressures for more tertiary care with high treatment costs. The government is now putting a strong emphasis on education, with the aim of improving both quality and efficiency.

## (3) Strategic Objectives

Sri Lanka's strategic objectives can be summarised as achieving economic growth and poverty reductions, comparable to that of its East Asian neighbours. The Government's goal is to maintain macroeconomic stability and to complete its reform agenda. It aims to carry this out through efficient job creation, export-led growth, further upgrading of the country's human capital, and by protecting the environment.

Stimulating Private Sector Growth through enhancing competition, enabling private sector investment, and creating jobs, is also one of the key targets of the present Government. If policy reforms are forthcoming, International Donors will increase their support to Sri Lanka thus strengthening private sector growth, and helping to improve the country's inadequate and poorly maintained physical infrastructure.

### 2.3.2 Kandy Municipality

In 1989, Kandy was nominated as a World Heritage City. This accolade was earned because of Kandy's Historic, Architectural, Religious, Socio Cultural, and Environmental Heritage.

The city of Kandy is a living organism which caters to a larger region acting as its service hinterland providing such services on health, education and specialised commercial activities. Functionally, Kandy City is at the highest level in the town hierarchy of the Central Province. Its service hinterland for the provision of certain services spreads beyond the region.

The ethnic and religious composition of the population varies by area. In Kandy, 79.3% of the population is Sinhalese, while in the Central Province and Sri Lanka as a whole the fig-

ures are 65.5% and 74%, respectively. This is mainly due to the traditional land ownership pattern and other socio-cultural reasons. The ratio of males to females is 53:47 There are also more job opportunities for males than females.

The active work force is 49.4% of the total population with 50.6% recorded as dependents. This is mainly due to the number of students in the town area. Although the unemployment rate at 9.6% in the city is very low, only about 8% are engaged in permanent employment, with 43% of work force engaged in temporary employment. This indicates that employees working in Government offices live outside of the town limits. The majority of the daily commuter population belongs to Government workers and the majority of the work force in the town is attached to the private sector.

All of the high population density areas are associated with slums, labour lines or squatter settlements. Low population density areas are at higher elevations that have less infrastructure and private ownership.

### **2.3.3 Greater Kandy Area outside of Kandy Municipality**

The Greater Kandy Area consists of Kandy municipality and a part of 10 PS's. Kandy is the capital city of Central Province and the Kandy Municipal Council is the largest urban administrative unit in Kandy District. Part of the Pradeshiya Sabhas surrounding the Municipality that have population densities comparable to that of the Municipality itself have become suburbs of Kandy. Within Greater Kandy Area but outside of Kandy Municipality, Wategama and Kadugannawa are administrated by separate Urban Councils with the remaining area of divided into 10 Pradeshiya Sabhas; Udunuwara (75%), Yatinuwara (60%), Kandy Four Gravets (98%), Harispattuwa (93%), Patha Dumbara (80%), Kundasale (90%), Akurana (98%), Pujapitiya (72%), Patha Hewaheta (20%), Udapalatha (3%). The percentage shown in parenthesis shows the percentage of total population in the Pradeshiya Sabhas.

As data for those portions of the Pradeshiya Sabhas lying within the stage are not readily available we have had to rely on data obtained from Kandy District or Kandy Municipality. The ethnic composition of the district population (1995 estimated) is 74.2% Sinhalese, 12.1% Tamils, 12.9% Moors, 0.5% Burghers, 0.3% Others. The unemployment rate is 19.4%. The percentage of cultivated land is Paddy 18.5%, Tea 31.1%, Coconut 5.2%, Rubber 2.3%, Minor Crops 23.5%, Others, 19.9%. The food Stamp Ratio is 31.3% (Nuwara Eliya 7.8%), and the Janasaviya Ratio is 11.9% (Nuwara Eliya 7.9%). The population density was 669 per km<sup>2</sup> (1995 estimate) (Sri Lanka 279 per km<sup>2</sup>).

## 2.4 Present and Future Land Use

### 2.4.1 Kandy Municipality

The present land use pattern in Kandy is as summarised in Table 2.2.

**Table 2.2 Present Land Use Pattern in Kandy**

| Land Use  | Extent in Hectares | Percentage    | in 1983 |
|---|--------------------|---------------|---------|
| 01 Residential  | 1,159.27           | 46.64         | 35.38   |
| 02 Commercial   | 58.65              | 2.35          | 1.69    |
| 03 Industrial   | 9.91               | 0.40          | 0.28    |
| 04 Public   |                    |               |         |
| Government Building   | 9.91               | 1.37          | 5.08    |
| Religious   | 41.49              | 1.67          | --      |
| Educational   | 60.23              | 2.43          | --      |
| Health  | 24.67              | 0.99          | --      |
| 05 Roads  | 172.9              | 6.96          | N.A.    |
| 06 Parks and Play Grounds   | 96.3               | 3.87          | N.A.    |
| 07 Vacant Lands including (Mixed crops)                               | 222.49             | 8.95          | N.A.    |
| 08 Paddy  | 66.7               | 2.68          | N.A.    |
| 09 Forest Lands   | 364.18             | 14.65         | N.A.    |
| 10 Water Bodies (Including ½ of the river as municipal boundary lays) | 174.46             | 7.02          | N.A.    |
| <b>TOTAL</b>  | <b>2,485.24</b>    | <b>100.00</b> |         |

Land use issues in Kandy are:

- Expansion of residential activities in high elevation areas and steep slopes and thereby contribution to high degrees of siltation, possible land slides and loss of scenic value on mountain areas.
- Intrusion of commercial activities, such as stores and service garages in residential areas thus resulting in high rents for residential units and loss of privacy in residential areas.
- Intrusion of competing uses such as car sales into residential areas.

Objectives of the Kandy Development Plan (1997) are:

- Conservation of Historic Heritage.
- Conservation of Cultural and Social Heritage.
- Conservation of Natural Environmental Heritage.
- Restoration and Conservation of the Architectural character of the town

- Enhancement of the socio-economic and physical conditions of the people living in the town.
- Provision of services and amenities to the people at the highest possible level.
- Provision of amenities and spaces for national and international uses.
- Provision of economic and social infrastructure without compromising the heritage aspects of the plan.

Physical Development Plan (Zoning Plan):

There are three major zones in the existing plan as follows:

(a) Preservation Zones

|  |           |
|--|-----------|
| 1. Inner Sacred Area Zone  | 14.50 ha  |
| 2. Sacred Area Peripheral Zone                                       | 34.98 ha  |
| 3. Water Shed Conservation Zone                                      | 58.29 ha  |
| 4. Nature Conservation Zone  | 405.19 ha |
| 5. Stream and Forest Reservation Zone and<br>Water Conservation Zone | 598.60 ha |

(b) Economic Development Zones

|                           |          |
|---------------------------|----------|
| 6. Commercial Zone I      | 29.16 ha |
| 7. Commercial Zone II     | 96.19 ha |
| 8. Commercial Zone III    | 51.03 ha |
| 9. Mixed Residential Zone | 45.92 ha |
| 10. Industrial Zone       | 7.29 ha  |

(c) Social and Public Utility Development Zone

|                                      |           |
|--------------------------------------|-----------|
| 11. Primary Residential Zone         | 643.88 ha |
| 12. Public and Semi Public Zone      | 165.29 ha |
| 13. Open Space and Recreational Zone | 160.20 ha |
| 14. Roads                            | 174.73 ha |

**TOTAL** **2,485.25 ha**

**2.4.2 Greater Kandy Area outside of Kandy Municipality**

(1) Concept

- Provision of a Major Administration and Educational Center at Gatambe and Gannoruwa.

- Provision of a Major Industrial agglomeration at Kudasale, Pallekele, Balagolle and Pallethalawinna area
- Provision of a Major Commercial and Tourism Center at Kandy Town.

(2) Proposals for Urban expansion (Greater Kandy Area)

- Greater Kandy Water Supply Master Plan
- Telecommunication Expansion Programme
- Electricity Expansion Programme
- Major Highway and Road Proposals
- Township Centers at Digana, Menikhinna, Madawala, Wattegama, Barigama, Muruthalawa and Pilimatalawa
- Water Shed Management and Conservation at Hantana and Hunnagiriya
- Physical and Environmental Development Plan for Greater Kandy area
- Multi Sector Investment Programme for Greater Kandy area
- Tourism Master Plan for Greater Kandy area

**2.5 Financial Status of the Study Area**

**2.5.1 Kandy Municipality**

The budget of KMC is divided into two parts - recurrent budget and capital budget. The total recurrent revenue in 1996 budget was Rs. 326 million. The composition of recurrent revenue is assessment 4.25%, grant 28.77%, water supply 26.29% and other 40.19%. The total recurrent expenditures in the 1996 budget was Rs. 326 million. The composition of recurrent expenditure is general administration 18.62%, health care 11.8%, road and building 13.09%, utility 23.87%, water supply 26.27%, welfare 6.17%. The first level of budget classification is called a program, while the second level of classification is called a project. In addition to the recurrent budget, a five year capital budget, which is shown in Table 2.3, is estimated in the budget. Except for financial provisions from recurrent expenditures in 1996, all these estimates are lacking an actual financial basis. As internal sources of income is very limited, these levels of capital expenditures are almost impossible without outside assistance.



**Table 2.3 Five Year Capital Budget Expenditure Estimate for  
Kandy Municipal Council**

(Rs.1000)

| Program   | 1996          | 1997          | 1998          | 1999          | 2000          | Total Estimate |
|---|---------------|---------------|---------------|---------------|---------------|----------------|
| 1 General Administration                        | 2,689         | 20            | 20            | 20            | 20            | 2,769          |
| 2 Health Services                               | 5,496         | 1,400         | 2,200         | 1,200         | 800           | 11,096         |
| 3 Physical Planning                             | 9,200         | 10,000        | 10,040        | 9,000         | 6,404         | 44,644         |
| 4 Water Supply                                  | 8,727         | 29,676        | 31,655        | 31,000        | 35,782        | 136,840        |
| 5 Other Utility                                 | 58,461        | 1,500         | 2,450         | 750           | 500           | 63,661         |
| 6 Welfare Facilities                            | 2,835         | 0             | 0             | 0             | 0             | 2,835          |
| <b>Total</b>                                    | <b>87,407</b> | <b>42,596</b> | <b>46,365</b> | <b>41,970</b> | <b>43,506</b> | <b>261,844</b> |
| Financial Provisions from recurrent expenditure | 42,923        | 0             | 0             | 0             | 0             |                |

A characteristic of the city finance is there is very little internal tax revenues because tax revenue with an income basis is non-existent. Further, the scale of the capital budget is very small, and upgrading of the infrastructure associated with the growth of population cannot be supported. Also, water supply accounts are not independent business accounts. Water supply is handled within the general administrative affairs account.

### 2.5.2 Greater Kandy Area outside of Kandy Municipality

The Study Area (Greater Kandy) outside of Kandy Municipality consists of a part of ten Pradeshiya Sabha. The financial status of these ten Pradeshiya Sabhas seems to be more or less similar to neighbour municipalities but their financial difficulties will be worse than for central cities. The details of the financial status of these ten Pradeshiya Sabhas requires further study.

With regard to the current water supply of the Greater Kandy Area outside of Kandy Municipality, neither Pradeshiya Sabhas nor Urban Councils have primary responsibility.

Generally it is responsibility of the NWSDB to supply residents with water. If we therefore consider the financial basis for the water supply in this area the financial status of the NWSDB is of more direct concern. As the NWSDB is a nation-wide public organisation the financial status of the NWSDB should therefore be considered at the national level.

The current status of the NWSDB financial performance is not critical, but nevertheless it cannot be accepted without reservation. In the long term its financial performance will dete-

riorate if addition investment is made with long term loans and not accompanied by an improvement in operational efficiency.

Operational efficiency can be improved if the current level of UFW (unaccounted for water) and ratio of staff to customers are both reduced. Additionally the water tariff for domestic users will have to be gradually incremented to a level that will recover long term water production costs. The NWSDB has taken steps in this direction, but further effort is still required.

At present three Pradeshiya Sabhas are managing their water supply directly. The Wattegama Water Supply Scheme is operated by the Wattegama Urban Council and two Pradeshiya Sabhas (Patha Dumbara and Kundasale) independently from the NWSDB. Two Pradeshiya Sabhas (Kundasale and Kandy Four Gravets) distribute water to a part of their residents obtained in bulk water supply from the NWSDB.