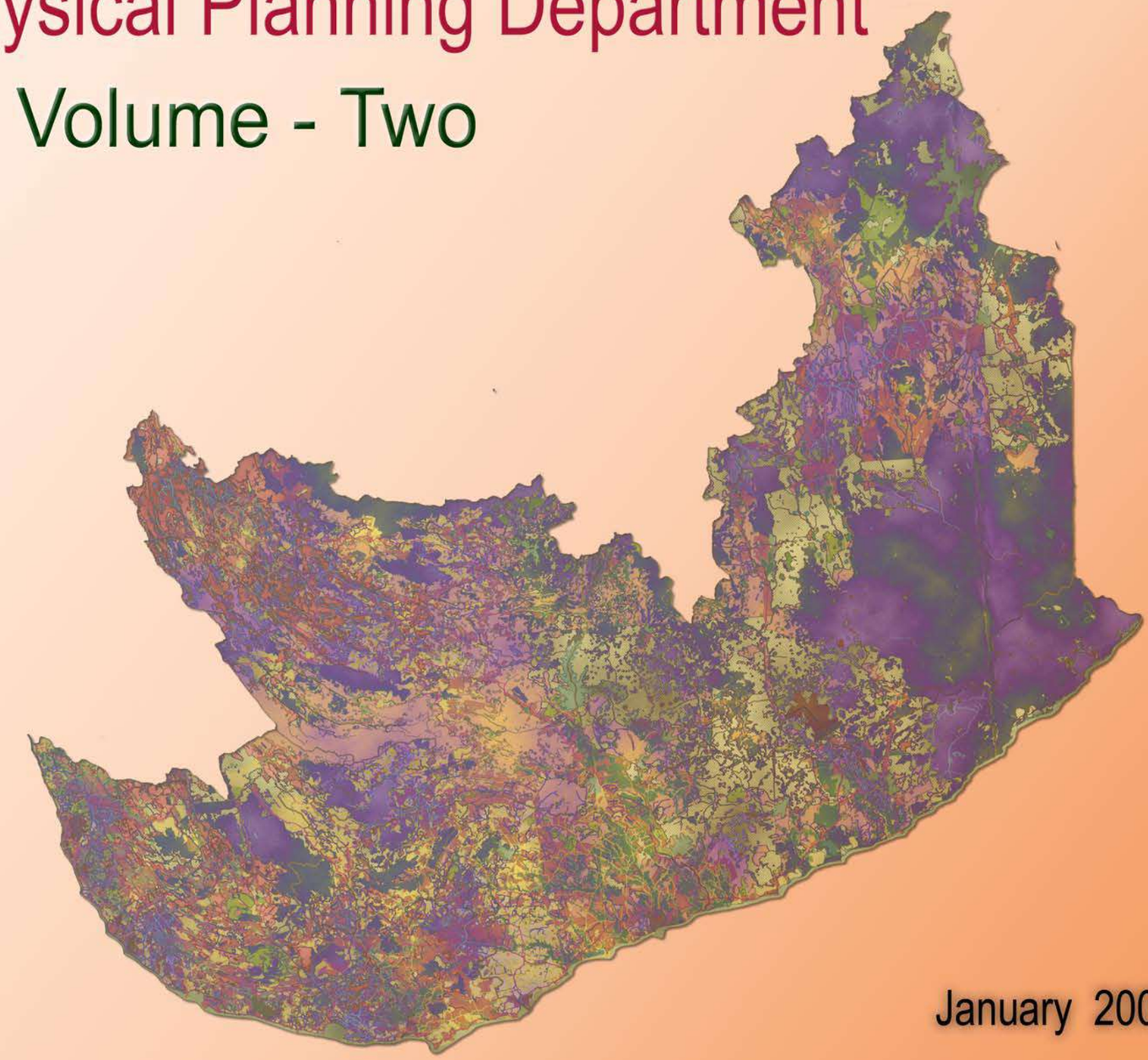
Surath Wickramasinghe Planning

Physical Plan for Southern Region

National Physical Planning Department

Volume - Two



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Chapter -01

Introduction

CHAPTER ONE

Introduction

1.1 Background

National Physical Planning Department (NPPD) intended to prepare a Physical Plan for Southern Region under the provisions of Town and Country Planning Ordinance of 1946 as amended by Act Number 49 of 2000. The regional plan should be guided by the National Physical Planning Guidelines prepared by the NPPD in 2002. NPPD commissioned "Surath Wickramasinghe Planning" to prepare the Regional Structure Plan for Southern Region. Accordingly Surath Wickremasinghe Planning engaged a multidisciplinary team of experts to prepare the plan.

The plan comprises two volumes – Volume I Data Base and Volume II, The Plan.

Volume I – Data Base - Volume I consists of 12 chapters as listed below;

Chapter	Contents
1.0	Introduction
2.0	Demographic Analysis
3.0	Land Use
4.0	Environmental Analysis
5.0	Agriculture, Animal Husbandry and Fisheries
6.0	Industries and Mineral Resources
7.0	Irrigation and Water Resources Management
8.0	Social Infrastructure
9.0	Settlement Pattern
10.0	Transport
11.0	Physical Infrastructure
12.0	Urban Design

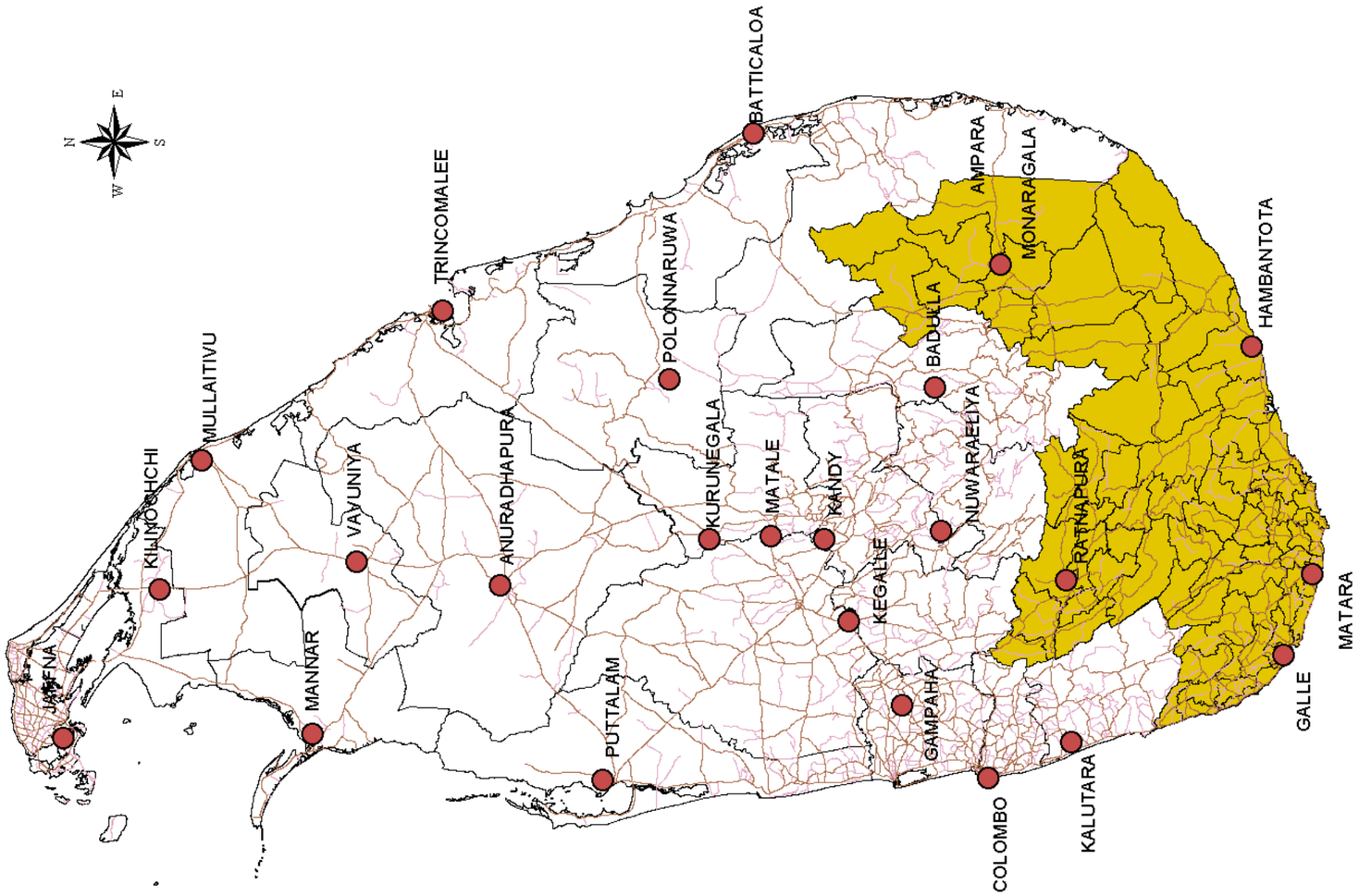
Every chapter of the volume I is formulated under three sub headings as;

(i) Analysis of existing data
(ii) Summary of stakeholder consultation meetings
(iii) SWOT analysis

Volume II – The Regional Physical Plan - Volume II consists of 16 chapters as listed below.

Chapter	Contents
1.0	Introduction
2.0	Economic Strategy Plan
3.0	Environmental Management Plan
4.0	Agriculture Development Plan
5.0	Industrial Development Plan
6.0	Water Resources Management Plan
7.0	Transport Plan
8.0	Tourism Plan
9.0	Settlement Plan
10.0	Zoning Plan
11.0	Physical Infrastructure Plan
12.0	Social Infrastructure Plan
13.0	Urban Design Plan for Galle City
14.0	Physical Structure Plan
15.0	Action Projects
16.0	Institutional Plan

Southern region consists of five districts namely, Galle, Matara, Hambantota, Monaragala and Rathnapura. The population of the region in 2001 was 3.68 million that represent approximately 20% of the total population of the country. Gross population density of the region in 2001 was 254 persons per sq.km which was far below that of the national average of 299. It covers a land area of 14,458 sq. km. representing 22% of the land extent of the country and falls into two climatic zones – wet zone and dry zone. Being major portion of the region falls into the wet zone with undulating landscape it has a very high level of bio-diversity.



Southern Region Physical Plan

Figure 1.1

Southern Region in the National Context

Scale:
Source: SWP SRPP

Road Network
District Capitals
Southern Region

National Physical Planning Department

A Physical Plan for a region essentially deals with the management of land uses, natural resources and human resources to achieve a set of development targets within pre-determined time schedules. Human resources are needed to abilze engaged in a manner to regulate development of natural resources. Hence the plan in expected to create a rational land use system for investment during the planned period. The spatial distribution of investments will achieving development targets.

Development targets in this plan are defined within sustainable development perspectives where higher economic growth, greater social equity and environmental conservation are integrated. All three dimensions in the southern region are equally important as the region has enormous potential for economic growth, large disparities in distribution of resources and other social infrastructure and very high biological diversity.

The Physical Plan for Southern Region is prepaired to achieve the objectives of the National Physical Planning Policy as listed below:

(a) Accelerate national economic growth.
(b) Promote integrated spatial development.
(c) Improve Sri Lanka's international competitiveness.
(d) Improve and utilize Sri Lanka's unique geographical locational advantage for the future economic upliftment.
(e) Optimize the use of the country,s limited resources.
(f) Generate employment opportunities and raise levels of income thruoghout the country.
(g) Achieve appropriate settlement patterns in terms of locations and levels of services provided.
(h) Improve the quality of life for all sectors of society wth the least threat of natural disasters.
(i) Conserve fragile environments and develop natural resources in a sustainable manner so as not to trigger/accelerate natural hazards prevalent in the areas concerned.
(j) Conserve and enhance the quality of the cultural heritage and places of aesthetic and architectural value

(National Physical Planning Policy -Volume -I)

1.1 Approach

The Southern region has lagged behind the development process for a long period of time despite to enormous development potentials. Therefore the approach followed in preparing this plan was "prove-development oriented" within a sustainable development perspective. Accordingly the plan aims at achieving a higher regional economic growth rate during the plan period, by generating employment, creating environmental friendly urban settlements while conserving the natural environment.

The approach was essentially a multidisciplinary one. The team also followed a systems approach where every element of the system was considered in developing the final plan.

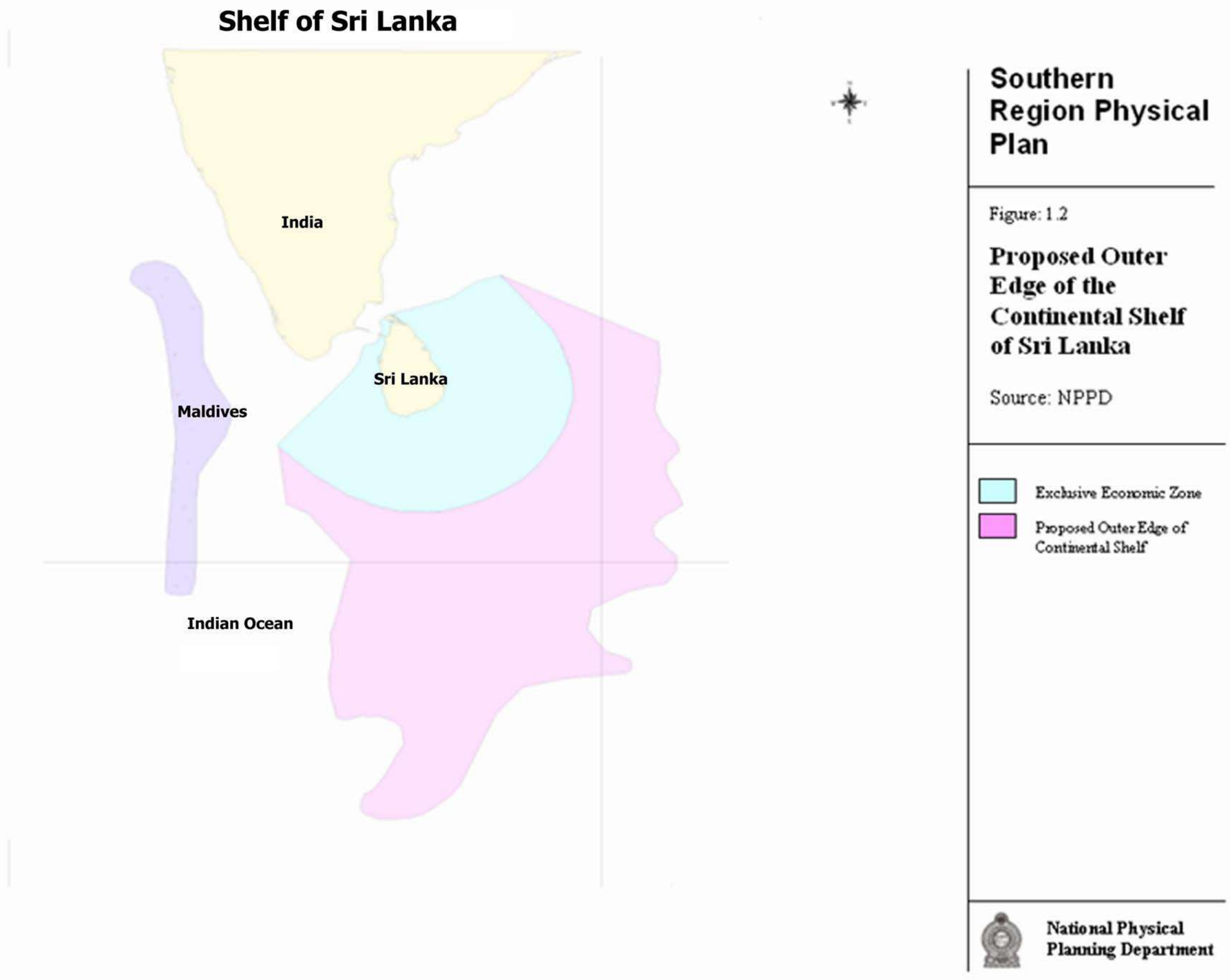
1.2 Methodology

The Planning Process followed is illustrated in figure 1.1. The process basically consists of four stages;

- Data Base Development
- Design Brief - What the technical experts studied, analyzed and proposed.
- Client Brief - What the stake holders proposed
- Brainstorming - Final product that came out after the two way process between design brief and client brief were brainstormed at different forms.

The data base was developed by reviewing published and unpublished existing literature, by having discussions with relevant public and private sector institutions and through stakeholder consultations.

The data were analyzed and a SWOT analysis donr for each sector. Five stakeholder consultation meetings were held at the district level with a wide participation of representatives covering all the sectors in the region. The results were amalgamated with the design brief. In addition special consultation meetings were held with specialists in the different sectors, such as; tourism, conservation, commercial, agriculture, port development, industrial development, etc.
During the brainstorming sessions SWOT analysis for individual sectors were put together to finalize the overall SWOT of the region. The plan preparation was guided


Shelf of Sri Lanka
India
Sri Lanka
Maldives
Indian Ocean
Southern Region Physical Plan
Figure: 1.2
Proposed Outer Edge of the Continental Shelf of Sri Lanka
Source: NPPD
Exclusive Economic Zone
Proposed Outer Edge of Continental Shelf
National Physical Planning Department

by the final results of the SWOT analysis.the Regional physical plan provides the guidance for future development of the region.
The plan while providing broader land use categories indicates spatial skeleton of the region with infrastructure and major projects that would regulate future development of the region.

1.3 Strategy

The plan proposes two economic strategies to shape the future of the region. All the other strategies proposed for development of the region are based on the economic strategies. The two economic development strategies are "high growth agricultural development strategy"and "export oriented service sector development strategy."

The Economic strategy plan and other plans are formulated based on the SWOT analysis of the region, and within the development frame work worked out in the National Physical Planning guidelines by the NPPD.

Therefore the strategies proposed have a direct bearing on the following strategies proposed in the National Physical Planning Policy as listed below:

(1) Capitalize on the country's locational advantage.
(2) Establish strong links with regional and international markets
(3) Accelerate development of the dry zone.
(4) Integrate urban and rural development.
(5) Promotion of industry as a thrust area.
(6) Improve agricultural productivity by empathizing high productivity areas.
(7) Expand the tourist sector
(8) Make optimum use of minerals and other non-agricultural resources.
(9) Make intensive exploitation of resources.
(10) Promote development oriented infrastructure.
(11) Recognized the key role of the IT sector.
(12) Integrate all areas that need to be conserved
(National Physical Planning Policy -Volume II)

1.4 Problems and Opportunities

Of large number of problems, the following are considered to be the most pressing ones that the region faces at present.

- Lack of water in most parts of the region.
- Lack of other infrastructure both physical and social infrastructure

The region has many opportunities for achieving fast economic growth.the **availability of water** more important of these are .

- Although most parts of the region (i.e. Monaragala and Hambantota districts) face a water storage the region has adequate water to meet future demands from various activities. The problem is the lack of an efficient water management system. A good water management system can provide adequate water for the whole region through out the year.

- **Locational advantages**, Hambantota being located close to the international shipping route provides the greatest opportunity forthe development of an international seaport. In accordance with the present studies the government has already placed a high priority in developing Hambantota as a sea port . Studies done by Air Port authorities reveal that the best location for the second international airport of Sri Lanka is also around Hambantota.
- The region is rich in mineral rescurces perticularly gemstones, industrial clay, edible saults and mineral sands

- Availability of a large extent of developable land, these lands at could be developed if water and infrastructure are provided.

- International Fiber Optic Cables – SEA – ME – WE 2 and SEA ME – WE 3 that are laid under the sea bed connecting Asia with the rest of world (Europe, Middle East and North America) run very close to Sri Lanka almost touching the southern coast.

- Very high biological diversity . Galle, Matara and ratnapura districts fall within the wet zone where the bio diversity is very high. Hambantota and Monaragala fall within the dry zone with a different type of flora and fauna. Due to its high

biological diversity tourism can be made a major economic sector of the region. In addition to wild life reserves and natural forests the region also has historical and archeological sites, ares of natural beauty and water bodies that can promote tourism as a key economic activity

- The protential for fisheries development: Due to the extension of coastal boundaries (exclusive economic zone) fisheries sector has the potential to make Sri Lanka self sufficient in fisheries

- The Protential for development of animal husbandary: Animal husbandry has been traditionally a well-established economic activity in the region, particularly in Monaragala and Hambantota districts. Elimination of present problems such as inadequate grasslands, inadequate incentives, indiscriminate import of powdered milk, etc.can make animal husbundary to a major economic activity of the region.

- National Physical Planning Policy has recomended the to development to Hambantota as a Metro urban centre.

1.5 The Plan

The physical plan comprises the following sub plans;

- Economic Strategy Plan
- Environmental Management Plan
- Agriculture Development Plan
- Industrial Development Plan
- Water Resources Management Plan
- Transport Plan
- Tourism Plan
- Settlement Plan
- Zoning Plan
- Social Infrastructure Plan
- Physical Structure Plan
- Urban Design Plan for Galle
- Physical Structure Plan

1.6 Vision

The vision of the physical plan is to make Southern Region a vibrant region of the country with sustained economic growth rateat 6% by 2030.

1.7 Goal

Goal of the physical Plan is to harness the resources available in the region to capture opportunities in the national and international markets aimed at alleviating poverty and increasing the living standards of people comparable to those in the fast developing nations in Asia.

1.8 Objectives

(i) Create a sustainable land use system
(ii) Provide adequate water to all the sectors
(iii) Create an efficient system of mobility and exchange of goods and services
(iv) Increase value addition and yields of agricultural produce. (Agricultural, fisheries and livestock)
(v) Develop a hierarchical order of settlements so as to conserve land, energy and other resources and increase the efficiency of investments in infrastructure development.
(vi) Create a competitive and skilled labor force
(vii) Achieve higher rate of urban growth 2.3 % by 2020 and 2.6 % by 2030.
(viii) Create investment opportunities for both local and international investors.
(ix) Create adequate employment opportunities
(x) Exploit the advantage of geographical location of the region particularly in the international perspective for optimum economic benefit.
(xi) Provide high quality social infrastructure, particularly health and education.
(xii) Develop an efficient system of supply and distribution of physical infrastructure such as potable water supply, electricity, telecommunication, waster water management and solid waste management.
(xiii) Create “Green, Clean and aesthetically pleasing” cities and towns.
(xiv) Conserve environmentally and aesthetically sensitive natural environments and historical sites.

1.9 SWOT Analysis

Volume I (Data Base) provides a detail note on SWOT analysis. The following provides a summary of the analysis.

(i) Environmental Management

Strength

- Availability of a large forest cover ranging from low land rainforests to dry monsoon forests that regulates bio diversity, micro climate and water resources.
- Presence of attractive places for tourists;
  - World renowned wild life reserves
  - A long coastal belt
  - Historical and cultural buildings and sites
  - Water bodies

  these has the potential to create a large number of jobs without destroying the environment.
- Availability of a number of NGOs who are directly or indirectly involved in environmental conservation efforts in the region

Weaknesses

- Poor solid waste management in all districts
- Lack of an efficient water management system

Opportunities

- Availability of diverse eco systems, some of which are world famous for their richness in bio diversity
- Presence of qualified persons to control environmental degradation
- Potential to harness natural beauty of the region for economic development
- Possess a climate which is ideal for growth of forest cover
- Availability of world heritage and Ramsar sites (Galle Fort, Rekawa Lagoon, Madu Ganga etc.)

Threats

- Illicit mining of mineral resources particularly gems in Monaragala district and Rathnapura district and limestone along the sea coast from Ambalangoda to Galle has resulted in the degradation of land and theats to human habitation
- Destruction of the forest cover for chena cultivation and timber
- If not properly planned the proposed coal power plant, petro-chemical industries, sea port and air port can degrade the sensitive environment
- the danger of attracting polluting industries with the development of Hambantota Sea Port
- High incidence of human-elephant conflicts

(ii) Industrial Development

Strengths

- Availability of a large amount of natural resources, (i.e. mineral resources, gems, salt,water etc.) high growth potential for agriculture (i.e. sugar, fruits, vegetables, grains, animal husbandry and fishing) and man power are the strengths of Southern Province for development of sustainable industrial base.

Weaknesses

- Poor infrastructure, particularly accessibility, to the Colombo Port.
- Heavy dependence on traditional type of industrial development based on foreign direct investment (FDI) or quotas. Such investments are very vulnerable tointernational strategies (ie;Incentives offered by other countries, status of quotas, political stability etc.).
- The enormous potential available in the region for sustainable industrial growth has not been harnessed yet. (i.e., fisheries, milk industry, port related service industry etc.).
- Lack of detail investigations related to mineral resources.

Opportunities

- The biggest opportunity is in the service industry, particularly relation to sea port and airport related activities .
- Manufacturing industries based on sea port development such as petrochemicals.
- Because of an inadequate exploitation of the mid sea fishery and the extension of exclusive economic zone.
- Export of vegetables, fruits and Ayurvedic produce has a growing market both in the Western Europe & Middle Eastern Countries.

Threats

- Illicit gem mining and export of gems without much value addition.

(iii) Water Resources Management

Strengths

- Location of 35 River Basins in the region
- Surplus water availability in wet zone river basins of Bentara Ganaga, Gin Ganga, Nilwala and Kalu Ganga
- Availability of a large number of suitable reservoir and regulatory sites in the middle reaches of above river basins for storage single purpose or multipurpose use. Eng. Hydropower, floods and transbasin diversions.

Weaknesses

- Lack of drainage facilities in the Western wet zone river basins prevents large extents from being cultivated. Eg. Rain fed paddy and SWE schemes
- Lack of storage tanks and poor water management lead to scarcity of water and loss of crops
- Inefficient water governance and sectoral approaches lead to a fragmented and uncoordinated development and management.
- Lack of sufficient water in the Menik Ganga during the festival season in Kataragama for pilgrims.
- No night irrigation is practiced.
- Water quality monitoring in river basins is absent. Eg. Sanitation, pesticides and factory effluents

Opportunities

- Presence of suitable sites for constructing fairly large size single and multipurpose reservoirs in water surplus river basins.
- Availability of number of suitable mini hydro sites in major streams and tributaries
- Existence of a large number of silted tanks, rehabilitation of which can increase storage, water harvesting and recharge.

Threats

- Most of the minor irrigation schemes damaged by May 03 floods are not repaired
- Encroachments on reservations of major irrigation systems put pressure on water allocations
- Uncontrolled direct pumping from upper reaches
- Salinity intrusions to water supply intakes during low flows in rivers
- Uncontrolled sand mining in rivers
- Floods and Droughts - due to the seasonal variation in rainfall
- Gem mining in rivers and streams
- Over extraction of water due to unplanned development of agro wells
- Bundala lagoon, Embilikkala and Malala lagoons affected by drainage waters
- Encroachments into reservoir catchments and canal reservations
- Degradation of the forest cover florest cover in watersheds and upper catchments
- Sedimentation of reservoirs

(iv) Social Infrastructure

Strengths

- Availability of highly mobile human resources (young job seekers)
- Availability of water, fertile land, know-how and local market
- Availability of electricity for more than one third of the population
- Majority including the poor are linked to centralized mass communication network
- High level of literacy.
- Health care system provided by the central government and provincial government, reaching even remote areas.

Weaknesses

- Non-use of the available information and lessons learnt from other development initiatives
- absence of plans in the public sector to mobilize young job seekers for the development of the region.
- Labeling poor and all programs are designed low cost that keeps the poor and poverty continuing.
- Poor participation of the end user in all stages of the development cycle
- Inadequate of social aspects in the planning of development initiatives
- Political interference in development priorities

Opportunities

- Many government, non-government, local and provincial government and private sector organizations involved in development has variety of resources
- Possibility to mobilize a large number of un-utilized or under-utilized human resources into the development initiatives.
- Availability of free education and free health services even in remote areas
- Proposals for developing mega projects (Proposed high ways, sea ports, air-ports etc.) that will provide more job opportunities for people.

Threats

- Change of governments resulting in the change of development priorities
- Inability to prevent change political interference in the development cycle
- Difficulty in getting away from poverty culture, lack of enthusiasm, commitment, welfare dependency, etc. of the poor and the development actors.
- Growing numbers of female-headed households (due to broken-marriages, and pregnancy before marriages.)

(v) Urban Development

Strengths

- Although the official statistics indicate a low rate of urbanization the urban population accounts for 38.0 percent of the region's population which is a good sign of urbanization.
- Poor revenue collection by local authorities, particularly by Pradeshiya Sabhas. Most of the Pradeshiya sabhas collect revenue from urban areas but invest them in rural areas without investing in urban areas.

Weaknesses

- problems in defining urban areas due to theprevailing administrative boundaries.

Opportunities

- The presence of a strong physical planning policy at national level to guide the overall urban system within the region.
- Location of information super highway fibre optic cable network running along the sea border closer to Matara and to the most vibrant urban centers that are located along the sea board,this could pave the way to create IT cities in the South.
- Proposed mega projects such as Sea Port, Airport, and Southern Highway etc. would provide the foundation to develop economically viable cities.
- Availability of a large number of tourist sites and resources along with the national objectives of Tourism Master Plan to make the southern Region a vibrant tourist destination could provide an impetus to develop economically and aesthetically vibrant urban centers.
- Although the existing urban system has a weak urban rural linkages the national policies and the on-going programmes would help to create an urban based economy to accelerate economic growth and create job opportunities for the to excess rural population.

Threats

- The gradual increase of low density dispersed settlement structures along arterial roads and main infrastructure corridors has not permitted the provision of necessary social and physical infrastructure facilities within the settlements.

This will make it difficult to plan cost effective social infrastructure facilities in the future and also restrict the planning and implementation of major development projects having a national and regional significance.

- Unplanned settlement development and adverse sprawling effects from urban to rural hinterlands creates an excessive demand on the available infrastructure facilities leading to deterioration of the living conditions both in urban and rural settlements.
- Inability of the authorities responsible for urban development to guide development because of the non-availability of policies and legally backed plans and the difficulties based in providing demand driven infrastructure facilities
- Unauthorized constructions and encroachments on public lands.

(vi) Transport

Strengths

- The Southern region is fairly well connected with other parts of the country.
- Availability of domestic airports at Koggala and Weerawila
- High density of A & B class roads in Galle, Matara and Ratnapura districts (0.22 Kms to 0.32 Kms per Km^2 - above national average)

Weaknesses

- Relatively longer travel time/ to other parts of the country (exceptGalle District.) from Mathara Hambantota, Monaragala & part of Ratnapura districd
- Low road accessibility (048 to 0.53 km km/1000 population - below national average.)
- Low road Km/vehicle ratio
- Poor accessibility to archeologically important sites and tourist attractions in Ratnapura and Monaragala districts.

Opportunities

- Proposal of the Government to establish second international airport in Wellawaya and Sea Port in Hambantota.

(vii) Agriculture Fisheries and Livestocks

Strengths

- Availability of a large extent (70% of the land extent) of reddish brown earths which are highly fertile and suitable for agriculture
- Diversity in agro-climatic conditions.
- Availability of a highly productive long coast line and exclusive economic zone.
- A large extent of inland water bodies

Weaknesses

- lack of access to modern technology
- High Incidence of post harvest losses in agriculture.

Opportunities

- The proposed large scale projects in the region (eg. Hambantota port development) will create a better demand for agricultural products
- Availability of a large extent of unused and under utilized lands that can be put to productive agriculture.If an effective water resources management system is introduced,

Threats

- High incidence of human elephants conflict
- Over and misuse of agro chemicals.
- Indiscriminate encroachments on public lands (particularly reservations)
- Indiscriminate sub division of productive agricultural lands into urban uses
- Land degradation due to indescriminate changes in cultivation,deforestration and use of agro-chemicals

(viii) Conclusion

Altough the Southern region has been lagging behind in development, and faces a number of constraints, particularly the lack of infrastucture, nevertheless it has a amount of potentials to achieve an accelarated economic growth.

Chapter -02

Economic Strategy Plan

CHAPTER TWO
ECONOMIC STRATEGY PLAN

2.1 Strategy

As economic growth drives spatial distribution of investments, achieving economic development objectives should be addressed in terms of a Physical Plan.

Poverty has been one of the major economic problems of the country. Central Bank Annual Report for 2003 records, that 7 % of the population of the country in 1995 received US $ 1 a day (Lower Poverty Line) while 45% received US $ 2 per day (Higher poverty line). Southern Region obviously reflects this situation. According to the Human Poverty Index for 2002 Monaragala district was rated as having the second highest poverty level of the country. According to the Human Development Index, all the five districts in the region are below the national average. Hambantota and Monaragala districts have also recorded a much higher suicide rates compared to the national average and are also mostly related to poverty. **Hence poverty alleviation is not only a key objective of the Region but also of the country as a whole.** Economic development in terms of a physical plan can greatly contribute towards the achievement of this objective.

70% of the country's population is still in the rural sector and the poverty in the rural sector is dominant (with 77% of the total rural population under the poverty line). Central Bank records that poverty in the rural sector is three times that in the urban sector. **Hence poverty is overwhelmingly a rural issue** where access to physical and social infrastructure is least developed. Rural population in the southern region in 2002 was 90.72 % of the total population. Urbanization is limited to a few small and medium size towns in Galle, Matara and Ratnapura districts. Urbanization in Monaragala and the Hambantota district is insignificant with 2.0 % and 4.1 % of the total population classified as urban population respectively. Hence sustaining urbanization at a manageable level should be a strategy to alleviate poverty. Table 2.1 compares the share of urban population in selected countries in South and South East Asia

Table 2.1
Share of Urban Population (In Millions 2002)

Country	Total Population	Share of Urban Population (%)	Per Capita Income US $
Singapore	4.2	100.0	20,631
Malaysia	24.5	58.1	3609
Thailand	63.4	20.0	1960
India	1,055.0	27.9	476
Sri Lanka	19.0	23.1	858

Source : Sri Lanka – Socio Economic Data 2004 and Internet.

The Table clearly indicates a strong relationship between the share of urban population and per capita income. Greater the share of urban population, higher the per capita income. India is an exceptional case being a country of a very large population size.

The sectoral significance in economic development, and its composition in GDP and employment generation is as follows,

Table 2.2
Composition of GDP (%) and Employment Generation (in Millions) by Sectors - 2003

National					
Agriculture		Industry		Services	
%	Employment	%	Employment	%	Employment
19	2.41mll	26	1.49 mll	55	3.04 mll

Source: Central Bank Annual Report – 2003.

The dilemma of the agricultural sector according to the Central Bank Annual Report 2003, is its marginal contribution to the growth of the economy accounting for only 5%, compared with the contribution of 70 percent by the Service sector. However the Agricultural Sector generated 2.4 million employment, about one million more than the Industrial sector and about half a million less than the Services sector.

The Government is clearly aware of the poor contribution of the agricultural sector to the national economy as the return on investment has been well below the potential. Therefore the overall policy of the Government is to make the agricultural sector sustainable and emerge as a strong force of the economy. On the basis of the potential available for development of the Agricultural sector in the Southern region including the water resources, a large extent of developable land, the high biodiversity, impressive low country tea holdings, proliferation of minor export crops, suitability for diversified livestock breeds, extensive deep sea fishing, a wide array of inland water bodies etc. it could become a key player of regional economic development.

Sectoral contribution to the economy in selected countries in South and South East Asia is as follows;

Table 2.3

Contribution to GDP (%) and Employment Generation (in Millions) by Sectors In Selected Countries in Asia (2003)

Sectors	India		Malaysia		Thailand		Vietnam		Sri Lanka	
	GDP %	Emp %	GDP %	Emp %	GDP	Emp %	GDP %	Emp %	GDP %	Emp %
Agriculture	23.6	60.0	8.4	14.5	9.0	49.0	24.0	63	19.2	38.0
Industry	28.4	23.0	45.3	36.0	42.0	14.0	37.0	7.0	25.3	17.0
Service	48.0	17.0	46.3	49.5	49.0	37.0	39.0		55.5	45.0

Source : Internet

A Sectoral comparison with regional countries is considered realistic as all these countries in the past had similar characteristics and even at present agriculture stands out playing a pivotal role in the economies. Malaysia enjoying a high living standard of course is an exception whilst Thailand despite comparatively higher living standards in the region has a predominent agricultural base. Vietnam which is developing on fast track with a GDP growth rate of 7.3% in 2003,is still mainly an agricultural economy, although the services sector contributes the major share to the GDP. In India, Thailand and Vietnam the agriculture sector contributes the smallest share to the GDP but generates highest employment compared to other sectors. When a comparison is made, Thailand's agriculture sector generates 49% of employment whilst contributing only 9% to the GDP, and Sri Lanka's agricultural sector generates 38% of employment contributing much higher share of 19.2% to the GDP. This positive correlation between agricultural sector and employment generation indicates that Sri Lanka can readjust the agriculture sector to achieve higher employment generation and economic growth.

The development status of some selected countries of South and South East Asia provides an indication as to what level of growth rates should be targeted.

Table 2.4

Development Status of Selected Countries in the Region

Country	Per Capita Income (GNP 2002 US $)	Growth Rate (2000 -2003 Real GDP %)
Singapore	20,631	3.6
Malaysia	3609	4.3
Thailand	1960	3.9
India	476	4.8
Vietnam	750	4.0
Sri Lanka	858	2.83

Source : Sri Lanka Socio Economic Data 2004.

Synergizing the availability of lands, water resources management, regional locational advantage, socio economic conditions, bio diversity, competing advantages, national physical planning guidelines, sectoral diversity, comparative status of some selected countries in the region, two economic growth strategies have been conceptualized. i.e. High Growth Agricultural Strategy and Export Oriented Service Sector Development Strategy. Both strategies have been integrated to achieve the objectives of the Plan.

The First Strategy - High Growth Agricultural Strategy encompasses agriculture, livestock and fishery. On the basis of the potential available in the region (and in the country as a whole) Sri Lanka can be self-sufficient in the

consumer products of these three sectors but at present a large amount of foreign exchange is spent on the import of the consumer food items. Statistics published by the Central Bank indicate that Rs. 54.1 and Rs54.5 billion were incurred for the import of all the consumer food items during the period 2002 to 2003. In 2003 the country has spent Rupees 43.1 billion on importing wheat grain, powdered milk, fish and fish products and sugar as follows.

Item	Wheat grain	Powdered milk	Fish & Fish Products	Sugar
Cost (Rs. Billion)	13.25	11.5	6.0	11.2

As explained in this study the Southern Region has the potential to produce rice milk and fish in excess of it's requirement. Surplus rice and other cereal products are good substitutes for imported wheat grain. The development of agriculture, livestock and fishery sectors in the southern region to optimum level would help the national economy to overcome the heavy reliance on imported food items and save valuable foreign exchange that could be used for capital investment. Therefore the target growth of these sectors will result in;

- Significant reduction of foreign exchange that is now being spent in importing food products.
- Foreign exchange earnings by exporting surplus and value addition.
- Higher income levels for those employed in the sectors.

It is a prerequisite that the implementation of this strategy needs to be based on efficient water management system, a land use control system and the efficiency in marketing the final products.

It has been inadvertently advocated that agriculture in Sri Lanka is not cost effective compared to other countries in Asia and Europe. This is levelled particularly against paddy and sugar. However this is a wrong premise particularly when considering the following factors.

- Incentives and subsidies provided by other countries for agriculture
- Forward and backward linkages within the production domain
- Generation of a large number of direct and indirect employment opportunities
- Saving of valuable foreign exchange

Considering the above agriculture, livestock and fisheries sectors have been considered to be the catalyst of economic development of the region.

The Second Strategy - "Export Oriented Services Sector Development Strategy" is based on export of Services. The proposed Hambantota Seaport and Airport are considered to be very vital projects in this regard. This strategy basically consists of exporting seaport and airport related services, information technology services, tourism etc. The strategy will generate considerable employment opportunities, enhance the added value of agricultural produce whilst sustaining the natural environment and higher rate of economic growth. This strategy however requires greater concentration of population, resulting in a higher growth in urban conurbations.

The overall situation of the Services sector has been continuous growth in the recent past accounting for 55 percent of the national GDP. Statistics of the Central Bank from 1999 to 2003 indicate the Service sector of the national economy recording the highest growth rates increasing from 5.6 percent in 1999 to 6.1 percent in 2002 and 7.7 percent in 2003. Negative GDP rate of -1.5 percent recorded in 2001 highlighted the unsettled political situation of the country.

When sub sectors of the Service sector are considered, the highest growth was indicated in the Telecommunication sub sector (24.5 percent) followed by Hotels and restaurants sub sector (22.0 percent) in 2003. Port Services sub sector has shown a significant growth rate of 10.8 percent in 2003. On the basis of the rational behavior of sub sectors, and with the proposed sea port and air port, tourism development and information technology in the Southern Region, the Services Sector could be expected to play a major role in economic growth.

It is inevitable however that a large amount of public/private investment is needed particularly in infrastructure development as a prerequisite for implementing the strategy.

Implementation of the combined strategy is based on providing a big push to implement selected number of high productive and high penetrative mega projects. Therefore implementation of this strategy requires an effective level of project prioritization and financial discipline, so that some less priority projects could be delayed even though some short-term social and political problems would arise. High priority projects regulating future development of the region would be selected for immediate implementation.

The export of petrochemicals as an industrial product among others with ayurvedic products, agricultural products, gems and related products etc. too have a remarkable potential in the development of Southern region. Medium scale industries particularly in the food processing and canning could make a significant impact in forging development.

2.2 Problems and Opportunities

Among a large number of problems, the following two are considered to be the most pressing the region confronts at present.

- Lack of assured supply of water for most parts of the region.
- Lack of other related infrastructure both physical and social.

The region has many opportunities for achieving fast track economic growth. Among them the following are outstanding.

- Although some parts of the region (i.e. Monaragala and Hambantota districts) experience the problem of inadequate water the region generally has adequate water even more than the future demand for various activities. The issue is lack of an efficient water resources management system to ensure adequate water for the whole region throughout the year.

- Locational advantage, particularly Hambantota being in close proximity to the international shipping lanes provides the greatest competing opportunity for development of an international seaport. Feasibility studies on the airports reveal that the best location for the second international airport of Sri Lanka is in vicinity of Hambantota port.(Kuda Oya)

- Availability of a large extent of developable land, particularly land that could be developed based on the provision of adequate water and infrastructure .

- International Fiber Optic Cables – SEA – ME – WE 2 and SEA ME – WE 3 that are laid in the sea bed connecting Asia with the rest of world (Europe, Middle East and North America) are in close proximity to Sri Lanka and almost tangential to the southern coast providing opportunities for easy access to the international information superhighway. Although at present a single landing point is restricted only to Colombo it is very likely that a landing point for the South could be obtained from the proposed SEA – ME – WE 4, if the Government makes an opportune policy decision for obtaining a landing point.

- The very high bio-diversity of flora and fauna of the region, the wide distribution of historical sites, natural endowment of the coastal zone could provide many opportunities for development of tourism as a major economic activity of the region.

- The extensive coastal zone and untapped deep sea resources is a potential to make Sri Lanka self sufficient in fishery products. Optimization of resource potential of inland water bodies for fishery activity would be complementary.

- Livestock has been traditionally a well-established economic activity in the region, particularly in Monaragala and Hambantota districts. Reduction of present problems such as inadequate grasslands, inadequate incentives, indiscriminate import of powdered milk, etc. could make this sector reap the full potential to re-emerge as a major economic activity of the region.

2.3 Objectives

Objective of the economic strategy plan for the region is to achieve an economic growth rate of 5.0 percent by 2020 and 6.0 percent by 2030 comparable with the national average.

2.4 Economic Role of Districts

In keeping with the strategy to achieve objectives of the Plan every district has been assigned a major economic role. Assigning an economic role was dependant on comparative advantage of one district on a specialized sector over other districts. The assigned roles of every district would be complementary with other economic activities. However emphasis is given on the assigned sector so as to achieve higher rate of productivity ,value addition and thereby economic growth.

District	Major Economic Role
Galle	Tourism, Services, Export crops and Fishery, ICT
Matara	Information Technology Services, Export Crops and Fishery
Hambantota	Major Industrial, Livestock and Export Crops and Tourism
Monaragala	Agriculture, Tourism and Mining industry
Ratnapura	Agriculture, Mining industry

2.5 Strategy for Developing Major Sub Sectors

2.5.1 Agriculture

The strategy proposed for development of the agricultural sub sector is three fold.

- Promotion of export oriented commercial agriculture that encompasses modernization, research and development, new technologies etc. To implement the strategy the Plan proposes the development of large scale commercial farms of 100,000 hectares in Hambantota, Monaragala and Ratnapura districts targeting the capture of niche markets (high markets) for produce that Sri Lanka has competing advantage over other countries.

- Promotion of investments in Research and Development particularly in areas such as plant breeding, crop improvements, high-brid seed development, integrated pest management, bio fertilizer, bio pesticide, integrated water management, soil fertility management, fruit and flower culture development and post harvest processing etc.

- Improving productivity and sustainability of small holders agriculture by making them effectively complementary and integrated with core strategies conceptualized.

2.5.2 Livestock

The main objective of livestock development is to create an environment for strong import substitutes particularly in dairy products. (At present Sri Lanka spends Rs. 11.5 billion per annum only for importing powdered milk). The strategy includes;

- Development of a large scale commercial dairy farms and grass lands through newly irrigated lands and existing lands in all the five districts. The estimated extent is 17,000 hectares.

- Development of large scale commercial farms for animal husbandry (i.e. free ranging poultry, goat farming etc)

- Increasing productivity of subsistence livestock through forging a link between out -growers and command centers.

2.5.3 Fishery

The main objective of the fishery sub sector is to make Sri Lanka self sufficient in fishery products. At present Sri Lanka spends Rs. 6.0 billion per annum to import

fish and fish products. The strategy includes;

- Promotion of large scale commercially oriented deep sea fishing through modernization and expansion of fishery harbours that can cater to multi-day boats.

- Promotion of fish farming of selected fish species to supply niche markets through quality assurance, adoption of new technologies ensuring uninterrupted earnings of foreign exchange.

- Promotion of inland fisheries and aqua culture through stocking new broods/ fingerlings and adopting advance technologies.

2.5.4 Tourism

The primary objective of Tourism sub sector is optimum utilization of natural resources, historical and adventure sites where the southern region has greater advantage than many countries in Asia. The strategy includes;

- Development of infrastructure and resorts in major tourist sites.

- Introduction of eco tourism, adventure tourism, farmland tourism, ayurvedic Spas and cultural tourism.

- Promotion of historically oriented festive tourism (Kataragama Devalaya, Saman Develaya Perahera)

2.5.5 Industries

Main focus of industrial development strategy is to concentrate on service industries and heavy industries. The strategy includes;

- Promotion of heavy industries such as oil refineries and petrochemicals based on Hambantota sea port providing the desirable infrastructure.

- Promotion of Port related service industries such as ship repairs, transshipments etc. based on Hambantota sea port development providing the required infrastructure.

- Promotion of food processing and food canning industries of small and medium scale in Monaragala, Hambantota and Ratnapura district creating a nexus between large scale farm producers and small holders produce.

- Establishment of large scale fish canning industry by developing deep sea fishing activities.

2.5.6 Energy

Production of energy would be a major utility activity complementing the Plan as the expected development in the region has an estimated energy demand of 3947 GWH by year 2025. The strategy includes;

- Establishment of large scale coal power plants in Hambantota as a component of the sea port development programme.

- Development of energy forest particularly in buffer zones of environmentally sensitive areas. (to create job opportunities, positive environmental benefits and alternative source of energy)

- Development of macro and micro hydro power projects integrated with river basin development.

2.5.7 Water Resources Management

The greatest challenge in the region is to promote optimal use of water for food production, drinking and sanitation and provide easy accessibility to all people. The region has several river basins. The major focus of the Plan is coordinated development & management of water, land & related resources to cater to all the

needs of the proposed economic sectors. The strategy related to the water resources management Plan includes

- Securing of water for food production (In river basin development & transbasin diversions)
- Use of modern technology, to promote hydropower macro & mini to maximise economic activity
- Mitigating risks - flood & variation in flows (droughts), protecting ecosystems & water pollution etc

2.5.8 Transport

The main objective of the transport plan is to develop a multi-modal transport system to enhance the functional efficiency and the productivity of the Southern Region.
Strategy of the transport Plan is three fold ;

(i) Synergizing the main land use systems proposed in the regional plan (i.e. urban centres, commercial agriculture zones, economic centres and rural home gardens) mainly by improving local and provincial roads and accessibility of the region with the rest of the country with high mobility roads and railway .

(ii) Development of scenic roads in a network to provide easy acessibility to scattered areas of tourist interest across areas of natural scenic beauty.

(iii) Exploiting the economic potential of international shipping industry by developing Hamabantota Port as an international Port and Galle Port as a regional port.

2.5.9 Physical Infrastructure

Critical issue in the provision of infrastructure of the region (a problem common to the whole country) is the high cost emanating from unbalanced dispersal of the human settlement pattern. Hence the guiding principle in the development of infrastructure plan lies in the re-structure of the settlement plan. Chapter 09 proposes high density urban settlements to accommodate 53.6% of the region's population by year 2030. (See Table 9.1)

2.5.10 Social Infrastructure

Poor social infrastructure particularly health and education mainly in Hambantota, Monaragala and Ratnapura districts was recognized as one of the major causes of underdevelopment. The objective of the social development plan is to integrate social infrastructure comprehensively with the economic activities so that both would sustain at optimum efficiency.

The strategy is based on the proposed settlement plan (Chapter Nine) where the present rural economy characterized by small land holdings, poor productivity, traditional practices, apathy to modern methods, lack of social and physical infrastructure etc would be transformed to a modern agricultural society by linking with fast growing urban centers and large scale commercial farms. This is expected to create a technology transfer, adequate job opportunities, market for rural produce and easy accessibility to high level of social infrastructure such as schools, training centers, health and recreation facilities to all social groups and be a catalyst for alleviation of most social inequalities.

2.5.11 Environmental Management Plan

Southern region except the arid South East is part of the bio-climatic Wet zone and characterized by high bio diversity and therefore a major part of the land area of the region (47.3%) being classified as environmentally sensitive. These sensitive areas consist of wetlands, forest reserves, wildlife reserves, coastal zones and archeologically hallowed sites. Most of these locations are very attractive tourist sites that could contribute immensely to the economic development of the region.

The overall objective of the environmental management plan is to sustain the natural environment of the region in its pristine form balancing the needs of social and economic development through;

- the use of living natural resources in wise and sustainable manner,

- the use of non-living resources more productively, efficiently and consistently with environmental best practices allowing a considerable amount for future generations, and minimizing the environmental degradation with aggressive attempts to reuse and recycle the resources.

The main strategy to achieve the overall objective is to develop a comprehensive land use system for the region that clearly recognizes;

- environmentally sensitive area where development is either totally restricted or partially permitted

- undeveloped areas comprising chena and scrubs that have a vast potential for economic and social development

- under-developed areas that could be rehabilitated in terms of productivity enhancement or as a new development.

Developable areas and undevelopable areas are clearly identified on the physical plan so that the envisaged development activities in the region could be located without major environmental degradation.

Implementation of the environmental management plan is also well synergized with the other plans such as, agricultural development plan (that promotes bio agriculture), water resources management plan (that would change the micro climatic conditions of the dry zone), settlement plan (that promotes high density development in selected urban centers) etc.

Chapter -03

Environmental Management Plan

CHAPTER THREE

ENVIRONMENTAL MANAGEMENT PLAN

3.1 Introduction

Considerable portion of the Southern Region is considerd to be environmentally sensitive. Extent of environmentally sensitive areas varies from 32.6 % in Rathnapura District to 59.7 % in Hambantota District. The region;

- has a large extent of forests, forest reserves and wildlife reserves.
- has annual and seasonal cultural activities such as Kataragama festival, 'Sri Pada' pilgrimage etc.
- is blessed with a variety of topography and climatic conditions.
- has a number of tourist attraction areas including a large strip of coastal belt,
- comprises several agro-ecological zones permitting the development of different varieties of agro-based industries.
- has a high potential for agriculture and is rich in mineral resources.

3.2 Problems and Issues

Even though the region is rich in natural resources, environmental degradation seems to be on the rise. Studies have shown that the districts have their inherent environmental problems and issues that need to be addressed in a sound environmental management process. The key problems and issues are;

Galle District

- Deforestration in Niyagama, Tawalama, Nagoda, Karandeniya, Uakkalamulla, Neluwa Divisional Secretariat divisions
- Flooding in Baddegama, Bope Poddala, Bentota, Elpitiya, Galle, Habaraduwa, Tawalama, Karandeniya, Neluwa and Niyagama local authorities
- Land slides in Elpitiya, Niyagama, Tawalama divisions
- Soil erosion in Niyagama, Tawalama, Neluwa, Nagoda, Yakkalamulla and Bope Poddala Divisional Secretariat Divisions
- Beach erosion in many coastal areas
- Environmental pollution due to industries such as cement industry, rubber processing, palm oil industry, tea industry, coir production, coconut husk retting, and tourism etc.
- Limestone and coral mining in Seenigama, Habaraduwa, Akurala, Kahawa, Thalwatta, Ahangama, Madampe, Thalpe, Piyadhigama and Thiranagama areas
- Improper solid waste management in all local authorities

Regrowth of vegetation at a deforested site at Thawalama

Soil erosion in Mapalagama, Nagoda

A flood prone area in Bope Poddala (Polathumodara Ganga)

A flood prone area in Bope Poddala

Beach erosion in Koggala

Beach erosion in Ahangama

Landslides in Batahena, Thawalama

Landslides in Malgalla, Hiniduma

Coir production in Galwehera, Balapitiya

Coir production in Madu Ganga

Beach erosion in Akurana

Beach erosion in Seenigama, Hikkaduwa

An abandoned limestone mining site in Akurana

Coral mining in Seenigama, Hikkaduwa. Note that illegal coral mining is carried out; the white bags are used to collect


Improper solid waste management in Ahangama

Destruction of wetlands in Polathumodara

Matara Distrct

- Beach erosion in Deduwela, Midigama, Weligama, Mirissa, Polhena, Dikwella, Kottegoda and Devundara areas
- Soil erosion in Kekunahena, Hiyanduwa, Andaradeniya, Rotumba, Alapathadeniya, Weliwa, Dakkouwa, Kudapana and Pattaramulla areas
- Destruction in wetlands in Kirale kale and Polathumodara
- Coral mining in Mirissa, Weligama and Midigama
- Environmental pollution due to industries such as burning of limestones, coconut husk retting, brick industry etc
- Intrusion of saline waters in Nilwala Ganga and Polwatta Ganga
- Poor water management in major water catchments
- Land slides in hilly areas particularly in Deniyaya
- Poor solid waste management in all local authorities
- Deforestation in all forests and forest reserves

Burning of limestones in Polhena, Matara

Coconut husk retting in Polhena, Matara

Beach erosion in Rasmulkanda, Weligama

Beach erosion in Polathumodara

Landslides in Deniyaya

Landslides in Diyaduwa, Deniyaya


Regrowth of vegetation at a deforested site in Akuressa


Deforestation in Indikatudeniya


Destruction of forest for chena cultivation in Bata Atha


Destruction of forest for chena cultivation in Siriyagama, Kirinda

Hambantota District

- Deforestation in Okawela and Katumana Divisional Secretariat Divisions
- Soil erosion especially in Pallegama, Peneriyagama, and Tissamaharamaya Divisional Secretariat Divisions
- Pollution due to industries such as paper and pulp industry, quarrying and crushing, coconut husk retting, sand mining, bricks and tile industry, fishing and tourism etc
- Poor solid waste disposal in all local authorities
- Poor water management affecting all areas
- Destruction of forest for chena cultivation
- Elephant human conflicts particularly in areas close to wildlife reserves
- Lack of drinking water in Hambantota, Ambalantota and Tangalle Divisional Secretariat Divisions
- High salinity in drinking water in many areas
- Destruction of crops by stray cattle and buffaloes


Destruction of crops by cattle and buffaloes in Tangalla


Destruction of crops by cattle and buffaloes in Bundala


Flooding in Sella Kataragama


A wetland in Kalametiya

Monaragala

- Soil erosion in highlands having steep slopes in Bibile, Medagama, Moneragala and Wellawaya Divisional Secretariat Divisions
- Deforestation in Bibile, Medagama, Monaragala, Kataragama, Buttala and Wellawaya Divisional Secretariat Divisions
- Setting fires to forest in Bibile, Medagama, Moneragala, Wellawaya, Buttala and Kataragama Divisional Secretariat Divisions
- Degradation of catchments such as Jelong mountain ridge, Maragala and dorapoda mountain ridges etc
- Degradation of river banks due to river sand mining in Kumbukkan Oya, Medagama Oya, Manik Ganga, Walave Ganga, Maw Ara, Hulanda Oya, Alupotha Oya and Gal Oya
- Poor solid waste management in all local authorities
- Loss of biodiversity in wildlife reserves
- Conflicts between human and elephants in Sewanagala, Thanamalwila, Kataragama, Buttala, Wellawaya and Siyambalanduwa Divisional Secretariat Divisions
- Land degradation due to gem mining in Moneragala, Medagama, Bibile, Buttala and Kataragama Divisional Secretariat Divisions

Regrowth of vegetation at a deforested site in Lunugala, Monaragala

Setting fires on forest in Wellawaya, Monaragala

Degradation of catchments, dorapoda mountain ridges in Bibile, Monaragala

Degradation of catchments, dorapoda mountain ridges in Bibile, Monaragala

Soil erosion in highlands having steep slopes in Bibile

Soil erosion in highlands having steep slopes in Wellawaya

Degradation of river banks due to river sand mining in Kumbukkan Oya

Degradation of river banks due to river sand mining in Kumbukkan Oya

Degradation of river banks due to river sand mining in Medagama Oya

Heda Oya Siyambalanduwa, Monaragala

- Poor solid waste management in many local authorities
- Loss of biodiversity due to human encroachment especially in forests and forest reserves
- Natural hazards due to anthropogenic effects such as land slides, erosion and flooding etc

It is imperative to mitigate the problems and issues identified for each district with the new interventions for which the information must be gathered and in general development potentials and contrains based on SWOT analysis are envisaged and given below

Poor Solid waste management in Siyambalanduwa

Land degredation due to gem mining in Medagama, Monaragala

Gem mining in Getahetta, Eheliyagoda

An abandoned gem mining site at Getahetta, Eheliyagoda

Ratnapura

- Deforestation due to illicit felling of commercially valuable trees
- Destruction of forests for the purpose of mining gems and other valuable minerals
- Sand mining in river basins
- Setting fires in forest (shrub) particularly in Kollonne and Balangoda Pradeshiya Sabhas
- Conflicts on water use particularly in Kolonna
- Water pollution in tributaries of Kuru Ganga, Kalu Ganga particularly during 'Sri Pada' season; Faecal pollution seems to be on the rise in many of the streams due to poor sanitary facilities

Gem mining in Pelmadulla

Sand mining in Kalu Ganga, Kapugamuwa, Ratnapura

3.3 Development Potentials and Constraints

To overcome the problems and to address the issues it is of utmost importance to examine with the development potentials of the Southern Region and the constraints. The region is rich in natural resources, which could be harnessed sustainably. The major development potentials in the region are given as below.

- Presence of high bio-diversity hotspots
- Presence of a large forest cover comprising both low land rainforests and dry monsoon forests.
- Availability of a large number of attractive tourist places such as world renowned wildlife reserves, a substantially long coastal belt, historical and cultural buildings and sites and water bodies that has the potential to create new employment opportunities without destroying the environment.
- Presence of different types of minerals of high commercial value
- Presence of world heritage and Ramsar sites (Galle Fort, Rekawa Lagoon, Madu Ganga etc.)

Along with the vast development potentials of the region, the likely constraints in the region need to be ascertained.

The major constraints are;

- Lack of drinking water facilities in Monaragala and Hambantota districts
- Poor solid waste management in all the districts
- Inefficient water management systems that destroys the environment
- Illicit mining of mineral resources in Monaragala district and Ratnapura district such as limestone along the sea coast from Ambalangoda to Galle.
- Destruction of the forest cover for chena cultivation and timber Monaragala district and Ratnapura district .
- The threats from high polluting industries with the development of Hambantota Sea Port
- High incidence of human-elephant conflicts
- Poor water quality along the costal belt

For sound environmental management the integration of all the development potentials is of paramount importance. The objectives are therefore setout taking into account the entire economic, social and environmental structures of the region.

Unawatuna beach, one of Sri Lanka's tourist attractions

Madol duwa, Koggala

Madu ganga, Balapitiya

Hikkaduwa fishery harbour


Regrowth of vegetation at a deforested site in Bata Atha


Yala Wild life reservoir


Biodiversity in Kalametiya


Biodiversity in Kalametiya



Bata Atha Industrial Park


Ussagoda sand area, Hambantota


Kalametiya lagoon


Salt Industry (Maha Lewaya) Hambantota


Crushing (Bata Atha Gal Mola), Bata Atha


Chandrika wewa Tank in Embilipitiya


Kunukalliya lewaya, Bata Atha


Yoda wewa tank in Tissamaharamaya


Samanalawewa Tank in Balangoda


Biodiversity in Kalametiya


Kuru Ganga in Kuruwita


Kalu Ganga in Malwala, Ratnapura


Mahagama kanda in Pallebedda


Sankapala Kanda, Dematagala, Embili-pitiya


Kalu Ganga in Ratnapura


Belihuloya Balangoda


Kolonne Oya, Kolonne


Maha Saman Devalaya, Ratnapura

3.4 Objectives

The overall objective of the environmental management plan is to promote the sound management of the natural environment of the Southern Region in its entirety without compromise, balancing the needs for social and economic development together with environmental integrity to the maximum extent possible

through

- the use of living natural resources in a wise and sustainable manner,
- the use of non-living resources more productively, efficiently and consistent with best environmental practices leaving a considerable fraction for future generations,
- minimizing environmental degradation and promoting the reuse and recycling of the resources in the region.

3.5 Strategies

National Physical Planning policy in its policy statement on the environment states that the protection of watershed areas, areas with rare eco-systems, eco-systems of exceptional diversity, areas with concentration of economically important or potentially important species of varieties and threatened species, fragile areas that may be easily degraded, important aesthetic, cultural, historical and recreational areas. The policy further emphasizes sustainable use of natural resources

The environmental management plan for the Southern Region is worked out within this national planning perspective.

The main strategy to achieve the overall objective is to develop a comprehensive land use system for the region that clearly recognizes;

- environmentally sensitive areas where development is either totally restricted or permitted with restrictions.
- undeveloped areas comprising chena and scrubs that have a vast potential for economic and social development
- under-developed areas that could be further developed in terms of productivity enhancement or a totally new development.

In other words developable areas and undevelopable areas are clearly identified in a physical plan so that the development activities in the region could be carried on without much environmental degradation.

Furthermore, the other strategies to achieve the overall objective could be categorized into different sectors such as;

- Forestry and wildlife conservation
- Agriculture, plantation land development and mining
- Fisheries, aquaculture and coastal and marine area management
- Industry and tourism
- Energy and transport
- Health, sanitation and urban development

Some of the sectors are combined so that their strategies are common. These strategies are in consonance with those identified by the Ministry of Environment and Natural Resources and the guidelines prepared by National Physical Planning Department. The strategies identified for the different sectors are given below.

Forestry and Wildlife Conservation

- Periodically (at least at ten-year intervals) carry out a forest resource survey of the region and make available the data for decision making

- Reclassify the natural forests of the region on a national system of classification based on the objectives of management, which should take into account ecological and social imperatives, and prepare and implement management plans for forestry

- Ensure that the wide range of habitats of animal and plant life present in the region are adequately represented in the protected areas in the region (under DWLC and FD), and that habitat bridges in the form of wildlife corridors are established where necessary

- Adopt the principle of conservation and sustainable use in place of the former policy of “protection only”, as appropriate, in relation to the different categories of protected areas (including Buffer Zones) under FD and DWLC and prepare and implement management plans accordingly

- Adopt a participatory approach to the management of forests and wildlife areas, recognizing the local people as stakeholders and beneficiaries and involving them in decision-making

- Demarcate the definitive boundaries of protected areas (under the FD and DWLC) and adopt strict measures to stop any activities impacting adversely on such areas (encroaching, illicit logging, poaching, setting fire, etc.)

- Strengthen the protection of all natural forest, seeking the support of local communities, and taking legal action when needed
- After careful study, promote nature-based tourism in the form of eco-tourism within sustainable limits, focusing on observing and appreciating the natural forest and wildlife of the region
- Continually review the legal provisions for forest conservation (Forest Ordinance) and wildlife conservation (Fauna and Flora Protection Ordinance) including the matters related to providing access to generic resources and sharing the benefits, and update the laws where necessary

- Promote the production and use of timber from non-forest sources (home gardens, rubber and coconut plantation)

- Promote the propagation of useful non-timber species (eg. Medicinal plants)

- Promote agro forestry systems where trees of suitable species will be an important component of mixed, sustainable farming systems

- Regulate the import and export of genetic resources so as to ensure that the principle of sustainable use and equitable sharing of benefits are adhered to

- Promote research on conservation of biological resources and on valuation of the conservation benefits of forests

- Ensure that decision making in forestry and wildlife conservation management based on traditional knowledge, scientific information and research findings

- Involve the private sector in promoting forest development activities and in the conservation of forest and wildlife

- Take necessary steps to conserve and protect traditional knowledge on the conservation and the preservation of biological diversity

Agricultural, Plantations, Land Development and Mining

- Develop a capability and an institutional arrangement for promoting soil conservation measures and implement the provisions of the law to promote soil conservation and good land management in all parts of the region.

- Initiate and pursue vigorously a program for putting into productive use the large area of fallow and partially used land (mainly *chena* lands, which are subject to continuing soil degradation) in the region and simultaneously carrying out research on rain fed farming systems, drawing on modern science and traditional knowledge to develop suitable cropping systems with a proper combination of annual and perennial species and animal husbandry

- Review land tenure systems in relation to their impact on land productivity and, where necessary, replace current tenure systems with systems that would promote good land management and improved productivity

- Strengthen extension services (including training) on the application of fertilizer and agrochemicals, and promote the use of integrated pest management and of bio-insecticides, insect repellants and organic manures

- Promote crop diversification where appropriate.

- Promote the adoption of conservation farming techniques

- Provide incentives, particularly to small holders, to improve productivity through good land management and the use of improved seed stock

- Promote the conservation of traditional varieties of plant and animal species used in agriculture and animal husbandry and the conservation of wild stocks of related species and varieties

- Establish suitable institutional arrangements to ensure that potential invasive species are not imported to the country and that the spread of such species already within the country is effectively controlled

- Maintain selected areas of the catchments of river systems under undisturbed natural forest and promote integrated management of land, water and other natural resources on the basis of river basins, watersheds, micro-catchments

- Promote irrigation and drainage practices that will reduce soil erosion, conserve soil and moisture and prevent environmental damage including water logging and salinity build-up

- Establish suitable institutional arrangements to ensure that potential invasive species are not imported to the country and that the spread of such species already within the country is effectively controlled

- Maintain selected areas of the catchments of river systems under undisturbed natural forest and promote integrated management of land, water and other natural resources on the basis of river basins, watersheds, micro-catchments

- Promote structural and non-structural measures that would minimize water quality deterioration

- Promote water resources development techniques with reusable materials (e.g. use of rubble packing and gabions), whenever feasible

- Mobilize farmer organizations and other stakeholders to take an active part in conserving soil, water and other natural resources and adopting ecologically and environment-friendly agricultural practices

- Adopt regulatory measures to ensure that all the mining activities are covered by permits from the designated authority, and that the terms and conditions of the permit relating to environmental safeguard (e.g. as regards minimizing atmospheric pollution, noise pollution, disturbances to natural habitats, and contamination of surface and ground water) are adhered to

- Ensure the ecological restoration of gem pits and other mining sites

- Restrict sand mining of river-beds and beaches to within environmentally safe limits and identify and promote the use of the suitable alternative sites for the safe extraction of sand

- Ensure that mineral resources are used with due regard to equity as regards benefits to present and future generations and with value addition within the country, as far as possible, in respect of exports

- Restrict, regulate and, where considered necessary, prohibit activities in the coastal zones so as to minimize or eliminate adverse impacts in relation to coastal erosion

- Minimizing negative impacts of offshore mineral resource extraction

- Identify coastal erosion trends and formulate and implement appropriate mitigatory measures

- Restrict, regulate, and where necessary, prohibit activities (development activities in the coastal zone such as aquaculture, discharge of untreated wastes, sediment, etc.) that are a threat to coastal biodiversity

- Promote conservation of biodiversity and sustainability in the use of resource within coastal habitats, focusing specifically on species and ecosystems under threat

- Adopt specific measures for protecting coral reefs

- Adopt measures to ensure that marine resources are harvested sustainably through regulation of fishing effort and the use of appropriate fishing gear

- Adopt special conservation measures for marine species under threat

- Involve the local communities in the management and sustainable use of coastal and marine resources

- Before introuducing alien species into inland water bodies for increasing productivity or other perceived benefits, carry out rigorous tests to ensure that, this will not lead to adverse impacts on the environment or on indigenous biodiversity

- Promote research on coastal and marine resources, on a prioritized basis, to determine population dynamics, sustainable levels of harvesting, and ecological parameters

- Increase awareness at all levels of the importance of the coastal zone and its resources and the need for development activities in relation to fisheries and other coastal and marine resources to remain sustainable

- Conserve high priority archaeological, historical and cultural sites and scenic areas within the coastal zone
- Protect and enhance coastal public access
- Ensure that the coastal environment, one of the nation's important assets, is clean and healthy

Industry and Tourism

- Promote "cleaner-production" by providing incentives and access to cleaner technology, organizing, training programs, carrying out waste audits, and encouraging cleaner product, particular for industries and other related services that are being newly set up, where provision can be made in the design stage
- Encourage the location (and relocation) of high-pollution industries in industrial estates provided with common waste treatment plants and solid waste disposal facilities
- Ensure that all new industrial estates are provided with common wastewater treatment facilities for effluent and a proper solid waste management plan for solid waste disposal
- Adopt control measures to avoid pollution through sewage discharge and ground water contamination in coastal areas and around inland water bodies
- In the development of nature-based tourism, ensure that the natural resources are adequately protected and that guidelines are fully adhered to
- Draw up zoning plans and adopt the provisions in such plans when allocating land for tourism related projects

Energy and Transport

- When developing power sector projects and planning power distribution it should be ensured that adequate attention is paid to safeguarding environmental and cultural values, including conserving landscapes and high recreational value and preserving region's natural beauty
- Pursue a systematic program for using new and renewable sources of energy for powering generation, where feasible
- Test the feasibility of using biomass fuel (Dendro power) for power generation, and promote if found feasible
- Design, construct and maintain roads to acceptable standards in order to minimize environmental pollution
- Enforce regulations on noise emission by transport vehicles
- Incorporate environmental safeguards into the development strategies of the energy and transport sectors and ensure that environmental safeguards are adopted
- Apply economic instruments for demand management of road transport and increase the use of a rail transport
- Promote inter-modal coordination for public transport

Health, sanitation and Urban Development

- Extend the provision of potable water (inadequate quantities) and safe sewage disposal facilities to urban centers
- Promote the conservation and reuse of water whenever feasible
- Promote education, communication and awareness among school children and the general public on various aspects of health, sanitation and personal hygiene
- Plan urban centers, allowing for the expected growth of the urban population, and paying special attention to the need to maintain a healthy environment
- Ensure that ambient water quality standards are maintained in water bodies within, and in proximity to, urban centers
- Provide for the proper collection and disposal of solid waste, including hazardous wastes, by sanitary landfills or other suitable means
- Ensure that development activities in urban centers, while taking advantage

of their strategic locations and access to resources, do not lead environmental degradation

- Introduce / Enforce legislation to prevent environmental degradation of public places

- Adopt suitable measures to cope adequately with natural disasters

3.6 Environmentally Sensitive Areas

The sensitivity of a particular geographical location could be defined in numerous ways. In general the areas that are most likely to be environmentally degradable are reckoned to be sensitive. Nevertheless, the environmentally sensitive areas are defined as per Gazette Notification dated 24th June 1993 based on the National Environmental Act No.47 of 1980. The classification is given in the Annexure 1. It was followed in determining environmentally sensitive areas.

The information and data gathered in terms of Annexure 1 are presented on a district basis so that a comparison could be made in relation to the optimum utilization natural available resources in each district.

Table 3.1 shows the extent of sensitive areas in each of the districts in the Southern Region. Figures 3.1 to 3.5 show the types of sensitive areas available in each of the districts.

Table 3.1
Extent of sensitive areas in each district of Southern Region

District	Extent (ha)	Percentage (%)
Galle	64954	40.2
Matara	44097	33.7
Hambantota	156719	59.7
Monaragala	317293	55.2
Ratnapura	106370	32.6
Southern Region	689433	47.3

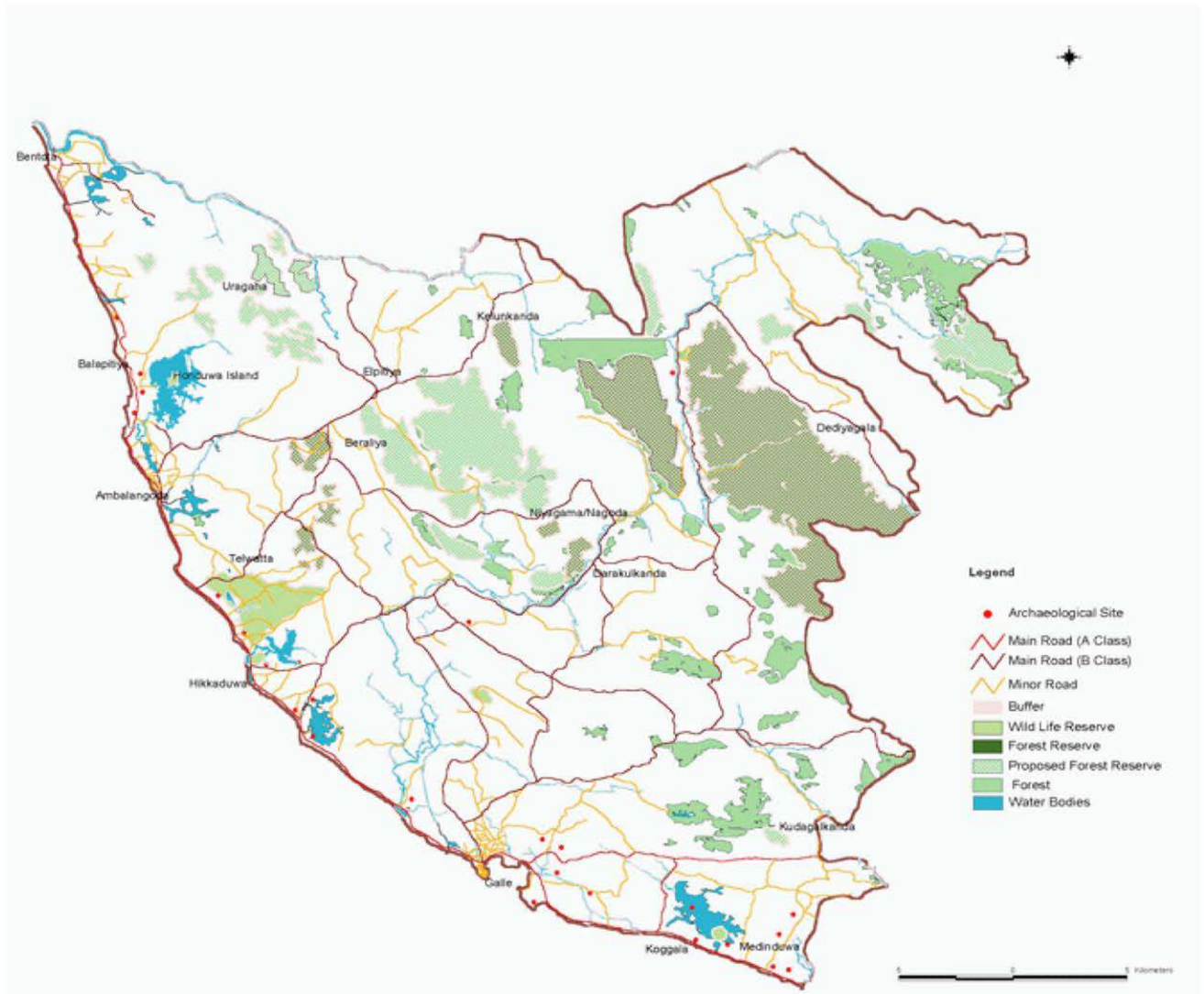
It is clear that in each district at least one third of the total extent comprises sensitive areas. Hambantota and Monaragala districts possess higher fractions amounting to about 60 and 55 persent respectively. These figures show that the region is divers in flora and fauna. This needs to be conserved and protected. The entire region as a whole (Fig. 3.6) has coverage of about 48 %, which is considered to be remarkably high when compared with other regions. Development of these sensitive land areas should be either completely restricted. If any developement has to take place it should be done with extreme care so as not to cause any environmental degradation.

3.7 Developable lands

It is envisaged that the lands for different development activities in the region should be physically identified in the zoning plan giving due consideration to sensitive areas. The undeveloped lands in each district, are the shrub and chena lands that could be effectively and efficiently utilized for any proposed development. The other areas (except for sensitive and built-up) are categorized as under-developed. They have the potential to be further developed in terms of current uses or else developed for a completely new use. Developable areas therefore comprise both undeveloped and under-developed areas. Table 3.2 shows the extent of developable and undevelopable areas in each of the district in the region. Figures 3.7 to 3.11 show the location of such areas in each district in the Southern Region. Figure 3.12 shows the developable lands in the entire Southern Region

Table 3.2
Extent of developable and undevelopable land by district (ha)

District	Undevelopable areas		Developable areas		Total land extent
	Built-up areas	Sensitive areas	Undeveloped areas	Under-developed areas	
Galle	560	64954	18032	78023	161569
Matara	445	44097	18380	68050	130972
Hambantota	9	156719	78371	27485	262584
Monaragala	54	317293	195179	62711	575237
Ratnapura	192	106370	100942	119113	326617
Southern Region	1260	689433	410904	355382	1456979



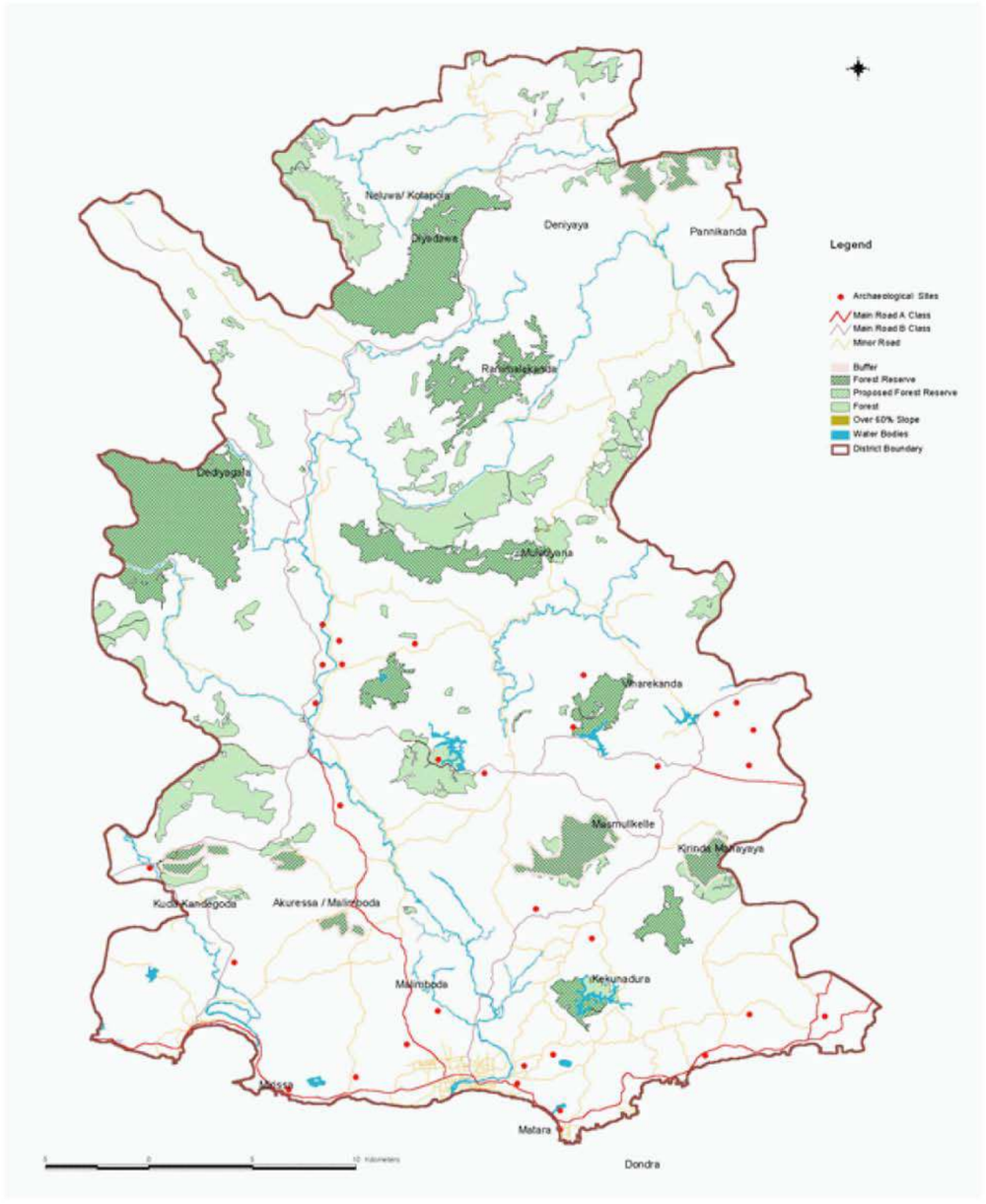
Southern Region Physical Plan

Figure: 3. 1

Environmentally Sensitive Areas in the Galle District

Source: Central Environmental Authority

National Physical Planning Department



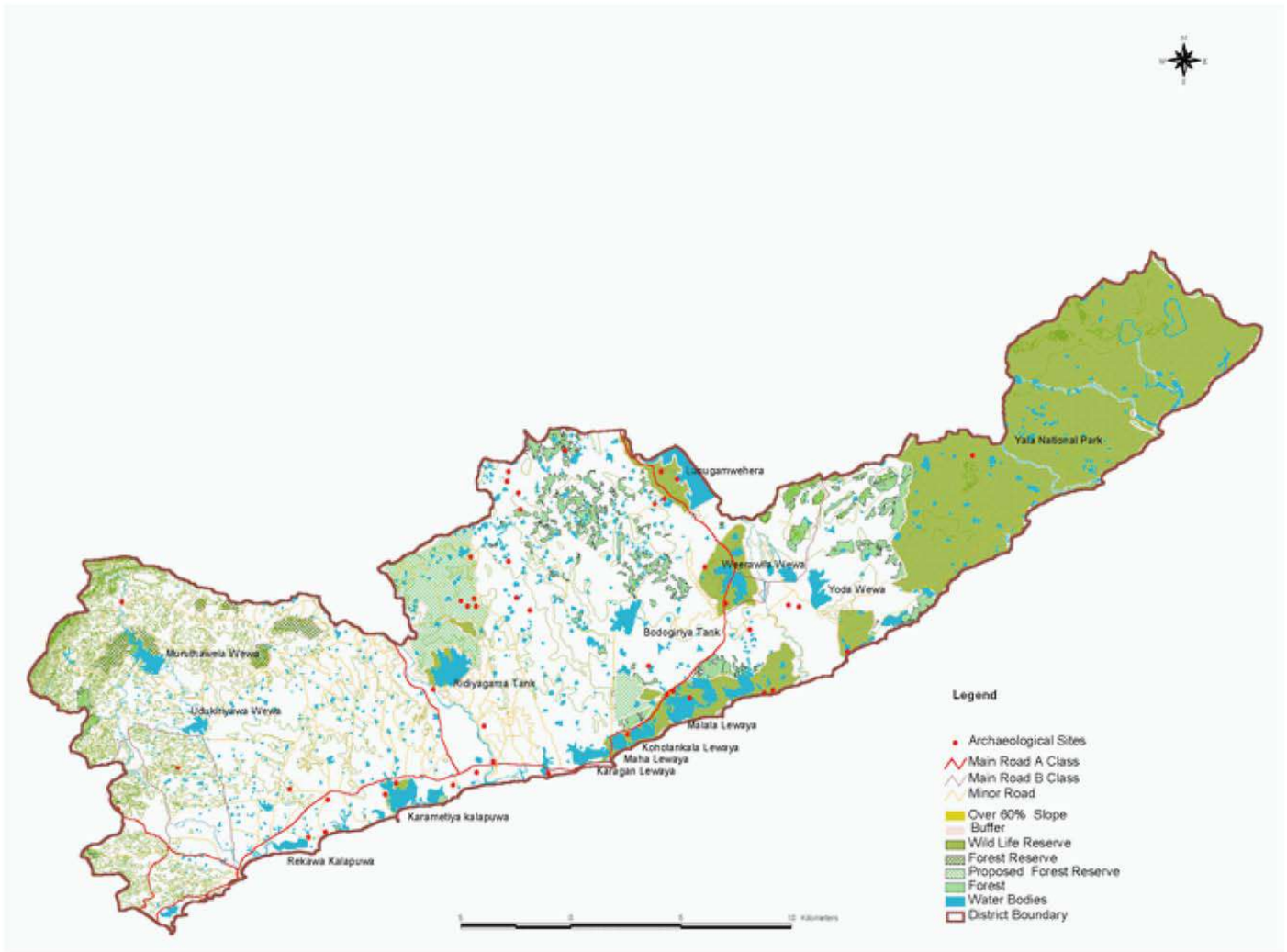
Southern Region Physical Plan

Figure: 3. 2

Environmentally Sensitive Areas in the Matara District

Source: Central Environmental Authority

National Physical Planning Department



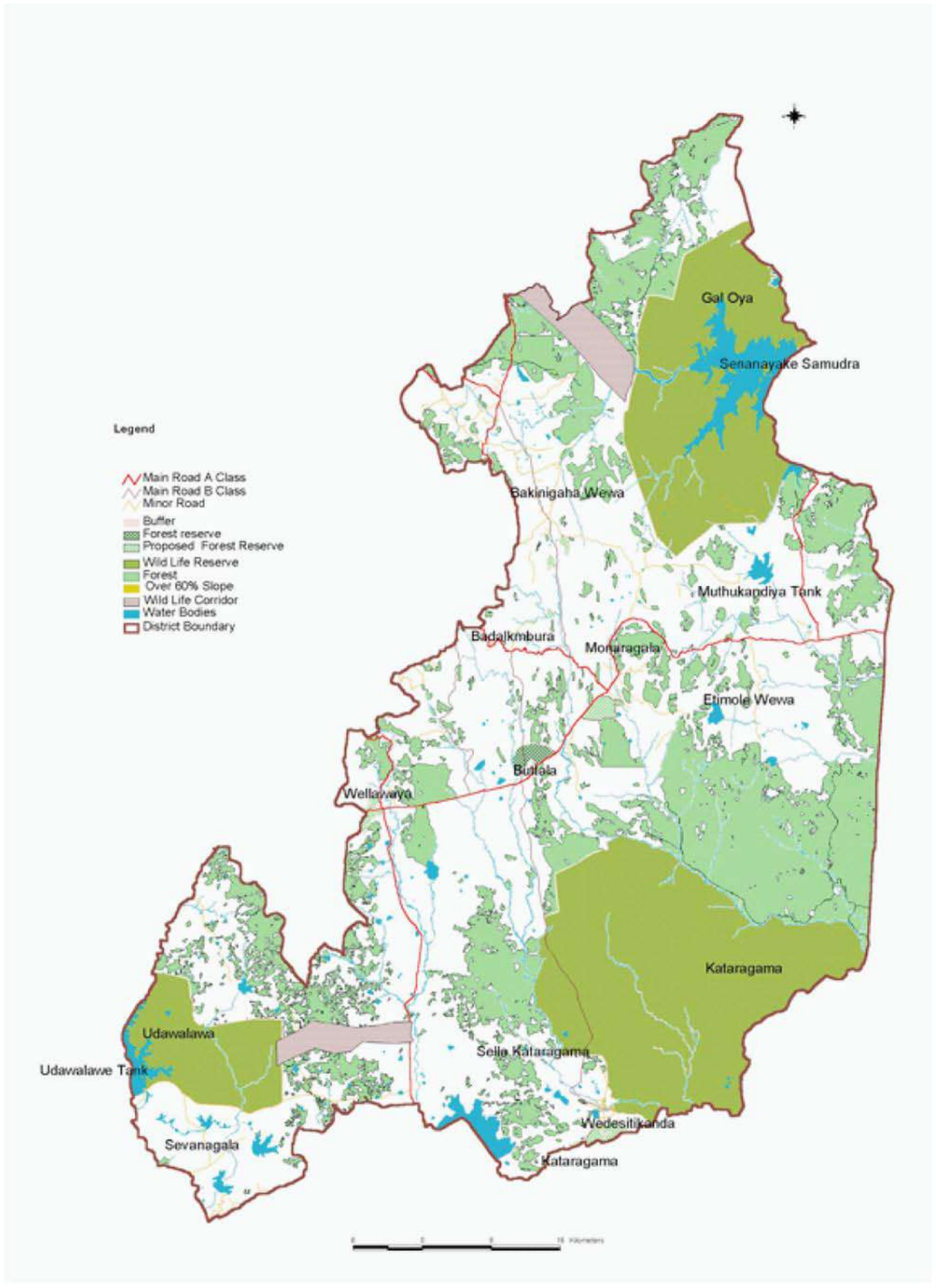
Southern Region Physical Plan

Figure: 3 .3

Environmentally Sensitive Areas in the Hambantota District

Source: Central Environmental Authority

National Physical Planning Department



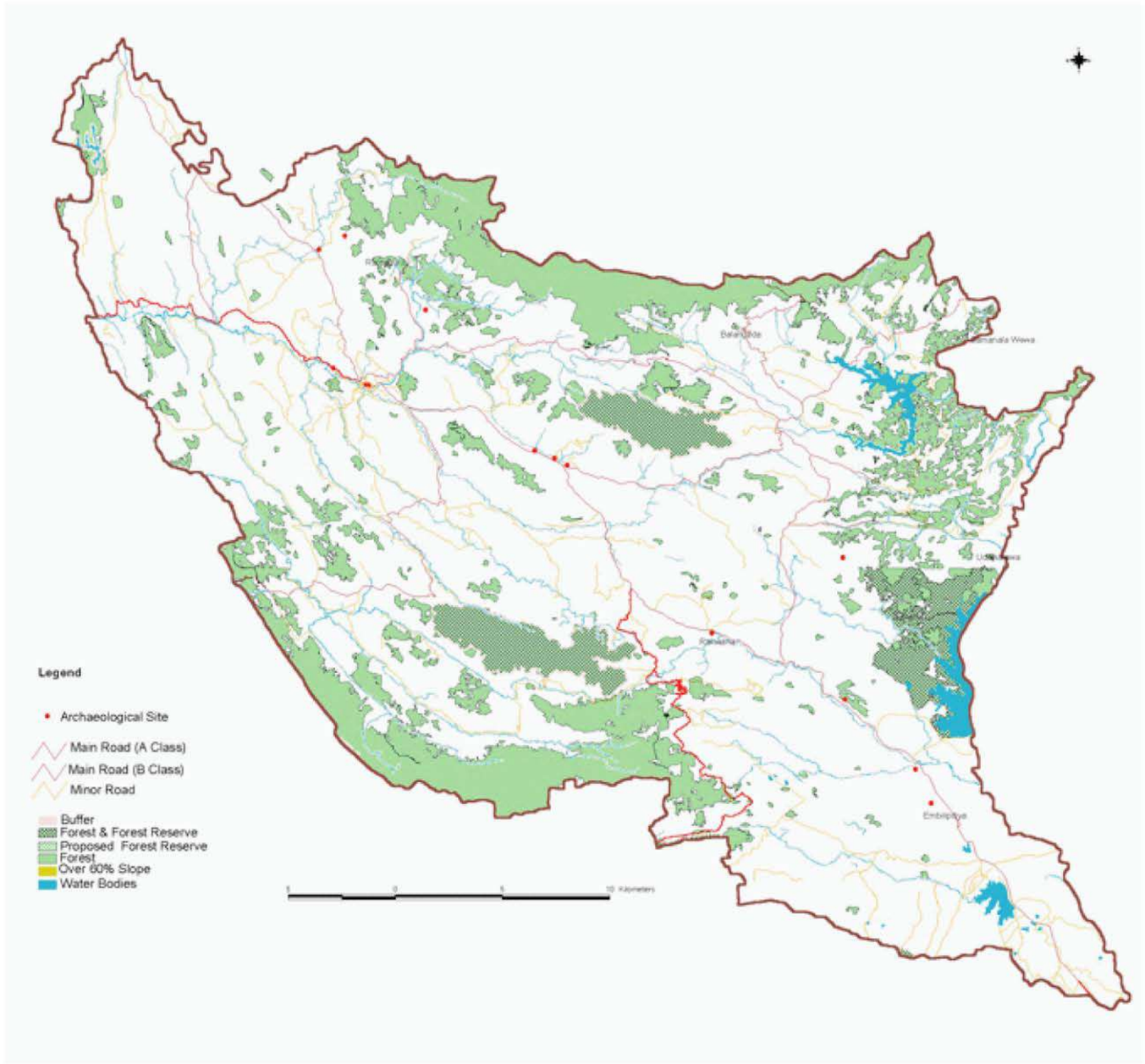
Southern Region Physi Plan

Figure: 3.4

Environmentally Sensitive Areas i the Moneragala District

Source: Central Environmental Autho

National Physic Planning Depar



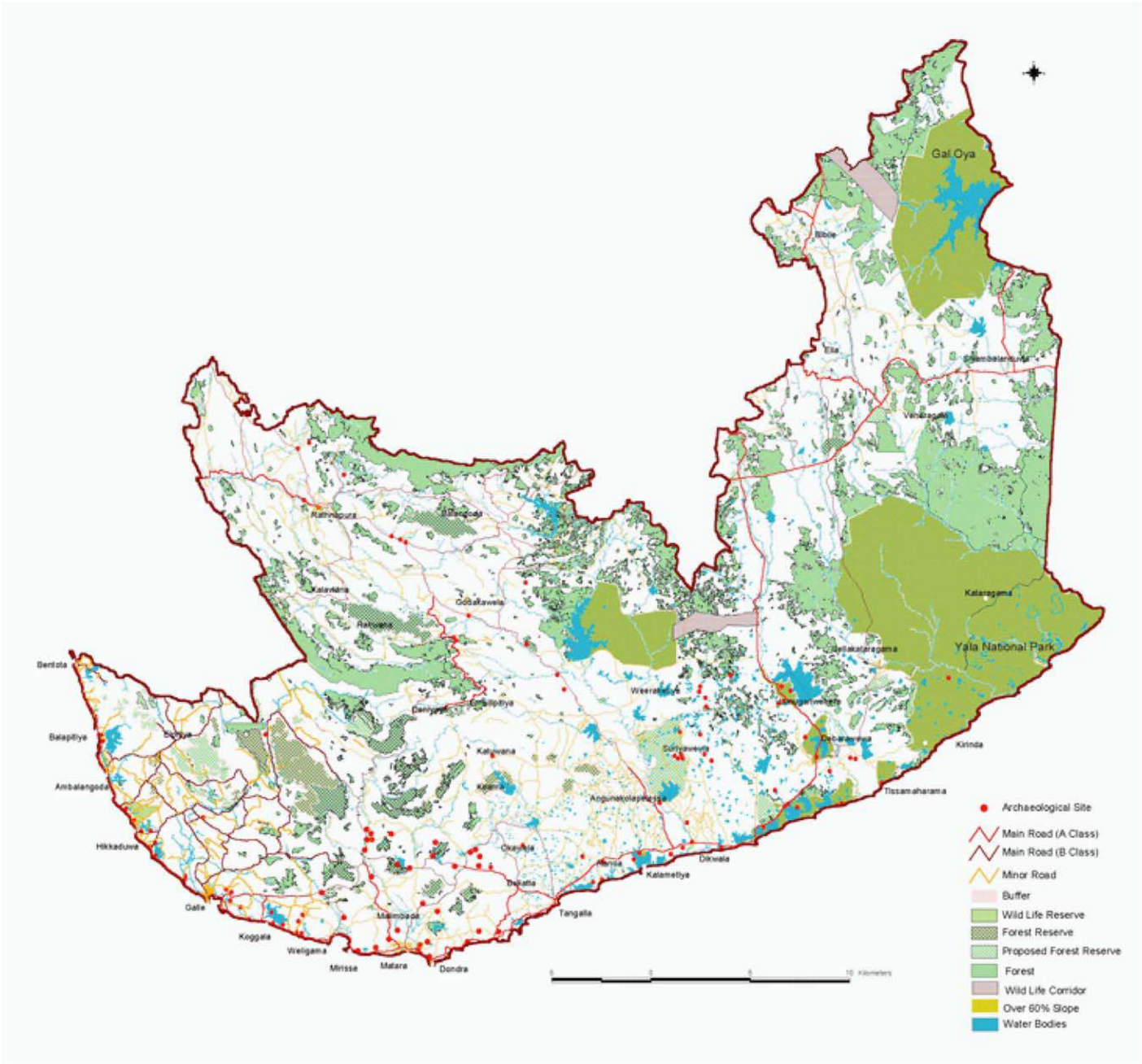
Southern Region Physical Plan

Figure: 3.5

Environmentally Sensitive Areas in the Ratnapura District

Source: Central Environmental Authority

National Physical Planning Department



Southern Region Physical Plan

Figure: 3.6

Environmentally Sensitive Areas in the Southern Region

Source: Central Environmental Authority

National Physical Planning Department

Table 3.3 indicates the lands that are available for developments (developable and undevelopable) in each district and in the entire region.

Table 3.3
Extent of developable and undevelopable lands by district (ha)

District	Undevelopable areas		Developable areas		Total land extent
	Extent	%	Extent	%	
Galle	65514	40.5	96055	59.5	161569
Matara	44542	34.0	86430	66.0	130972
Hambantota	156728	59.7	105856	40.3	262584
Monaragala	317347	55.2	257890	44.8	575237
Ratnapura	106562	32.6	220055	67.4	326617
Southern Region	690693	47.4	766286	52.6	1456979

Development activities based on the availability of suitable lands in each district are described below.

Galle District

Approximately 40% of the lands in the districts are undevelopable and about 60% are developable. Most of the undevelopable areas fall within the forest secter and these are located in the central part of the district. Of the developable areas 19.0% are undeveloped and 81.0% underdeveloped.

Matara District

Of the lands in the district 34.0% are undevelopbale and of these lands 99.0% comprise sensitive areas which are widely dispensed. Nearly two-thirds of the lands are developable and of these 79.0% are underdeveloped areas and the remaining 21.0% undeveloped areas.

Hambantota District

Approximately 60% of the lands in the district are undevelopable and nearly all of these lands comprise sensitive areas. A little over 40.0% of the lands are developable and of these only 26% comprise underdeveloped areas. Approximately 74.0% of the lands are undeveloped and the bulk of these lands are in the Tissamaharamaya, Lunugamveherera, Suriyawewa, Hambantota and Ambalantota Divisional Secretariat Divisions.

Monaragala District

It is clear that a little more than 50% of the district is covered with highly sensitive areas, but fairly larger areas are available for development. The areas covered in shrub jungle and chena (195179 ha) are available for new developments. As the district comprises lands, which are either undeveloped or under-developed, development activities in agriculture sector is strongly recommended. The district is composed of about 55 % of undevelopable areas and about 45 % of developable areas. However, it would be advisable to leave proposed elephant corridors without any development so that the human-elephant conflicts could be minimized. In addition, restoration of abandoned tanks is of great importance for the increase in irrigable area of the district.

Ratnapura District

As indicated, a large number of forests and watercourses cover the entire district and as the Ratnapura District is blessed with higher rainfall intensities, landslides are often a common scenario and even major natural disasters could result in. It is further manifested that the areas that are left for developments are not found in hilly areas. A Considerable portion of the land is still available in the form of chena (100942 ha) and a substantial land area is already developed as rubber cultivation. However steep slopes are present in hilly areas and hence it would be advisable to develop only the areas available in Embilipitiya and its surrounding environment. Comparatively a large area is still available towards the southeast part of Ratnapura District and major projects requiring extensive land cover are recommended only in such areas. Nevertheless the district as a whole has about 33 % of undevelopable areas and about 67 % of developable areas respectively.

The entire Southern region has about 47 % of undevelopable lands, which are recommended to be preserved, protected or conserved and the rest 53 % could be efficiently and productively developed for economic and social activities.

3.8 Mechanisms of Environmental management

Constitutional provisions

As the objective is to prepare an environmentally sound physical plan it is important that the objective be realized through the proper implementation of policies established by different state sectors. It is therefore prudent to briefly illustrate the available provisions for the conservation and preservation of environment and the legal framework.

The firm commitment of the state for the conservation of environment was made in the 1978 (current) Constitution of the Democratic Socialist Republic of Sri Lanka, through Article 27(14), which states that the state shall protect, preserve and improve the environment for the benefit of community. Further, Article 28f also states that the exercise and engagement of rights and freedom is inseparable from the performance of duties and obligations, and accordingly, it is the duty of every person in Sri Lanka to protect nature and conserve its reaches. The 13thAmendment to the Constitution of Sri Lanka in 1987 introduced Provincial Councils as a new level of governance between the Central and Local governments. This allowed the decentralization and devolution of many functions of the Central Government to Provincial Governments through the establishment of Provincial Councils. Provincial Councils are now empowered with legislative and executive powers to enact laws pertaining to environment provided that they are not lenient and do not conflict with the laws passed by the Central Government. Hence, all the development activities proposed under the physical plan must be implemented without violating the constitutional provisions at the national and provincial levels.

Integration of environmental management

It is a well-known fact that the environment of the Southern Region could not be managed by one sector or a single institiution. There are a variety of laws and regulations and a multitude of institutions and agencies at different levels of authority that are directly or indirectly concerned with environmental management of the region. The different areas being addressed are diverse but inter-related. Hence that integration is badly needed to resolve conflicts that could arise due to different development activities. Some such areas are conservation and management of forests, wildlife, agriculture, coastal and marine resources, land and water, biodiversity, prevention of pollution, etc. The integration of environmental management is therefore vital and the possible mechanisms are illustrated in the Annexure 2.

Environmental legislation an its implementation

Legislation pertaining to the conservation of environment has been in force since the British colonial administration in the form of statutes that had provisions relating to the environment, land use, water, fauna and flora and waste disposal and also in the common law in the form of abatement of nuisance. However, the environmental legislation dealing with environmental management is of more recent origin.

Environment related legislation enacted at present is administered and implemented by a number of government agencies/institutions. Sri Lanka has over 80 laws that are directly concerned with conservation of environment, pollution abatement and control and, the management of land, soil, water, etc (MENR, 2002).

Some laws have been in force as opposed to others. Legislation pertaining to encroachment on forests and reservations to water bodies, illicit felling of timber, unauthorized mining of gems and corals, indiscriminate use of steep slopes, river banks, stream reservation, etc is not strictly implemented due to a variety of reasons. Political involvements, corruption and lack of human resources are some of the reasons for the poor implementation of these laws. In addition, some laws have gaps that make enforcement difficult. Table 2.3 in Annexure 3 outlines some of the important environmental related laws along with conservation measures and implementing agencies.

3.9 List of projects recommended

The following projects are recommended in order to achieve the strategies mentioned above.

Galle District

- Control of coastal erosion through engineering interventions in Bentota, Hikkaduwa, Habaraduwa, Ambalangoda and Galle
- Integrated tourism development project. (Galle fort - creation of a high quality theme park for entertainment and leisure, Port-underwater museum and marina, Linear park along the beach up to Unawatuna, conservation of Rumassala mountain for hiking)
- Establishment of integrated solid waste management for Ambalangoda, Galle, Hikkaduwa and Beruwela/Bentota
- Sewer network and treatment plant for urban centers
- Restoration of landslide prone areas located in Elpitiya, Niyagama, and Thawalama areas
- Control of soil erosion with proper land management in Niyagama, Thawalama, Neluwa and Bope-Poddala areas
- Control of exploitation of river sand in Karandeniya, Balapitiya, Galle, and Habaraduwa areas

Matara District

- Introduction of bio-tea in 1000 hectares
- Establishment of integrated solid waste management for Matara, Tangalle and Weligama
- Sewer network and treatment plant for urban centers
- Relocation of all high polluting industries to Charly Mount and Udukawa industrial estates with the development of wastewater treatment plants
- Re-forestation in forests and forest reserves located in Kotapola, Pitabeddara, Urubokka, Pasgoda and Kamburupitiya areas
- Restoration of landslide prone areas in Kotapola, Pitabeddara and Urubokka
- Control of soil erosion with proper land management in Kotapola, Pitabeddara, Urubokka

Hambantota District

- Development of at least 10,000 hectares of energy forests in forest and wild life buffer zones
- Establishment of integrated solid waste management for Tissamaharamaya, Hambantota and Ambalantota
- Sewer network and treatment plant for urban centers
- Industrial estate to accommodate large scale industrial establishments in Hambantota
- Conservation and reforestation of forests in the district

Monaragala District

- Development of elephant corridors to lessen the elephant-human conflicts particularly in Kataragama, Wellawaya, Buttala, Tanamalwila and Sevenagala areas
- Development of at least 10,000 hectares of energy forests
- Establishment of integrated solid waste management for Monaragala, Buttala and Wellawaya
- Sewer network and treatment plant for urban centers
- Development of large scale farms (10,000 hectares) for production of pesticide free vegetable and fruits for export market

- Development of 5000 hectares for production of cereal crops (black gram, green gram, corn etc) based on organic farming principles
- Establishment of eco-agricultural park in Kahakurullanpalasse and promotion of eco tourism
- Conservation and reforestation of forests in areas such as Wellawaya, Bibile, Madagama, Monaragala, KadukaraKorale, Kataragama, Buttala, Madulla, Tanamalwila and Siyambalanduwa
- Control of soil erosion with proper land management in Bibile, Medagama, Monaragala and Wllawaya
- Control of setting fire to forests and pathanas in Bibile, Medagama, Monaragala, Wellawaya, Buttala and Kataragama with stringent monitoring and law enforcement
- Control of land degradation due to gem-mining in Moneragala, medagama, Bibile, Buttala and Kataragama through proper monitoring and law enforcement

Ratnapura District

- Establishment of integrated solid waste management for Ratnapura, Embilipitiya and Balangoda
- Sewer network and treatment plant for urban centers
- Development of 5000 hectares for production of cereal crops (black gram, green gram, corn etc) based on organic farming principles
- Control of soil erosion with proper land management in Ratnapura, Ehaliyagoda, Ayagama, Kuruwita, Elapatha, Opanayake, Balangoda and Kolonna
- Control of land degradation due to gem-mining in Kalawana, Kahawatte, Kirielle, Niwithigala, Pelmadulla, Balangoda, Kolonna, Ratnapura, Eheliyagoda, Ayagama, Elapatha, Kuruwita, Opanayake and Godakawela through proper monitoring and law enforcement
- Conservation and reforestation of forests in areas such as Kalawana, Kahawtte, Niwithigala, Pelmadulla, Balangoda, Kolonna, Ratnapura, Eheliyagoda, Ayagama, Elapatha and Opanayake
- Control of floods by development of new reservoirs in Ratnapura, Pelmadulla and Elapatha
- Control of land slides and relocation of people from likely areas in Eheliyagoda, Balangoda, Ayagama, Weligepola, Kalawana, Pelmadulla, Kuruwita, Embilipitiya, Elapatha, Niwithigala, Godekewela, Embulpe, Kiriella, Ratnapura and Kahawette

Annexure 1
Definition of Environmentally Sensitive Area

In accordance to the Gazette Notification dated 24th June 1993 prepared based on National Environmental Act No.47 of 1980, an environmentally sensitive area could be defined as any area

(1) Within 100m from the boundary of or within any area under:

- the National Heritage Wilderness Act, No 3 of 1988,
- the Forest Ordinance (Chapter 411),

whether or not such areas are wholly or within the Coastal Zone as defined in the Coast Conservation Act, No 57 of 1981.

(2) Within the following areas whether or not the areas are wholly or partly within the Coastal Zone:

- any erodable areas declared under the Soil Conservation Act (Chapter 450),
- any flood prone area declared under the Flood Protection Ordinance (Chapter 449) and any flood protection area declared under the Sri Lanka Land Reclamation and Development Act, No. 15 of 1968 as amended by Act, No. 52 of 1982,
- 60 meters from the bank of a public stream as defined in the Crown Lands Ordinance (Chapter 454) and having a width of more than 25 meters at any point of its course,
- any reservation beyond the full supply level of a reservoir,
- any archaeological reserve, ancient or protected monument as defined or declared under the Antiquities Ordinance (Chapter 188),
- any area declared under the Botanic Garden Ordinance (Chapter 446).

The Gazette notification No. 772/22 of 24th June, 1993 has added another two categories into the environmentally sensitive areas such as:

- within 100 meters from the boundaries of, or within, any area declared as a Sanctuary under the Fauna and Flora Protection Ordinance (Chapter 469)
- within 100 meters from the high flood level contour of, or within, a public lake as defined in the Crown Lands Ordinance (Chapter 454) including those declared under section 71 of the said Ordinance.

However the definition given above does not directly address the wetlands but indirectly include the protected ones through the National Heritage Wilderness Act, No. 3 of 1988. In to this act, all unique ecosystems enriched with genetic resources consisting of flora and fauna belonging to endangered, threatened and/or endemic categories are included in the sensitive areas. As described in the Forest Ordinance (Chapter 451), all the forests and forest resources (declared and proposed) are categorized as sensitive areas. Forests include all the lands defined under forests, waste, chena, uncultivated or unoccupied lands unless the valid proof of authority is produced by a private or an individual. It also includes all lands resumed by the State under the provisions of the Land Resumption Ordinance and all lands, which have been declared to be the property of the State by any order passed under "The Waste Lands Ordinances, 1897 to 1903", the Land Settlement Ordinance, or to which the State is otherwise lawfully entitled. A forest reserve includes a forest and every part of a forest declared to be a reserved forest under the provision of Section 3 of the Forest Ordinance or the corresponding provisions in any enactment repealed by Ordinance. No. 16 of 1907 or in any enactment to be hereafter enacted for the purpose of defining forests or plantations, forest depots, and chenas planted with forest trees.

As the erodible areas of the southern region are yet to be identified and declared and even to include landslide prone areas into the same category, areas having slopes greater than 60 degrees are considered to be undevelopable lands but conservable to a great extent. As such, this report accounts for all lands having the slope greater than 60 degrees under the 'erodable lands' category. However this category could be updated as necessary when the present study being contributed by the National Building Research Organization (NBRO) concludes.

Flood prone and flood protection areas of the Southern Region are lie on either side of the major rivers. Some flood prone areas are protected by bunds. Other open areas in which floods occur are yet to be identified and declared. Nominal flood levels identified by the Irrigation Department are sometimes misleading and hence only the established levels and areas are marked.

A reservation of 60 meters is provided for all public streams defined as any stream other than a private stream. A Private stream according to the Crown Land Ordinance (Chapter 454)is a stream whose source and entire course falls within a private land.

All archaeological reserves, ancient or protected monuments are considered to be

sensitive areas. According to the Antiquities (Amendment) Act, No. 24 of 1998, a monument is defined as any building, or any other structure or erection, or any tomb, tumulus or other place of interest, or any other immovable property of a like nature or any part or remains of the same or any other site where the material remains of historic or prehistoric human settlement or activity may be found and includes the site of any monument and such portion of land adjoining such as may be required for fencing or coring in or otherwise preserving. Ancient monument is defined as any monument lying or being found in Ceylon which dates or may reasonably be believed to be dating from a period prior to the 2nd day of March 1815 and also includes any other monument which has been declared to be an ancient monument by an Order published in the Gazette under Section 16 and any tree in respect of which an Order under Section 17 respectively.

Public lake is defined as any lake other than a private lake. Private lake is reckoned to be a lake, which is situated entirely within the boundaries of any private land.

Annexure 2
Institutional Provisions for sound Environmental Management

To promote integration within the sphere of environment, the state prepared the National Conservation Strategy (NCS) in 1988. This identified the key environmental issues and environmental degradation in Sri Lanka and also provided the first policy statement on industrial pollution control (IPC).

In order to translate the NCS into plan, the Central Environmental Auhtority (CEA) prepared an inter-sectoral National Environmental Action Plan (NEAP). The NEAP of 1991 (covering the period 1992-1996) provided a frame work for environmental planning and management for sustainable development for different agencies/ institutions/departments. The NEAP was updated in 1993 (to cover the period 1995-1998). The third revision of NEAP covering the period 1998-2001 to deal with strategies for sustainable development of the country. It also defined the policies, institutional changes and actions needed to meet the environmental challenges and addressed nine different sectors namely land, water, biological resources, coastal and marine resources, industry, minerals, energy, built environment, environment and health.

The latest version of NEAP entitled “Caring for the Environment 2003-2007: Path to Sustainable development” accompanied the need for the use of economic instruments in managing the environment.

Although a large number of agencies are empowered to manage the environment, the implementation of laws and plans have been impeded by the absence of a key and transparent mechanism. The Ministry of Environment and Natural Resources addressed the problem by formulating an institutional framework for coordination and integration of environmental concerns and issues in the entire country. This was done through the establishment of committees on Environment Policy and Management (CEPOMs) in 2000 that are linked to an apex committee on Integrating Environment and Development (CIEDP) and to the various other sectoral agencies. At present, eight CEPOMs have been identified to resolve the issues on land and minerals, water, forestry and biodiversity, costal and marine affairs, industry, urban and built environment, energy, and climate and environmental health. The CEPOMs are primarily expected to strengthen the cooperation and coordination among public and private sector agencies and NGOs as well.

The CIEDP is expected to address intersectional environmental issues that arise through the CEPOMs and to examine and provide policy directions on such issues. The CIEOP is composed of secretaries of line ministries that have relevance to the issues. The CIEDP is also directly linked to the NEAP steering committee. Each CEPOM is expected to meet three times a year and the decisions taken must be conveyed to the sectoral agencies, National Environmental Legislation Committee, Provincial Councils and Local Authorities.

In view of the devolution of power and responsibilities, the capacity for environmental planning, management, monitoring and evaluation must be strengthened at the provincial, district, divisional and local levels. This is needed to address environmental issues relevant to many stakeholders particularly on issues related to land, water, and natural resources that could arise as a consequence of economic activities in the region. Controversial development activities could then be negotiated on case-by-case basis with wider participation of stakeholders in order to bring about benefits for the community. Nevertheless it should be borne in mind that national and sectoral policies should not be ignored when implementing development activities in the Southern Region.s

Annexure 3 - Table 3.3
Main Legislation relating to Environmental Conservation and Management in Sri Lanka (Source: MENR, 2002)

Legislation	Conservation measures
Soil Conservation Act, No. 25 of 1951; amended in 1996	The Act empowers the Director of Agriculture to undertake surveys and investigations to be made for the purposes of ascertaining the nature and extent of land degradation due to various factors including floods, droughts, salinisation, desertification, siltation and soil erosion. It also empowers the Minister to declare and acquire "erodible areas', to specify measures regulating the use of land in such areas and to acquire land for carrying out measures to prevent erosion. As this Act was inadequate to meet present day demands for a number of reasons, the deficiencies have been rectified in the Amended Act of 1996. Accordingly there has also been a shift of focus from the control of soil erosion to land resource management, while covering damage by floods, stream bank erosion, salinity, alkalinity and water logging. One of the major shortcomings in soil conservation legislation has been identified as the lack of provision to integrate the application of soil conservation measures on a watershed basis.
Land Development Ordinance No. 19 of 1935; and its subsequent amendments	Under this Ordinance, the Minister responsible for land development may, by notification published in the Gazette, declare that any state land is constituted as a state reservation for any one or more of stated public purposes, including for the prevention of the erosion of the soil. This law provides for the systematic development and alienation of state land, for which a Land Commissioner is appointed, who apart from the duties and functions assigned to him under the Ordinance, is responsible for the general supervision of land officers in the administration of state land. Under this law there is no mechanism for monitoring the use of land at high elevations, and regulating the alienation and unauthorized use of land on slopes and hilltops.
Land Grants SpecialProvisions Act No. 2 of 1979	This Act provides for the transfer to the state land vested in the Land Reform Commission and the transfer of this vested land, free of charge, to landless persons. The transfers are subject to certain conditions, one of which is the stipulation that the transferee should carry out on his land, such soil conservation measures which the District Secretary may require from time to time.
Mahaweli Authority of Sri Lanka Act No. 23 of 1979; and amendment 59 of 1993.	This Act has provision for the Mahaweli Authority to have the power to take such measures as may be necessary for watershed management and control of soil erosion in the relevant lands under its purview.
Flood Protection Ordinance No. 4 of 1924.	This Ordinance deals with protecting areas subject to damage from floods; notably areas declared to be a flood area by the Director of Irrigation.

Water Resources Board Act No. 29 of 1964.	This Act decrees that 'It shall be the duty of the Board to advise the Minister on specific matters, and on any other matters that are referred to the Board for advice by the Minister. This Act also provides for the appointment of a Water Resources Board, which is responsible for advising the relevant Minister on the use of water resources, maintenance of irrigation schemes, drainage, flood control, hydropower, promotion of forestation, control of soil erosion, prevention of pollution of rivers and other water courses, formulation of national policies on the use of water resources, and preparation of plans for conservation and use of water resources. However, it does not empower the Board to act or intervene in any of these areas. The Board is also responsible to advise the Government on means for prevention of the pollution of rivers, streams and other water sources; to formulate national policy and draft legislation relating to the disposal of sewage and industrial wastes; and to take adequate steps to enforce such laws.
National Aquatic Resources and Development Agency Act No. 54 of 1981.	This Act was enacted to establish the National Aquatic Resources and Development Agency (under the Ministry of Fisheries in 1981) as the premier national institution to carry out and co-ordinate research, development and management activities on the subject of aquatic resources, including freshwater and oceanic resources available for economic use, including fisheries resources.
National Water Supply and Drainage Board Act No. 12 of 1974.	This provides for the establishment of the NW&SDB which has to develop and operate an efficient water supply for public, domestic and industrial purposes; to operate and co-ordinate an efficient sewerage system; to distribute or sell water in bulk; and to take over and operate any existing water supply and sewerage system transferred to the Board. However, the implementation of the provisions of the law is far from effective.
Irrigation Ordinance No. 32 of 1946; Irrigation Act No. 1 of 1951 and its subsequent amendments.	This Act covers all matters connected with irrigation and paddy cultivation within irrigation schemes. It deals with the legal provisions concerning the prevention of waste and misuse of water, and specifically prohibits water wastage.
Crown Lands Ordinance	The right to use, manage and control water in any public lake or stream has been vested in the State under Section 72 of this Ordinance. Thus, the occupant of a land on the bank of any public lake or public stream has a 'right to the water in that lake or stream for domestic use, livestock or agricultural purposes' provided that it is extracted by manual means. However, all beds of public streams and lakes belong to the state and their use is allowed only by a permit.
Colombo District (LowLyingAreas) Reclamation and Development Board Act of 1968, and the Amendment – Sri Lanka Land Reclamation and Development Corporation Act No. 52 of 1982.	Under this Act the Sri Lanka Land Reclamation and Development Corporation is the authority responsible for the maintenance of canals in Colombo, but the enforcement is poor. At present canal banks are extensively encroached by squatters and shanty dwellers while industries on the banks discharge industrial wastes directly into the canals. Powers to prevent encroachments and abuses are vested in the Local Authorities.
Mines and Minerals Act No. 33 of 1992.	This act was introduced to liberalize the minerals sector and to attract investments. It has also provided for the restructuring of the former Geological Survey Department and the establishment of the Geological Survey and Mines Bureau to administer the Act, and to regularize the mining industry by issuing licenses in this sector.

Coast Conservation Act No. 57 of 1981, and the amendment No.64 of 1988.	The Act requires the coast Conservation Department to survey the Coastal Zone and inventory the resources available therein, including coastal ecosystems and material regularly removed for commercial or industrial purposes from this area, and to draw up Coastal Zone Management Plans periodically. The Act vests the administration, custody and management of the coastal zone in the state, while the responsibility of administering and implementing the Act devolves on the Director of the Coast Conservation Department who has to issue permits for all development activities undertaken within the coastal zone. This requires calling for an Environmental Impact Assessment before permitting any such activities.
Agrarian Services Act No. 58 of 1979, and its subsequent amendments, and the new Agriculture and Agrarian Services Act of 1999.	This act has provisions for the Commissioner of Agrarian Services to specify and ensure that the owner, cultivator or occupier of any agricultural land carries out, in addition to such other duties as the Commissioner may in his discretion specify, measures for proper maintenance of the land to ensure the maximum conservation of soil and water. This Act has been updated to regularize ownership of land and to create better ownership of land among farmers, and to empower grassroots level organizations involved in the agricultural sector.
Plant Protection Act No. 35 of 1999 (replacing Plant Protection Ordinance No. 10 of 1924).	This Act controls the introduction of noxious plants, pests and diseases of plants into Sri Lanka. The Director of Agriculture is the administering authority under this Act. However, this Act needs revision to ensure that it addresses alien invasive species, GMOs, and LMOs more comprehensively.

The Forest Ordinance No. 16 of 1907, and its subsequent amendments, (a new Forest Conservation Act is in the draft stage).	The Forest Department is responsible for the implementation of this Ordinance which has been subject to many revisions to make provision for the protection of state forests from unlawful felling, clearing, encroachment, removal of produce, etc; the declaration of forests as Reserve Forests: the control of felling and other forms of exploitation in forest; and the transportation of timber. The recent amendments have created Conservation Forests. Despite this, enforcement of the Forests Ordinance has not been fully effective, as seen by the illicit felling and encroachment that continue to occur in the state forests
The Fauna and Flora Protection Ordinance No. 2 of 1937, and subsequent amendments including Act No. 49 of 1993. (currently under revision)	The Department of Wildlife Conservation is primarily responsible for the implementation of this Act. Under it six categories of wildlife reserves are recognized. In addition, the Act besides protecting animal and plant life within the national reserves has provision to protect certain categories of animals and plants wherever they are found. The Act also states the penalties for violation of the law. However, enforcement of this Act too remains weak.
Felling of Trees Control Act No. 9 of 1951.	This Act makes provision for the prohibition, regulation or control of the felling of specified valuable tree species, including cultivated species such as jak.
The National Heritage Wilderness Area Act No. 3 of 1988	This act has been enacted to enable the preservation of unique natural ecosystems under the jurisdiction of the Forest Department and the genetic resources found in them.
The Botanic Gardens Ordinance No. 31 of 1928.	This deals with *ex-situ* conservation of plants, and concerns the management and administration of botanic gardens.

The Fisheries and Aquatic Resources Act No. 2 of 1996.	This Act, replaces the Fisheries Ordinance No. 24 of 1940, and promotes measures for the integrated management, regulation, conservation and development of fisheries and aquatic resources in Sri Lanka and addresses the protection of fish and aquatic resources, including permitting the state to set aside marine areas such as fisheries reserves, where necessary, for replenishment of wild stocks.
Town and Country Planning Ordinance No. 13 of 1946.	This low governs the functions of the Town and Country Planning Department on land use planning and zoning, and deals with the planning and development of land in the country; the protection of natural amenities, and the preservation of buildings and objects of interest or beauty. Environmental considerations have been included in the law to ensure proper sanitary conditions and conveniences, and the preservation of buildings and places of architectural, historical or artistic interest and places of natural beauty. Both the human environment and the natural environment are covered by this law.
Housing and Town Improvement Ordinance, No. 19 of 1950.	This ordinance regulates the construction of buildings and the demolition of ruined buildings. Standards have been specified for buildings, rooms and streets. This is the only law, which specifies standards to be adopted in building activities. This ordinance spells out different improvement schemes to be carried out for housing and town improvements.
Urban Development Authority Law No. 37 of 1978, as amended by subsequent Acts, the recent ones being Act No. 44 of 1984 and Act No. 4 of 1992.	This law served to establish the Urban Development Authority (UDA) to promote the integrated planning and implementation of social, economic and physical development of areas declared as "Urban development areas". The Act provides for the development of environmental standards and schemes for environmental improvement in areas identified as UDA areas.

The National Environmental Act No. 47 of 1980 and the amendment No. 56 of 1988. (a new National Environmental Protection Act is being drafted)	The NEA served to create the Central Environmental Authority, while its amendment of 1988 empowers all project approving agencies to obtain an Environmental Impact Assessment (EIA) from any developer for prescribed developmental projects. The NEA has also provided for the establishment of District Environmental Agencies (DEAs) in each administrative district for devolution of powers to the regions in relation to environmental management through the Provincial Councils and the DEAs. The draft Act updates the existing legislation while introducing new concepts in relation to pollution abatement.
Marine Pollution Prevention Act No.59 of 1981.	This Act enabled the establishment of the Marine Pollution Prevention Authority (MPPA) and provides for the prevention, reduction and control of pollution in Sri Lankan waters, and for giving effect to international conventions that Sri Lanka is a signatory to for the prevention of pollution of the sea.
The Motor Traffic Act	On mobile sources, the Motor Traffic Act appears to be the only legislation in force. The statute does not mention air quality as such, but it authorizes the issuance of regulations that may prescribe "any condition or requirement not expressly provided for in this Act, as to the construction of equipment and use of all, or any, specified class or description of motor vehicles.

Chapter -04

Agriculture, Live Stock, and Fisheries Plan

CHAPTER FOUR

AGRICULTURE, LIVESTOCK AND FISHERIES PLAN

4.1 Introduction

Southern region has been traditionally a rich agricultural region. It was much prosperous during ancient kingdoms. Present Monaragala district happened to be one of the most rich areas of agriculture around which a strong civilization existed. This area was earlier known as Wellassa (hundred thousand rice fields). The collapse of the system that was based on a well developed water resources management system was marked with "Uwa Wellassa Uprise" where the water resources management system and the agricultural fields were completely destroyed by the British.

The agricultural sector (including forestry, livestock and fisheries) in region grew at an average rate of 4% over the period 1990-2000. It remains as an important determinant of GDP, directly accounting for 38% of regional output and employing about 47% of the workforce. Though the relative importance of the agriculture sector at the national level continued to decline from 22.43 in 1996 to 19.8 in 2002, its importance in the region has increased from 36.43 to 38.34 during the same period (Table 4.1). Since agriculture sector plays a major role in the regional economy, it should be the key factor in any development framework for the region. The indirect stimulus it provides to other sectors, such as industry (timber industry, agro-processing, etc.,) and services (eco-tourism, agro-forestry etc.,), makes the agricultural sector even more important than suggested by above data.

Agriculture sector is the most important sector with respect to poverty reduction. It is reported that poverty in Sri Lanka is mainly a rural phenomenon, with the rural and estate sectors accounting for more than 90% of the total poor[1]. Furthermore, agriculture represents the best chance for reducing poverty throughout the region because it absorbs the largest portion of the poor workforce. Moreover, the sector employs more than 35% of total labour force, against 23% of the industry sector. The agricultural development in the region needs a synergistic interaction of many development actors, comprising institutions and people, such as farmers, private sector, marketing, processing, input, research, NGOs, extension, scientists, and consumers.

Table 4.1
Percentage contribution of agriculture sector to GDP during 1996 – 2002 period

	1996	1997	1998	1999	2000	2001	2002
Southern Region	36.43	34.79	36.64	39.28	38.18	34.44	38.34
Country	22.43	21.87	21.11	20.67	19.41	20.05	19.80

Source: Annual Report 2003, Central Bank of Sri Lanka

The growth in population has led to smaller average holdings (Table 4.2). The result of the most recent agricultural census conducted during August-October 2002 confirms the trend of increasing land fragmentation of the last two decades[2]. The highest percentage of landless and near landless households is reported in Monaragala followed by Hambantota (Table 4.2). However a large extent of cultivable lands is also available in these districts. Therefore, establishment of commercial agricultural activities is the most suitable development strategy to utilize the land resource as well as human resource in these districts.

While, agricultural land extent including estate sector in the country has decreased by 3%, same of the region has increased by 9% during the last two decades amounting to about 46,000 ha[3]. All these new agricultural lands are found in Hambantota, Monaragala and Ratnapura districts indicating this region's potential for agricultural development.

Based on the above observations, emphatic attention should be paid to agricultural sector in any development plan for the region.

The agriculture sector in the region is divided into five broad sub sectors:

(i) Plantation sector, that produces three main export crops (tea, rubber and coconut) and some minor export crops such as cinnamon, citronella etc.,
(ii) Domestic agricultural sector, which mainly produces paddy but involves a whole range of other annual field crops, cereals, vegetables, fruits etc.,
(iii) Livestock sector including farm and household livestock production
(iv) Forestry sector and
(v) Fisheries (both marine and inland) sector.

Table 4.2
Average plot size and landless or near landless household percentage

District	Average size of the plot (ha) in 2002	Percentage decreased in plot size during 1992-2002	Landless and near landless households percentage*
Galle	0.36	40	18
Matara	0.42	35	23
Hambantota	0.71	28	33
Monaragala	0.97	17	49
Ratnapura	0.53	31	29
Southern Region	0.55	29	30

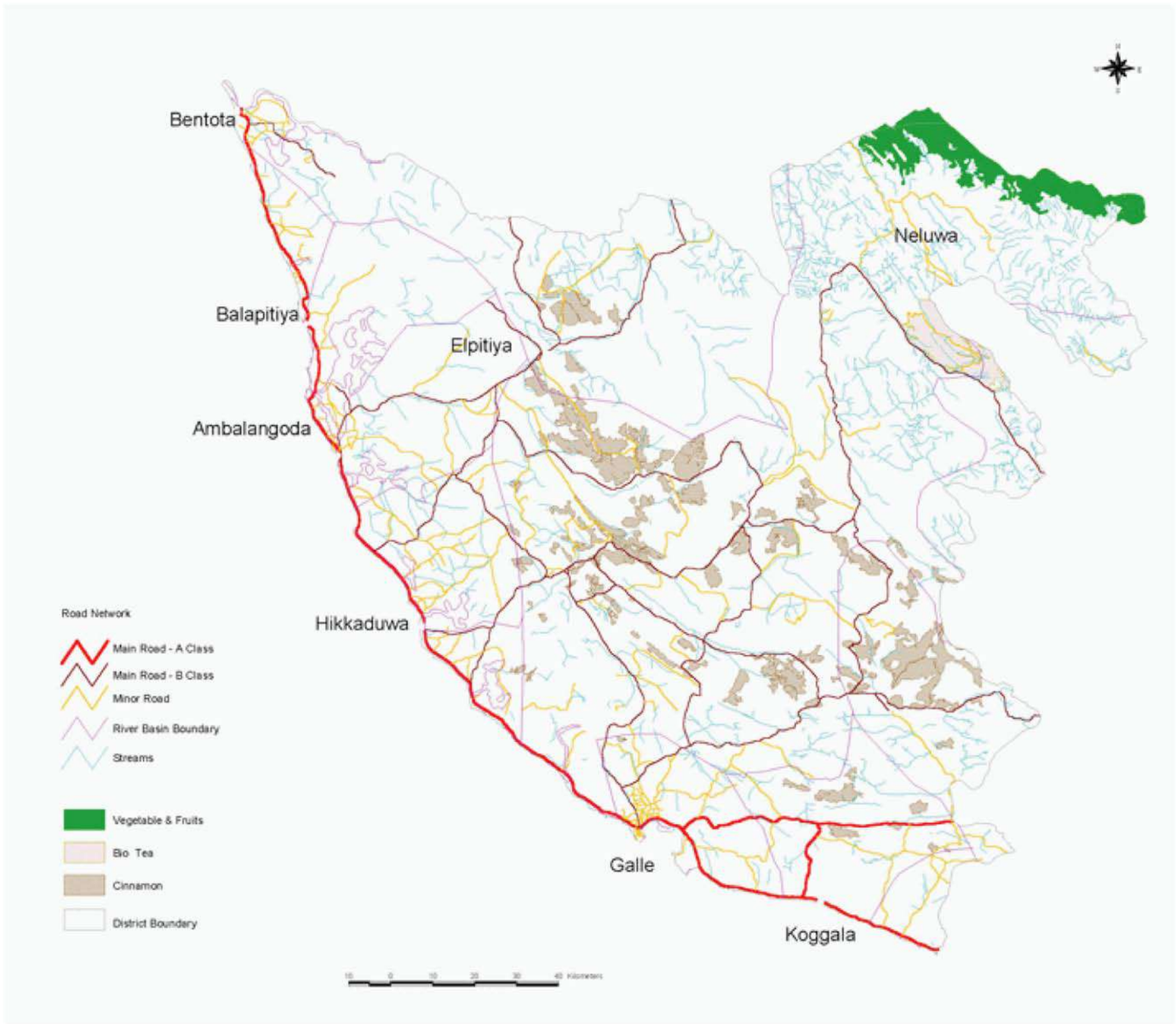
*This includes households without any land and owning only home garden
Source: Agriculture census, Department of Census and Statistics (2003)

4.2 Opportunities

- Availability of large extent (70 % of land extent) of reddish brown earths which is highly fertile and suitable for agriculture
- Eco-friendly environment
- Availability of variety of natural resources
- Availability of high productive long seashore and exclusive economic zone for marine fishing
- Diversity in agro-climatic conditions
- High density of inland water bodies
- Availability of research centers in the region
- Potential for eco-friendly diversified agricultural development due to varying agro-climatic regions
- Favorable land: man ratio especially in Hambantota and Monaragala districts and Southeast part of Ratnapura district
- Potential to exploit the already existing brand names (e.g. Ruhunu curd)
- Shift of world tea market from Europe to Middle East creating demand for low grown tea
- Potential to receive water to the region through trans-basin diversions

4.3 Constraints

- Low level of marketing facilities
- Unsecured ownership to land and land tenure problems
- Lack of access to modern technology
- Low productivity of many dependent activities and human capital (agricultural labour)
- Insufficient attention and investment in development, operation and maintenance of cascade systems and other water bodies
- High incidence of post harvest losses in agriculture
- Absence of regular assessment of available marine resource
- Absence of effective database, technologies such as GIS and communication methods for improved decision making in the agriculture, livestock and fisheries sectors
- Existence of a large number of stray cattle and buffaloes in the region destroying crops and damaging farm and irrigation structures
- Sand mining in costal areas which increase salinity and limestone mining which disturb and threaten agricultural land



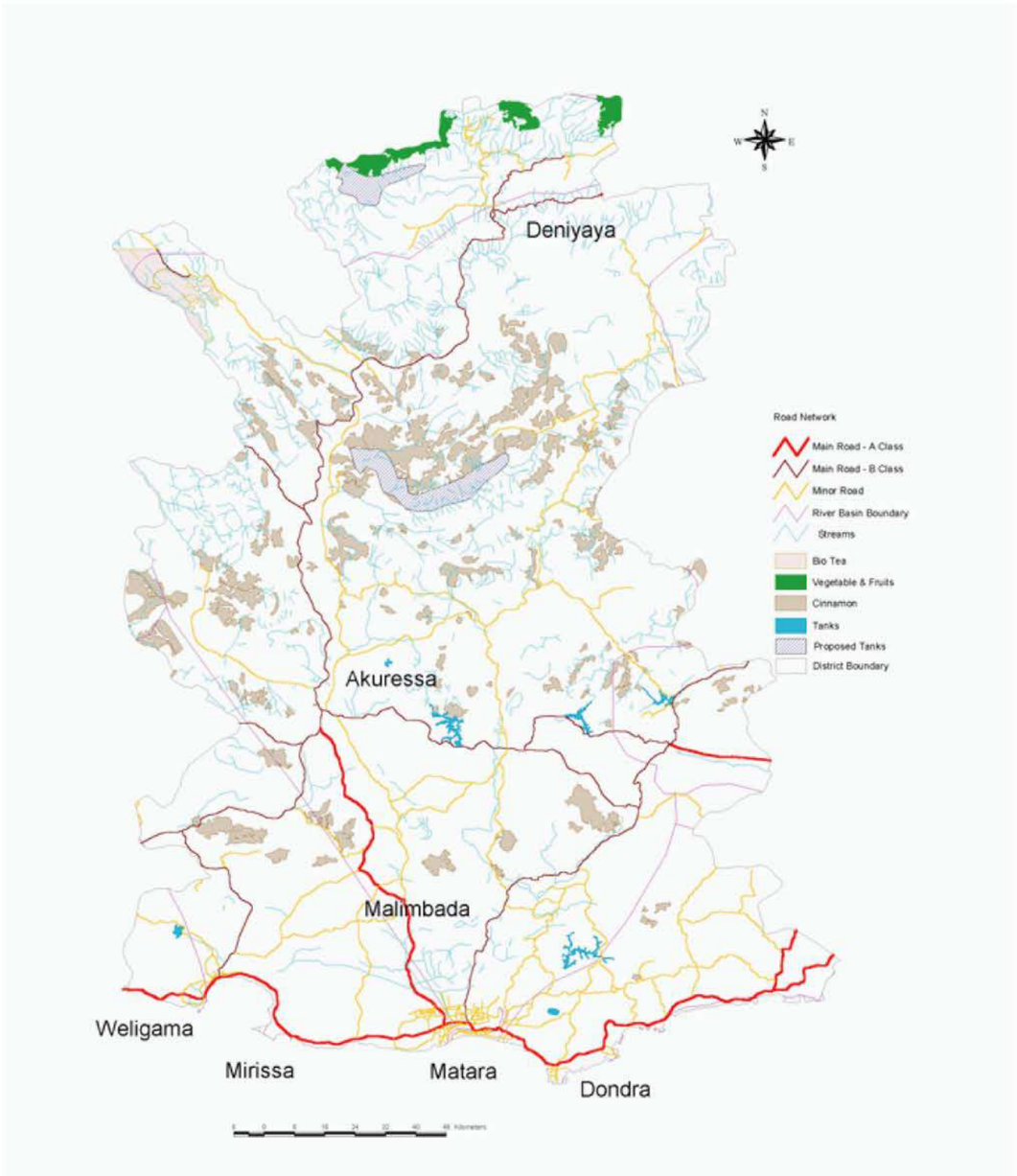
Southern Region Physical Plan

Figure: 4. 1

Proposed Commercial Agriculture Areas Galle District

Source: SWP_SRPP

National Physical Planning Department



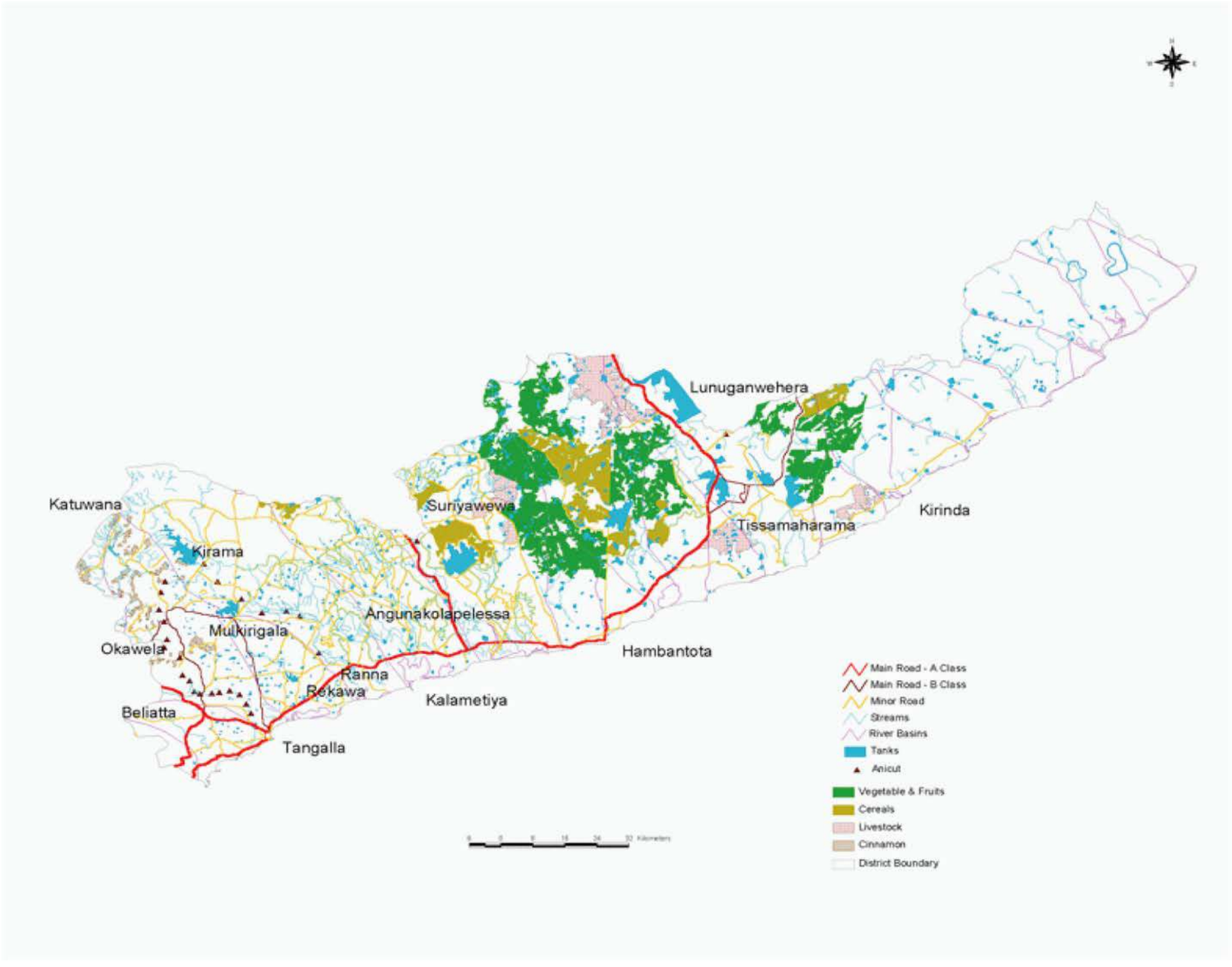
Southern Region Physical Plan

Figure: 4. 2

Proposed Commercial Agriculture Areas Matara District

Source: SWP_SRPP

National Physical Planning Department



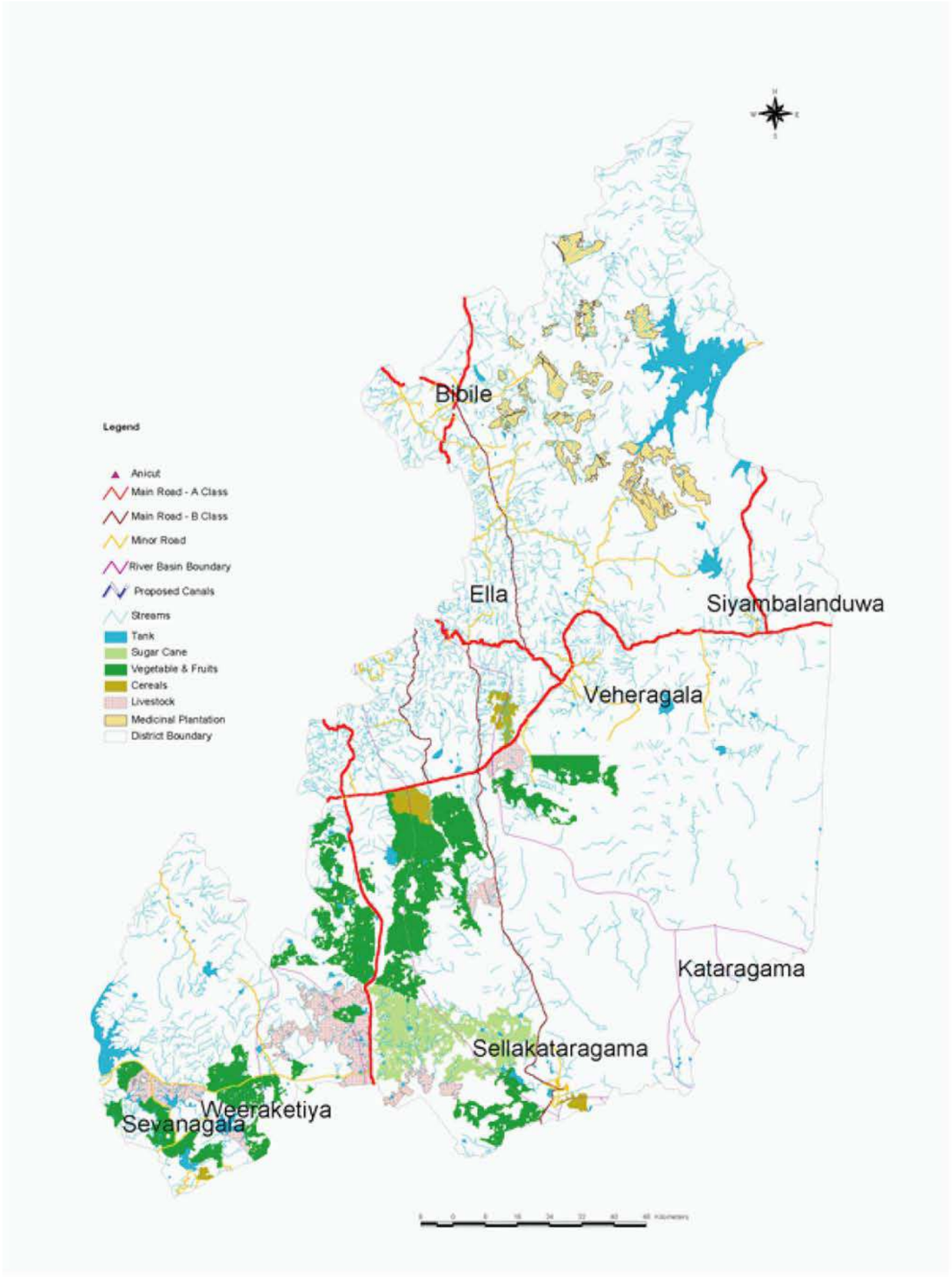
Southern Region Physical Plan

Figure: 4. 3

Proposed Commercial Agriculture Areas Hambantota District

Source: SWP SRPP

National Physical Planning Department



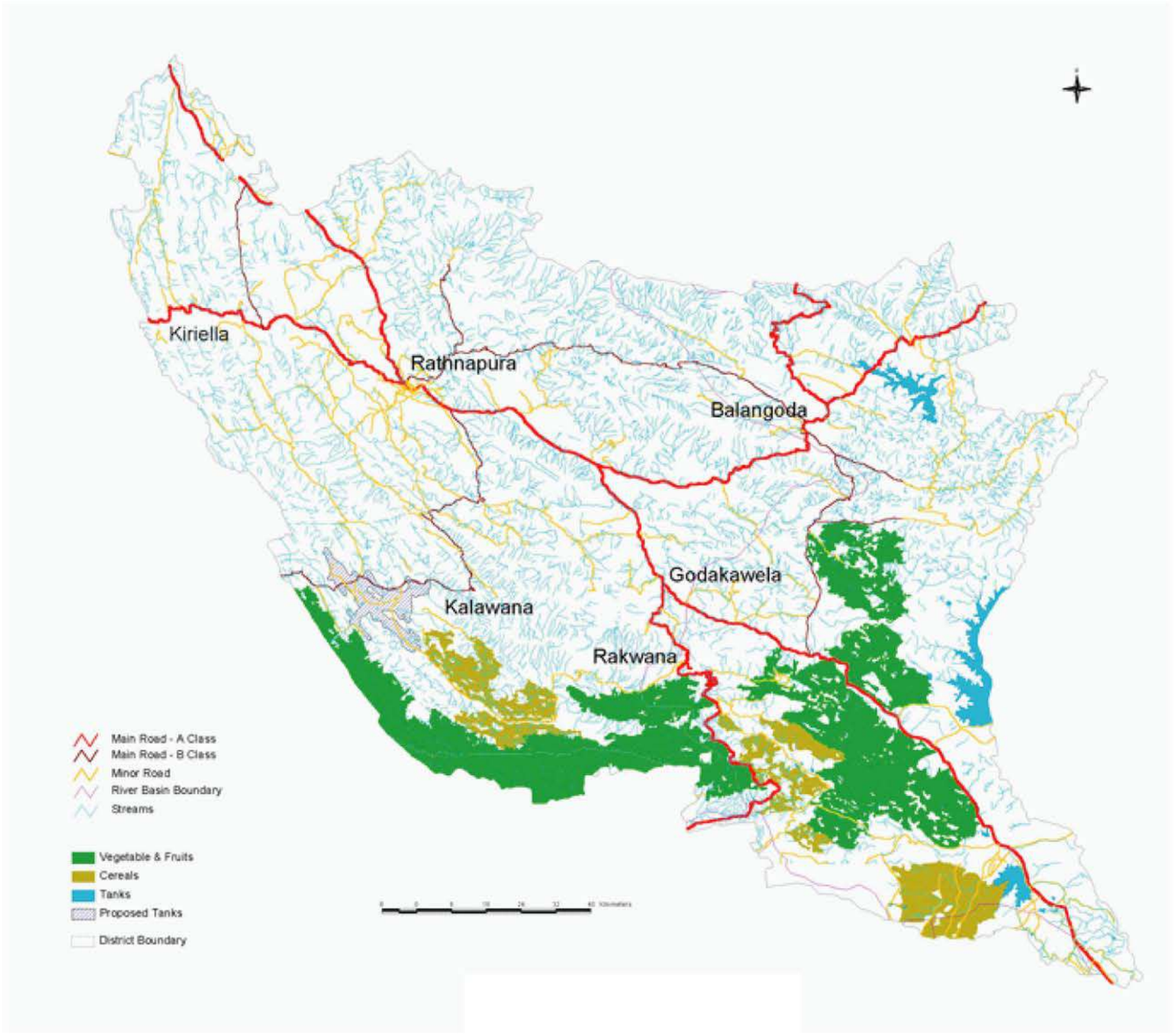
Southern Region Physical Plan

Figure: 4. 4

Proposed Commercial Agriculture Areas Moneragala District

Source: SWP_SRPP

National Physical Planning Department



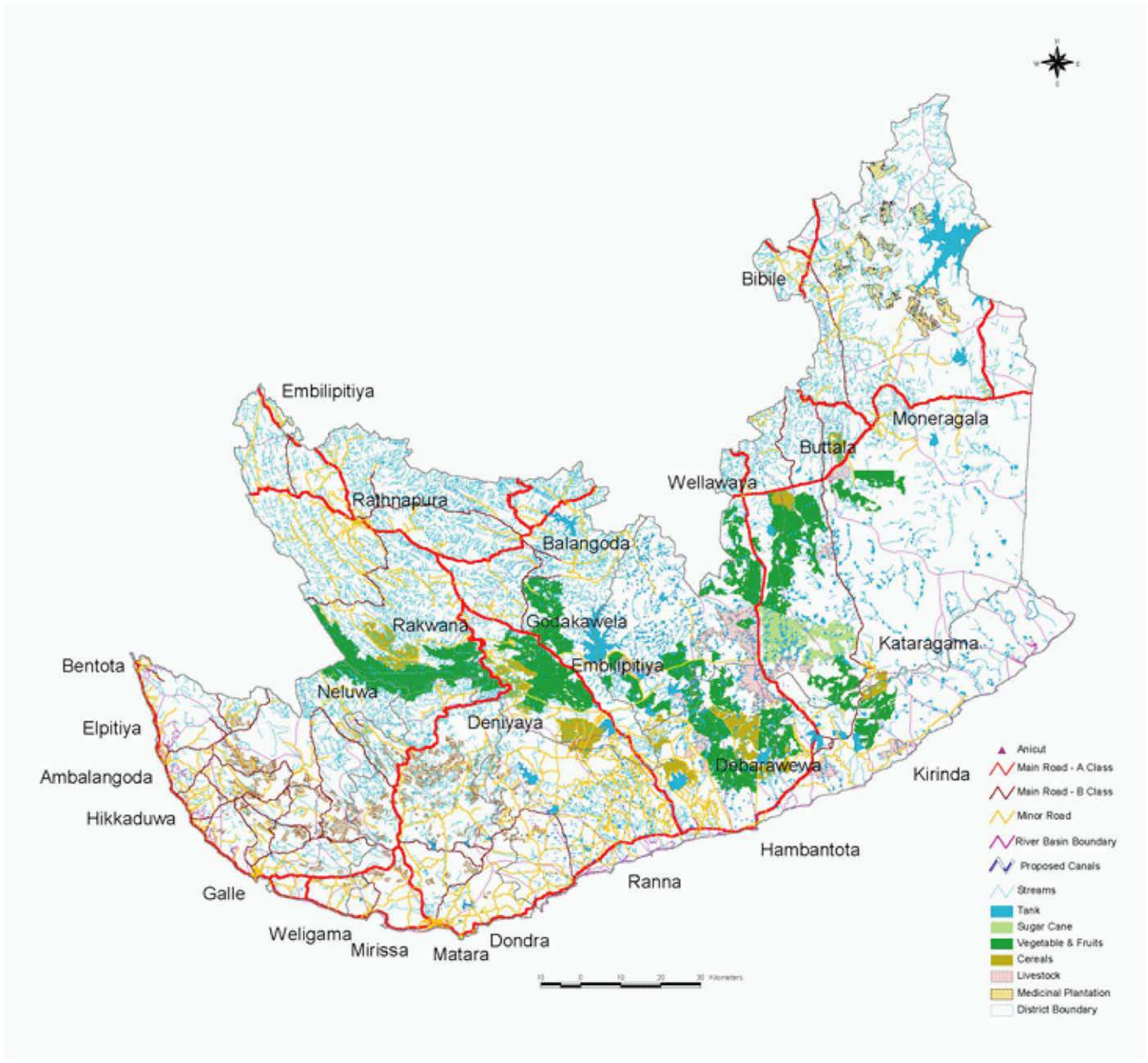
Southern Region Physical Plan

Figure: 4. 5

Proposed Commercial Agriculture Areas Ratnapura District

Source: SWP_SRPP

National Physical Planning Department



Southern Region Physical Plan

Figure: 4 .6

Proposed Commercial Agriculture Areas Southern Region

Source: SWP_SRPP

National Physical Planning Department

- Devastation of farming, irrigation and human life by wild animals and in particular elephant damages
- Frequent droughts experienced in the Southern Region impede performance of some agricultural activities
- Tendency to encroach crown lands in catchment area especially in Monaragala district
- Overuse and misuse of agrochemicals
- Misconceptions on water use

4.4 Goal and the Objectives

The goal of the agriculture, livestock and fisheries plan of the Southern region is to increase the regional food production by minimum of 3 folds, ensure almost 100% food security and self sufficiency, save the foreign exchange by minimum of 50% of the respective sectors' regional GDP, increase the regional share of foreign exchange earning in respective sectors by 2 folds and reduce regional poverty by minimum of 75%.

The objectives of the proposed agriculture, livestock and fishery plan of the region are to

- Strategically position the region as the most eco-friendly region in South-East Asia through creating sustainable competitiveness for agricultural development and related investments.
- Make the region a competitive choice for private sector investment for agriculture livestock and fisheries and related industries.
- Change the present subsistence agriculture driven economy to an eco-friendly commercial agriculture system with the introduction of new technology
- Achieve a change in the mindset and attitudes of the people.

It is also essential that when designing those objectives, grassroots-level interventions are not totally discarded. The success factor of the Region's development relies on minimizing the levels of marginalized persons. Therefore, it is important that poverty reduction is well protected in the structure of the Region's agricultural, livestock and fisheries development plan.

4.5 Plantation Sector

Plantation sector in the region covers an extent of 133,171 ha (Table 4.3). This is about 30% of the total extent of plantation crops in Sri Lanka. These plantations are mostly found in wet zone of the region.

More than 70% (120 kg mn.) of the country's low grown tea is produced in the Southern Region. The demand for low grown tea has increased considerably with the gradual shifting of the world tea market from Europe to Middle East. This indicates a better future for region's low grown teas.

Table 4.3
Extent under plantation crops (ha)

District	Tea	Rubber	Coconut	Cinnamon	Total
Galle	21,370	1,670	3,660	10,075	3,6775
Matara	17,070	1,450	4,250	7,966	30,736
Hambantota	400	40	11,460	1,782	13,682
Monaragala	47	530	5625	0	6202
Ratnapura	25,860	9,540	7,716	2,660	45,776
Total	6,4747	13,230	3,2711	2,2483	13,3171

Lack of soil conservation, low organic matter content in the soil and lack of labour has adversely affected the tea industry in the region. In addition, global tea prices were not very attractive during 2003 due to an increase output in all major producing countries. Therefore, promotion of bio tea production in major low grown tea producing districts (Galle, Matara and Ratnapura) will enhance the comparative advantage of the region in the global tea market.

The region has an extent of 13,230 ha of rubber plantations. Attractive prices for natural rubber have encouraged the growers to increase the tapping intensity to raise rubber production. But output increases fell from the potential due to a greater number of rainy days. Therefore, rubber cultivation in northwest part of Monaragala district will be able to overcome this barrier. The average rubber yield (900 kg/ha) in the region is well below the potential yield of 1500-2000 kg/ha estimated by Rubber Research Institute. The low yield of the region is mainly attributed to non-application of recommended levels of fertilizer, poor usage of rain guards, poor usage of high yielding clones, non-adherence to systematic infilling practices, and scarcity of competent and skilled tappers.

Domestic consumption of rubber in the industrial sector was 57 million kg in 2003. This accounted for 62% of the national rubber production. In addition, country has imported 9 million kg of rubber in 2003. Further more, quantity of rubber exported as intermediate product has declined by 4% to 35 million kg due to high domestic demand. Therefore, promotion of rubber cultivation in the region will help to save as well as earn the foreign exchange.

The present extent of coconut plantations in the region is 32,711 ha. Though price fluctuations of nut are high, various parts of the coconut plant are used to make a number of by products. Therefore this crop has a very high industrial value.

About 90% of the total extent of cinnamon (22,483 ha) is cultivated in the region. Main cinnamon growing districts are Gall and Matara. Cinnamon is the most important export crop next to tea and rubber. Export earnings from cinnamon in primary form amounted to Rs. 4.3 billion, while earnings from cinnamon bark oil and leaf oil exports amounted to 224 million[4]. There is a considerable potential for region to increase value added exports from cinnamon instead of exporting as a primary product. Lack of cinnamon peelers in the region is the main obstacle to increase the production. Centrally located high tech processing unit linking small holders through out-grower arrangements will help to increase the production as well as value added exports.

Monaragala district and Southeast part of Ratnapura district are popular for sugarcane cultivation. Present domestic production caters less than 15% of the national requirement. After privatization of Sevanagala and Pelwatte sugar factories, sugar production has increased by 42% to 54,365 metric tons[5]. Low yields, poor recovery rates and constant labour problems have adversely impacted the sugar industry in the region. Due to the decline in the international price, sugar production *per se* will not be a profitable venture. Therefore, while producing sugar the industry should also invest in making various by products such as animal feeds, energy generation, good quality alcohols and other sprits to make the industry viable. The Sugarcane Research Institute has recommended two new varieties for commercial cultivation in the region.

4.6 Domestic Agricultural Sector

The domestic agricultural sector is hampered by low productivity due to a multitude of problems, including limited credit, supply driven agricultural production and the scarcity or poor adoption rates of appropriate modern technologies, high-quality seeds and propagation materials. Other negative factors include fragmentation of land holdings, post-harvest losses estimated at as much as 40%, inconsistent produce pricing and trade policies and market constraints.

A range of grains, legumes, cereals, roots crops, chillies, and onions are cultivated in the region. No reliable data is available to present the cultivated extent and productivity in the region. However, it is reported that yield of most of these crops is higher in the region in comparison to the national yield levels.

The wet and intermediate zones of the region are suitable for vegetable cultivation. Although vegetable cultivation is not practiced as a large-scale activity, various low-country vegetables are cultivated in these two zones. Predominant ones are beans, tomatoes, gourds, okra, and pumpkin. In dry zone area, particularly in Hambantota district, a variety of pumpkin types are cultivated. Reliable data is not available to present the exact extent of cultivation and also it is reported that the extent of cultivation varies in different years. It is estimated that about 25% of the total national production of low country vegetables is produced in the wet and intermediate zones of the region.

4.7 Livestock Sector

Southern region already has a substantial livestock (especially cattle) population (Table 4.4 and 4.5). Neat cattle and buffaloes populations in region are about 14% and 24% of the country's neat cattle and buffaloes populations respectively. These animals are mostly country-bred types and grazing animals maintained traditionally as herds. No attempt has been made to upgrade the animals or rear them in sheltered habitats. Therefore milk production per cow is very low. The percentages of milking cows in the neat cattle herds are very low ranging from 29% in Galle to 10% in Monaragala. The products are limited to raw milk and making of curd with the exception of yoghurt made in small quantities. There is a great potential for developing the dairy industry in the area due to the availability of labour and land.

Unlike in the case of neat cattle, southern region contributes almost half of the country's milking buffaloes and about a quarter of total number of buffaloes. region has been traditionally famous for buffalo curd. Hambantota having the largest buffalo herd reports the lowest productivity. This is mainly due to the predominance of stray buffaloes with virtually no production. It is a promising activity to systematise the buffalo rearing activities and attempt to increase the production of unproductive animals.

The current domestic supply of milk is adequate to meet only about 15% of the country's requirement. During the year 2003, 67,941 metric tons of milk and milk-based products were imported incurring import bill of Rs. 11.5 billion[6]. Therefore sustainable exploitation of the region's potential for livestock development will immensely benefit the country to save foreign exchange.

Table 4.4
Neat cattle population and milk production in the region by districts

District	Cattle population	No. of cows in milch	Daily milk production (liters)	% of milking cows	Milk yield (l/cow/day)
Galle	12,854	3,691	8203	29	2.23
Matara	14,126	4,330	6700	31	1.53
Hambantota	45,639	11,562	11277	25	0.96

Monaragala	75,151	7,532	11297	10	1.50
Ratnapura	11,671	1,632	2690	14	1.63
Southern Region	159,441	28,747	40167	18	1.40

Source: Agriculture Census, Department of Census and Statistics, 2002

Table 4.5

Buffaloes population and milk production in the region by districts

District	Buffaloes population	No. of cows in milch	Daily milk production (liters)	% of milking cows	Milk yield (l/cow/day)
Galle	7,360	2,217	4816	30	2.17
Matara	5,228	1,702	3076	33	1.80
Hambantota	34,063	11,432	13902	34	1.20
Monaragala	12,831	4,058	5381	32	1.33
Ratnapura	7,330	1,559	2181	21	1.40
Southern Region	66,812	20,968	29356	31	1.40

Source: Agriculture Census, Department of Census and Statistics, 2002

The high cost of animal feed is one of the biggest drawbacks in developing the livestock industry[7]. The main reason for high cost is due to the use of expensive imported raw materials. This can be minimized by using local raw materials adequately available in the region.

Small ruminants such as goats are very popular in upper parts of Galle and Matara districts where plantation crops are grown. Goat industry is also popular in Hambantota area. Therefore substantial potential is available in these areas for goat husbandry. The sponsorship of large-scale commercial animal husbandry farms by recognized meat producers would increase wage-based employment greatly in these areas.

Table 4.6

Small ruminants population in Southern region by districts

District	Goats/sheep
Galle	2323
Matara	1186
Hambantota	8681
Monaragala	2394
Ratnapura	1365
Southern region	15949

Large-scale free-ranged poultry farming and game farming have a good potential in the region. Free-ranged poultry farming with local birds (*Gam Kukula*) will definitely have a very good market as it produces low cholesterol eggs with high fiber content. Game farming would supply the demands of exotic meat market of gourmet restaurants.

4.8 Forestry Sector

It is widely accepted in Sri Lanka that deforestation is one of the major environmental problems and that unless planned action is taken, the demands for various forestry products and services will outstrip the productive capacity of the remaining forest resources. Deforestation has threatened not only the environment, but also high levels of biological diversity and the endemism prevailing in the country. Sri Lanka has greater biodiversity than most Asian countries when measured per unit area. More than 3,650 species of flowering plants, 300 species of pteridophytes, about 400 birds, almost 100 mammals and more than 160 reptiles can be found in Sri Lanka. And 26% of the flowering plants, 76% of land snails, 60% of amphibians and 49% of the reptiles are endemic to Sri Lanka[8].

The rate of forest plantation establishment has been in the range of 3,000 ha per year. In addition, enrichment planting of degraded natural forests and protective planting by the Forest Department, village reforestation through selected farmers on a short-term 4 year lease agreement supported by payment of incentives was carried out under the Participatory Forestry Programme (PFP). There is a huge demand for forest products (timber as well as non timber products) in the country. State sector cannot meet this demand while maintaining the ecological balance of the natural forests. Therefore, a new approach was launched in 1995 i.e. establishing commercial forest plantations on barren state lands through long-term 30 years lease to private sector. There are two types of commercial forests namely, energy plantations and timber forests.

Sri Lanka's only indigenous "commercial" energy source is hydropower electricity. The share of hydropower in the total power generation is around 40% in year 2002[9]. Hydropower has only a limited further development potential of about 3500 GWh per year[10]. On the other hand, thermal power generation by petroleum and coal is also has many limitations due to high cost, lack of foreign exchange, environmental pollution and social problems. Therefore, the best solution to the country's energy crisis is the use of bio-energy (dendropower). Dendro and hydropower accounted for about 75% of the primary energy supply in the country[11]. The major issues and constraints in the energy plantation sector are lack of recognition of the importance of fuelwood as a major source of energy, lack of coordination among institutions and lack of modern technology[12].

Table 4.7.
Projected demand for wood-based products in Sri Lanka

Wood-based product	2000	2020	Increase in demand
Wood-based panels (m^3 per year)	41,500	82,000	98%
Paper and other related products	182,000	407,000	124%
Poles (million m^3 per year)	0.492	0.571	16%
Fuelwood (million m^3 per year)	0.626	0.889	42%

Source: Pitigala G.H. and H.M. Gunathilake (2002)

It is estimated that the roundwood requirements of the country grew from 1,821,200 m^3 in 2000 to 2,062,100 m^3 in 2020[13]. Due to this ever-increasing demand for timber, the emerging picture of the forestry situation in Sri Lanka is not bright. Industry wants to produce sawn wood and other forest products, rural people need fuel wood to meet their energy requirements, the growing population requires land to produce additional food and environmentalists and other concerned people want to preserve the remaining natural forests intact. Therefore, only solution to meet all above needs is to establish commercial timber forest plantations in scrublands of region. As the supply of timber from natural forest will be restricted in near future, the commercial forestry will be the only major sources of timber supply.

Commercial forests immensely help to maintain the Carbon balance. Plantation forests absorb over 10 tons of Carbon per ha per annum[14]. This is needed to maintain the global Carbon balance within a comfortable range. Therefore, establishment of large-scale commercial timber forests and energy (dendro power) plantations in the large extent of scrublands and barren lands available particularly in Hambantota and Monaragala districts and Southeast part of Ratnapura district is an economically as well as environmentally very viable.

4.9 Fisheries Sector

Fisheries sector of the Southern region has a big potential. Region owns a considerable extent of Country's 1700 km of seashore and large number of inland water bodies (over 20,000 ha of surface area). But this sector has not able even to cater the region's fish requirement. In fact total fish production in the country has declined by 5.4% in 2003[15]. However, annual exports of fish and allied products have increased by 180% to 9793 metric tons (earning foreign exchange of Rs. 5.1 billion) during 1992 to 1999[16]. This was mainly shrimps, ornamental fish and lobster exports. On the other hand, imports of fisheries products have also increased by 20% during the above period. Therefore it is needed to reform the policies and regulations applicable in the fisheries sector to attract private investment including foreign investment in order to ensure the long-term growth in the industry.

4.9.1 Marine Fisheries

Fish production in the marine sector, which accounts for 89% of the country's total fish production, has dropped by 6.8% in 2003[17]. Sri Lanka enjoys 500,000 sq. km. of ocean under Exclusive Economic Zone (EEZ) and 1700 km of coastal line. Despite these resources availability, marine fish harvesting takes place only in 30,000 sq. km. area. Thus Sri Lanka exploits its marine fish resources only in 6% of its total EEZ. The loss of fishing days due to bad weather experienced in Southern coastal areas has adversely affected the marine fish production[18].

Marine fisheries sector has two sub-sectors, (i) coastal fisheries (fishing up to 40 km from cost) and (ii) offshore (fishing at 40 to 160 km from coast) & deep-sea (fishing beyond 160 km from coast at depth of 100 –600 meters) fisheries. Coastal fisheries in the region contribute about 30% of the country's coastal fish production. This sector has exploited to its maximum (rather over exploited) and it is mainly a smallholder intervention. But the region has a huge potential to expand its offshore & deep-sea fisheries.

Therefore, it is essential to use modern fishing gears and multi-day fishing vessels to overcome such climatic barriers and to ensure continuous high marine fish production in Southern coast. Provision of modern vessels, cold storage facilities, and extensive research in ocean resources to better use, are also essential to safeguard the region's fishing industry from the threat posed by the legal and illegal foreign fishing vessels and to encourage the offshore & deep sea fishing.

4.9.2 Inland Fisheries

There is no organized commercial inland fishery in the region although indigenous fishes are harvested in a subsistence fishery, especially in the villages, from reservoirs, rivers and streams. Reservoirs and tanks (both seasonal and perennial) comprise a major inland water resource in the region. The density of reservoirs and tanks is high in Hambantota and Monaragala Districts and Southeast part of Ratnapura District. In fact, Sri Lanka has the highest density of small reservoirs in the World[19]. Therefore there is a huge potential for inland fisheries in the region. However, current fish yields in these reservoirs and tanks are very low and variable due to various factors. Contribution of inland fisheries sector to the national fish production was 19% in mid eighties, 5% in 1994 and 11% in 1999. This was due to the termination and reintroduction of Government assisted services for stocking and supply of fingerlings. The common species available are tilapias, carps, rohu, catla and some local species. Fish yields in large and medium reservoirs (>200 ha surface area) can easily be increased up to 500 kg/ha/year (mean), by introducing tilapias[20]. In Thailand carps and tilapias stocked in small reservoirs have yielded 600 kg/ha/year (mean)[21]. According to above statistics, the present fish yields in the reservoirs and tank in the region are only 1% of its potential. The main reasons for low fish yields are illegal fishing, unregulated fishing, use of wrong fishing gears, irregularity in releasing of fingerlings to the reservoirs, water pollution due to the illegal cultivation of upper part of reservoir beds and the catchments and siltation of the reservoir. Therefore, inland fish production can be dramatically increased with the private sector involvement in the sector. It is also essential to introduce processing and value addition to inland fisheries in order to obtain the competitive advantage and premium price at the market and generate more employment opportunities for the region's rural youth.

Although the primary objective of this component is to increase the inland fish production in the region, secondary objectives are to optimize the use of inland water bodies, maintain the natural balance of the region and generate income and employment opportunities. Furthermore, inland fishery development will be a productive use of a natural resource, which has been converted to water bodies.

4.10 Strategy for Developing the Sector

4.10.1 Current Strategy

Various development programmes such as IRDP, SEEDS, MICDP, SDA have been implemented by the Government and NGO's in all five districts for well over two decades resulting in most of the rural areas receiving social and economic infrastructure facilities to upgrade their socio economic levels. Furthermore, these projects have introduced innovations such as social mobilization, savings mobilization among the poor, strengthening of community based activities, integration of environmental conservation into development projects etc. These interventions have assisted in improving the living standards of the rural poor and improved the rural environment to a certain extent in addition to preventing deterioration of the position of the poor under the open market economy. However these interventions have not been successful in achieving the following:

- Bringing about a dynamic change in the regional economy
- Creation of sufficient employment opportunities for the unemployed youth
- Developing sustainable income generating activities within the region
- Establishing linkages in markets and technology, which are crucial to sustain, expand and move rural incomes beyond the subsistence level.
- Harnessing and utilization of the private sector in the development process especially in regard to increasing productivity, generating employment opportunities and increasing income levels in agricultural sector

4.10.2 Background to the Development of Strategy

A development strategy is a course of actions formulated by planners to address certain issues that have arisen in a given area. The resource potential, available infrastructure and other facilities/services, existing development, links with other regions and constraints, will influence this very largely. They will indicate the inter- and intra- regional comparative advantage. Based on this principle, following strategic development thrusts are determined for the Southern region.

- Large extent of unutilized and under utilized lands is available in Hambantota and Monaragala districts and Southeast part of Ratnapura district. Therefore commercial agricultural development including livestock farming will be the most suitable strategic thrust for this area.
- In rest of the region most of the land suitable for agriculture is already used for it and the land: man ratio is low. Therefore main strategic thrust for this area of the region will be to develop non-farm sector. However, development of export agricultural crops through increased production and value addition will be the next strategic thrust for this area.
- Marine fisheries and inland fisheries will be the thrust in coastal belt and locations where inland water bodies are available.
- Tourism will be the thrust in locations with scenic sites, eco resources, historical places and archiological sites

The agriculture, livestock and fisheries development strategy proposed for the region is based on the following key factors.

- Natural resource endowment in the region
- Comparative advantage of the region
- The productive assets established by previous development initiatives
- The human resource base in the region
- World trend towards eco-friendly organic products

4.10.3 Agriculture and Forestry Development Strategy

Carrying out a land zoning and identifying the lands/locations for agriculture and forestry.

Land zoning is important in carrying out any development activity in the region. Soil, water, climatic conditions, topography and socio-economic conditions are the key factors to be considered in agricultural land zoning. In addition, communication, infrastructure, the attitude and values of the people are also considered in zoning of lands for commercial agriculture. Tea, rubber, coconut and cinnamon plantations that already exist in Galle, Matara and Ratnapura districts are considered as plantation agriculture zones. In addition, it is proposed to cultivate rubber in western part of Monaragala district. Large-scale commercial agricultural farms will be confined to the large extent of scrublands found in Embilipitiya, Tanamalwila, Wellawaya, Monaragala and Siyambalanduwa area. This area will be identified as "Green Belt or Green Corridor" of the Southern region.

Creating an environment for joint ownership among key players namely, the private sector, the public sector and other stakeholders

The donor agencies and the government of Sri Lanka are the current partners in the regional development. But there is a multitude of organizations, entities, private sector, NGOs and Region's target groups that can be the key players in the regional development. While all above named segments, partners and stakeholders are under-prepared to cooperate in the task ahead, cultural and mental barriers obstruct the smooth functioning of the regional development. Hence, the region's ability to respond to market demand is handicapped with such a structure. Motivation of all partners in the development process to build up a sense of ownership towards the Region will be the most important human resource exercise needed to create the correct level of commitment. It is a well-known fact that a considerable amount of money has been infused into the region through various development projects and welfare programmes both by the government and NGOs. This has led to people developing a "dependency syndrome" with little interest for rapid socio-economic advancement. Therefore, the development of an entrepreneurial culture with a change in attitude from the presently negative one to a positive, optimistic and outward looking one is very necessary.

Establishment of large-scale commercial farms (1000 ha a unit or more) with joint partnership of state and private sector.

Large-scale commercial farms will be established within the "Green Corridor" for production of functional foods, organic fruits and vegetables etc. These farms will also serve as "Agricultural Command Centers" and be equipped with high-tech water saving irrigation facilities (e.g. drip irrigation, fertification units, sprinkler irrigation etc.), modern post harvest processing and value addition facilities, e-commerce and other IT facilities to link with global market, weather forecasting devices, laboratory facilities etc. Small-scale farmers will be linked to these Agricultural Command Centers through out-grower arrangements.

Establishment of energy plantations and timber forests

The most valuable natural resource of the region is natural forest cover. About 30% of the land extent of the region is covered with natural forest. To protect this invaluable natural resource, it is proposed to establish energy plantations and commercial timber forests along the periphery of the natural forest as a buffer zone.

Strategically positioning the region in order to achieve a competitive base for the region's agricultural production and agri-businesses.

Competitiveness is the key element of a region's comparative advantage. Regional competitiveness is the ability of a region to strategically position itself to the global market successfully offering an attractive package of options to desiring customer's willing to pay a premium. In view of its remoteness, environment, vastness, scenic beauty and high biodiversity, the south eastern part of the region ("Green Corridor") could position as one of the world's most ecological regions, giving it a base to strategically position a range of eco-friendly agricultural products and services. Branding the Southern region as an eco-friendly region will give it a competitive edge extending a base for its enterprise to build its marketing operations on.

Identification of an appropriate marketing strategy

The identification of an appropriate market strategy is of paramount importance. To achieve this objective, generic branding of the region's product should be carried out on a priority basis. Market identification and development for the region's products should be supported through creation of sustainable links to the global market place. It is vital that expert advice is sought on this matter. It is equally important for wider participation of all concerned groups, as it is only then that there would be some kind of ownership towards the brand. This is vital, as the brand would need maximum commitment behind it to succeed in a very competitive global marketplace.

4.10.4 Livestock Development Strategy

Livestock development strategy for the Southern region includes two components, commercial farms and domestic sector.

Establishment of large-scale commercial livestock farms within the "Green Corridor".

Large-scale commercial dairy farms will be established within the "Green Corridor" for production of milk and milk products. These farms will also serve as "Livestock Command Centers" and be equipped with milking machines, milk processing units, chilling plants, laboratories, artificial insemination centers,

veterinary surgeons etc. These farms will also provide extension services to small-scale livestock farmers in and around the area.

Domestic livestock development

Southern region has a traditional domestic livestock sector. This region is famous for "Ruhunu curd" but reports low productivity (Table 4.4 & 4.5). Therefore, establishment of grasslands managed by small-scale milk producers associations (or companies) will be done with the state involvement. In addition the productivity will be increased through technology transfer, awareness programmes, extension services, artificial insemination, and out-grower arrangements with commercial farms. In addition, similar facilities will be provided to small ruminants (goats) farmers and free-range poultry farmers.

4.10.5 Fisheries Development Strategy

Coastal fisheries development

Costal fishing will mainly be limited to small-scale fishermen. Existing small fishery harbours will be developed and fishermen will be equipped with modern and appropriate fishing gears. Local fish markets will be upgraded and value addition will be promoted.

Offshore & deep-sea fisheries development

Offshore and deep-sea fishing will be developed as large-scale commercial enterprises. Galle, Hikkaduwa, Dodanduwa, Purana Wella, Mirissa, Kirinda, Tangalle and Kudawella fishery harbours will be redeveloped to international standards to accommodate large fishing vessels. In addition, new fishery harbours will be developed at Ambalangoda, Dodanduwa, Hambantota and Kalamatiya. Fully equipped modern ships (mother ships) will be located in deep sea and large fishing vessels will be used to feed these mother ships. Processing, canning and value addition will be done in these ships. A continuous shuttle service between ships and the harbours will be conducted.

Inland fisheries development

The fish productivity in the inland water bodies will be enhanced through release of sufficient number of fingerlings at regular intervals and proper management of fishery resources. Capacity of the existing fish breeding centers (e.g. Udawalawe, Angunakolapalase) will be increased to ensure continuous release of fingerlings to water bodies. Fishermen will be organized into fishermen organizations and those will be linked with niche markets.

4.11 Projects Identified for Implementation

Priority projects identified for immediate implementation are as follows

4.11.1 Production of Bio-tea

Objectives
The objective of this project component is to produce organically grown bio-tea for selected international niche markets.

Location & extent
Neluwa, Thawalama, Nagoda, Pasgoda, Pitabaddara area. The extent will be 2,000 ha.

Activities
- Selection of tea plantations
- Organize planters into a bio-tea producing company
- Supply of expert advice and other facilities to switch on to bio-tea production
- Value addition and establishment of market links

Expected outputs
- Additional employment generation of 730,000 man days per year. (about 2,500 employment opportunities)
- Additional income generation of Rs. 54.68 million per year through increased yield, value addition and reduced cost of production
- Savings of foreign exchange of Rs. 23 million by non-application of agrochemicals
- Crop biodiversity and soil conservation will be increased by 50%

4.11.2 Development of Cinnamon Production

Objectives
The objective of this project component is to increase the cinnamon production in the region by 50%

Location & extent
Kurundugaha Hethapma, Elpitiya, Pitigala, Meetiyagoda, Baddegama. The extent will be 25,000 ha including existing plantations.

Activities
- Infilling and upgrading of existing plantations
- Establishment of new plantations
- Establishment of centrally located high tech processing plant in the area for post harvest processing and value addition.
- Linking of cinnamon growers with processing plant through out-grower arrangements
- Linking the processing plant with international market.

Expected outputs
- Additional employment generation of 9,125,000 man days per year. (about 34,000 employment opportunities)
- Additional income generation of Rs. 2,262 million per year through increased yield, and value addition.
- Crop biodiversity and soil conservation will be increased by 30% and 10% respectively

4.11.3 Establishment of Energy Plantations

Objectives
The primary objective of this project component is to produce electricity while maintaining the carbon balance of the environment, saving the foreign exchange and producing bio-fertilizer.

Location & extent
Periphery of the existing forest reserves of Hambantota, Monaragala and Ratnapura districts. The extent will be 25,000 ha.

Activities
- Allocation of lands to private sector on 30 years lease
- Establishment *Gliricidia sepium* plantations
- Application of soil and moisture conservation measures
- Establishment of dendro power-plant
- Provide incentives to community to establish small-scale energy plantations (dendro farmers)
- Linking of power-plant with dendro farmers through out-grower arrangements

Expected outputs
- Additional employment generation of 1,600,000 man-days per year. (about 6,000 employment opportunities)
- Additional income generation of Rs. 800 million per year
- Soil conservation will be increased by 100%
- Foreign exchange savings of Rs. 7.3 million from savings of petroleum fuel for thermal power generation
- Annual Carbon sequestration will be increased by 250,000 metric tons of carbon
- Biodiversity and protection to natural forests and wildlife will be enhanced substantially
- Production of bio-fertilizer

4.11.4 Commercial Agriculture Development

Objectives
The objective of this project component is to shift the region's agriculture from subsistence farming to market-oriented commercial farming

Location & extent
"Green corridor" of the region and Nilgala forest reserve. The extent will be 100,000 ha (70,000 ha of fruits and vegetables, 20,000 ha of functional foods and 10,000 ha of medicinal plants).

Activities
- Allocation of scrublands in "Green corridor" on 30 years lease.
- Establishment of commercial farms (Agriculture command centers)
- Provide infrastructure, primarily water
- Equip these farm with all modern technology including R&D facilities

- Link surrounding farmers with these centers through out-grower arrangement
- Link these centers with global markets
- Enhance the production capacity of Nilgala medicinal forest in a more environmental friendly and sustainable manner.
- Redevelop the medicinal plant processing unit at Nilgala to international standards

- Promote medicinal plant cultivation among the inhabitants around Nilgala area and link them with processing unit through out-grower arrangements
- Promote production of value added arurvedic products at the processing unit and link with local and international market.

Expected outputs

- Additional employment generation of 28,000,000 man-days per year.(about 10,000 employment opportunities)
- Additional income generation of Rs. 14,900 million per year
- Soil conservation will be increased by 30%
- Foreign exchange savings of Rs. 100 million per year from import substitution
- Biodiversity, sustainable exploitation and protection of Nilgala forest and wildlife will be enhanced substantially

4.11.5 Sugarcane Production

Objectives

The objective of this project component is to increase the sugar production to save foreign exchange

Location & extent

Palawatte, Sewanagala, Thanamalwila and Wellawaya area of "Green corridor". The extent will be 10,000 ha.

Activities

- Promotion of sustainable sugarcane production techniques among the farmers in these areas.
- Introduction of newly bred high yielding sugarcane cultivars to farmers
- Improve the already existing out-grower arrangements and establish new links between sugar factories and farmers
- Improve and modernize the existing factories
- Introduce more value added by products to sugar industry in order to make the industry a viable enterprise while producing sugar at a cheaper rate to compete with international sugar prices

Expected outputs

- Additional employment generation of 1,000,000 man-days per year.(about 3,500 employment opportunities)
- Additional income generation of Rs. 2,207 million per year
- Foreign exchange savings of Rs. 2,207 million from import substitution
- Local sugar production will be increased by 50%

4.11.6 Fisheries Development

Objectives

The objective of this project component is to exploit inland water and marine fisheries resources to generate income and employment and for the import substitution

Location & extent

Exclusive Economic Zone (EEZ) of the southern region and 20,000 ha of surface area in large and medium inland water bodies in the region.

Activities

- Marine fisheries
  - Equip small-scale fishermen with modern fishing gears and boats for coastal fishing
  - Develop local fish markets in such way to attract not only the customers but local and foreign tourists also. This can easily be done with value addition, such as fish fillets, fried fish, BBQ etc.
  - Modern multi-day fishing vessels and fishing gears will be provided to medium and large scale fishermen to fish in offshore.
  - Galle, Hikkaduwa, Dodanduwa, Purana Wella, Mirissa, Kirinda, Tangalle and Kudawella fishery harbours will be redevelop to international standards to accommodate large fishing vessels. In addition, new fishing harbours will be developed at Dodanduwa, Ambanlagoda, Hambantota and Kalamatiya
  - Fully equipped modern ships will be located in deep sea around the region and medium to large fishing vessels will be used to feed these ships. Processing, canning and value addition will be done in these ships.
  - A continuous shuttle service between ships and the harbours will be conducted.

- Inland fisheries
  - Inland fishermen in large and medium water bodies will be organized into fishermen organizations or companies
  - Fingerling production will be increased by introducing modern fish breeding facilities to existing inland fish breeding stations at Angunakolapellase and Udawalawe

- Regularization of fingerlings release to water bodies and uncontrolled fishing through fishermen organizations
- Value addition of inland fish production and linking fishermen organizations with selected niche markets such as gourmet restaurants.

Expected outputs

- Additional employment generation of 800,000 man-days per year. (about 3,000 employment opportunities)
- Additional income generation of Rs. 32,750 million per year
- Foreign exchange savings of Rs. 6,000 million from import substitution

4.11.7 Livestock Development

Objectives

The objective of this project component is to develop livestock production (especially milk and milk products) to save foreign exchange

Location & extent

"Green corridor" of the region. The extent of the commercial livestock farms will be 17,000 ha.

Activities

- Allocation of scrublands in "Green corridor" on 30 years lease.
- Establishment of commercial livestock farms (Livestock command centers)
- Equip these farm with all modern technology including R&D facilities
- Link surrounding farmers with these centers through out-grower arrangement
- Processing, value addition and branding
- Linking farms with local and international markets

Expected outputs

- Additional employment generation of 2,500,000 man-days per year.(about 9,000 employment opportunities)
- Additional income generation of Rs. 4,530 million per year
- Foreign exchange savings of Rs. 4,530 million per year
- Soil conservation in scrublands will be increased by 50%

4.11.8 Other Projects

(a) Galle District

(i) Introduction of new improved paddy varieties that were tested at Bombuwela and Ambalantota by the Department Agriculture, in Ginganga basin

(ii) Cultivation of traditional rice varieties, which have medicinal properties (e.g. Gonabaru, Suwandal, Ma Wee, Kalu Heenati etc) in Ginganga basin. These rice have a very high market value within a closed market (e.g. Upper middle class health conscious middle age community, Healthy food stores, Health resorts etc).

(iii) Development of Labudoowa farm as a seed production farm to cater the seed requirement of Galle and adjoining districts

(iv) Cultivation of 10,000 hectares (presently abandoned) of rain fed agricultural lands with non-traditional high value cash crops

(v) Promotion of rearing of small ruminants (e.g. goats) in the hill part of the district (tea growing area) as a backyard livestock industry for an additional income

(vi) Establishment of free-range poultry farms (with local birds-*Gam Kukula*) to produce eco-farm eggs (*Gam Biththra*) containing low cholesterol and high fiber in old tea estates in Ellpitiyta, Batapola and Pitigala

(vii) Establishment of an artificial insemination center for the district to upgrade the cattle industry in the district.

(viii) Increase productivity of Rubber from 648 kg / ha to national average of 911 kg / ha with the target of achieving 1,500 – 2,000 kg / ha of optimum potential yield. 12,015 hectares of present rubber cultivation areas to be targeted with infilling of underdeveloped areas. Develop new nurseries. Provide improved machineries to make sheet rubber in place of crape rubber to increase value addition.

(ix) Develop coconut plantation as a plantation of regional significance due to large industrial base from it's by products. Increase productivity of present 12,850 hectares of land with infilling and better practices

(b) Matara District

(i) Increase productivity of Rubber from 648 kg / ha to national average of 911 kg / ha with the target of achieving 1,500 – 2,000 kg / ha of optimum potential yield. 5,600 hectares of present rubber cultivation areas to be targeted with infilling of underdeveloped areas. Develop new nurseries. Provide improved machineries to make sheet rubber in place of crape rubber to increase value addition.

(ii) Develop coconut plantation as a plantation of regional significance due to large industrial base from it's by products. Increase productivity of present 16,180 hectares of land with infilling and better practices. Increase production of desiccated coconut as a good value added product.

(iii) Establishment of commercial forests in abandoned private lands in Hakmana and Mulatiyana DS divisions (500 hectares) in order to improve the land productivity and provide self employment opportunities for rural youth

(iv) Promotion of rearing of small ruminants (e.g. goats) in the hill part of the district (tea growing area) as a backyard livestock industry for an additional income

(v) Establishment of free-range poultry farms (with local birds-*Gam Kukula*) to produce eco-farm eggs (*Gam Biththra*) containing low cholesterol and high fiber

(vi) Establishment of an artificial insemination center for the district to upgrade the cattle industry in the district

(c) Hambantota District

(i) Promotion of traditional small ruminants (goat) industry in Hambantota area and establishment of meat processing unit and cold room facilities and linking with chain super markets

(ii) Value addition to traditional curd industry in Hambantota and linking the industry with chain super markets and hotel sector

(iii) Home garden improvement in Tangalle, Beliatte, Weerakatiya area

(iv) Improvement of the condition of coconut plantations and promotion of the manufacturing of coconut based by-products

(d) Monaragala District

(i) Establishment of commercial timber forests in Buttala and Thanamalwila DS divisions

(ii) Expand rubber plantation by another 5,000 hectares

(iii) New plantation of cashew in 2,000 hectares

(e) Ratnapura District

(i) Establishment of commercial timber forests in Embilipitiya DS divisions

(ii) Development of 2,000 hectares of grasslands for improving productivity of free-range cattle industry

(iii) Establishment of free-range poultry farms (with local birds-*Gam Kukula*) to produce eco-farm eggs (*Gam Biththra*) containing low cholesterol and high fiber

4.12 Public Policy

4.12.1 Existing Policy

The country's agricultural policy was spelled out in two statements made by the Ministry of Agriculture and Livestock and the Council for Agriculture Research and Policy (CARP). The policy thrust was focused on uplifting the agricultural sector whose contribution to the national economy and return to investment has been well below the potential.

The National policy on Agriculture and Livestock (NPAL) drafted by Ministry of Agriculture and Livestock for the period from 2003 to 2010 emphasizes the need for mobilizing both state sector and private sector involvement to transform the agricultural sector into a sustainable and strong economic force. This is complemented by the National Agriculture Research Policy formulated by CARP. Other key reform areas identified in the NPAL are market reforms, enhancing the role of private entrepreneurship in agriculture, closer integration with the food processing industry, and conservation and sustainable use of resources.

The Government has two main initiatives in land reform and regularization. Firstly the World Bank supported pilot Land Titling and Related Services Project launched in early 2002; and secondly development of a national land-use policy with the involvement of the FAO. Specific policies within the overall national land-use policy include a land allocation programme to meet genuine demands for agricultural and residential land, and the distribution of under-utilized and unutilized land vested with state authorities.

The first Forestry Master Plan was prepared during 1983-86 by the Forestry Planning Unit of the Ministry of Land and Land Development under the Forest Resources Development Project funded by FINNIDA and World Bank. The revision of the Forestry Master Plan, which was called the Second Forestry Master Plan, commenced in 1993. Although only a revision was envisaged at the beginning, due to the deficiencies of the first Forestry Master Plan the final output of this exercise was the preparation of a Forestry Sector Master Plan (FSMP). The first Forestry Master Plan was a classic investment plan. In contrast the second FSMP is a policy, strategy, and programme-oriented plan. The FSMP covers the period 1995-2020.

One of the most important items under the FSMP is the formulation of a National Forest Policy for Sri Lanka. The important areas of emphasis in the policy adopted in March 1995 by the Government are:

- High priority on conservation of biodiversity and soil and water resources;
- Building partnerships with local people, communities, NGOs and the private sector in all forestry development activities; and
- The establishment and management of industrial forest plantations on the state lands will be entrusted progressively to the private sector.

4.12.2 Proposed Policy

Proposed agricultural and livestock policy will mainly aim to improve productivity, increase income and ensure food supplies at affordable prices. Its next goal will be to facilitate the transformation of traditional agriculture and livestock production into a commercially and economically profitable venture. Furthermore, the proposed policy will recognize the importance of small-scale agriculture and livestock production as a means of reducing poverty in rural areas. Policies for maximizing the agriculture and livestock sector's contribution to poverty reduction will involve:

- Improving land markets and strengthening land tenure arrangements;
- Making improved technology available to small farmers through intensive adaptive research on technologies that have proved successful elsewhere;
- Transferring the responsibility for commercial seed production, veterinary services, etc., to the private sector; and
- Upgrading the agricultural marketing system.

Connecting poor and marginalized communities to the growing domestic and national markets will be an important part of the proposed policy. A cornerstone of this policy will be creating an enabling environment for the private sector to engage in marketing and processing activities so as to stimulate the rural economy. However, in a context of growing globalization and stiff competition on international markets, ever more attention must be paid to World Trade Organization negotiations, and bilateral and regional trade agreements, to protect the agriculture and livestock sector against the volatility of the global market.

Proposed fisheries policy will aim to exploit the marine aquatic resources within the exclusive economic zone in a profitable and sustainable manner. Costal fishing will mainly be limited to small scale fishermen, while deep sea and offshore fishing will be done in a commercial scale by the private sector. Inland fisheries industry will be developed as a cheep protein supplementary to the rural community to combat with mal-nutrition. Value-added inland fishery products will be promoted to cater certain niche markets such as gourmet restaurants etc.

Forestry Sector Master Plan covers the period from 1995 to 2020. This plan has many positive approaches to develop and conserve the forestry in Sri Lanka. Therefore proposed forestry policy will follow the Forestry Sector Master Plan. In addition it is proposed to include energy plantations in the buffer zone of the forest reservations.

Table 4.8
Economic analysis of selected major projects in agriculture, livestock and fisheries sector

	Bio tea	Cinnamon	Energy plant.	Commercial & export agri			Suger	Inl. Fish	Marine fish	Livestock	Total
				Veg. & Fruits	Cereals	Medicinal					
Extent (Ha)	2000	25000	20000	70000	20000	10000	10000	20000	-	17000	194000
Addi. Emplo. Gen. (man days)	730000	9125000	1600000	20000000	6000000	2000000	1000000	200000	600000	2500000	43755000
Addi. Income gen. (Mill. Rs)	54.68	2262	800	11620	1280	2000	2207	750	32000	4530	57503.68
Export potential (%)	100	100	N/A	60	0	80	0	50	50	10	
Foreign exchange savings	23	0	7.3	900	0	100	2207	0	6000	453	9690.3
Gender equity (Female: male)	9	0.5	0.5	1	1	1	1	0	0	0.5	
Food security	N/A	N/A	N/A	Yes	Yes			Yes	Yes	Yes	
Soil conservation (% increase)	50%	10%	100%	30%	20%	10%	0%	0%	0%	50%	
Agro-based/byproduct industries	N/A	N/A	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
New tech	N/A	Yes	N/A	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Crop biodiversity (% increase)	50%	30%	0	30%	0	30%	(-10%)	0	0	0	
Yield (% increase)	30%	50%	N/A	100%	100%	N/A	50%	1000%	N/A	300%	
Value addition (Mill. Rs.)	38.28	2262.00	0.00	3486.00	384.00	2000.00	441.40	75.00	3200.00	2265.00	14151.68
Sector GDP (Mill.Rs.)	12000	78000.00	12000.00	78000.00	78000.00	78000.00	78000.00	24000.00	24000.00	78000.00	
Contribution to GDP (sector)	0.77	5.80	6.67	19.37	2.13	5.13	3.40	3.44	146.67	8.71	
Sector increase % wrt 2003	0.81	50	1.86	33.65	23.23	-	50.46	30.00	62.02	39.53	

(Footnotes)

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Chapter -05

Industrial Development Plan

CHAPTER FIVE

INDUSTRIAL DEVELOPMENT PLAN

5.1 Introduction

Industrial development of Sri Lanka has been heavily concentrated in the main urban area - the Western Province which accounts for 48 percent of the national GDP. Although extensive resources, particularly raw materials are available in the Southern Region the industrial development has been insignificant in its economic development and therefore the contribution to economic growth marginal.

Table 5.1
Distribution of Industries by Districts, 2002 and 2003

Area	Industries registered under the Ministry of Industries		Industries registered under BOI Section 17		Industries registered under BOI Section 16		200 Garment Factory Program	
	2002	2003	2002	2003	2002	2003	2002	2003
Galle	24	25	54	54	28	29	8	7
Matara	26	26	15	16	1	1	6	6
Hambantota	11	13	15	17	-	-	6	7
Monaragala	1	1	4	4	2	2	6	6
Rathnapura	6	6	19	21	4	4	15	14
Southern Region	68	71	107	112	35	36	41	40
Sri Lanka	1505	1567	1419	1464	687	691	189	180

Source: Central Bank, Annual Report, 2003

Table 5.1 clearly indicates that the growth of industries in the region during 2002 and 2003 has been almost negligible with Hambantota, Monaragala and Ratnapura districts not making an effective contribution.

Based on popular economic concepts that prevailed during 1960s and 1970s particularly in Third World Countries (i.e. equitable distribution of investments among regions in order to eliminate regional disparities), the then Governments implemented a programme of locating large scale industries outside the Western Province. However due to interventionist public policies on industrial development coupled with poor management, these industries did not bring about the expected benefits to the regional economic development. Hambantota salt industry which has been in existence for a long period of time continue to play a key symbolic role in the industrial development of the region.

During 1980s & 1990s under the decentralisation of garment factories scheme & free trade zone program over 100 factories were established in the Southern Region. However, when compared with the national average, Southern region remains relatively backward. On account of poor infrastructure facilities Southern Region did not attract adequate investments for industrial development.

Table 5.2
Percentage of Employed Population in the Manufacturing Industry – 2001

District	Percentage of Total Employed		
	Male	Female	Total
Galle	11.6	22.7	15.1
Matara	13.0	20.6	15.4
Hambantota	9.1	23.1	12.7
Monaragala	5.3	7.5	6.0
Ratnapura	9.5	16.3	11.6

Source : Dept. of Census & Statistics

Compared with the national average of 17%, the percentage of employment in the manufacturing sector in the region is low, The averages recorded for the Southern region as shown in the table 5.2 are somewhat over rated due to higher percentage of female workers engaged in the garment factories.

According to district data for 2002, unemployment rate of Hambantota and Matara has been 14.5 percent and 14.3 percent of the labour force respectively whilst Galle was marginally lower with 12.6 percent. These rates are comparatively higher than the national average of 10 percent. A high percentage of the families of the region are beneficiaries of Samurdhi illustrating the need for employment generation and industrialization being a major driving force.

5.2 Development Potentials

Southern region possesses much potential for development as an industrial region. A summary of the potential is presented below.

(i) The services industry, associated with the seaport and airport related activities.

(ii) Manufacturing industries based on the proposed Hambantota seaport development such as; petrochemicals, oil refineries, power plants, ship repairing dry docks and such complementary industries. BOI has already received applications from the private sector developers for investment in these industrial activities.

(iii) Fisheries industry offers a high potential particularly due to inadequate exploitation of deep sea fishery hitherto. The Exclusive Economic Zone is exploited by foreign companies and Sri Lanka has failed to invest in deep sea fishery on a large scale.

(iv) Vegetables, fruits and ayurvedic produce have a growing export market both in the Western Europe & Middle Eastern Countries.

(v) The region's surplus produce of vegetables and fruits is an inexhaustive base for food processing industries**.**

(vi) International Fiber Optic Cables – SEA – ME – WE 2 and SEA ME – WE 3 laid on the sea bed connecting Asia with the rest of world (Europe, Middle East and North America) almost touching southern coast provide opportunities for easy access to international information superhighway. Although at present a single landing point is restricted only to Colombo it is very likely that a landing point for the South could be obtained from the proposed SEA – ME – WE 4 if the Government makes an opportune policy decision in this regard. This could lead to betterment of employment opportunities available for the educated youth in the ICT service industry.

(vii) Mineral Resources

The region has several mineral resources of which some are economically exploitable and some are not. Geological Survey and Mines Bureau (GSMB) submitted a detailed report to NPPD on the availability of such resources in the region.

Base Metal

- Iron Ore

Katuwana in Hambantota district, Wilpita in Matara district, Dikgoda estate, Marawila estate and Karandeniya in Galle district are the notable locations. Due to the scattered nature and varying sizes of the boulders GSMB finds it extremely difficult to estimate the deposits. Also the scattered nature pre-empt economic exploitation. However GSMB states that the resources can be used in the cement industry mixed with clay and limestone to fix the iron deficiency.

Building Material

- Building Stone, Road Metal and Dimension Stone

GSMB has recorded abundance of high-grade metamorphic rocks in the Southern region most of which usable in buildings and road construction activities. Therefore production of construction material remains a very promising industry in the region. Rocks that are suitable as dimension stones are also available in a few locations.

- Sand and Gravel

A number of sand accumulated sites have been found in recent surveys.

- Structural Clay

Promising sites of clay deposits of economic significance are located in Hambantota, Monaragala and Ratnapura districts. Mineralogically they differ from each other and are more suitable for pottery, brick and tile industry.

Industrial Minerals

- Kaolin Deposits

Galle district is very rich in some of the significant kaolin (china clay) deposits in the country. Most promising locations are, Meetiyagoda, Nindana, Aluthwala, Lewduwa, Manampitiya, and Batapola. The Meetiyagoda deposits are used in the ceramic industry at present.

- Vein Quartz and Feldspar

Vein Quartz is commonly known as silica quartz. At present they are used in Sri Lanka as a ceramic raw material, as refractory material and as an abrasive. Although detailed estimates of the reserves are still not available it is believed that these deposits are in significant economic quantities for extraction in industrial development. High-purity quartz is used in a number of High-Tech industries which includes the manufacture of ferro-silicon, metallic silicon, optical glass, optic fiber, photovoltaic cells, high-temperature glass and crystal ware.

Therefore Vein Quartz is an industrial mineral that has remarkable potential to develop high tech industries in the region and thereby become a good income generator.

Feldspar is an essential raw material in the ceramic industry. Economically exploitable deposits are sited in the region.

- Graphite

Application of graphite in the manufacture of refractory, foundries, lubricants and batteries is well known. Economically exploitable deposits are available in the region.

- Mica

Kolonne and Embilipitiya in the Ratnapura district and Katuwana in Hambantota district have significant deposits of Mica. Much of the Sri Lankan Mica falls into the category called scrap grade as presently exported in large quantities. It is widely used in plastics and paint industry and also as a lubricant.

- Garnet Sand

Renewable deposits of garnet concentrated beach sand (15 to 50%) are recorded between Galle and Ambalangoda in Galle District. Dune sand in Hambantota district has also found to be having 20% concentration of garnet. Extraction of garnet requires careful examination as it is directly related to coastal erosion and coastal landscape.

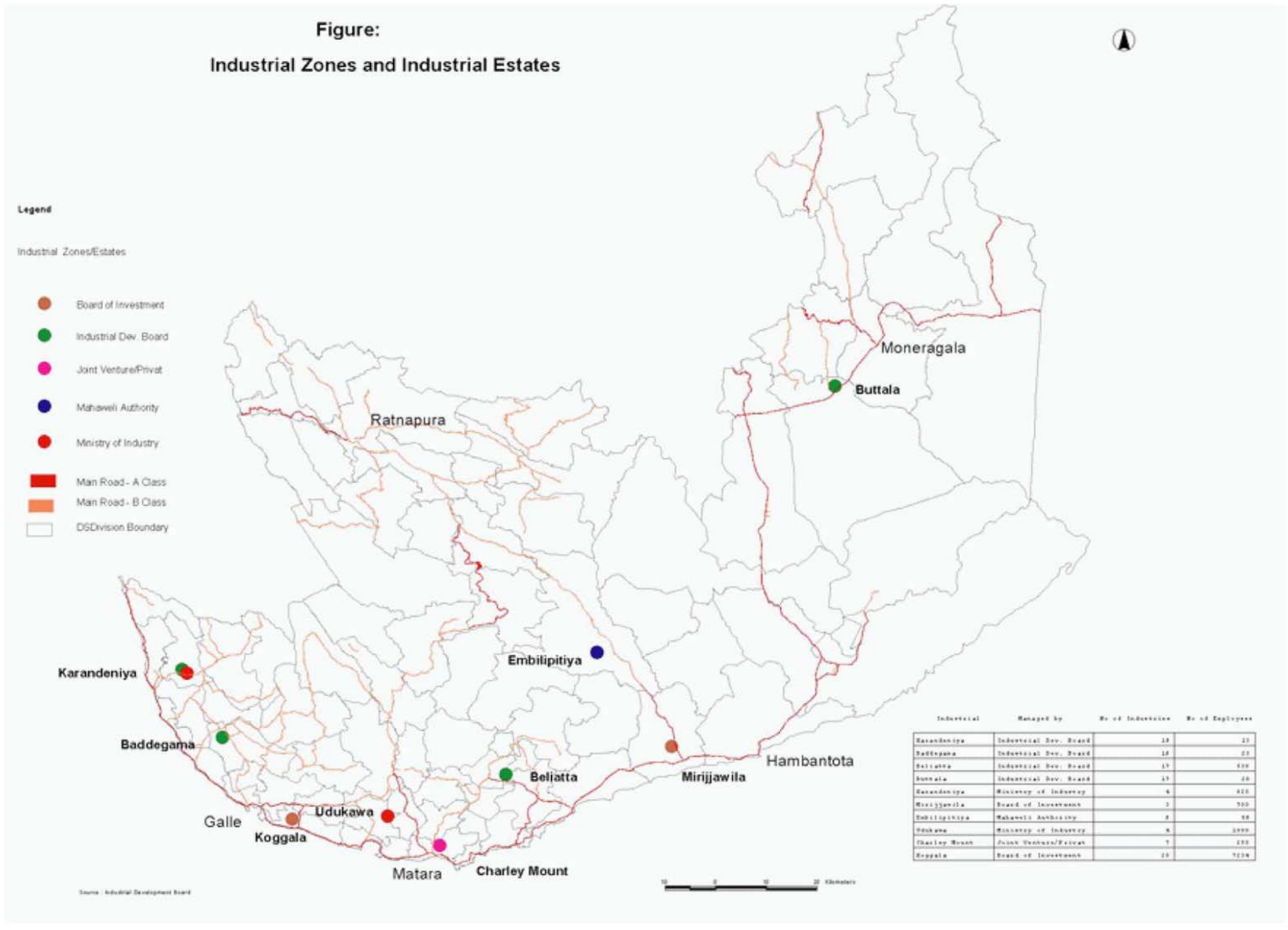
Garnet International of Canada had setup a Joint Venture Company with Krishna Mining Company (Ceylon) to cater to the export market. It is expected to extract 20,000 to 30,000 tons of Garnet per annum. The proposed project also expects to extract 6000 to 9000 tons of Ilmenite per annum for the export market.

- Shell Beds

The coastal belt between Ambalangoda and Hambantota has recorded very rich shell beds. The geographical cover of the area extends for about 40 km in length and about two kilometer inland. Calcium Carbonate content of these deposits is said to be 95% and therefore suitable for the production of high quality lime. At present illicit mining takes place along the coast. Due to the sensitive nature of the locations on the coast, extraction needs very high environmental considerations.

- Gemstones and Gold Occurrences

A large number of gem fields are found in the Ratnapura and Monaragala districts. Buttala, Monaragala and Syambalanduwa in the Monaragala district, Embilipitiya and Kolonne in the Rathnapura district have recorded very rich deposits. In the Hambantota district, Mirijjawila, Chitragala, Kahandamodara, Lunugamwehera, Handugala, Galwewa, Getamana, Min-Etiliya and Hingura are prominent centres of deposites. In the Galle district, Yakkalamulla, Thawalama and Neluwa and in Matara Discrict Akuressa, Mulathiyana, Thihagoda, and Kotapola are centres of potentially high deposites. Hence it appears that gemstones deposits occur through out the region. Due to the high value and foreign exchange earning capabilities discouraging exports in raw form whilst encouraging gem based industries particularly jewellery is desirable for the region's development.



Southern Region Physical Plan

Figure: 5. 1

Industrial Zones & Industrial Estates

Source: Industrial Development Board

National Physical Planning Department

- Serpentinite

A 100 meter thick body of serpentinite with high Nickel (1000 ppm) and Chromium (7700 ppm) is located close to the beach of Ussangoda in Galle district. The size of the deposit suggests the possibility of commercial exploitation.

- Salt

Hambantota provides ideal environmental conditions for extraction of Salt. Possibility of producing 200,000 tons of salt annually has been estimated at Hambantota Maha Levaya and Palatupana. However the present production is only about 100,000 tons.

5.3 Constraints

Constraints for industrial development in the region are enumerated as below;

(i) Except for a few, mineral based industries have not developed to realize maximum economic benefits of the resources partly due to constraints associated with industries.

(ii) Although locations of most mineral deposits have been mapped investigations on quantification are not complete.

(iii) Development policies of the country have not been explicitly oriented towards value addition of mineral based activities particularly exporting finished products, by-products and up market products.

(iv) Poor infrastructure has been a major problem for industrial development in the region. Most of the Industrial Estates have failed to optimize their operation due to poor transport infrastructure, particularly fast tract accessibility to Colombo port. In the Koggala Export Processing Zone, only 21 factories are in operation whilst still 85 industrial plots are not occupied. The main associated problems are cost and travel time to Colombo port and the compensating incentives to attract investors.

(v) Heavy dependence on traditional type of industrial development either based on foreign direct investment (FDI) or quotas and vulnerability in the face of international competitive strategies (Incentives offered by other competing countries, status of quotas, political stability etc.). Tri Star Apparels Company closed down 10 factories and commenced gradual relocation in Africa.

5.4 Objectives

The objective of the industrial development plan is to optimize the potential to generate a large number of employment opportunities. Industrial sector (Manufacturing) in Sri Lanka generates only 17% of employment, compared to 23% in India and 36% in Malaysia. In the southern region the figure is halved. Extensive resources including agricultural products like rubber, fruits, fisheries & fish canning, non metallic minerals, salt production and the proposed Hambantota port development would create the base to realize the objective of rapid industrialization.

5.5 Strategy

Main focus of the industrial development strategy is to concentrate on services industries and heavy industries in the specified locations. The strategy has four areas of potentiality.

(i) Promotion of heavy industries such as oil refineries, power generation, petrochemicals, ship repairs etc. based on Hambantota sea port assisted by developing the appropriate infrastructure.

(ii) Promotion of Port related services industries such as, transshipment, supply of food, water and oil to ships (provisions and bunkering) etc developing the appropriate services infrastructure.

(iii) Promotion of food processing and food canning industries of small and medium scale in Monaragala, Hambantota and Rathnapura districts, linking large scale farm producers and small scale stakeholders.

(iv) Provision of common treatment facilities to the existing and the proposed polluting industries in existing Industrial Estates

(v) Establishment of large scale fish canning industry assuring regular supplies from deep sea fishing.

(vi) Provision of adequate infrastructure, for accessibility, marketability and high mobility.

Selection of desirable and high growth industrial activities in different districts of the region is illustrated as follows;

District	Specialty
Galle	Regional port, cement, minerals and cinnamon
Matara	Information Communication Technology, services and fishery
Hambantota	International sea port, heavy industries, food processing, minerals
Monaragala	Food processing, sugar and gems
Rathnapura	Food processing and gems

5.6 Projects

Projects proposed for the industrialization of the Southern region are as follows:

5.6.1 Galle District

(i) Convert Koggala EPZ to a mixed industrial zone to accommodate non-polluting / low polluting industries.
(ii) Major aggregate quarrying industry (in Ambalangoda, Dodanduwa and Habaraduwa.) to cater for large scale construction works (Galle port, Colombo port and beach protection) marine structures(groynes).
(iii) Extend land development for cement industry in Nugaduwa & Eramudugaha Marsh Area (--100 hectares)
(iv) Establish an ICT centre in Galle to capture the demand of the outsourced market.
(v) Infrastructure improvement of the existing small and medium scale Industrial Estates

5.6.2 Matara District

(i) Relocate all high polluting industries in the Charley Mount and Udukawa Industrial Estates with the provision of waste water treatment plants.
(ii) Establish an Information Communication Technology Park mainly for training and to capture a niche share of the out - sourced international market.
(iii) Establish a food canning factory

5.6.3 Hambantota District

(i) Establishment of an Industrial Estate to accommodate Oil Refineries Petro-Chemical Industries, Power Plants and other large scale industrial development activities.
(ii) Metal quarrying in Weerawila to cater to Hambantota port, air port, industrial estate and such large projects
(iii) Off shore sea sand harvesting project to ensure regular supplies to the construction industry
(iv) Mineral sand extraction eg: garnet
(v) Further expansion of the salt industry (Palatupana, Maha Levaye and Kunukalliya)
(vi) Expand Bata-atta Industrial Estate
(vii) Energy forestation in buffer zones of conservation areas
(viii) Plantation of managed forestry
(ix) Development of infrastructure facilities of the existing Beliatta Industrial Estate.

5.6.4 Monaragala District

(i) Development of Wellawaya (Kuda Oya) new international air port
(ii) Establishment of agro processing park at Buttala and organizing out growers to supply agricultural raw materials to the processing park
(iii) Industry to manufacture animal feeds from maize, other cereals and agricultural by-products such as sugarcane tops etc in Buttala
(iv) Systemize gem industry

5.6.5 Ratnapura District

(i) Establishment of one stop international gem shop in Ratnapura.
(ii) Develop a medium size industrial estate for food processing, canning and by -products of milk in Embilipitiya.

Chapter -06

Water Resources Mamagement Plan

CHAPTER SIX

WATER RESOURCES MANAGEMENT PLAN

6.1 Introduction

Southern Region consists of 35 river basins and thousands of small and medium size tanks. However due to unequal distribution of rainfall, perennial water bodies in the region, while South Western Part has excess water, South Eastern Part face severe water problems. Surface water availability of the region is estimated to be 10,993MCM per annum of which only 3180MCM or 34% is used at present for irrigation and other purposes while the balance flow to the ocean unused.

In the ancient period the region had an efficient water resources management system and that was the backbone of the rich agricultural civilization. The system was based on cascading small and medium size tanks that conserved water and replenished the ground water. During the ancient period Monaragala was known as "Wellassa" meaning 100,000 paddy fields. The whole system was completely destroyed by the British during "Wellassa Uprising"

27 % of developed water resources in the Southern Region are being used for agriculture as compared to 85% of Sri Lanka's. Since the River Basin is the natural unit of WRM, coordinated approaches to river basin planning & management will be the fundamental principle of water resources management. Under the 13th amendment to the constitution, inter-provincial rivers are on the national list. Administration of water resources in respect of all inter-provincial rivers will be the responsibility of the national agencies. The provincial & local governments will be involved in resources management issues in general.

Water Resources Development & Management in the Southern Region is operated solely by sub sectors such as Irrigation, Water Supply, Drainage & Hydro power. Irrigation sub sector has six principle agencies namely Irrigation Department, Mahaweli, Provincial Councils & Agrarian services coming under the Ministry of agriculture and so on. Drinking water agency is NWS&DB and Water Resources Board especially for ground water. Sub sector policies and strategies are established & evolved within the requirement of each sub sector.

The main problem facing the water surplus river basins is the safe disposal of surplus water during the heavy rainy periods than the conservation within the basin. Minimizing peak flows & floods are of special importance in reducing downstream floods. Hence the significance & importance of proper water shed management in the upper catchment areas is vital.

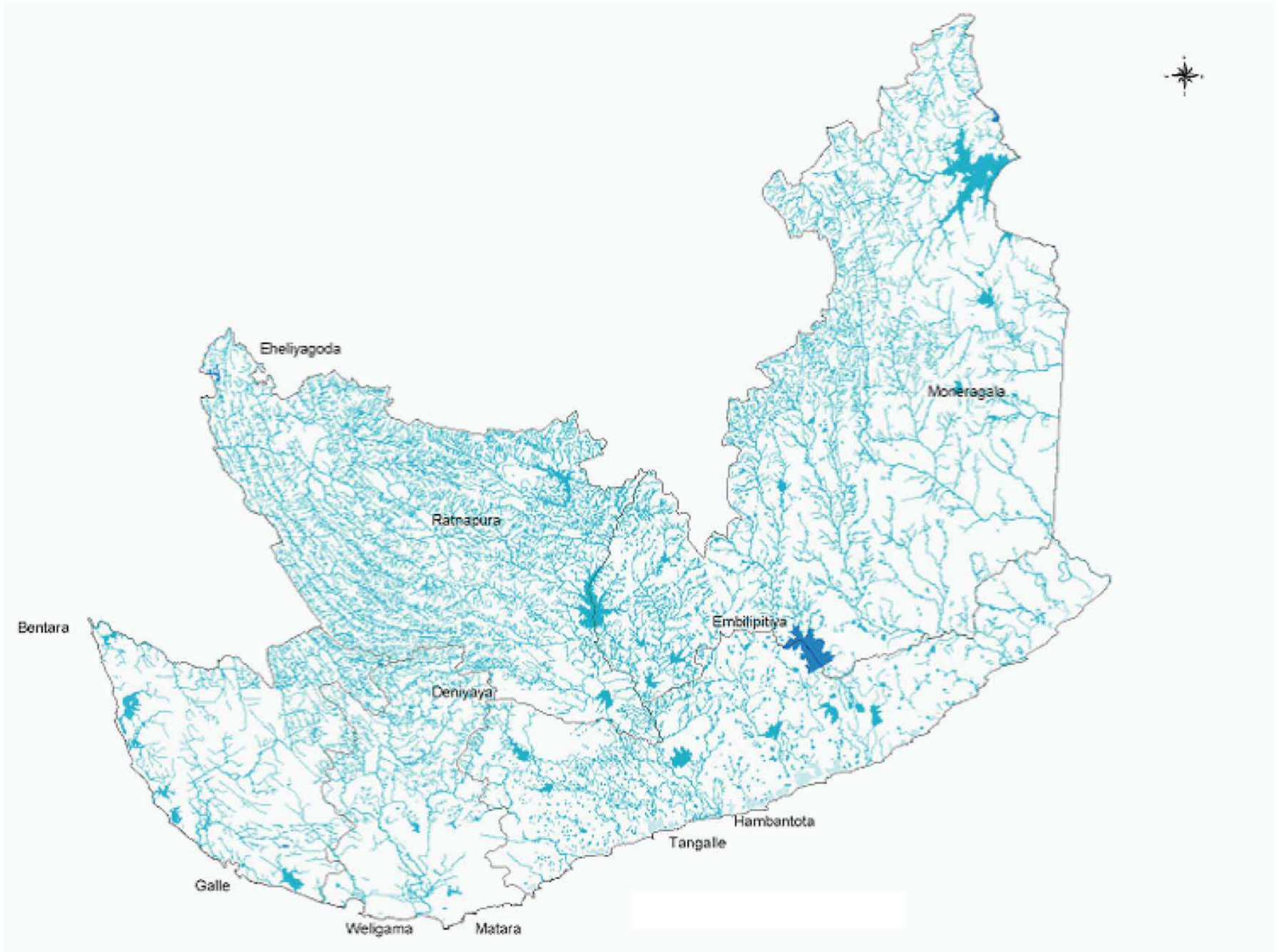
"National Water Resources Policy" expresses the government's commitment to Water Resources Management (WRM) through the National Water Resources Authority (NWRA). It will be the national apex body for water resources management and will be responsible for coordination, planning, regulation and monitoring of national water resources, and to mitigate the effects of past-uncoordinated water resources use. NWRA will work in partnership with agencies, which already have water resources management mandates.

6.2 Development Potentials

- Location of 35 River Basins in the region.
- All three Agro-Ecological Climatic zones within the region, Wet, Intermediate and Dry Zone
- Surplus water availability in wet zone river basins of Bentara Ganga, Gin Ganga, Nilwala Ganga & Kalu Ganga
- Availability of a large number of suitable reservoir & regulatory sites in the middle reaches of above river basins for storage single purpose or multipurpose use. Eg: Hydropower, floods and trans basin diversions
- Possibility of water transfers from surplus to deficit areas
- Number of suitable mini hydro sites in major streams & tributaries
- Large number of abandoned tanks await restoration for conservation of water
- Existence of a large number of silted tanks ,rehabilitation of which can increase storage, water harvesting & recharge

6.3 Constraints

- Lack of drainage facilities in the Western wet zone river basins prevent large extents from cultivation ; eg: rain fed paddy & SWE schemes
- Most of the minor irrigation schemes damaged by May '03 floods are not repaired



Southern Region Physical Plan

Figure: 6.1

Existing Water Resources – Southern Region

Source: Survey Dept

Rivers /Streams
Canals
Tank Working
Tank Abandoned
Reservoirs
Lewaya/ Lagoons
District Boundary

National Physical Planning Department

- Encroachments on reservations of major irrigation systems put pressure on water allocations
- Lack of storage tanks and poor water management lead to scarcity of water & loss of crop
- Inefficient water governance – sectoral approaches lead to fragmented and uncoordinated development & management
- Lack of sufficient water in Menik Ganga during festival season in Kataragama for pilgrims bathing & cultural activities
- Uncontrolled direct pumping from upper reaches
- No night irrigation is practiced
- Water quality monitoring in river basins is absent eg: sanitation, pesticides & factory effluents
- Salinity intrusions to water supply intakes during low flows in rivers
- Uncontrolled sand mining in rivers
- Environmental needs are not met /affected
- Floods & Droughts – highly seasonal variation in rainfall
- Gem mining in rivers & streams
- Development of in-basin infrastructure upstream major reservoirs in inter-provincial rivers Eg: banned in Kirindi Oya upstream Lunugamvehera reservoir by a cabinet decision
- Construction of barriers to arrest salinity intrusion and ensure minimum base flows in water supply intakes could have effects during floods
- Haphazard reclamation of wetlands
- Over extraction due to unplanned development of agro wells
- Bundala National Park lagoon, Embilikkala & Malala lagoons affected by drainage waters
- Encroachments into reservoir catchments & canal reservations
- Degrading forest cover in watersheds & upper catchments
- Sedimentation of reservoirs

6.4 Objectives

The objectives of the proposed Water Resources Management Plan for the SR 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.

Further objectives for water resources management are to:

- Securing water for people & for food production in the region including inland fishery
- Ensure equitable sharing of water resources for meeting current and future demands in the region
- Safeguard investments in water resources development and other sectors of economy through flood protection & hydro power generation etc.
- Improve standards in the maintenance of safe quality of water sources required for various water uses and resources using a comprehensive, river basin oriented approach.
- Protecting vital eco-systems
- Conserve and recognize scarce water resources and managing risks: floods & droughts.
- Ensure a healthy environment and sustainable use of both surface and ground water

6.5 Water Requirements of Existing and Proposed Developments

The plan encompasses physical planning for Southern Region with a view to translate the region in to a vibrant economy. For the purpose of estimating the water requirements of existing & proposed developments, the under-mentioned water uses have been considered.

- Irrigated Agriculture & Land resources
- Domestic water supply
- Industry
- Tourism
- Power & Energy

(i) Irrigated Agriculture

Water demand for existing and on going agricultural developments is estimated as indicated in the table 6.4, which has been summarized & shown below.

District	Water Demand for irrigated Agriculture (MCM)	
	Existing Projects	Proposed Projects
Galle	387.63	607.0
Matara	585.40	495.0
Hambantota	1781.20	2428.8
Monaragala	215.60	318.3
Rathnapura	111.60	130.0

Irrigated agriculture provides the greatest potential for further growth and intensification of crop production. Further development of irrigation will continue to play a critical role in maintaining food security and facilitating rural development. Investments in rice research & technology should be strengthened as rice will remain the back bone of irrigated agriculture and much of the rural economy for the foreseeable future.

Irrigation uses more than 28% of total water availability in Sri Lanka and the region use around 27% of its availability (excluding Rathnapura District). The following table illustrates the present status.

Item	Sri Lanka	Southern
Total area (Sq,KM)	65,525	14,498
Annual average Rainfall (mm)	1,836	1,766
Annual water availability(MCM)	43,000	10,993
Annual irrigation usage(MCM)	12,000	2,969
Irrigation usage / availability	28%	27%

In the Southern region water diverted for all sectors Viz. Agriculture, Domestic & industry is estimated as 3186 MCM when compared with the regions' annual water resources of 10,990 MCM which is about 34% of annual water resources.

As major irrigated agriculture with more than 130% cropping intensity is concentrated in the Ruhunu Basins, this sector uses more than 96.5 % average on all water diverted for usage. These values give only annual averages.

It is estimated that SL's efficiency percentages are below 30% & 40%. The normal project efficiency levels for gravity fed irrigation systems based on FAO criteria remain at 45%. These have been worked in relation to irrigation ditch or canal command area with cropped area. This is not applicable to SL as most of our settlement schemes with small holders, mostly depending on main canals for community life for multiple uses in bathing, livestock and even drinking water etc. Therefore loading these community withdrawals to the crop is unrealistic.

A design worked out on the above basis in Uda Walawe where lining was expected to bring increase 1000 Ha of new land under irrigation had to be withdrawn as permanent crops in community living areas suffered damage and wells running dry.

Water productivity can be improved by improving existing facilities to capture more water and improving farming practices to achieve higher crop yields. Water conservation techniques and activities are not in place in Walawe Basin. Non beneficial uses of water can be reduced. Excessive irrigation drainage outflow could be reduced through recycling.

In major systems, structures are designed for continuous flow and mostly for rotational irrigation. As night irrigation is not practiced, over 40 % of water returns to the drainage canals or river. Downstream developments of new areas take this in to consideration to use drainage water. Therefore from a project perspective the efficiency would appear low (30 % to 35%), but on a basin level efficiency would be very much more. Kirindi Oya basin is an example in the region as the flow to the sea has been negligible during some periods indicating high basin efficiency.

Primary means of food production in most countries is through rain fed irrigation. In the SR, the contribution from rain fed paddy in the wet zone is fairly low. Improving the productivity of rain fed agriculture has to be given an impetus.

A more significant characteristic of the regions rainfall, which has important implications for the management and conservation of water resources is its very high inter-annual& inter-seasonal variation when wet and dry zones are compared. Thus in the dry zone the main precaution should be for conservation and hence the need for a large network of surface storage tanks.

Hambantota District in the South East dry zone is fortunately blessed with 12 river basins starting from Kirama Oya (RB 14) on the West & Manik Ganga (RB26) on the East. Kirama & Urubokka Oya are water short and comparatively smaller basins. Kachchigal Ara which had been a non perennial river and water short basin receives drainage water from Walawe basin and more than 6,000 Ha of paddy lands are fed by Uda Walawe & Liyangastota anicut at present. Cropping intensity of the lands are 200% and do not have any water shortage now. Hathgala anicut across Kachchigal Ara is not in operation at present due to water logged condition. Though in the past Kachchigal Ara had been a dry Ara, with the new paddy areas, now it has become a perennial river which has lot of water.

Malala Oya is a closed river and two major/medium schemes Badagiriya tank & Mahagal Wewa and Ranmudu wewa, Maha Aluthgam Wewa, Pallemattala Wewa & Pahala Andara Wewa was suffering from water shortage. Only 228 Ha were cultivated during Maha season out of 556 Ha under the above schemes. In order to overcome this situation Mau Ara diversion project was implemented by ID during 2001/2002. In addition to the above lands another 400Ha of new lands in Malala Oya are planned to be cultivated with paddy and OFC during Maha & Yala respectively.

In case of Manik Ganga & Kumbukkan Oya there is a constraint in harnessing their waters due to the sources being located within the national parks. The water resources of the Walawe, Malala Oya, Kirindi Oya and Manik Ganga (after proposed developments) are just sufficient to cultivate the existing lands under the existing cropping patterns. The Wila Oya, Heda Oya and Karande Oya basins are not much developed but it is noted that the yields in these basins are small.

(ii) Land Resources

According to the Land Use map, the developable lands around Hambantota are about 80,000Ha (chena – 29,314 Ha & scrub 49,059Ha); Moneragala has more than 200, 000 ha of such lands ((chena 78,035 and scrub 123, 152Ha). Part of the said lands in Hambantota have already been developed for agriculture under Uda Walawe Extension area under new settlements & for other social needs in the recent past. Same could be stated with Moneragala also but not to that extent.

Consequently integrated water resources management should also incorporate management of land use. How to share the rain, rather than the water availability is the crucial long term issue in managing water in the river basins.

Low intensity data on soils and land maps are necessary for land use planning for all parts of the project. More detailed surveys will have to be done to produce maps on a scale of 1: 10,000 to assist in the task of project design. Future irrigation demands would be estimated based on the currently planned projects giving priority to provide for the irrigation requirements for the full potential in basin lowland primary agricultural upland development.

Investment & policy reforms in water & irrigation management will be significant determinants of future food production, demand, price and trade.

(iii) Domestic Water supply

For the purpose of estimation the per capita consumption of the population served by the sources has been assumed as 150 liters /day in the urban areas and 90 liters per day in the rural areas.

Cities actually consumes very little of the water. In a municipal area, a person uses less than 150 liters of water per day, compared this to the 2000 to 5000 liters of water required to produce enough food to feed one person per day

Augmentation of supply in to the city areas presumes that new sources located at greater distances have to be tapped. Consequence of pollution, which affects quality & usability as water passes through the city have to be taken into account and timely, addressed. Attention has to be paid to environment sustainability as well; primarily to the downstream communities and lagoons activities which could be threatened.

It is seen that the projected demands are very small compared to the demands of irrigated agriculture & Industry. The significant factor in respect of domestic water demands is the quality requirements. The earlier concept of installing the water supply intakes at the lower most downstream reaches in rivers & streams have failed to find solutions for regular supply with high demands in the urban expansion. Water shortages normally occur during periods of prolonged drought and become acute with salinity intrusion in the coastal rivers. The shifting of intake points further upstream practiced by the authorities is also facing the same challenges after a period of time.

Salinity barriers are proposed to be constructed downstream of the intake points by the NWS&DB to prevent salinity intrusion. These barriers would be obstructions to the flood flows especially in Gin Ganga and Nilwala Ganga if not properly planned and maintained as flood mitigation bunds already in place are not designed to cater for higher water levels. It is more appropriate to build reservoirs in the middle reaches entirely for drinking water supply. Digili reservoir in Nilwala ganga and Mediripitiya reservoir in Gin Ganga are examples

(iv) Industrial water

In estimation of the projected industries, the following have been given due consideration. Galle Port Development, Hambantota Port Development, and requirements of the industrial parks proposed for the future by the BOI. The most important aspect of industrial water use is, pollution from effluents which could degrade the quality of water so as to make it unsuitable for other uses.

Water demands for the Hambantota Port development studies carried out under a special study during 2003 has estimated that a total of 105MCM would be required and that quantity could be met from Walawe Ganga . For details of above water demands projected for the 2015 & 2025 see Table 5.

(v) Hydro Power

FR Germany under a technical assistance programme conducting a master plan study for the Ceylon Electricity Board in 1989 recommended that the untapped economical hydropower potential amounts to 3200 KWH annually, about 130 % more than the present electric needs of the country. These included the following in the region.

Code	River Basin	Annual Energy (GWH) % Guaranteed		Project Cost US$ Mn	Generating Cost (US$ / kwh)
Ging O74	Gin	152		52	1.1 / 6.4
	Walawe	61		29	5.2 / 5.7
Beli 015	Kalu	73		253	2.2 / 8.3
	Kalu			90	10.1/ 11.2
Kuku 022					
Kalu 075					

Source: GTZ Master Plan study -1989

The hydropower projects developed so far in the region are as follows

River Basin	Project	Storage Capacity MCM	Installed Capacity MW	Firm Energy GWH
Kalu Ganga	Kukule Run Of River	1.63	2/40	317
Walawe Ganga	Uda Walawe reservoir	268.76	5.4	
	Samanala Wewa	278.0	2/ 60	430

The hydropower projects envisaged with the new developments is the Uma Oya Diversion Project and mini hydro projects. Locations for mini hydro power projects have been identified in Kalu, Gin, Nilwala, Walawe, Kirindi and Kumbukkan Oya Basins.

Hydro power provides unique benefits, rarely found in other sources of energy. The energy of the water cycle, which is driven by the sun, is tapped most efficiently with hydro power. Their benefits can be attributed to the electricity itself or to the side benefits, often associated with the reservoir development. The net benefits of hydropower are far superior to fossil based generation. Carefully planned hydropower development can also make a vast contribution to improving living standards especially to the rural poor through reduced operating costs and access to water.

(vi) ENVIRONMENTAL FLOW REQUIREMENTS

The protection of eco-systems should be a premise of water management, as eco-systems are the source of water & life. For ecosystems to continue producing their goods & services, a minimum amount of water must be left for the eco-systems to function. Using all the water there, destroys eco-systems and the communities that depend on them.

With the available information it is not possible to make realistic estimates of the required minimum flows. In most of the rivers the dry weather discharges are insufficient to prevent the formation of sand bars at the mouth. In some of the lagoons and estuaries the ecological conditions have undergone changes mainly due to agricultural activities. Such changes include:

a). Increased discharge in Kachchigal Ara due to drainage flows from lands irrigated under Uda Walawe right bank canal has decreased salinity levels in Kalamatiya and Lunama Lagoons to such an extent as to interfere seriously with prawn fisheries in the lagoons.

b). Drainage inflows from lands irrigated under Lunugamvehera reservoir right bank canal system have adversely affected the conditions in the Bundala lagoons.

c). Construction of salt water exclusion structures too close to river mouths (in the rivers of the southwestern part of the study area) have interfered with fishery development. eg: Madampe Lake

In the absence of specific basin wise data to estimate the requirements to maintain ecological balance, this requirement is taken as 10% of the average annual runoff. In the case of the rivers in the study area, most of the basins are exploited and in order to estimate the required minimum flows, a hypothetical average annual discharge based on runoff coefficients for the largely unexploited catchments were used giving consideration to the nature of catchment and average annual rainfall.. The results are presented in Table: 6.1

6.6 Estimation of Water availability.

The method of estimating water availability is primarily based on conditions of river basin with regard to the degree of human interventions, such as structural changes and land use. In addition, the availability of hydro-meteorological observations also influences the methodology.

The Southwestern sector of the area is subject to the southwest monsoon and the impact is felt from Kalu ganga to Nilwala ganga and could be called as southwest monsoonal basins. Mean annual rainfall in this zone is over 2000mm varying upto 3600 mm. For smaller basins after Nilwala Ganga, Seenimodera Oya to Urubokka Oya lying in the intermediate zone average annual rainfall varies from 1500 to 2000mm. Walawe Ganga has its source in the central hills and flows in a southerly direction, receives rain from both monsoons and have perennial flow conditions. River basins beyond Walawe Ganga are influenced by the North-East monsoon and receive rainfall between 1000-1800mm annually, which are called as South-Eastern dry zone basins.

By considering scope of the study, a different approach was adopted to estimate the water availability. Appropriate runoff rainfall ratios estimated for river basins were used to convert the total water available from average annual rainfall to direct runoff. Rainfall and run off factors have been prepared using the yield curves for smaller basins, but for larger basins computed values of some selected basins available have been used. The values computed using the above methodology as given in Table6.2 shows the general characteristics of the river basins. This method provides information for comparison with the estimated flow to the sea based on actual measurements as shown in Table6.3. This table provides information on surplus water river basins and how much is available for future planning.

Surface water availability had been assessed using the river gauging flows at the available stations and comparing with the representative rainfall for the catchment area of the respective gauging site is used in estimating the runoff at river mouths in the same river basin. For some river basins, there are river gauging stations within, but for many river basins such stations do not exist. River basins from Kirama Oya to Kumubukkan Oya were considered as exploited due to major river diversions and storages across these rivers. Therefore traditional gauging stations do not provide the required information for water resources assessment as natural conditions of the catchments are disturbed. Reservoir replenishment data and other indirect methods have been adopted to estimate the availability in the above river basins. For river basins with no river gauging records, extrapolation of results from the nearby and representative basin was analyzed in comparison with the average rainfall of respective catchments and basin areas. The surface water availability for the river basins computed is shown in Table 6.3.

Table:6.1
Minimum River Flows To Maintain Ecological Balance

NO	RIVER BASIN NAME	CATCHMENT AREA	RAINFALL	RAINFALL	RUN OFF	HYPOTHETICAL- RUNOFF	REQUIRED RUNOFF
		SQ.KM	MM	MCM	MCM	MCM	MCM
3	Kalu Ganga	1394	3796	5291	3862	3968	396
4	Bentara Ganga	629	3796	2388	1565	1600	160
5	Madu ganga	60	3568	214	140	143	14
6	Madampe Ganga	91	3568	325	213	218	22
7	Telawatte Ganga	52	3322	173	113	116	12
8	Ratgama Lake	10	3066	31	20	21	2
9	Gin Ganga	932	3676	3426	2438	2438	244
10	Koggala Lake	65	3000	195	128	128	13
11	Polwatte ganga	236	3000	708	464	464	46
12	Nilwala Ganga	971	2077	2017	715	1109	111
13	Seenimodera Oya	39	2543	99	35	50	5
14	Kirama Oya	225	2543	572	43	286	29
15	Rekawa Oya	76	1710	130	16	52	5
16	Urubokka Oya	352	2070	729	36	364	36
17	Kachchigala Ara	223	1053	235	18	94	9
18	Walawe Ganga	2471	1818	4492	533	1123	112
19	Karagan Oya	59	1106	65	33	33	3
20	Malala Oya	404	1071	433	26	151	15
21	Embilikkala Oya	60	868	58	15	17	2
22	Kirindi Oya	1178	1398	1647	106	494	49
23	Bmabawe Oya	80	1100	88	22	26	3
24	Mahasilawa Oya	13	878	13	2	4	0
25	Butawa Oya	39	1100	43	7	13	1
26	Menik ganga	1287	1429	1647	298	552	55
27	Katupila ara	87	1100	96	15	29	3
28	Kurunda Ara	132	1100	145	23	44	4
29	Nambadagas Ara	109	1100	120	70	70	7
30	Karambe Ara	47	1100	52	30	30	3
31	Kumubukkan Oya	1233	1507	1858	619	650	65
32	Bagaru Oya	93	1420	132	78	78	8
33	Girikula Oya	16	1420	23	13	13	1
34	Helawe ara	52	1420	74	43	43	4
35	Wila Oya	490	1482	728	229	254	25
36	Heda Oya	611	1551	948	298	332	33
37	Karandan Oya	427	1539	642	207	225	22

Table 6.2
Characteristics of River Basins in Southern Region

No.	Name of river Basin	Catchment	Rainfall	Volume of Precipitation	Run Off Factor	Basin Runoff
		Sq.Km	MM	MCM	%	MCM
3	Kalu Ganga	2766	3796	10,500	73	7665
4	Bentara ganga	629	3,796	2,387	58	1384
5	Madu ganga	60	3,568	214	59	126
6	Madampe Lake	91	3,568	324	39	126
7	Telwatte Ganga	52	3,322	173	54	94
8	Ratgama Lake	10	3,066	28	55	17
9	Gin Ganga	932	3,676	3,426	71	2433
10	Koggala Lake	65	3,000	195	40	78
11	Polwatte ganga	236	3,000	708	45	319
12	Nilwala Ganga	971	2,077	2,016	48	968
13	Seenimodera Ganga	39	2,543	99	29	29
14	KiramaOya	225	2,543	572	29.5	169
15	Rekawa Oya	76	1,710	130	19	25
16	Urubokka Oya	352	2,070	728	32	233
17	Kachchigala Ara	223	1,053	235	21.5	50
18	Walawe Ganga	2471	1,818	4,492	48	2156
19	Karagan Oya	59	1,106	65	12	8
20	Malala Oya	404	1,071	433	16	69
21	Embilikkala Oya	60	968	58	12	7
22	Kirindi Oya	1178	1,398	1,646	24	395
23	Bambawe Aru	80	1,100	88	14	12
24	Mahasiliwa Oya	13	978	13	13	2
25	Butawe Oya	39	1,100	43	13	6
26	Manik Ganga	1287	1,429	1839	20	368
27	Katupila Ara	87	1,100	96	15	14
28	Kurunda Ara	132	1,100	145	21	30
29	Nambagas Ara	109	1,100	120	15	18
30	Karamabe ara	47	1,100	52	15	8
31	Kumbukkan Oya	1233	1,507	1,858	22	409
32	Bagura Oya	93	1,420	132	15	20
32	Girikula Oya	16	1,420	23	15	4
34	Helawa Ara	52	1,420	74	23	17
35	Wila Oya	490	1,482	726	25	182
36	Heda Oya	611	1,551	948	37	350
37	Karanda Oya	427	1,539	657	26	171

* Runoff factors from Annual yields - 1974-ID

Table : 6.3
Surface Wteravailability - Southern Area

RIV-ER NO	BASIN NAME	CATCH AREA	RAIN FALL	Observed Stream Flow at Strategic Points MCm					Estimated Flow Volume to the Sea -MCm				No. of Gaug-ing Stations	Basis of Estimation
		Sq.Km	Mm	Location	Cat Area	NE	SW	Ann. Total	NE	SW	Estimated	National Atlas		
3	Kalu Ganga	2766	3796	Ellagawa	1393			3768			2704		6	
4	Bentara Ganga	629	3796						730	835	1565	1538		Gin Ganga
5	Madu ganga	60	3568						65	75	140	149		Bentara Ganga
6	Madampe Ganga	91	3568						99	114	213	171		Gin Ganga
7	Telawatte Ganga	52	3322						53	60	113	98		Gin Ganga
8	Ratgama Lake	10	3066						9	11	20	20		Gin Ganga
9	Gin Ganga	932	3676	Agaliya	681.17	879	1007	1886	1137	1301	2438	1903	3	Gin Ganga
				Tawalama	376.85	533	610	1143						
10	Koggala Lake	65	3000								128			
11	Polwatte ganga	236	3000						216	248	464			
12	Nilwala Ganga	971	2077	Pitabeddera	332.82	210	240	450	333	382	715	1104	5	Nilwala
13	Seenimodera Oya	39	2543						16	19	35	20		Nilwala
14	Kirama Oya	225	2543	Kirama	15.02	5	6	11	20	23	43	120	nill	Kirama Tank
15	Rekawa Oya	76	1710						7	9	16	40	nill	Kirama Tank
16	Urubokka Oya	352	2070	Muruthawala	109	40	26	66	22	14	36	198	1	Muruthawela
17	Kachchigala Ara	223	1053						11	7	18	56	nill	Urubokka
18	Walawe Ganga	2471	1818	Uda Walawe	1152	454	189	743	325	208	533	2166		Udawalawe
19	Karagan Oya	59	1106						20	13	33	15	nill	Udawalawe
20	Malala Oya	404	1071	Badagiriya	350.95	15	9	24	16	10	26	74	nill	Badagiriya Tank
21	Embilikkala Oya	60	969						9	6	15	15	nill	kirindi Oya
22	Kirindi Oya	1178	1398	Lunugamvehera	902.14	211	135	346	65	41	106	476	5	kirindi Oya
23	Bambawe Oya	80	1100						13	9	22	28	nill	kirindi Oya
24	Mahasilawa Oya	13	978						1.5	0.5	2	5	nill	Menik Ganga
25	Butawa Oya	39	1100						5	2	7	15	nill	Menik Ganga
26	Menik ganga	1287	1429	Kataragama	787.36	165	47	212	232	66	298	486	1	Menik Ganga
27	Katupila ara	87	1100						12	3	15	33	nill	Menik Ganga
28	Kurunda Ara	132	1100						18	5	23	50	nill	Menik Ganga
29	Nambadagas Ara	109	1100						55	15	70	41	nill	Kumbukkan Oya
30	Karmabe Ara	47	1100						20	10	30	17	nill	Kumbukkan Oya
31	Kumubukkan Oya	1233	1507	Maligawila	374	59	125	184	420	199	619	774	3	Kumbukkan Oya
32	Bagaru Oya	93	1420						53	25	78	39	nill	Kumbukkan Oya
33	Girikula Oya	16	1420						9	4	13	6	nill	Kumbukkan Oya
34	Helawe Ara	52	1420						29	14	43	28	nill	Kumbukkan Oya
35	Wila Oya	490	1482						155	74	229	215		Heda Oya
36	Heda Oya	611	1551	Siyam B'duwa	292	100	47	147	202	96	298	394		Heda Oya
37	Karandan Oya	427	1539						140	67	207	196		Heda Oya

Table : 6.4 WATER BALANCE IN THE SOUTHERN AREA 2004Present Situation

RIVER BASIN		CATCH AREA	RAIN FALL	RUN OFF	RUN OFF	TOTAL STORAGE	Irrigation Water Demand	Domestic Water Demand	Industrial Demand (ruhunupura)	Total Water Demand
NO	NAME	SQ.KM	MM	FACTOR	MCM	MCM	MCM	MCM	MCM	MCM
3	Kalu Ganga	2766	3796	0.75	7875		77	34.6		111.6
	Total	**1394**			**3762**		**77**	**34.6**		**111.6**
4	Bentara Ganga	629	3796	0.75	1790		46	7.43		53.43
5	Madu ganga	60	3568	0.75	160		76	7.5		83.5
6	Madampe Ganga	91	3568	0.75	243		4			4
7	Telawatte Ganga	52	3322	0.75	129		17			17
8	Ratgama Lake	10	3066	0.75	23		1			1
9	Gin Ganga	932	3676	0.75	2569		171	38.9		209.9
10	Koggala Lake	65	3000	0.75	146		15	3.8		18.8
	Total	**1839**			**5060**		**330**	**57.63**		**387.63**
11	Polwatte ganga	236	3000	0.75	531		176	4.5		180.5
12	Nilwala Ganga	971	2077	0.75	1512		345	21.7		366.7
13	Seenimodera Oya	39	2543	0.2	20-		12			12
	Total	**1246**			**2043**		**533**	**52.4**		**585.4**
14	Kirama Oya	225	2543	0.2	114	1	74	3.5		77.5
15	Rekawa Oya	76	1710	0.2	26		4			4
16	Urubokka Oya	352	2070	0.2	146	50	105	2.5		107.5
17	Kachchigala Ara	223	1053	0.2	47		160	3.1		163.1
18	Walawe Ganga	2471	1818	0.25	1123	620	1018	28.1	5	1051.1
19	Karagan Oya	59	1106	0.2	13		2			2
20	Malala Oya	404	1071	0.2	86		41	1		42
21	Embilikkala Oya	60	969	0.2	12		2	1		3
22	Kirindi Oya	1178	1398	0.2	329	255	424	7		331
	Total	**5048**			**1896**		**1730**	**46.2**	**5**	**1781.2**
23	Bambawe Oya	80	1100	0.2	18		2			2
24	Mahasilawa Oya	13	978	0.2	3		0			0
25	Butawa Oya	39	1100	0.2	9		0			0
26	Menik ganga	1287	1429	0.2	368		58	6		64
27	Katupila ara	87	1100	0.2	19		2	1		3
28	Kurunda Ara	132	1100	0.2	29		3			3
29	Nambadagas Ara	109	1100	0.2	24		3			3
30	Karambe Ara	47	1100	0.3	15		0			0
31	Kumubukkan Oya	1233	1507	0.3	557		49	5		54
32	Bagaru Oya	93	1420	0.3	39		4			4
33	Girikula Oya	16	1420	0.3	7		2			2
34	Helawe Ara	52	1420	0.3	22		3			3
35	Wila Oya	490	1482	0.4	218		16	2		18
36	Heda Oya	611	1551	0.4	379	32	31	2		33
37	Karandan Oya	427	1539	0.4	263		26	0.6		26.6
	Total	**4716**			**1970**		**199**	**16.6**		**215.6**

6.7 Water Balance

The water balance for the current situation in 2004 is given in Table 6.4. There is a large surplus in the wet zone particularly from the Bentara Ganga to Nilwala Ganga. The basins therefore present an obvious source of water for storage for in basin or multipurpose development and diversion to the dry zone.

The Walawe Ganga although at present shows a surplus with in basin development reaching its potential, there are local areas of water shortages within the basin in the middle reaches. It should also be noted that there are useful surpluses along the eastern side of the region from Menik Ganga towards Heda Oya and Karanda Oya, indicating there is potential for further in basin development within these basins.

One of the main findings to emerge from the water balance is the severe water shortage that is currently being experienced in the Kirindi Oya and Malala Oya basins. The water shortage in the above basins has been known for some time. This clearly demonstrates that this water shortage is a major issue, if not the key water issue be addressed in the Southern Region.

The Lunugamvehera reservoir on the Kirindi Oya suffers from severe water shortage problems brought about by higher than anticipated irrigation water demands together with lower than anticipated reservoir inflows. This water shortage has a serious impact on the rest of Kirindi Oya basin by preventing any further irrigation development both upstream and downstream of the reservoir. The problem can be partly alleviated by improved water management and by encouraging farmers to switch from growing rice, which has a higher water demand, to growing other field crops which have a much lower water demand. However, even if water management practices are improved a water short situation will still remain.

Also water shortages are being experienced in the Urubokka and the Kirama basins which have been caused, in part, by uncontrolled irrigation expansion. Thus additional water resources are required in these basins to overcome the water short situation there.

6.8 Water Resources Development Strategy

In water resources management scarcity situations the broad strategies that are commonly adopted are;

- Attack the problem from outside the water sector. (Example through crop breeding for more rapid yield growth).
- Increase the supply of water for food production through investments in irrigation projects such as building new dams and tanks upgrading and restoration of tanks.
- Conserve water & improve the efficiency of water use through water management and policy reforms.

The strategy for the future water development strategy in the Southern region has to address and focus on the following issues.

- Alleviating poverty through ensuring reliable and safe access to water – Rehabilitation of minor & medium reservoirs and restoration of abandoned tanks in Hambantota & Monaragala Districts.
- Food Security- Improving performance of poorly managed irrigated agricultural system by providing reliable irrigation to farmers and improving water productivity by ensuring access to water for income generation. Example, Granary Area Program (for existing projects identified see- -------- 2004 to 2010)
- Improving the productivity of wet zone rain fed irrigation (paddy, vegetables & cereals) and sugar cane and cereals in Monaragala District.

With increased competition for water, improving the productivity of water in agriculture is the key to solving the problem. Water productivity is expressed by means of water use efficiency (WUE). In order to have a high WUE, it is important to save water while the yield is maintained at higher level. Getting more crops per drop enhances food security and makes more water available for nature & other sectors. It enables also to reduce investments in new water storage and irrigation infrastructure. The present WUE, is expressed in terms of kilograms of rice produced per cubic meter of water used, is extremely low when compared to other crops. So promotion of OFC cultivation in water scarce yala season is one option especially on RBE soils. Reuse of ground water lost in seepage & percolation can effectively increase surface WUE. (Shallow well irrigation)

6.9 Proposed Projects for Implementation

The Ministry of Irrigation & Water Management's through the planning division of the Irrigation Department in the Master Plan has selected the following Major irrigation projects for detail investigations to utilize the available water resources in the Southern region. The projects identified in the wet zone will have multiple benefits such as flood control, drainage, hydro-power, irrigation & water supply etc. The other projects identified will have the benefit of mostly augmenting water supply to the existing irrigation infrastructure and also to provide much needed drinking water to the rural community. Following Projects Fig. 6.5 have been identified in the Southern Region.

(i) Menik Ganga Basin development
(ii) Uma Oya Diversion to Kirindi Oya
(iii) Flood Protection to Rathnapura Town- Kalu ganga
(iv) Digili Oya & Urawa Reservoir- Nilwala ganga
(v) Muthukandiya Project & Heda Oya reservoir
(vi) Kumbukkan Oya Basin Development
(vii) 6 new storage tanks for water supply to Hambantota Port & Industry
(viii) Gin Ganga & Nilwala Diversion to Hambantota district
(ix) Kalu Ganga Basin Development & Diversion to Hambantota District

(i) Menik Ganga Basin Development

Major Irrigation schemes are not available within the Menik Ganga Basin. However there are six existing anicut schemes and five tank schemes under medium irrigation systems within the basin managed by the ID. The total irrigable area under medium irrigation schemes is about 1650 Ha and under minor irrigation systems is 1043 Ha. Most of the minor irrigation tanks do not have perennial water sources.

The Menik ganga basin is one of the least developed river basins in Sri Lanka and more than 50% of the land is undeveloped. Especially in the lower basin of Menik Ganga lands are undeveloped due to the existence of Ruhuna National Park and Yala National parks. There is no major storage reservoir across the main river. Under the Buttala anicut scheme, north of the Yala national park 640 Ha are presently being cultivated with paddy. Rainfed sugar plantation has been developed at Pelawatte in the upper region of the basin just above the rainfall isohyets of 1500mm. The sugar plantation has a net area of about 8,500Ha.There fore the development already taken place are limited to the upper basin, upstream of Kataragama town.

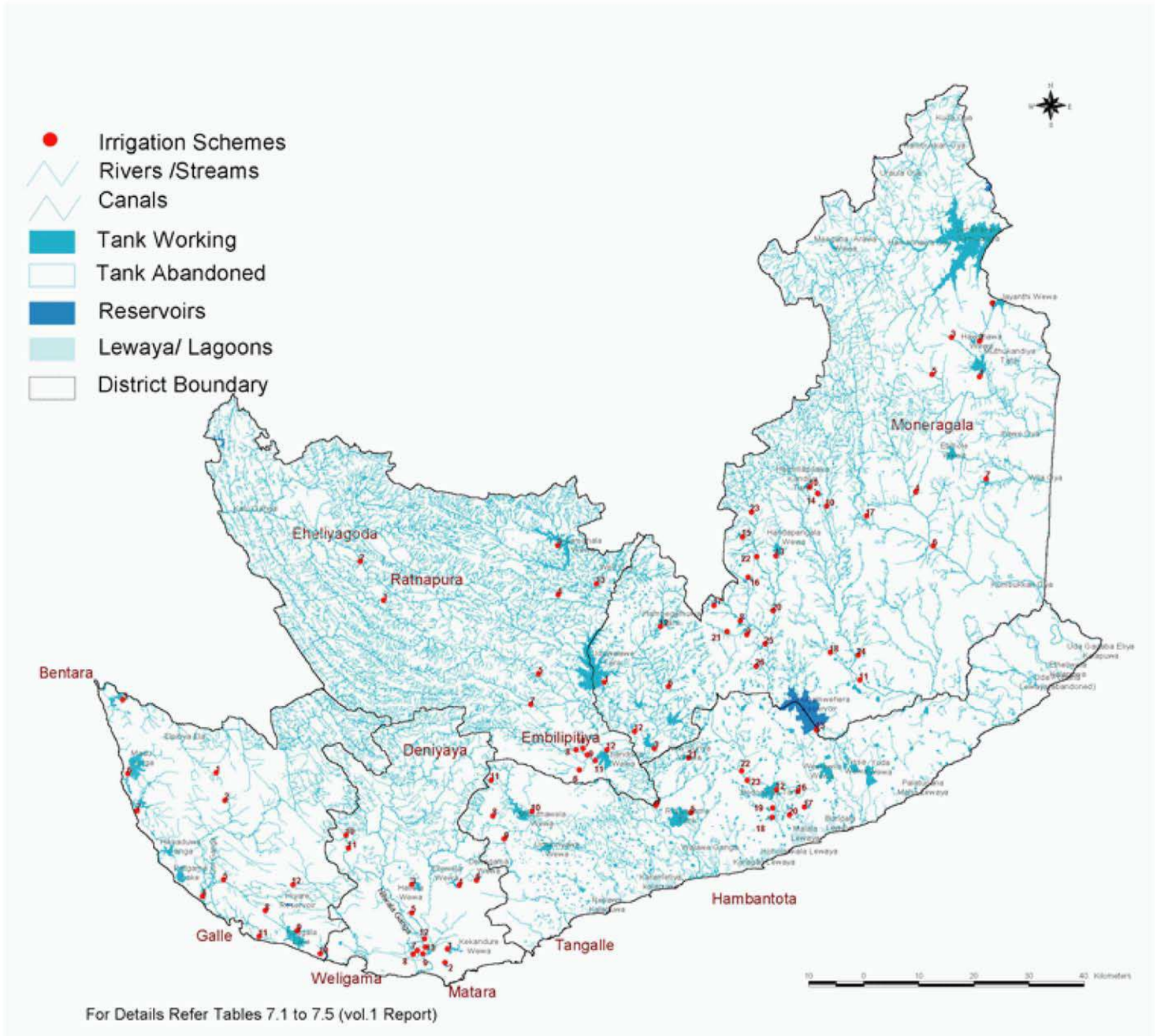
The present water supply demands of Buttala, Kataragama and Badalkumbura are 5,222 m3 /day and annual demand is 2MCM. More than 25,000 people are provided with domestic water from Menik Ganga at the above three locations.

Mean annual runoff is 368MCM.Projected Demand by 2025 will be 70 MCM for irrigation, 16MCm for drinking water, industrial & other demands. However this annual average water surplus hides the fact that in the months of June, July and August basin runoff averages 4.6MCM while total demand by 2025 is projected to equal 10.3MCM, leaving a monthly deficit of 5.7MCM. Action is clearly needed to address this significant deficit forecast. The proposal for development of a multipurpose dam in the basin needs further to be considered in the context of a basin water management plan.

Lunugamvehera reservoir in Kirindi Oya basin is short of about 100MCM annually to meet the present demands in right bank tracts 3 & 4, Left bank tract 3part &4 about 2900 Ha. It is proposed to extend the Muthukeliyawa LB canal upstream of Buttala anicut to provide irrigation facilities for 210 Ha under minor tanks which are located downstream of Kongaha Wewa.

A number of current water management issues and competing demands for water have been identified in the Menik Ganga basin.

- Expansion of irrigation schemes in the mid basin. Eg: Buttala anicut scheme has increased by 25% in an unplanned manner Cropping intensity has dropped. Competition with other irrigation areas has resulted in the complete closure of diversions at Buttala during August.
- Uncontrolled expansion of private, low-lift pumping is occurring in the mid basin for banana & sugar cane.
- Safe water supply is available to only 46% of basin's 300,000 residents.
- The town of Kataragama is a major religious and cultural center, attracting large numbers of visitors during the August festival season and at other times. August is also low flow period in Menik Ganga and water has not been available for Kataragama.
- Yala National Park, one of country's premier wild life areas and tourist attractions, is suffering from reduced dry season flows.

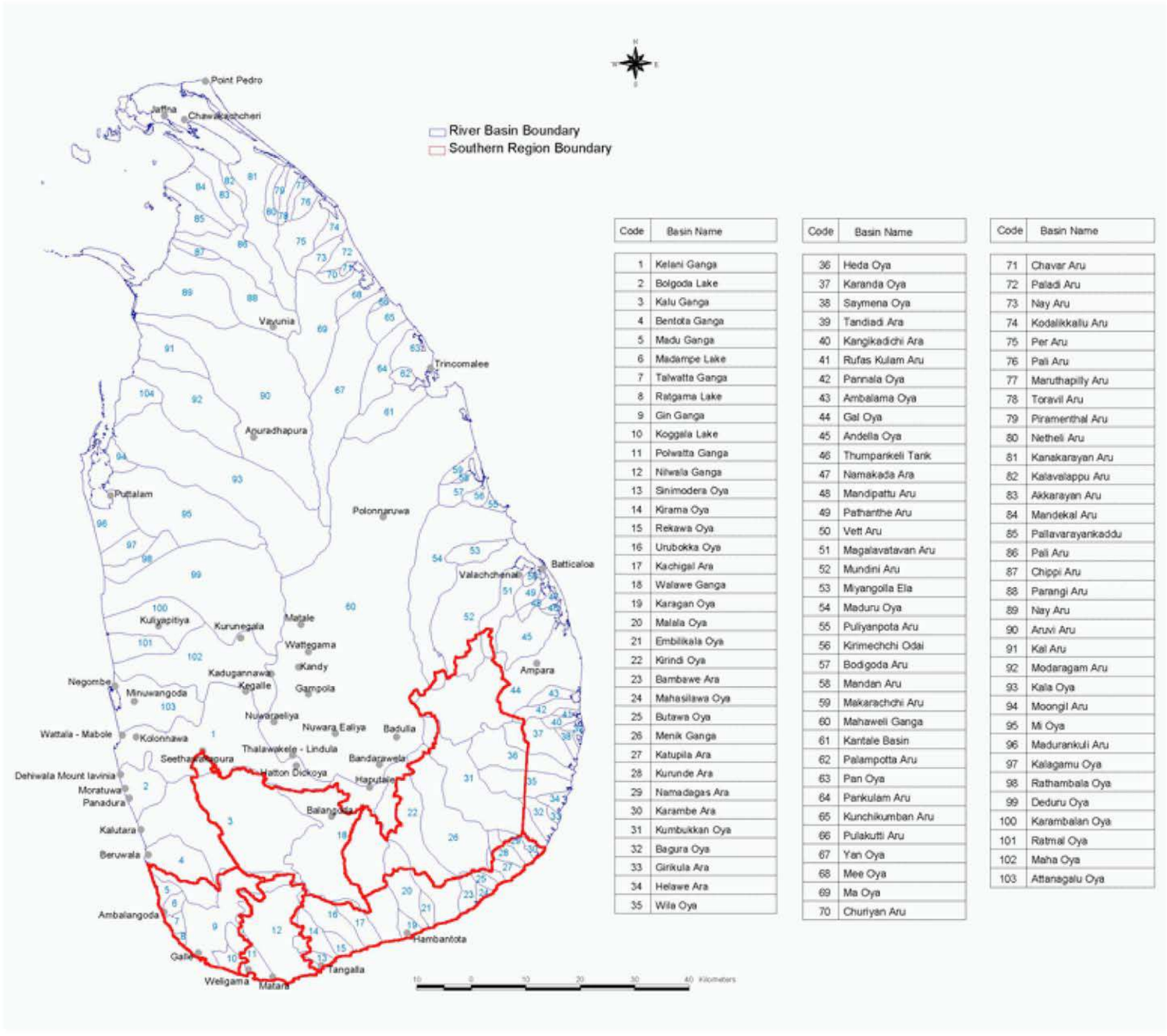


Southern Region Physical Plan

Figure: 6.2

Source: SWP_SRPP

National Physical Planning Department



Code	Basin Name
1	Kelani Ganga
2	Bolgoda Lake
3	Kalu Ganga
4	Bentota Ganga
5	Madu Ganga
6	Madampe Lake
7	Talwatta Ganga
8	Ratgama Lake
9	Gin Ganga
10	Koggala Lake
11	Polwatta Ganga
12	Nilwala Ganga
13	Sinimodera Oya
14	Kirama Oya
15	Rekawa Oya
16	Urubokka Oya
17	Kachigal Ara
18	Walawe Ganga
19	Karagan Oya
20	Malala Oya
21	Embilikala Oya
22	Kirindi Oya
23	Bambawe Ara
24	Mahasilawa Oya
25	Butawa Oya
26	Menik Ganga
27	Katupila Ara
28	Kurunde Ara
29	Namadagas Ara
30	Karambe Ara
31	Kumbukkan Oya
32	Bagura Oya
33	Girikula Ara
34	Helawe Ara
35	Wila Oya

Code	Basin Name
36	Heda Oya
37	Karanda Oya
38	Saymena Oya
39	Tandiadi Ara
40	Kangikadichi Ara
41	Rufas Kulam Aru
42	Pannala Oya
43	Ambalama Oya
44	Gal Oya
45	Andella Oya
46	Thumpankeli Tank
47	Namakada Ara
48	Mandipattu Aru
49	Pathanthe Aru
50	Vett Aru
51	Magalavatavan Aru
52	Mundini Aru
53	Miyangolla Ela
54	Maduru Oya
55	Puliyanpota Aru
56	Kirimechchi Odai
57	Bodigoda Aru
58	Mandan Aru
59	Makarachchi Aru
60	Mahaweli Ganga
61	Kantale Basin
62	Palampotta Aru
63	Pan Oya
64	Pankulam Aru
65	Kunchikumban Aru
66	Pulakutti Aru
67	Yan Oya
68	Mee Oya
69	Ma Oya
70	Churiyan Aru

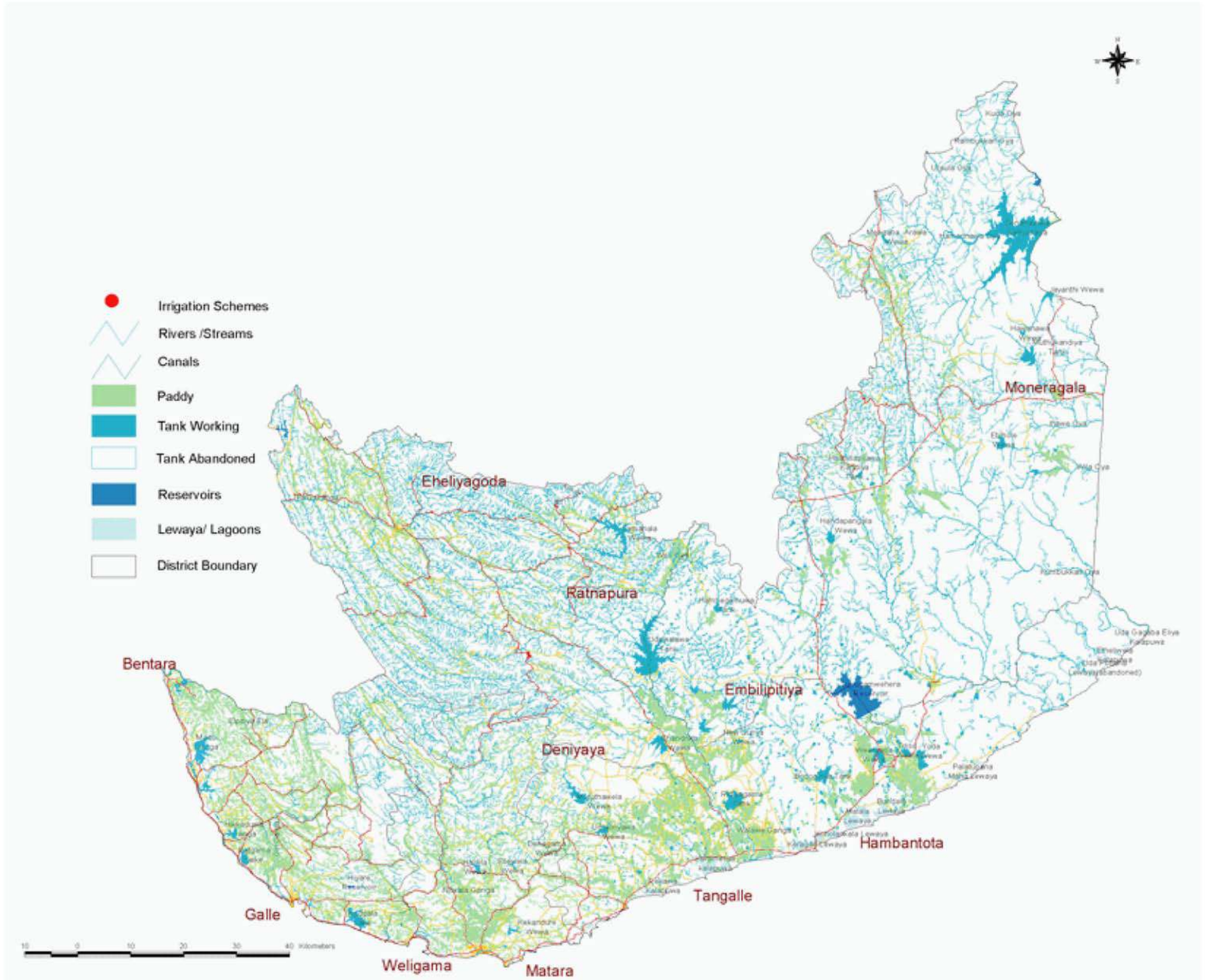
Code	Basin Name
71	Chavar Aru
72	Paladi Aru
73	Nay Aru
74	Kodalikkallu Aru
75	Per Aru
76	Pali Aru
77	Maruthapilly Aru
78	Toravil Aru
79	Piramenthal Aru
80	Netheli Aru
81	Kanakarayan Aru
82	Kalavalappu Aru
83	Akkarayan Aru
84	Mandekal Aru
85	Pallavarayankaddu
86	Pali Aru
87	Chippi Aru
88	Parangi Aru
89	Nay Aru
90	Aruvi Aru
91	Kal Aru
92	Modaragam Aru
93	Kala Oya
94	Moongil Aru
95	Mi Oya
96	Madurankuli Aru
97	Kalagamu Oya
98	Rathambala Oya
99	Deduru Oya
100	Karambalan Oya
101	Ratmal Oya
102	Maha Oya
103	Attanagalu Oya

Southern Region Physical Plan

Figure: 6.3

Source: SWP_SRPP

National Physical Planning Department

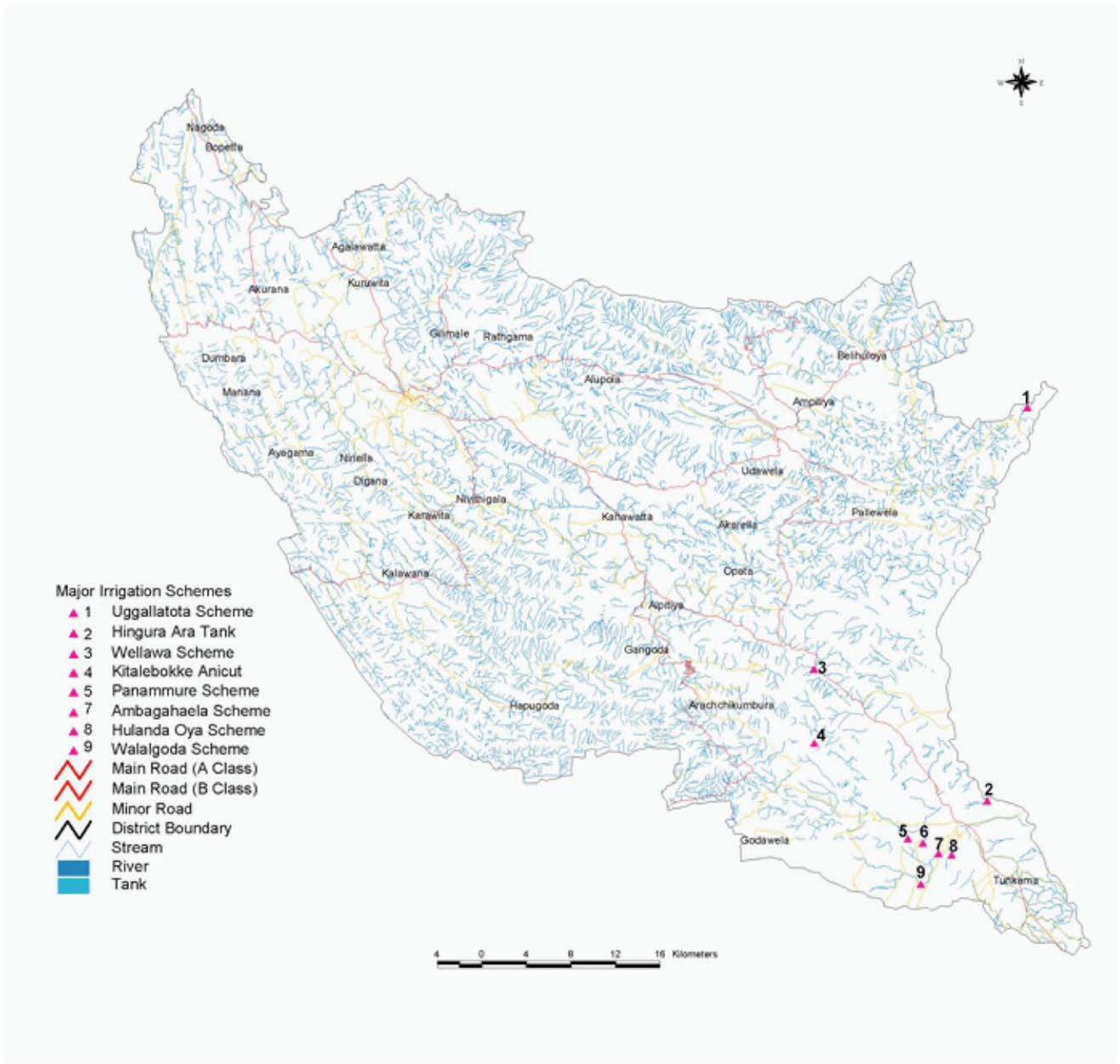


Southern Region Physical Plan

Figure: 6.4

Source: SWP_SRPP

National Physical Planning Department

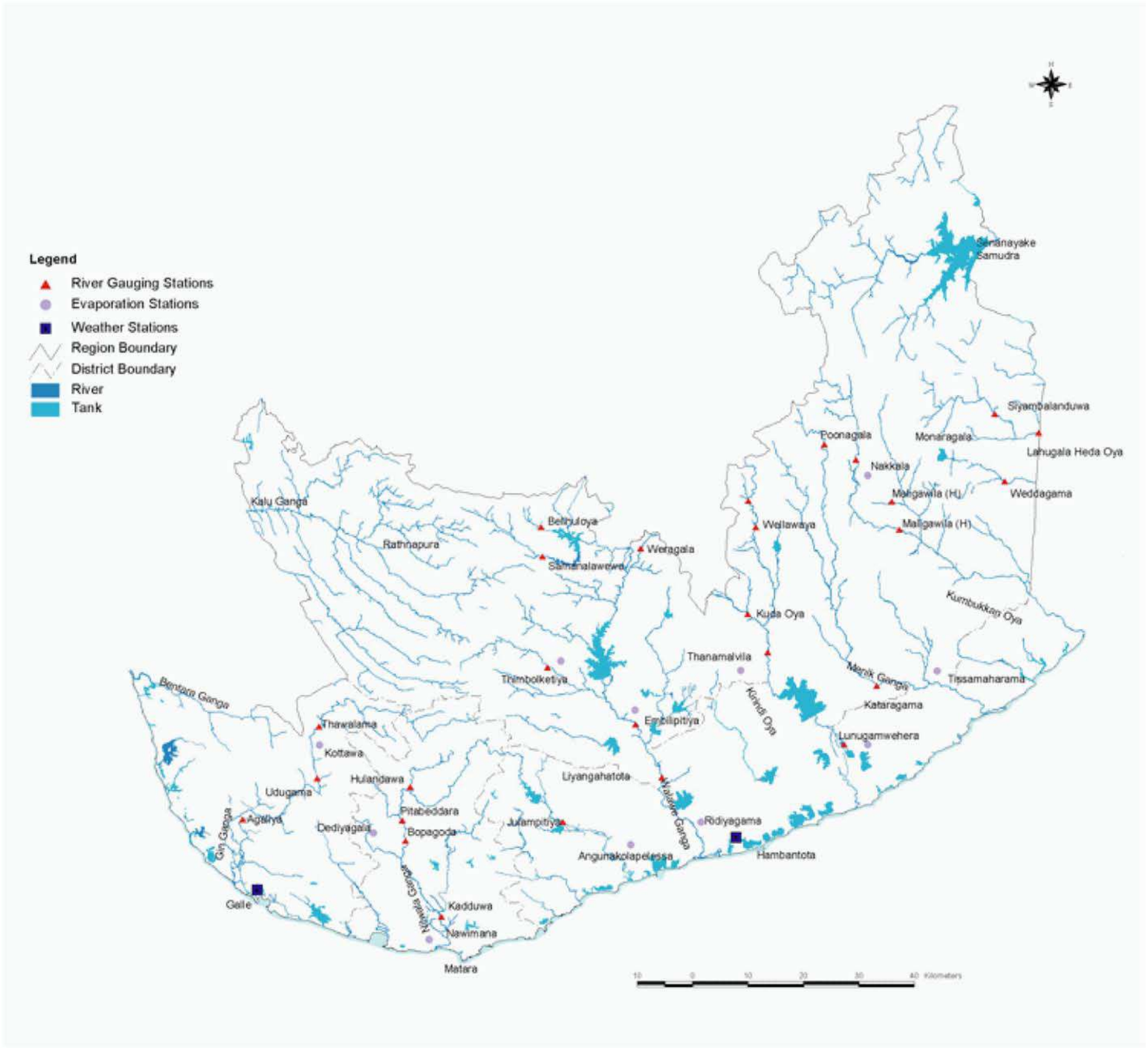


Southern Region Physical Plan

Figure: 6.5

Source: SWP_SRPP

National Physical Planning Department

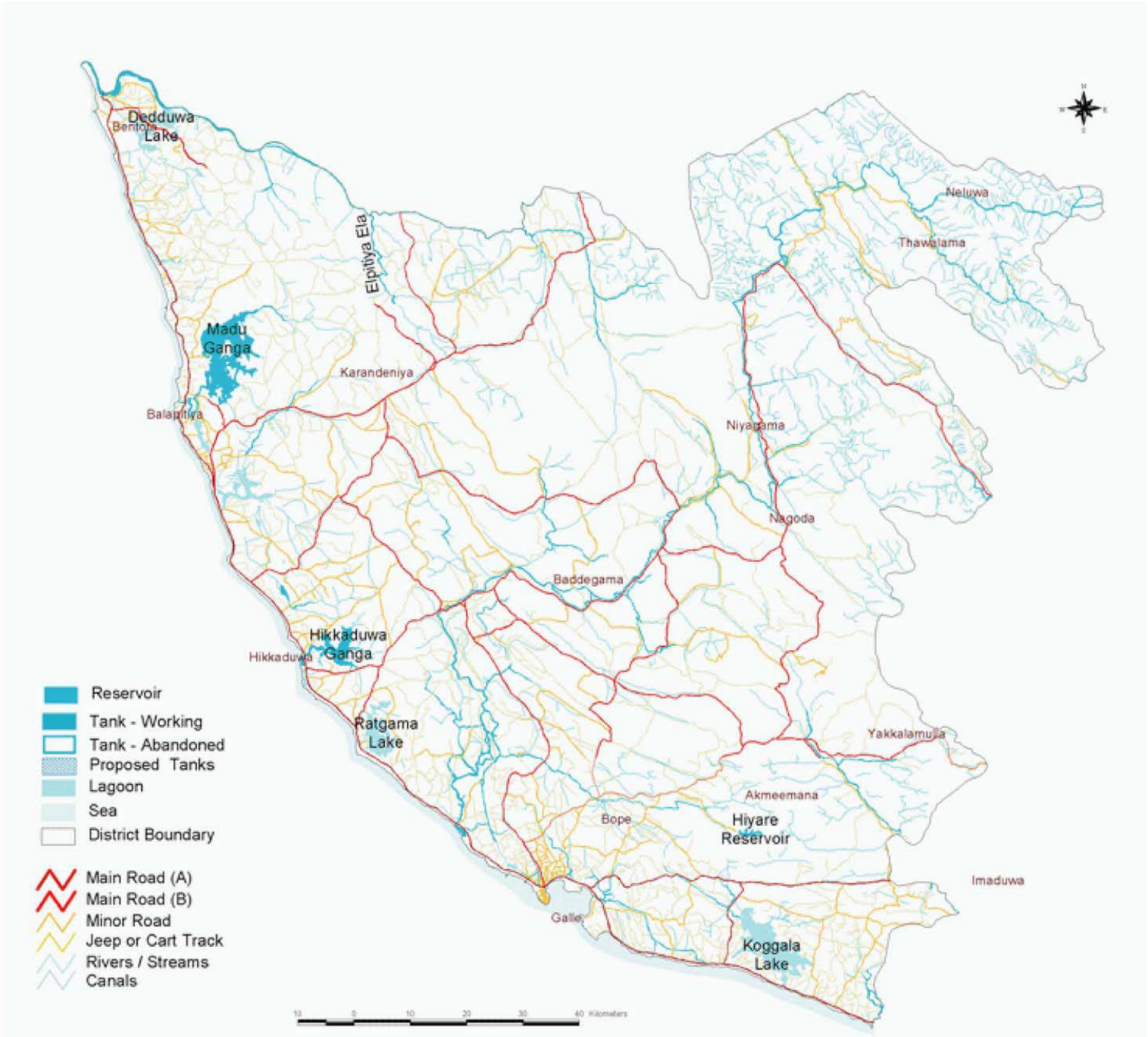


Southern Region Physical Plan

Figure: 6.6

Source: SWP_SRPP

National Physical Planning Department



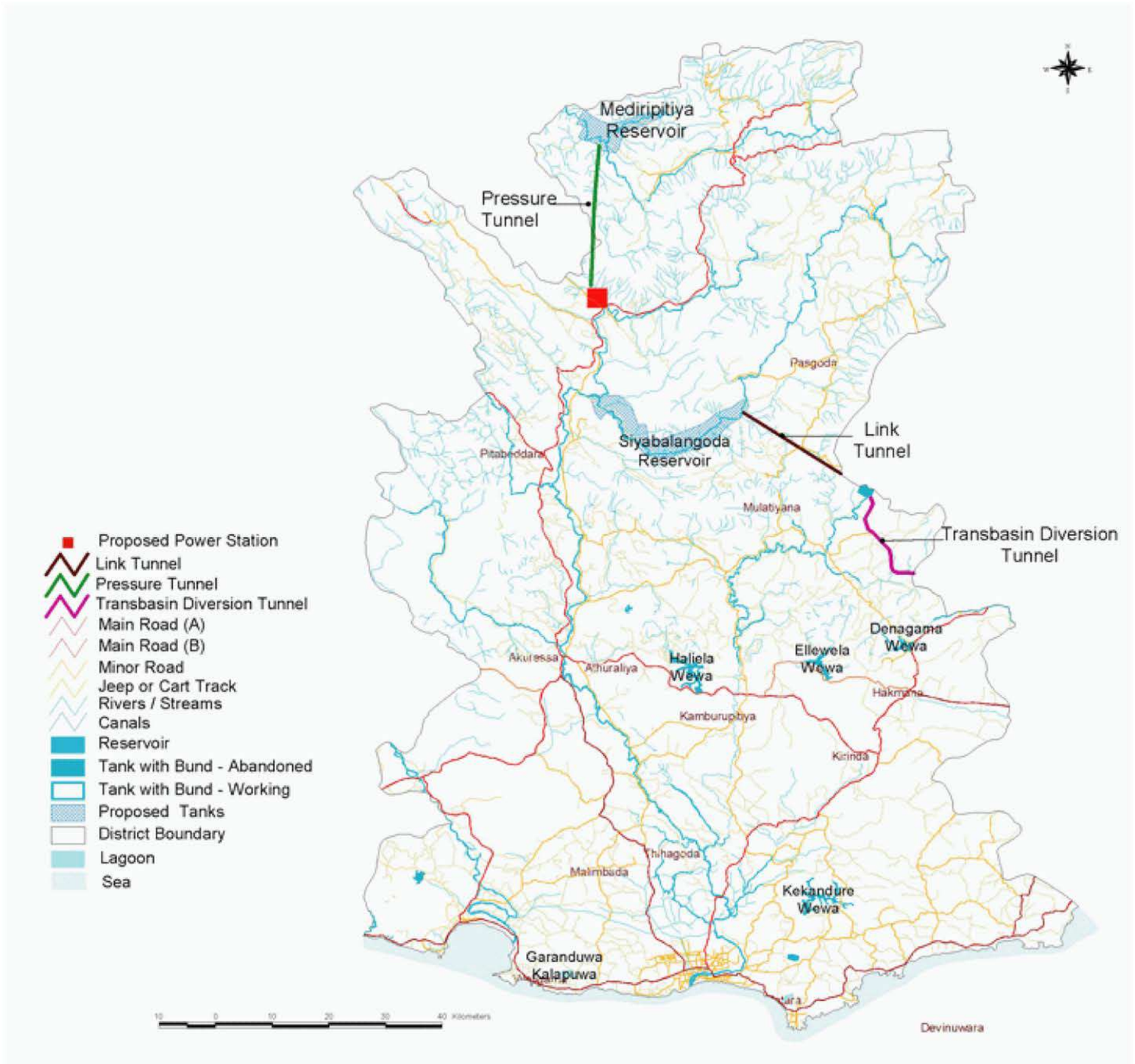
Southern Region Physical Plan

Figure: 6.7

Proposed Water Resources Development - Galle District

Source: SWP_SRPP

National Physical Planning Department



Southern Region Physical Plan

Figure: 6. 8

Proposed Water Resources Development Matara District

Source: SWP_SRPP

National Physical Planning Department

In the development of remaining water resources in Menik Ganga in the light of major issues and development already taken place in the adjoining Kirindi Oya, five (5) reservoir sites in the basin have been identified and studied by ID. Originally reservoir sites, Veheragala and Hangune Ara were proposed for the augmentation of water supplies while Darage reservoir proposed to maintain the environmental flows required for fauna & flora of the wild life reserves and to maintain the river and estuary in sound health.

(ii) Weheragala Reservoir

In order to make use of the available water resources, it is proposed to construct a reservoir across Menik Ganga at Weheragala of capacity 75 MCM, upstream of Kuda gal amuna anicut to augment Lunugamvehera reservoir by 70 MCM of water annually. A canal designed to carry a discharge of 8,5m3/Sec and 8.5 Km long will transfer the part of the water requirements to Lunugamvehera reservoir. It also ensures 2m^3/Sec of flow in Manik ganga at Kataragama to meet social & environmental requirements while meeting irrigation requirements under Kuda gala muna scheme constructed last year. The tentative cost estimate is Rs 1,250Mn. Location map of Weheragala reservoir and transbasin canal with other new proposals are shown in Figure 6.11

Construction of 20MCM capacity Hangune Ara Reservoir across Hangune Ara to ensure double cropping of 250 Ha of lands under Hangune Ara anicut scheme and 100 Ha of irrigable lands under Maha Wewa and to augment Kataragama water supply is proposed.

Studies carried out by ID reveals that even after the construction of Weheragala reservoir, about 197 MCM will flow out to sea; while meeting the social demands of Kataragama & environmental needs of the river. Presently 279 MCM of water is flowing to the sea.

(ii) Uma Oya Diversion to Kirindi Oya Basin

Studies have been carried out by several consultants for the usage of Uma Oya waters within the basin and transfer to adjoining Kirindi Oya by transbasin diversion. Uma Oya has a mean runoff of 600MCM and annual discharge at the Dam site has been estimated as 270MCM. Uma Oya & Mahototilla Oya yields an average annual inflow of about 285 MCM at the confluence. This project provides water for 5,000 Ha of new lands in Monaragala while ensuring the much needed water to Hambantota district for future development after satisfying the water requirements of Lunugamvehera reservoir.

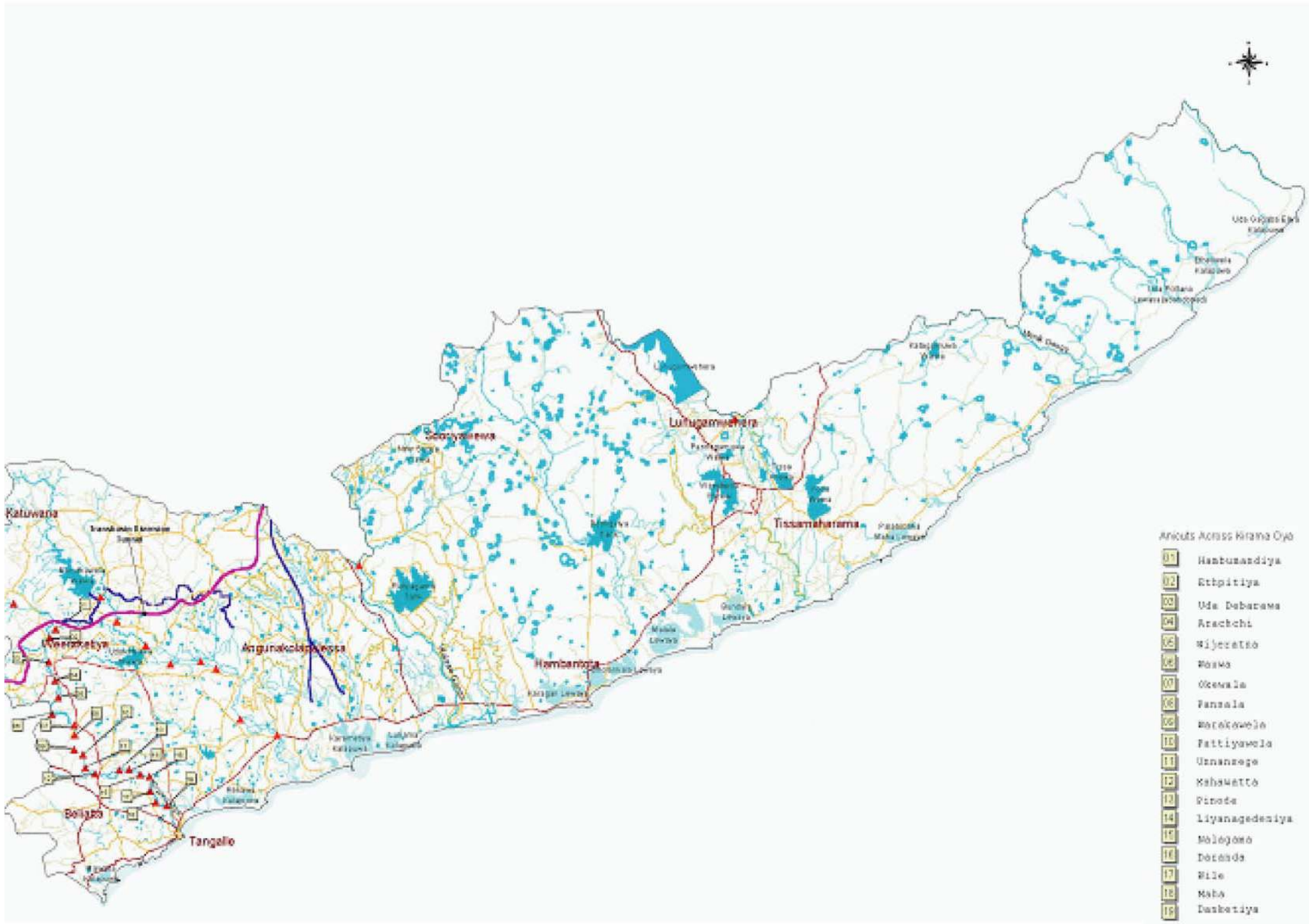
The feasibility study carried out by SNC- LAVALIN Canadian Consultancy Group has recommended trans basin development after considering available in basin development and transbasin development options and finally optimizing the best in- basin and trans- basin schemes.

Under the above recommendations, a reservoir across Uma Oya is proposed at Puhulpola, slightly downstream of Welimada town in Badulla district. The trans basin diversion envisages to divert water from Puhulpola reservoir to Dyaraba dam across Mahatotilla Oya closer to Etampitiya. Annual quantity of 192MCM of water would be transferred from Uma Oya to Kirindi Oya via 23 Kms long tunnel to supplement 2400 Hectares in Lunugamvehera reservoir and 2,600 of new and 400 ha of existing lands in Handapangala area upstream of Lunugamvehera reservoir, while producing 312 GWH of annual energy. The installed capacity of the powerhouse would be 90Mw. A reservoir will be constructed across Alikote Oya to regulate the velocity of water from the tail race of the power house before releasing water for irrigation. Total project cost estimated is US$140Mn. Proposed diversion to Kirindi Oya and the connected works are shown in Figure 6.12 The drinking water requirements of Kirindi oya basin & part of Hambantota Port related development also could be met.

(iii) Flood protection to Rathnapura Town – Kalu Ganga basin

Rathnapura Town and the adjacent areas are subjected to annual flooding from Kalu Ganga. The last floods between the 11th & 19th May 2003 was the 5th worst flood according to flood heights recorded at Rathnapura. There had been higher floods in 1947, 1941, 1913 and 1940.However the damage due to the last cyclonic storm flood was the highest due to settlements of people in areas prone to land slides and floods. The total damage to property & infrastructure is of the order of Rs 1000Mn and 133 deaths reported in Kalu ganga basin.

Five alternate proposals have been studied by ID & Chinese Team of Consultants.. Malwala dam site in Kalu ganga near Rathnapura town is located 5Km upstream of Ratnapura Town. Protection of Rathnapura Town from frequent flooding can



Southern Region Physical Plan

Figure: 6.9

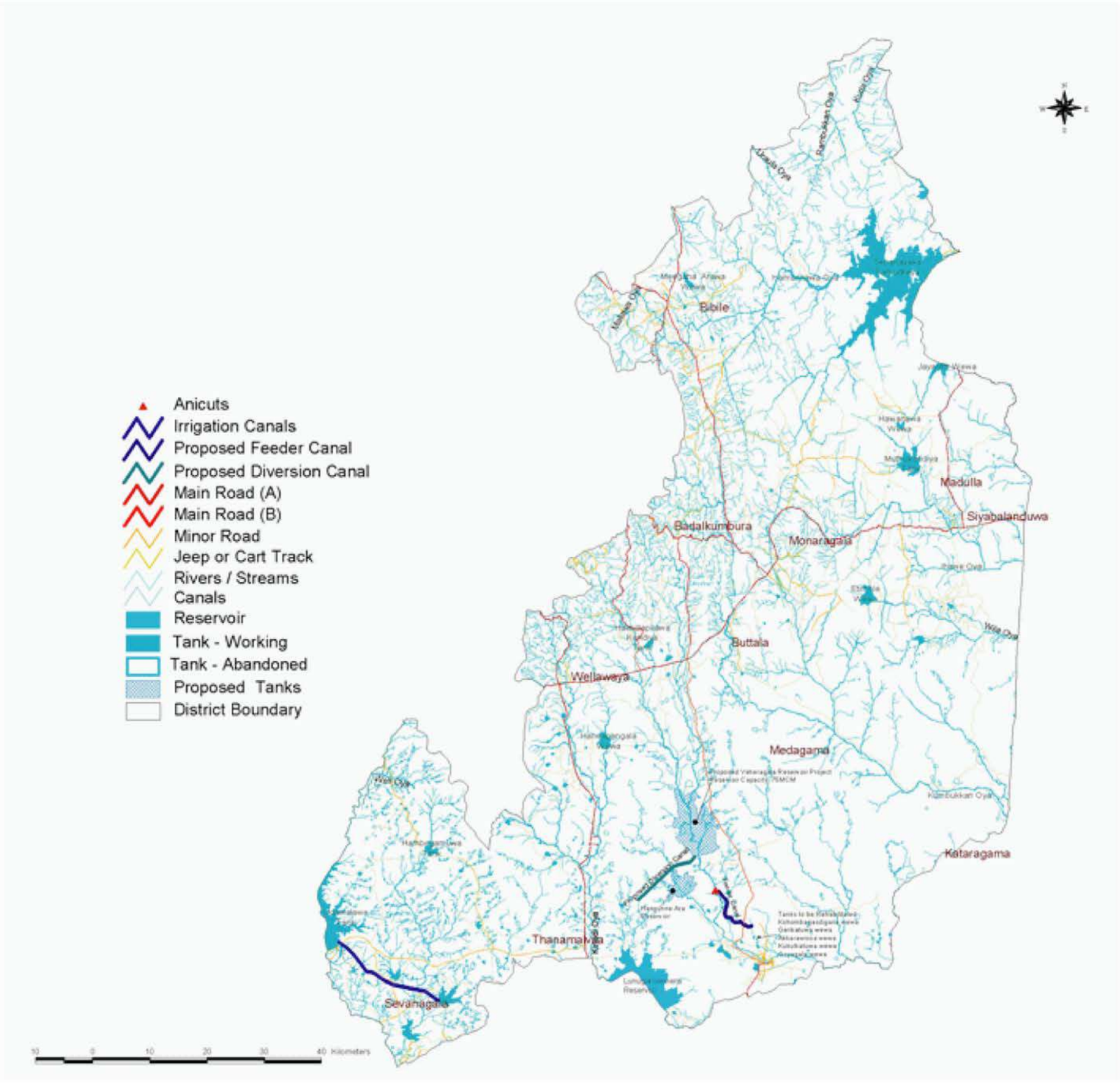
Proposed Water Resources Development Hambantota District

Scale:

Source: SWP_SRPP

- Anicuts
- Irrigation Canals
- Transbasin Diversion Tunnel
- Main Road (A)
- Main Road (B)
- Minor Road
- Jeep or Cart Track
- Rivers / Streams
- Canals
- Reservoir
- Tank with Bund - Abandoned
- Tank with Bund - Working
- Proposed Tanks
- Lagoon / Salt Pans
- Sea
- District Boundary

National Physical Planning Department



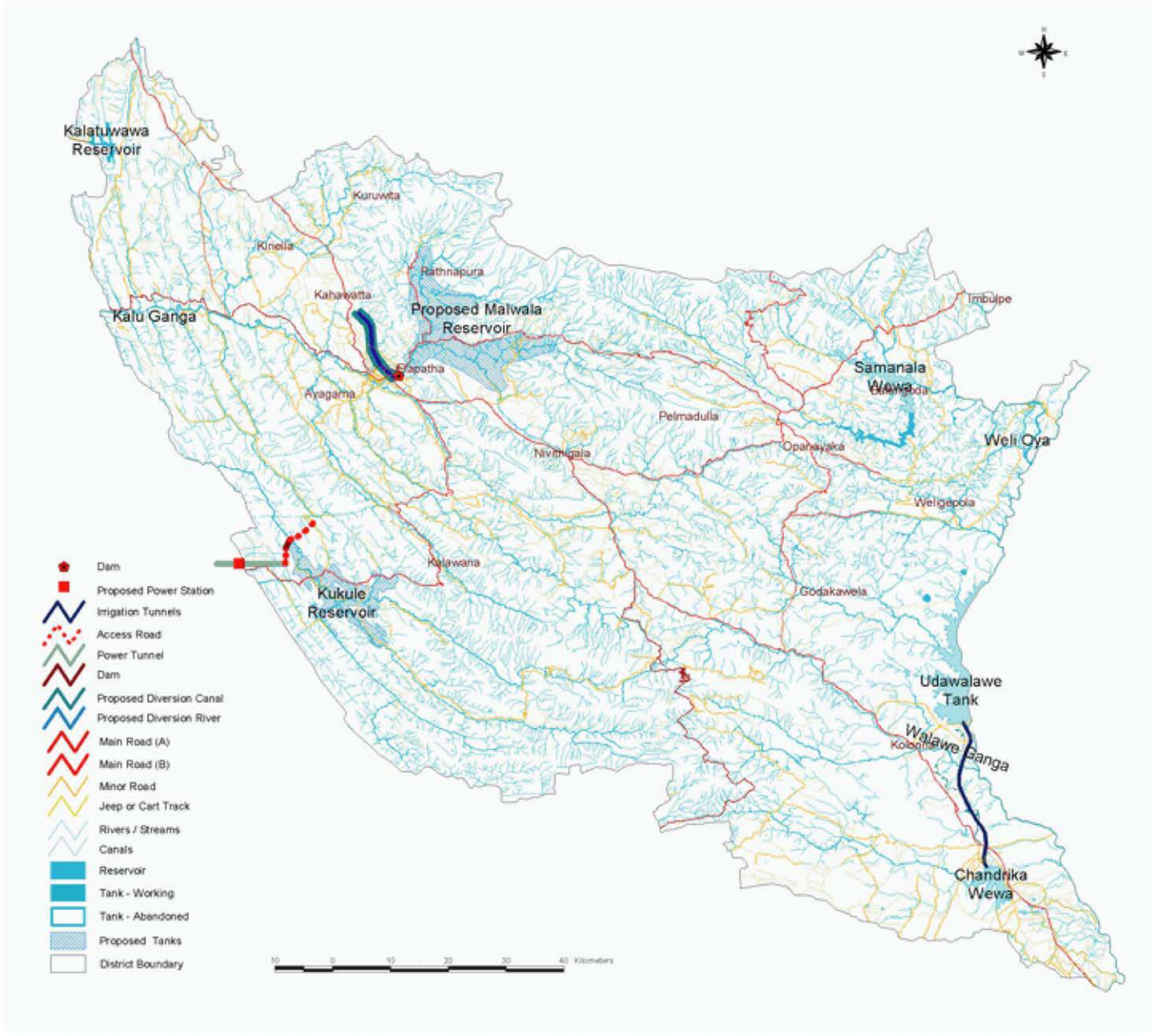
Southern Region Physical Plan

Figure: 6. 10

Proposed Water Resources Development Moneragala District

Source: SWP_SRPP

National Physical Planning Department



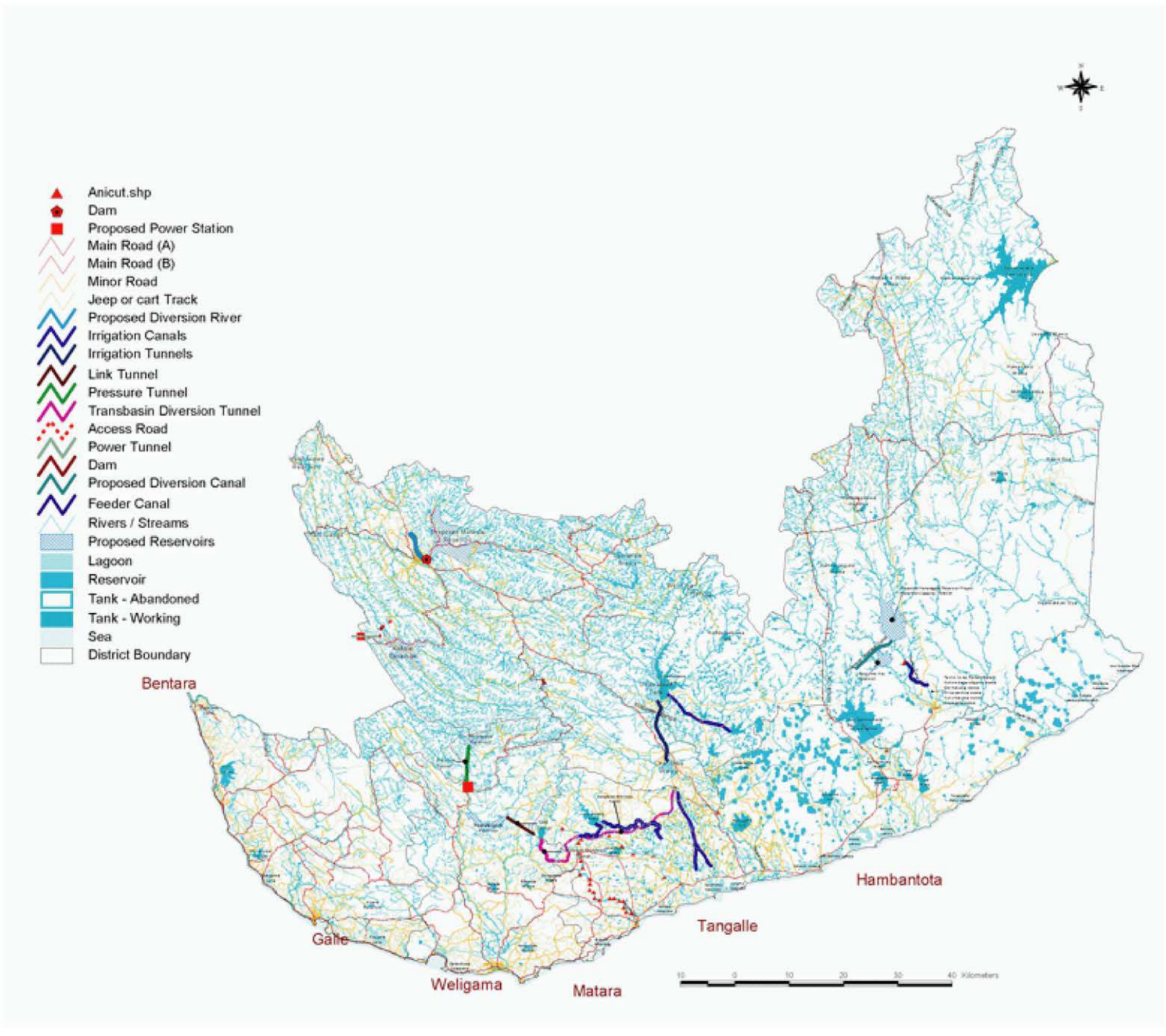
Southern Region Physical Plan

Figure: 6. 11

Proposed Water Resources Development Ratnapura District

Source: SWP_SRPP

National Physical Planning Department



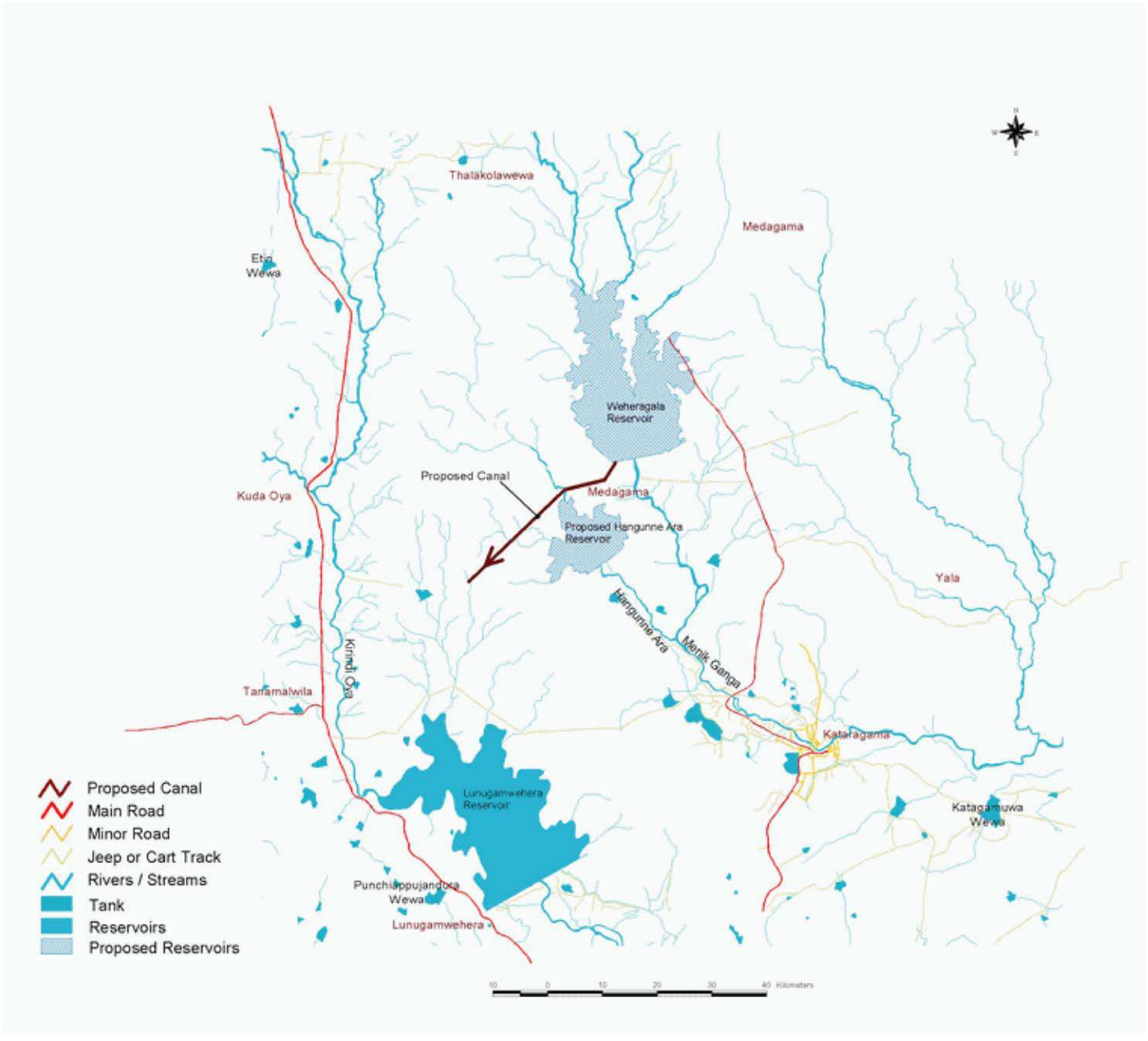
Southern Region Physical Plan

Figure: 6.12

Proposed Water Resources Development Southern Region

Source: SWP_SRPP

National Physical Planning Department



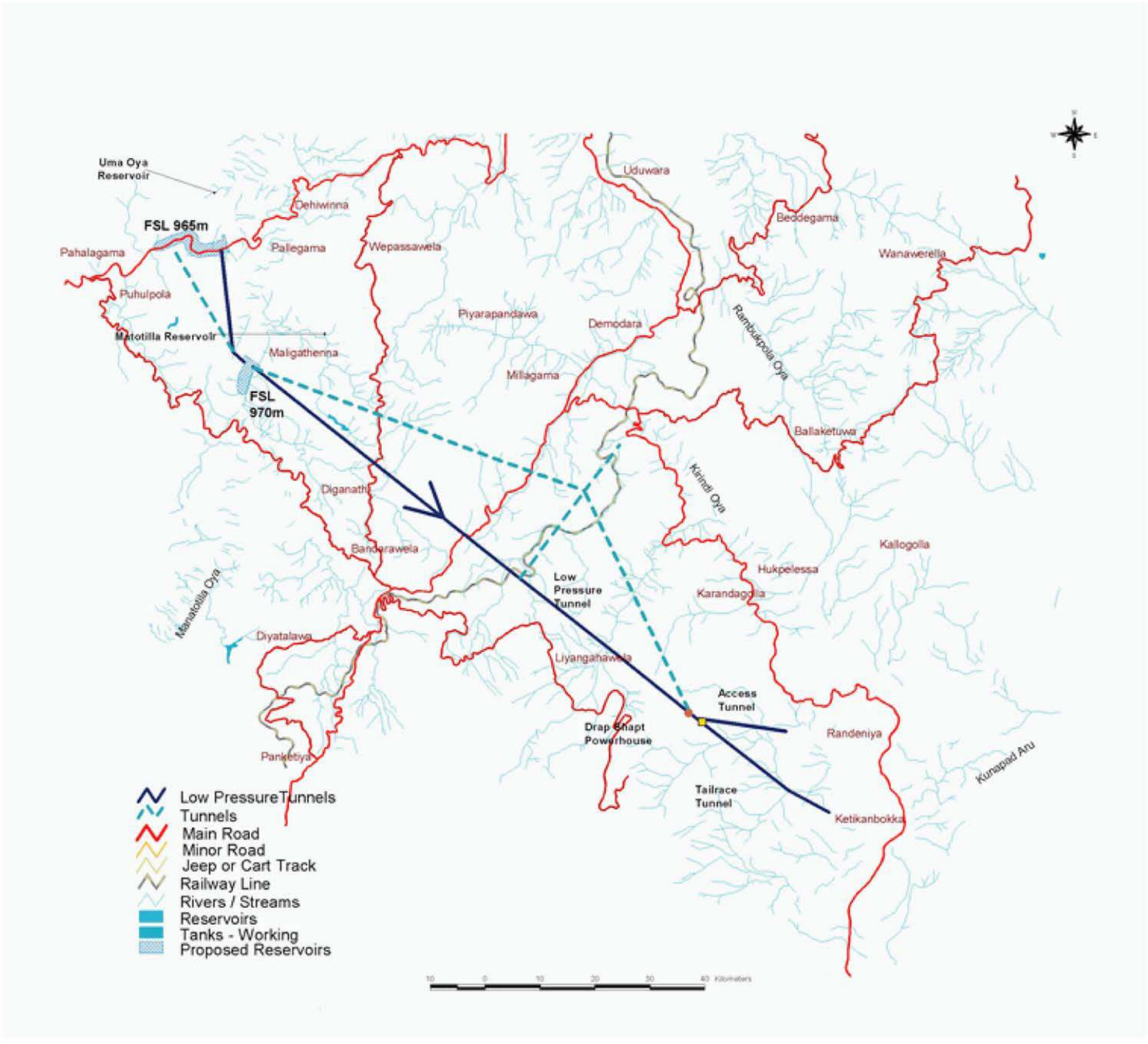
Southern Region Physical Plan

Figure: 6.13

Proposed Vehera - gala Reservoir & Diversion of Menik Ganga – Moneragala

Source: SWP_SRPP

National Physical Planning Department



Southern Region Physical Plan

Figure: 6. 14

Proposed Uma Oya Diversion to Kirindi Oya

Source: SWP_SRPP

National Physical Planning Department

be fully achieved by constructing of a 30m high dam to absorb a 100year flood at Malwala. The reservoir will have a storage capacity of 190MCM and would inundate 713 Ha of lands and three fourths of these lands are developed. The approximate cost of this dam without provision for hydropower is Rs 5000 Mn. Location Map of Malwala Reservoir is shown in Figure 6.13

Multipurpose dam to a height of 70 m can be constructed at the same location for flood control and power generation; this reservoir will have a storage capacity of 459 MCM and 33MW of installed a capacity with the potential of hydro power to the tune of 111GWH per annum. The cost of this project is Rs 11,000Mn

Even if 100 year flood is regulated at Malwala reservoir at Rathnapura, catchment area of Kalu ganga below the reservoir is 2046Sq,.Kms. This catchment can create floods in the lower Kalu ganga and therefore flood bunds have to be constructed to mitigate this situation. If the Malwala reservoir is constructed, it is found that dykes have to be constructed between Kalutara and Kiriella for a length of 24Kms and about 6Kims along Kuda ganga. This would cost around Rs 1,000Mn.

(iv) Nilwala basin Development

(a) Digili Oya reservoir

Nilwala ganga has no reservoirs in the main stream and in any of the main tributaries. Digili Oya is the main right bank tributary and its discharge represents about 40% of the total flow which drains into Nilwala at Akuressa right at the beginning of the flood plain. There are two anicuts across this stream which commands 300ha in addition to 100 ha under rainfed conditions. Simultaneous floods in Digili and in the upper basin of Nilwala basin cause considerable inundation downstream, in particular in the towns of Akuressa and Tellijjawela.

The construction of a reservoir has been considered for a long time and investigations have been carried since 1978 by ID. Gerser , the Fench Consultants studied the feasibility of the above reservoir in the context of regulation of the flow of this river which has a considerable effect on the floods in the valleys downstream, and to solve the problem of water shortage for irrigation under the two anicuts schemes and for supply of water to 1,500 ha of paddy in Kiralakale area. Production of electricity by means of turbine installations using the regulated volume of water 453Kw for a discharge of $2M^3$/sec.

Main Features of the reservoir are:

- Full capacity : 17MCM
- Useful capacity : 13MCM
- Total annual regulated Volume : 43MCM
- Maximum height of Dam : 33M
- Crest length : 340M

The cost of the project with turbine installation was Rs 750Mn (1986 Prices).

Present water supply difficulties experienced in Matara Intakes due to salinity intrusion could be easily resolved if the above reservoir is constructed in addition to the reduction of effects of flooding and irrigation demands. The proposed construction of salinity barrier across Nilwala at Nadugala by the NWS &DB could be eliminated if this reservoir is constructed. Discharges from the reservoir could be made to arrest the minimum flows that is required to keep out the salinity wedge build up. The other induced advantage would be the effect on the protection works recommended for Matara Protection with the reduction in river flow by the reservoir storage during floods. The By-pass will not be required if this reservoir is constructed and would eliminate much of the flooding problems in the lower valleys.

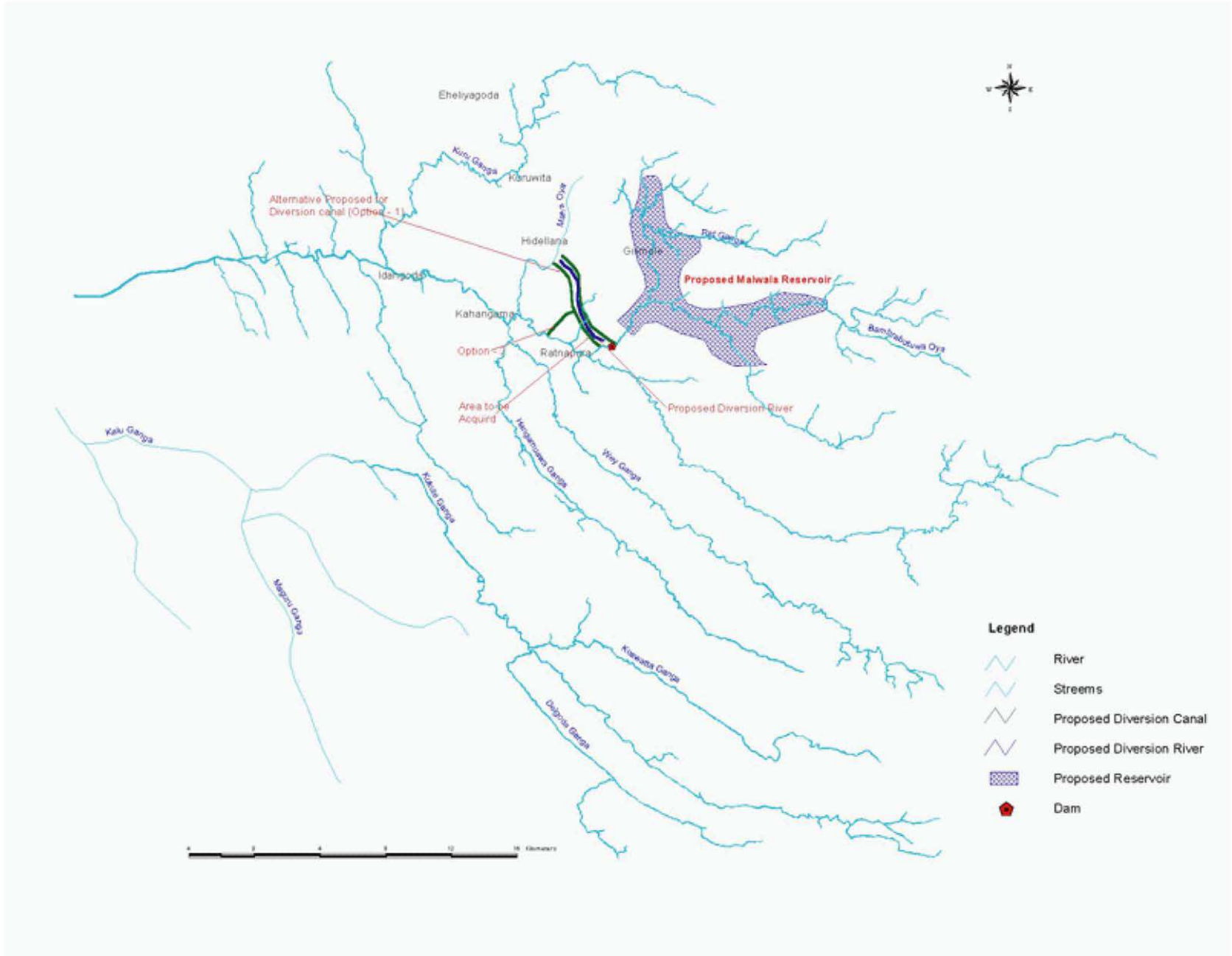
(b) Urawa Diversion Project – Nilwala Ganga

A reservoir of capacity 16 MCM is proposed at Urawa across Urubokka Ganga in Nilwala Basin to divert water to Muruthawela reservoir in Urubokka Oya. Muruthawela reservoir scheme commands 6000Ha in Urubokka & Kirama Oya basins with low cropping intensities. There is a shortfall of 30MCm for double cropping in the above schemes. Approximate cost is Rs 1,500Mn. Project Map of Urawa diversion project is shown in Figure 6.16

(v) Heda Oya Basin development

(a) Muthukandiya Reservoir & Dry Farm area- Productivity Enhancement

This main oya is mostly untapped and the only reservoir in the basin is the Muthukandiya reservoir across Meeyal Oya in one of the tributaries of Heda oya.



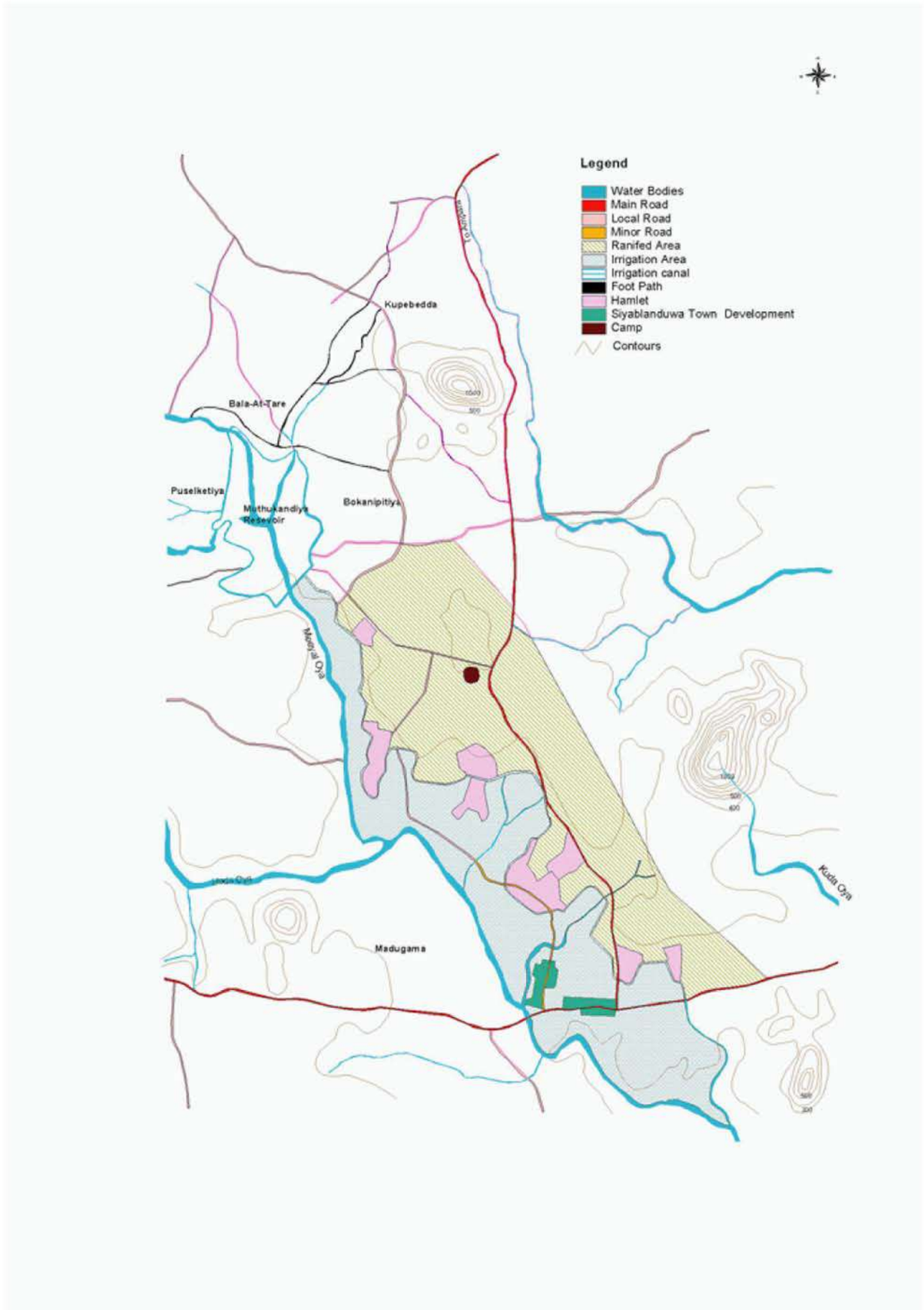
Southern Region Physical Plan

Figure: 6. 15

Proposed Malwala Reservoir & Diversion of Kalu Ganga

Source: Irrigation Dept

National Physical Planning Department



Southern Region Physical Plan

Figure: 6.16

Productivity Enha -ncement & Micro Irrigation to Dry Farming under Muthukandiya

Source: Irrigation Dept

National Physical Planning Department

Muthukandiya reservoir is the only major irrigation reservoir project in Monaragala District. The capacity of the reservoir is 30.17 MCM and the irrigable area is 820Ha. The scheme map is shown in Figure 6.14

Dry farm area on the left bank of the main canal comprising 1400 acres of 2Ha blocks in 4 zones has been developed by the Australian Development agency during 1979. The settlers in the farm blocks solely depend on agricultural products in the rain fed systems involve integrated livestock, seasonal & perennial crops. Many of the farm blocks are not in a sustainable state and the potential for development is enormous.

NorthEast Irrigated Agriculture Project (NEIAP) has studied during 2002/03 , 10 major Irrigation projects in the North and East and in the adjoining areas for productivity enhancement as these schemes have been affected due to conflict issues prevailed in the past 20 years or so.

Detail studies leading to feasibility & design stage have been completed by two leading Sri Lankan consultancy firms and presentations & discussion were held last year with foreign lending agencies. The objectives of the study was to formulate a short, medium and long term strategies to upgrade income generating opportunities of the population centered on the Muthukandiya irrigation and settlement scheme by:

- Framing proposals for improving the standard of living of rural households in the scheme in a sustainable manner.
- Focusing on strategies, measures and actions that will increase farm production and income of the house holds, land and water productivity of the scheme inclusive of the upland area, upgrade marketing, extension, credit system, role of the private sector and transform the scheme in to a more productive and agricultural production system.

Cost of the project proposals is Rs. 525Mn to be completed in 4 years.

(b) Heda Oya reservoir

It is proposed to construct a reservoir at the border of the district boundary between Moneragala & Ampara districts at Siyambalanduwa. The proposed reservoir benefits 4,000 Ha of lands in Lahugala, Panama, Naval ara and Radella in the Ampara District. The proposed reservoir capacity is 118MCM. The estimated cost is Rs 1,000Mn.Siyambalanduwa town ship could benefit from this development.

(vi) Kumbukkan Oya basin Development

(a) Nakkala reservoir

The proposal is to construct a reservoir at Nakkala upstream of Kumubukkan Oya and divert 100MCm of water to Weheragala reservoir via a 28Km long trans-basin canal to augment Lunugamvehera reservoir and develop 450 ha of new lands in left bank of Manik Ganga down stream of Weheragala reservoir.

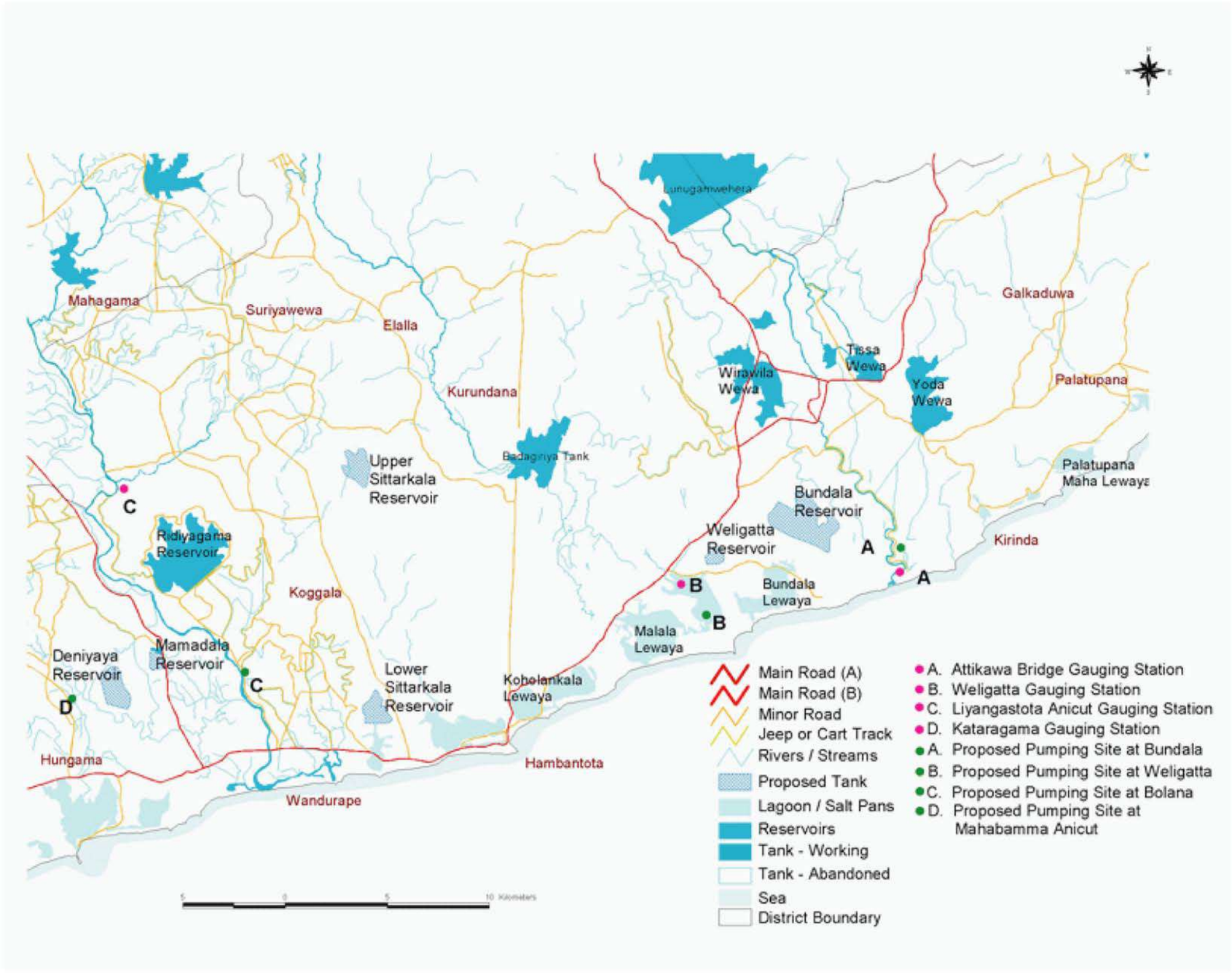
(vii) Proposed Six Water supply reservoirs in Hambantota

Ruhunapura Area has been declared on the 26th July 1999 gazzette as a special area for development in the Southern area. The Ruhunapura project envisages development of Ruhunapura city, which will cover parts of Hambantota & Monaragala districts and the total land area coming under Ruhunapura is about 113,000Ha. Under the concept of Ruhunapura a commercial harbour, an air port, industrial and commercial areas, a modern city center, residential areas, public amenities, other infrastructure such as roads, railways are proposed. Limiting factor for the development of Ruhunapura is identified as the shortage of water resources to meet the current and future demands arising out of development activities explained above.

Prefeasibility study for an assessment of the potential water resources, selection of suitable sites and supply of water for meeting domestic, industrial and commercial including environmental needs have been carried out by ID as lead consultant with the assistance of other national agencies during 2001/02. The Urban Planning Consultant has estimated the annual water demands as 100MCM by the year 2030 including the stabilized population of 1.0 Mn in the project area.

The sources considered to meet this demand in an around the project region included Walawe Basin,Karagam oya, Malala Oya, Kirindi Oya, Menik Ganga & Kachchigal ara basins. Walawe Ganga is the only perennial river in the project area. Two phases considered in providing water to meet the Ruhunapura demand involved:

- Water Resources Development Phase
- Water supply Development phase.



Southern Region Physical Plan

Figure: 6. 17

Proposed Six Water Supply Schemes to Hambantota

Source: Irrigation Dept

National Physical Planning Department

The recommendations for water resources development phase are shown below

No.	Project	Source	To supply System Annually (MCM)	Pump Capacity (M^3/Sec)	Length of Pumping Main (M)	Storage Capacity (MCM)
1	Upper Sittarama	Walawe.Ganga	29	4	12000	14
2	Lower Sittarama	Walawe Ganga	16	3	12000	10
4	Mamadola	Kachchigal	30	1.29	6000	3.5
5	Deniya	Ara	10	0.64	1200	2.3
6	Weligatta	Kirindi Oya	5	0.25	2000	2
7	Bundala		10	0.43	6000	4
8	Hangune Wewa	Menik Gan	5	-	-	20
Total						105

The total civil & Electro _mechanical cost has been estimated as Rs.6,855Mn. The proposed 6 reservoirs are shown in Figure 6.15

The total Cost of Water Supply Development including Water Distribution system will be Rs 20,210Mn, while the operation and Maintenance cost will be Rs. 312 Mn per year.

(viii) Gin Ganga and Nilwala Ganga Basin Development & Diversions

In 1968,ECI. Inc. of USA has studied three dam sites in the two river basins namely Hulandawa _ Bingahamara in Nilwala ganga and Jasmin dam in Gin ganga basin for diversion to Hambantota district.

(a) Hulandawa Bingahamara Reservoir

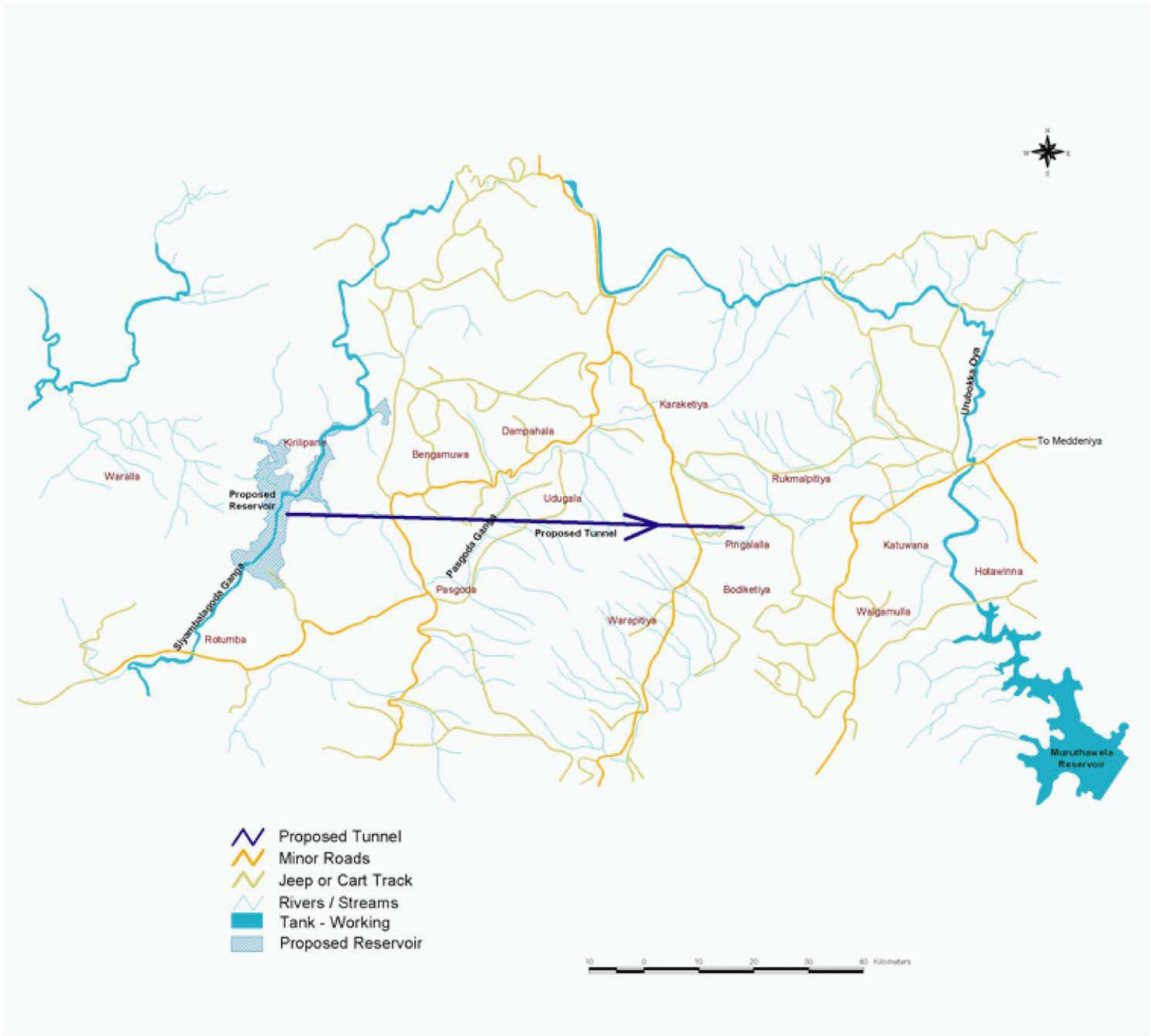
The above reservoir was conceptualized as far back as 1967 by Engineering Consultants Incorporated (ECI) in their study for the three basins of Kalu , Gin and Nilwala. According to the studies made at that time the construction of the dam to a height of 64M would have provided the possibility of absorbing a 50 year flood and diverting water to Hambantota. The capacity of the reservoir designed was around 850MCM with hydro power development of 50MW. This trans-basin canal leading up to Ruhunu National Park, intercepting and augmenting the water deficit Kirama, Urubokka, Malala ara , Kirindi Oya systems would have benefited 20,000ha. The estimated cost was Rs 250Mn at that time.

(b) Siyambalagoda Reservoir

The possibility of having a reservoir at Siyambalagoda has been examined. The dam intercepts 177Sq.Kms of upper Nilwala Ganga and has the advantage of having a higher elevation at 90M in order to divert water to Hambantota. Its capacity of storage would be 120MCM and water spread area is 550Ha. This proposal would not eliminate flooding in the lower part of the basin.

The Central engineering Consultancy Bureau (CECB) conceived a multipurpose transbasin diversion scheme and planned to divert Gin Ganga and Nilwala waters to Kachchigal Ara via a trans basin canal. Under this proposal, Mediripitiya reservoir in Gin Ganga basin and Siyambalagoda reservoir in Nilwala basin, link tunnels and trans basin canal will be constructed.

The proposed dam site on Gin Ganga is located at Mediripitiya and water from this reservoir is to be brought to Nilwala basin by a 7 Km long tunnel. The annual yield at Mediripitiya reservoir site is 320MCM and its catchment area is 132 Sq.Kms. The reservoir capacity is 65MCM at full supply level fixed at 295MASL. 40MW power plant is planned at the end of link tunnel on the left bank of Miallawa Ela which is a tributary of Nilwala Ganga. It will generate 132 GWH of electrical energy annually using 200m drop between Gin and Nilwala reservoirs in a single stage development. The proposed dam site on Nilwala ganga is located at Pahurutota at 1 Km downstream of the confluence of Kotapola Oya and Urubokka oya. At the proposed site Nilwala ganga drains a catchment area of 292 Sq.Kms and annual yield at the reservoir site is about 430MCM. Capacity of the reservoir is about 224MCm at FSL 77 masl. It is planned to divert 500 MCM of water from Nilwala Ganga and



Southern Region Physical Plan

Figure: 6. 18

Proposed Urawa Diversion Project

Source: Irrigation Dept

National Physical Planning Department

Gin Ganga through a series of tunnels and canal; to augment 18,000Ha of existing lands. The proposed scheme Fig. 6.17 would benefit the other intermediate basins such as Kirama Ara, Urubokka Oya, Kachchigal ara where shortages are already identified. This would also enable to reduce the water releases to right bank canal under Uda Walawe and this excess water could be utilized to develop left bank of UdaWalawe.

The construction of storage reservoirs in Nilwala and Gin Ganga Basins would reduce the frequency of flooding of low lying areas in the basins and sea water intrusion could be checked by downstream releases from the reservoirs to improve water supply difficulties now experience during low flow periods in the two basins.

(c) Nilwala Ganga Flood Protection Scheme-

The Nilwala basin experienced a major flood during may 2003. This flood is one of the largest observed major floods in the recent past.

Flood protection measures for the lower part of the basin have been provided in the two lower most sectors of Kiralakale & Kadawedduwa to afford protection from a 20 year design flood. The main features of the project already implemented were 14Km of flood bunds on either side of the river and installation of 24Nos large pumps in 3 Pump houses at Tudawa, Magallegoda and Talgahagoda to deal with the local drainage. Only part of the full project planned was constructed. The upstream part comprising of the balance 10 sectors were not implemented. A large number of people still continue to live in the above upstream areas and in the unprotected area already implemented.

The construction of any of the reservoirs above mentioned would eliminate flooding effects in the so called unprotected areas to a greater extent.

(ix) Kalu Ganga Hydro Power development & Diversion to Hambantota District

In 1968 Engineering Consultants Inc. of U.S.A conducted planning studies at Feasibility level for the multipurpose development of water resources of the Kalu ganga basin, Gin ganga & Nilwala basins. The Kalu ganga development options were envisaged as multipurpose including potentially, flood control, hydro-power generation and for inbasin irrigation purposes. In these studies ECI identified Kukule Ganga Hydro-Electric Project.

(a) Kukule High Dam

The project is on Kukule Ganga, a tributary of Kalu Ganga which is the second largest river in Sri Lanka, draining a mean annual flow about 280 M^3/Sec with a high rainfall averaging around 4000mm annually across the basin while the Kukule Ganga and the project area drains an annual mean flow of 30.4M^3/sec receiving average 3750mm annual rainfall with a basin area of 312K sq.Km.

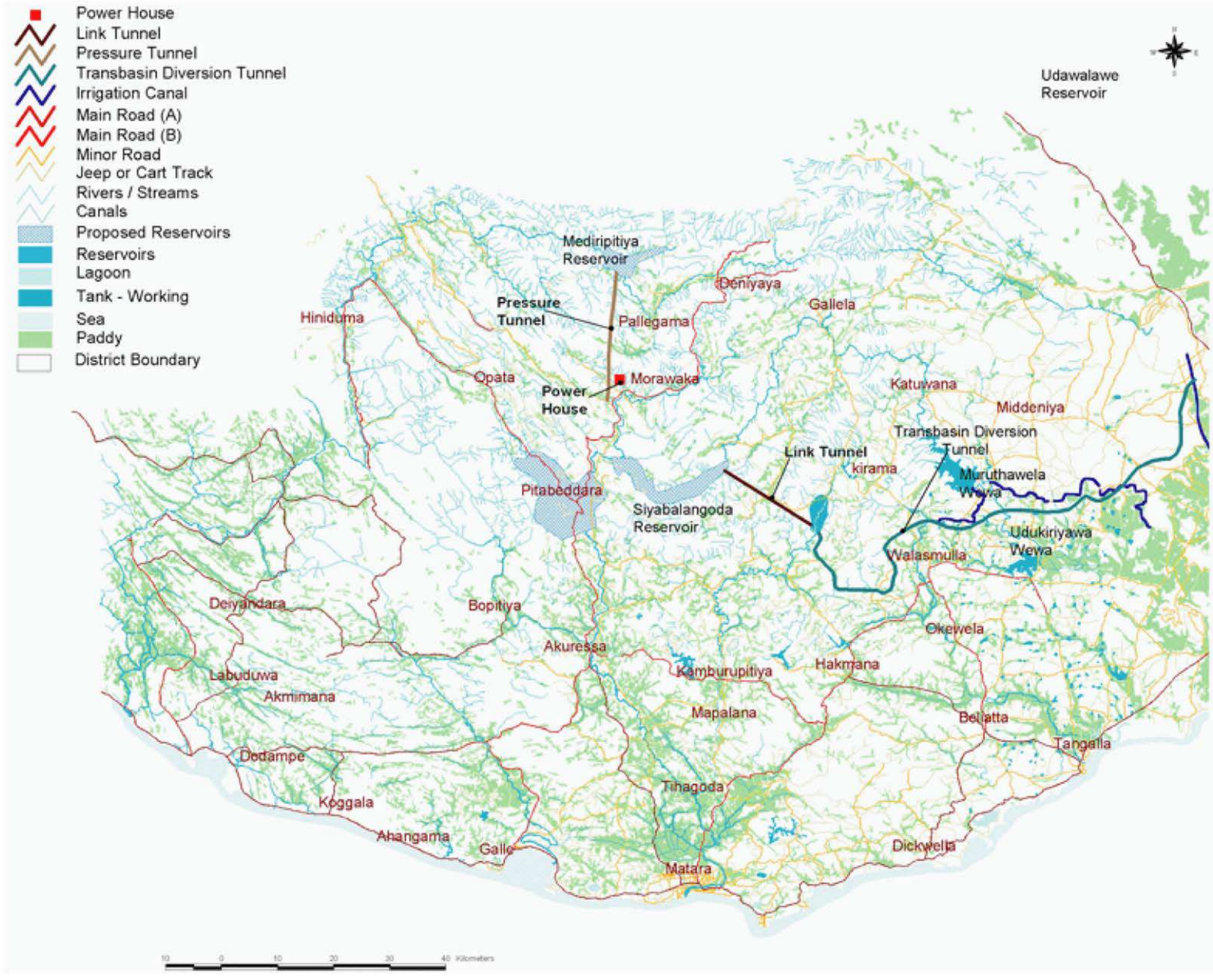
Mainly 3 schemes have been identified.

- Single purpose hydropower on Kalu Ganga itself, 5 Km upstream of Rathnapura town
- Single purpose hydropower station at Kukule Ganga
- A multipurpose hydropower at the same site with inter basin transfer to SEDZ.

In 1988, TAMS consultants Inc of U.S.A. studied the feasibility of the Kalu Ganga water resources development and concluded that diversion of water to SEDZ for irrigation purpose, although technically feasible was not an economically viable proposition.Main constraints stated was that water discharged from hydro power station after generation of power could not be used in the lower Kalu ganga basin and that excessive water usage in LB canal of Uda Walawe. TAMS concluded that the only economically viable project that could be implemented was the KUKULE single purpose hydro Electric project, which is in effect a run of the river hydro electric project. This coincided with the Master plan study for electricity supply in Sri Lanka proposal for a 50m high dam across kukule Ganga and power out fall on the Peleng Ganga which was later implemented by the CEB during 2000 /2003.

Kukule High dam 103 M high having a storage capacity of 950MCM with two options of locations of tunnels and hydro power stations for generation were identified.

Option I – Peleng Ganga underground Hydro Power Station and Option 2 – Maguru Ganga surface Hydro Power station. Fig. 6.18



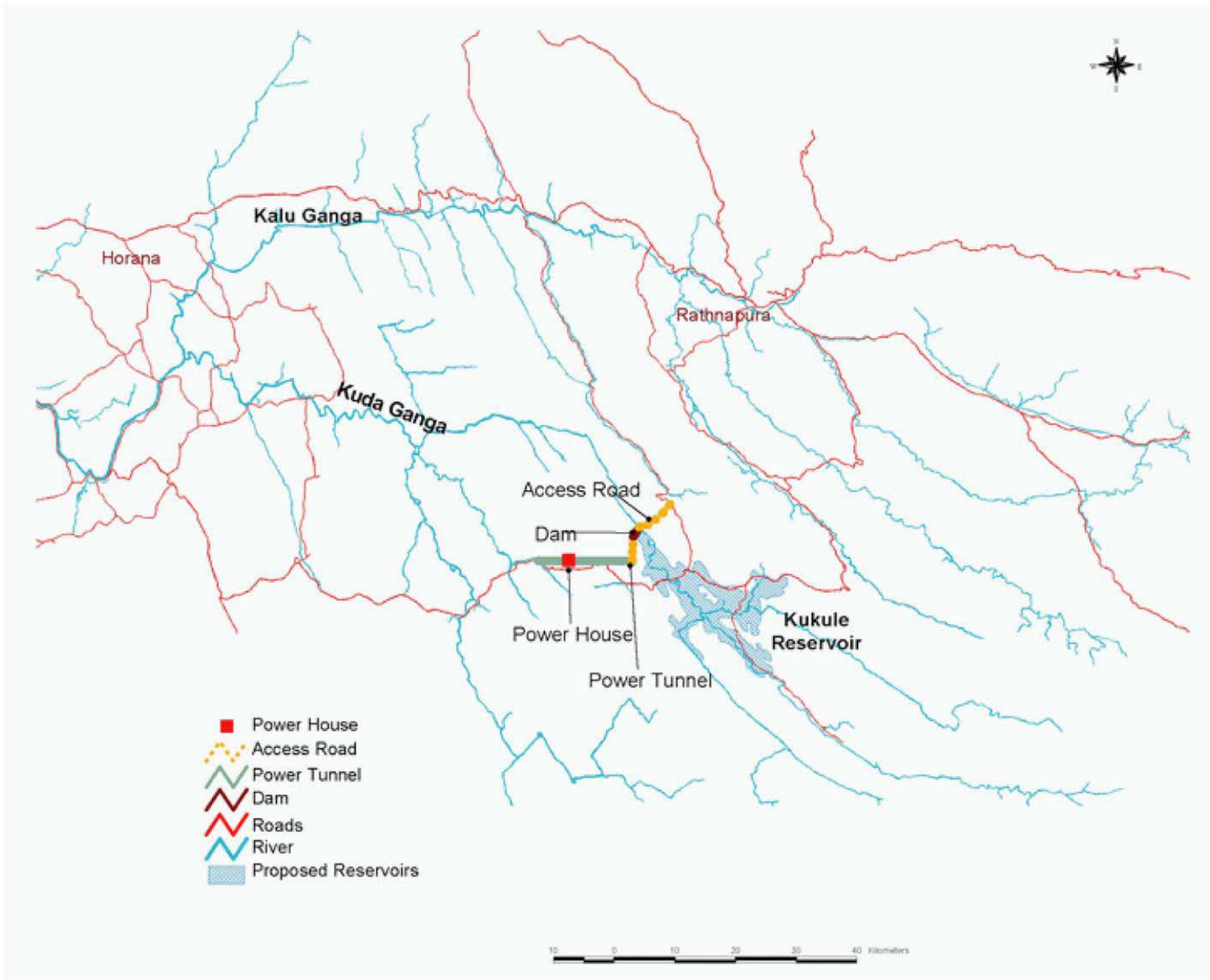
Southern Region Physical Plan

Figure: 6. 19

Proposed Gin-Nilwala Trans Basin Diversion Project

Source: SWP-SRPP

National Physical Planning Department



Southern Region Physical Plan

Figure: 6. 20

Kukule-Peleng Ganga Hydro-power Project Location Plan

Source: Irrigation Dept.

National Physical Planning Department

Conveyance tunnel	: 5.5Km
Installed generating capacity	; 88MW
Water head over turbines	: 208M
Firm power production per annum	: 385Mn KWH
Secondary Power production	: 9.4 Mn KWH

The topography and geology at the Maguru ganga hydro power station very favourable for a surface hydro power station which considerably reduces the capital cost was finally proposed. ECI in 1968 concluded that the Kukule Ganga Hydro power electric project was marginally economically viable as there were no accretion of benefits from flood protection or in basin irrigation. However, ECI stated that if Kukule Ganga waters could be diverted to the South east Dry Zone (SEDZ) Walawe, Kirindi Oya and the basins beyond that it would become attractively economically viable due to the benefits derived from irrigated agriculture of lands which remained partly developed due to severe shortage of water.

In the present context, now that potential water resources and lands in Walawe & Kirindi Oya basins have been developed , we have to see what extents of lands would be available for future development for agriculture after selecting the lands for proposed Port development , urbanization & other industrial estates and so on. The construction of the Kukule high dam to capture the flood flows may require to inundate a large extent of land and the justification of such a large reservoir may have to solely on irrigation benefits on the SEDZ.

6.10 Phased Water Resources Development Program

The water balance analysis has clarified quantitatively that water shortage already exist in the Kirindi Oya, Malala Oya , Urubokka & Kirama Oya basins. Manik Ganga also may face shortages in future. In addition to above the land use study identified the availability of large extents of developable lands in the Ruhunu basins in Hambantota & Moneragala Districts for commercial & export agriculture as proposed in the Agricultural Plan for Southern Region (chapter 3.0). The Agriculture Development Plan envisages an ambitious development of commercialized export agriculture in the above two districts. The table 6.6 Indicates the irrigation requirements to achieve the above plan.

Table : 6.6
Agriculture Plan – District Extents & Irrigation Requirements

Hambantota District- 41,000Ha for 2015 & 39,000Ha for 2025

River Basin	Water Requirements MCM(2015)	Water Requirements (2025) – MCM
Walawe	75+9+6 = 90	75+6+6 = 87
Malala	25 = 25	25 = 25
Kirindi	50+6+3 = 59	50+3+3 = 56
	Total = 174	Total =168

Moneragala District –24,000Ha for 2015 & 23,000Ha for 2025

River Basin	Water Requirements MCM(2015)	Water Requirements (2025) – MCM
Menik	50+3+3 = 56	50+3 = 53
Kumbukkan	25 = 25	25 +3 = 28
Heda Oya	25+3+1.5 = 29.5	25 = 25
	Total = 110.5	Total =106

Irrigation water requirements for the development of agricultural lowlands & Uplands were computed using FAO methods and criteria published by the Irrigation Department. The future irrigation demands cannot be met from in basin developments and have to come from the surplus wet zone rivers.

The strategy for Water Resources development would be implemented under two phases. Phase I covers the period 2005 to 2015 , and Phase II 2015 to 2025.The Action Plan showing water Resources Development Projects' main features are shown in Table 6.5 Projects details are described in section 6.9.

Table : 6.7

WATER BALANCE IN THE SOUTHERN AREA 2015

WITHOUT PROJECT IMPLEMENTATION

NO	RIVER BASIN NAME	CATCH AREA SQ.KM	RAIN FALL MM	RUN OFF FACTOR	RUN OFF MCM	Storage MCM	Inflow from other Basins MCM	Irrigation 2004 Demand MCM	Agriculture Plan 2015 MCM	Domestic Water Demand MCM	Industrial Demand MCM	Total Water Demand MCM	TransBasin Diversion MCM
3	Kalu Ganga	2766	3796	0.75	7875	500*		77		47.2		124.2	
4	Bentara Ganga	629	3796	0.75	1790			46		9.5		55.5	
5	Madu ganga	60	3568	0.75	160			76		9.5		85.5	
6	Madampe Ganga	91	3568	0.75	243			4				4	
7	Telawatte Ganga	52	3322	0.75	129			17		3.3		20.3	
8	Ratgama Lake	10	3066	0.75	23			1				1	
9	Gin Ganga	932	3676	0.75	2569			171		49.6		220.6	
10	Koggala Lake	65	3000	0.75	146			15		4.6		19.6	
11	Polwatte ganga	236	3000	0.75	531			176		5		181	
12	Nilwala Ganga	971	2077	0.75	1512	16*+17*		345		29.9		374.9	
13	Seenimodera Oya	39	2543	0.2	20			12				12	
14	Kirama Oya	225	2543	0.2	114	1+3.9*		74	16	4.5		94.5	
15	Rekawa Oya	76	1710	0.2	26			4				4	
16	Urubokka Oya	352	2070	0.2	146	50		105	30	3.5		138.5	
17	Kachchigala Ara	223	1053	0.2	47			160		3.6		163.6	
18	Walawe Ganga	2471	1818	0.25	1123	620		1018	90	35.13	45	1188.13	
19	Karagan Oya	59	1106	0.2	13			2				2	
20	Malala Oya	404	1071	0.2	86			41	25	1.5	15	82.5	
21	Embilikkala Oya	60	969	0.2	12			2		1.5		3.5	
22	Kirindi Oya	1178	1398	0.2	329	255		424	159	11.5		594.5	
23	Bambawe Oya	80	1100	0.2	18			2				2	
24	Mahasilawa Oya	13	978	0.2	3			0				0	
25	Butawa Oya	39	1100	0.2	9			0				0	
26	Menik ganga	1287	1429	0.2	368	95*		58	56	8.5		122.5	
27	Katupila ara	87	1100	0.2	19			2		1		3	
28	Kurunda Ara	132	1100	0.2	29			3				3	
29	Namabdagas Ara	109	1100	0.2	24			3				3	
30	Karambe Ara	47	1100	0.3	15			0				0	
31	Kumubukkan Oya	1233	1507	0.3	557	40*		49	25	9.6		83.6	
32	Bagaru Oya	93	1420	0.3	39			4				4	
33	Girikula Oya	16	1420	0.3	7			2				2	
34	Helawe Ara	52	1420	0.3	22			3				3	
35	Wila Oya	490	1482	0.4	218			16		3		19	
36	Heda Oya	611	1551	0.4	379	32		31	29.5	4		64.5	
37	Karandan Oya	427	1539	0.4	263			26		2		28	
	Total				**14751**		**0**	**2969**	**430.5**	**247.93**	**60**	**3707.43**	**0**

6.10.1 Phase I Development (2005 to 2015)

The phase I development aims to alleviate the current serious water deficits in the Kirindi Oya, Malala Oya , Urubokka & Kirama Oya basins. In this context the candidate projects in order of priority are :

- Weheragala reservoir Diversion to Kirindi Oya
- Urawa Diversion to Urubokka ganga
- Uma Oya Diversion to Kirindi Oya

Manik Ganga diversion with Hangune Ara & Weheragala reservoirs have to commence immediately so as to address the water deficits of 2900 Ha presently experienced in Lunugamvehera Reservoir settlement scheme.

In addition to the Agriculture Development for 2015, provision of domestic and industrial supplies to meet the demand projected for 2015 including that of Hambantota Port development also be included in Phase I. It is also proposed that Rathnapura Town ship and area affected by annual floods have to be afforded with protection measures by constructing the multipurpose reservoir 70m high at Malwala 5Km upstream from Rathnapura.

A water balance analysis of this development scenario, without project implementation is presented in Table 6.7. This scenario includes in addition to the present irrigation utilization requirements, the irrigation demands for Weli Oya diversion, Kekiri Obada reservoir and Uda Walawe L B extension projects, which have taken off the ground and the Granary area Program criteria described earlier. Taking the existing situation plus the above developments into the water balance, following deficits are noted.

It is clear that to make up a deficit of this magnitude would require the implementation of a major water resources development program. Candidate projects that could possibly meet these deficits are Uma Oya diversion, Digili Oya Reservoir project (drinking water) and Nakkala reservoir Projects. Muthukandiya reservoir project is recommended to be immediately taken up for rehabilitation as Feasibility & Design studies are already in place. These Projects are described in section 6.9.

The estimated 80% probable annual yields from these projects are 192CM for Uma Oya, 90 MCM for Manik Ganga and 30 MCM for Urawa in Nilwala diversion. A water balance analysis showing how these projects satisfy the requirements of Phase I development, is presented in Table 6.8. The economic analysis of the above projects is given in Table: 6.9 .

6.10.2 Phase II Development Program (2015 to 2025)

The phase II development represents maximum potential irrigation development for the Southern Area. The development area extends from the Left bank of Walawe Ganga to the Kumbukkan Oya . An area of about 62,000 Ha prime agricultural uplands have been identified located close to rivers and are easiest to command.

A water balance analysis of the phase II development scenario, without project implementation , is presented in Table 6.10 and includes provision of municipal & industrial supplies of Hambantota Port related development. This shows that, without project implementation, there would be a gross deficit of 800MCM for phase II, an increase of 450MCM per annum over and above phase I. Thus further water development projects would be required during phase II.

The principle Phase II development area extends from the Malala Oya to Kumbukkan Oya. From the water balance analyses, it can be seen that this can only practically be achieved by extending the Gin -Nilwala diversion to supply the Urubokka Oya and Malala Oya via the Walawe L B Canal.

The estimated 80% probable yield from the Gin Ganga at the proposed diversion point is 200MCM per annum, which would be diverted via a tunnel and hydropower station to connect with the Nilwala diversion proposed. This would increase the total diversion to 500 MCM which could be transferred to the Urubokka Oya and on to Chandrika Wewa to supply the Walawe right bank areas which would enable the Walawe L B canal to be extended up to Malala Oya.

A water balance analysis showing how these projects satisfy the requirements of the phase II development , is presented in Table 6.11.Thus it is recommended that Gin Nilwala Ganga Diversion be put forward as the anchor project for the phase II development.

6.11 Conclusion

Southern Region has remained an agricultural based society when compared with most of the other regions. Development activities in the region have been mainly concentrated with irrigated farming; paddy & sugar cane cultivation taking precedence in Moneragala District. There still remains a big gap in developing the full potential of water resources especially in the wet zone river basins, and

TABLE: 6.5 ACTION PLAN WATER RESOURCES DEVELOPMENT _ SR

Item	River Basin	Prop.Project	Catchment Area Sq.Km	Capacity FSL M	Elevation FSL-M M	Sur-face Area Ha	Diversion to River Basin	Annual Diversion MCM	Irrigation Extent Ha	water sup-ply Demand MCM	Installed Capacity MW
1	Manik Ganga	Weheragala & Hangune	575	75	91.65	850	Kirindi Oya	60	2900	5	
		Reservoirs	34	20	77.25	497	In Basin		322	5	
2	Uma Oya (Mahaweli)	Mahatotilla	600				Kirindi Oya	192	4750 new		90
3	Kalu ganga	Malwala -30m high	190	19			Flood	Protection			
		70m high	500				FP -100Yr & Hydro Power				33
4	Heda Oya	Muthukandiya +Dry Farm	65.85	30.17	95.12	387	In Basin			2	
5	Nilwala Ganga	Urawa	50.5	16	180	105	Muruthawela	30	2000	1.8	
		Digili - 33mHigh dam	30	17	51	90	In basin	FP & Irrigation	1300	3	2
		Siyambalagoda	177	120	90	550	Walawe R/B	450	40,000		
		Hulandawa		850					20,000		50
6	Gin ganga	Mediripitiya	132	65	295			100	10,000		40
7	Water supply to H'tota Port & Industry Walawe										
		Sittarama Upper	12.8	12.95	41.36			26		10	
		Sittarama Lower	4.86	10.74	20.93			19			
	Kachchigala	Mamadola	2.08	3.5	21.3	86				10	
		Deniya	1.47	2.3	50.47	74		11.6			
	Kirindi	Weligatte	1.74	2	12.65	34		7.2		70	
		Bundala	9.32	4	13.1	113		10.2		10	
8	Kalu ganga	Kukule High Dam		950			Ruhunu Basins irrigation				
		(Maguru Power House					HP+In basin FP				88

Table: 6.8
WATER BALANCE IN THE SOUTHERN AREA 2015
WITH PROJECT IMPLEMENTATION

NO	RIVER BASIN NAME	CATCH AREA SQ.KM	RAIN FALL MM	RUN OFF FACTOR	RUN OFF MCM	Storage MCM	Inflow fromother Basins MCM	Irrigation 2004 Demand MCM	Agriculture Plan 2015 MCM	Domestic Water Demand MCM	Industrial Demand MCM	Total Water Demand MCM	TransBasin Diversion MCM
3	Kalu Ganga	2766	3796	0.75	7875	500*		77		47.2		124.2	
4	Bentara Ganga	629	3796	0.75	1790			46		9.5		55.5	
5	Madu ganga	60	3568	0.75	160			76		9.5		85.5	
6	Madampe Ganga	91	3568	0.75	243			4				4	
7	Telawatte Ganga	52	3322	0.75	129			17		3.3		20.3	
8	Ratgama Lake	10	3066	0.75	23			1				1	
9	Gin Ganga	932	3676	0.75	2569			171		49.6		220.6	
10	Koggala Lake	65	3000	0.75	146			15		4.6		19.6	
11	Polwatte ganga	236	3000	0.75	531			176		5		181	
12	Nilwala Ganga	971	2077	0.75	1512	16*+17*		345		29.9		374.9	30
13	Seenimodera Oya	39	2543	0.2	20			12				12	
14	Kirama Oya	225	2543	0.2	114	1+3.9*		74	16	4.5		94.5	
15	Rekawa Oya	76	1710	0.2	26			4				4	
16	Urubokka Oya	352	2070	0.2	146	50	30	105	30	3.5		138.5	
17	Kachchigala Ara	223	1053	0.2	47			160		3.6		163.6	
18	Walawe Ganga	2471	1818	0.25	1123	620	60	1018	90	35.13	45	1188.13	155
19	Karagan Oya	59	1106	0.2	13			2				2	
20	Malala Oya	404	1071	0.2	86			41	25	1.5	15	82.5	
21	Embilikkala Oya	60	969	0.2	12			2		1.5		3.5	
22	Kirindi Oya	1178	1398	0.2	329	255	202	424	159	11.5		594.5	
23	Bambawe Oya	80	1100	0.2	18			2				2	
24	Mahasilawa Oya	13	978	0.2	3			0				0	
25	Butawa Oya	39	1100	0.2	9			0				0	
26	Menik ganga	1287	1429	0.2	368	95*		58	56	8.5		122.5	70
27	Katupila ara	87	1100	0.2	19			2		1		3	
28	Kurunda Ara	132	1100	0.2	29			3				3	
29	Namabdagas Ara	109	1100	0.2	24			3				3	
30	Karambe Ara	47	1100	0.3	15			0				0	
31	Kumubukkan Oya	1233	1507	0.3	557	40*		49	25	9.6		83.6	100
32	Bagaru Oya	93	1420	0.3	39			4				4	
33	Girikula Oya	16	1420	0.3	7			2				2	
34	Helawe Ara	52	1420	0.3	22			3				3	
35	Wila Oya	490	1482	0.4	218			16		3		19	
36	Heda Oya	611	1551	0.4	379	32		31	29.5	4		64.5	
37	Karandan Oya	427	1539	0.4	263			26		2		28	
							292	2969	430.5	247.93	60	3707.43	355

Table : 6.9 Economic Analysis of Major Action Projects - Water Resources - SR

Project Name	Acreage Ha	Paddy Yield T/Ha	Power MW	IRR	FPR	HPR	WSR	Total Rs. Mn
Weheragala reservoir - Menik Ganga	2900	29000		435				435
Uma Oya Diversion Project	4750	47500	98	712.5		1693.44	93.6	2499.54
Malwala reservoir- Kalu Ganga	0	0	33	0	230	570.24		800.24
Muthukandiya & dry Farm area	850	8500		127.5		0		127.5
Urawa & Siyambalagoda- Nilwala	6000	30000	50	450	100	864	83.2	1497.2
Mediripitiya _Gin Ganga	2000	20000	40	300	50	691.2		1041.2
Restoration of abondoned tanks -130Nos.	200	1600		24		0		24
Bolana 6 Tanks - water supply	0	0		0		0	1080	1080
								0
Total		136.6		2049	380	3818.88		6247.88
Sector GDP				27.8				27.8%
Contribution to GDP (sector)				7.37				7.370%
Contribution to Total GDP								0
Sector increase % wrt 2003		4.26		4.26				4.258%

Menik Ganga , Kumbukakkan Oya, Heda Oya & Karanda Oya in the South east dry zone.

34 River basins and the upper part of the Kalu Ganga basin flowing through the region have tremendous water resources potential. River basins in the Southwestern part have water surpluses and remain unexploited. According to the assessment of water availability studies for the region shown in Table 6.3, and the census of population 2001, the present per capita water availability is 2900 Cu M.

The salt water exclusion schemes in the coastal basins of Galle & Matara are performing at very low level of efficiency. Turning over these lands for other uses such as prawn farming & recreational activities or tourism would be advantages. Eg: Koggala lake & Dedduwa Rantotawila in Bentara ganga.

Although Hambantota & Monaragala areas are considered as dry zone areas, all the rivers running through these two districts have not been fully utilized to store & regulate the water potential except for Walawe & Kirindi Oya basins. Even these two rivers have excess water during the rainy seasons and discharge a fair amount of water to the sea annually. Kirindi Oya basin is short of about 100MCM for irrigation. Major part of this requirement could easily be met from Menik Ganga diversion & the balance have to come from outside basins of Uma Oya . Many studies have been carried out in the three river basins of Kalu, Gin & Nilwala since 1967 by ECL .Inc USA for multipurpose development to solve flooding, hydro power generation & diversion to the South east dry zone.

Three of the projects selected to be implemented by the year 2025 would generate much needed electrical energy to the national grid. The installed capacities will be 220MW of hydropower out of the potential of 300MW of hydropower still remaining to be commissioned.

The initial water supply needs for the Hambantota Port development could be met from Hangune Ara reservoir (5MCM) & balance from Uma Oya diversion to Kirindi Oya. The salinity barriers proposed to be constructed across Nilwala & Walawe by the NWS &DB need not be constructed if the above planned projects are implemented. There is no necessity to construct additional 6 reservoirs as a measure to augment Bolana intake to meet the Port development & related activities. The Gin Nilwala Diversion would look after this during the second phase for once and for all. But it is recommended to install an additional intake upstream of the Liyangastota anicut scheme where an assured supply could be guaranteed free of salinity.

What is required is the political commitment to implement indicating the dire requirements in Monaragala & Hambantota districts during drought periods as no other district suffers from water scarcity at present for longer periods in order to facilitate economic development of the region making use of its abundant natural resources such as land & water.

TABLE: 6.10
WATER BALANCE IN THE SOUTHERN AREA 2025
WITHOUT PROJECT CASE

RIVER BASIN		CATCH AREA	RAIN FALL	RUN OFF	RUN OFF	Storage	Runoff from Other Basins	Irrigation 2015 Demand	Agricultur Plan 2015-2025	Domestic Water Demand	Industrial Demand	Total Water Demand	TransBasin Diversion
NO	NAME	SQ.KM	MM	FACTOR	MCM	MCM	MCM	MCM		MCM	MCM	MCM	MCM
3	Kalu Ganga	1394	3796	0.75	3762	500*		77		53		130	
4	Bentara Ganga	629	3796	0.75	1790			46		11.8		57.8	
5	Madu ganga	60	3568	0.75	160			76		11		87	
6	Madampe Ganga	91	3568	0.75	243			4				4	
7	Telawatte Ganga	52	3322	0.75	129			17		5.5		22.5	
8	Ratgama Lake	10	3066	0.75	23			1				1	
9	Gin Ganga	932	3676	0.75	2569			171		60.8		231.8	
10	Koggala Lake	65	3000	0.75	146			15		5.5		20.5	
11	Polwatte ganga	236	3000	0.75	531			176		7		183	
12	Nilwala Ganga	971	2077	0.75	1512	33		345		42.5		387.5	
13	Seenimodera Oya	39	2543	0.2	20			12				12	
14	Kirama Oya	225	2543	0.2	114	4.9		90		5.5		95.5	
15	Rekawa Oya	76	1710	0.2	26			4				4	
16	Urubokka Oya	352	2070	0.2	146	50	30	135		5.6		140.6	
17	Kachchigala Ara	223	1053	0.2	47			160				160	
18	Walawe Ganga	2471	1818	0.25	1123	620	60	1018+90	87	57.7	85	1247.7	
19	Karagan Oya	59	1106	0.2	13			2				2	
20	Malala Oya	404	1071	0.2	86			66	25	3.5		69.5	
21	Embilikkala Oya	60	969	0.2	12			2		2		4	
22	Kirindi Oya	1178	1398	0.2	329	255	202	583	57.5	32	15	528.5	
23	Bambawe Oya	80	1100	0.2	18			2				2	
24	Mahasilawa Oya	13	978	0.2	3			0				0	
25	Butawa Oya	39	1100	0.2	9			0				0	
26	Menik ganga	1287	1429	0.2	368	95*		104	53	16	5	257	
27	Katupila ara	87	1100	0.2	19			2		1.5		3.5	
28	Kurunda Ara	132	1100	0.2	29			3				3	
29	Nambadagas Ara	109	1100	0.2	24			3				3	
30	Karmabe Ara	47	1100	0.3	15			0				0	
31	Kumubukkan Oya	1233	1507	0.3	557	40*		74	28	12.8		89.8	
32	Bagaru Oya	93	1420	0.3	39			4				4	
33	Girikula Oya	16	1420	0.3	7			2				2	
34	Helawe Ara	52	1420	0.3	22			3				3	
35	Wila Oya	490	1482	0.4	218			16		3.5		19.5	
36	Heda Oya	611	1551	0.4	379	32+118*		31	25	4.3		60.3	
37	Karandan Oya	427	1539	0.4	263			26		2.8		28.8	
							292	3400	275.5	344.3	105	4122.8	

Table : 6.11
WATER BALANCE IN THE SOUTHERN AREA 2025
With Project Implementation

RIVER BASIN		CATCH AREA	RAIN FALL	RUN OFF	RUN OFF	Storage	Runoff from Other Basins	Irrigation 2004 Demand	Agriculture Plan 2004-2025	Domestic Water Demand	Industrial Demand	Total Water Demand	TransBasin Diversion
NO	NAME	SQ.KM	MM	FACTOR	MCM	MCM	MCM	MCM		MCM	MCM	MCM	MCM
3	Kalu Ganga	2766	3796	0.75	7875	500		77		53		130	
4	Bentara Ganga	629	3796	0.75	1790			46		11.8		57.8	
5	Madu ganga	60	3568	0.75	160			76		11		87	
6	Madampe Ganga	91	3568	0.75	243			4				4	
7	Telawatte Ganga	52	3322	0.75	129			17		5.5		22.5	
8	Ratgama Lake	10	3066	0.75	23			1				1	
9	Gin Ganga	932	3676	0.75	2569	65*		171		60.8		231.8	100*
10	Koggala Lake	65	3000	0.75	146			15		5.5		20.5	
11	Polwatte ganga	236	3000	0.75	531			176		7		183	
12	Nilwala Ganga	971	2077	0.75	1512	33+495*		345		42.5		387.5	430*
13	Seenimodera Oya	39	2543	0.2	20			12				12	
14	Kirama Oya	225	2543	0.2	114	4.9	10	90		5.5		95.5	
15	Rekawa Oya	76	1710	0.2	26			4				4	
16	Urubokka Oya	352	2070	0.2	146	50	55	135		5.6		140.6	
17	Kachchigala Ara	223	1053	0.2	47		50	160				160	
18	Walawe Ganga	2471	1818	0.25	1123	620	230	1118	177	57.7	85	1437.7	
19	Karagan Oya	59	1106	0.2	13			2				2	
20	Malala Oya	404	1071	0.2	86		50	41	50	3.5		94.5	
21	Embilikkala Oya	60	969	0.2	12			2		2		4	
22	Kirindi Oya	1178	1398	0.2	329	255	332	424	115	32	15	586	
23	Bambawe Oya	80	1100	0.2	18			2				2	
24	Mahasilawa Oya	13	978	0.2	3			0				0	
25	Butawa Oya	39	1100	0.2	9			0				0	
26	Menik ganga	1287	1429	0.2	368	95		58	109	16	5	188	70
27	Katupila ara	87	1100	0.2	19			2		1.5		3.5	
28	Kurunda Ara	132	1100	0.2	29			3				3	
29	Nambadagas Ara	109	1100	0.2	24			3				3	
30	Karmabe Ara	47	1100	0.3	15			0				0	
31	Kumubukkan Oya	1233	1507	0.3	557	40		49	53	12.8		114.8	100
32	Bagaru Oya	93	1420	0.3	39			4				4	
35	Wila Oya	490	1482	0.4	218			16		3.5		19.5	
36	Heda Oya	611	1551	0.4	379			31	54.5	4.3		89.8	
37	Karandan Oya	427	1539	0.4	263			26		2.8		28.8	
							727	2969	558.5	344.3	105	4122.8	855

Chapter -07

Transport Plan

CHAPTER SEVEN

TRANSPORT PLAN

Introduction

Southern Region is served by all modes of transport available in Sri Lanka; i.e. road, rail, air and sea. However, the facilities available in the five districts vary significantly. Road transport is the predominant mode of transport. Most of the National roads are paved roads with traditional metalled & tarred surfaces. Some of the main roads and selected Provincial Council roads in the Galle, Matara & Hambantota Districts have been recently rehabilitated with asphalt concrete surfacing. However majority of the roads in southern region are in bad condition due to poor surface condition. Lack of maintenance and poor drainage facilities are the main reason for bad road conditions. Significant proportion of Local Government roads are gravel roads. These roads are also in poor condition due to same reasons. Average speeds on these roads are well below the typical rural standards.

Buses operate on main routes without much coordination. Majority of the buses that operate belongs to private operators and three state own cluster bus companies also provide services in this region. Public transport access to rural areas is very limited especially in Hambantota & Moneragala Districts. Rail service though exists, connects only two Districts to Colombo. Potential of the railway has not been fully utilized. No train service is available in Ratnapura, Hambantota & Moneragala Districts even though there had been a rail service in the Ratnapura District in the past.

There are two domestic airports within the region; one in Galle District at Koggala and the other in the Hambantota District at Wirawila. At present both these are managed by the Sri Lanka Air Force. The government has initiated a plan to develop an international airport at Kuda Oya in the Moneragala District.

7.1 Objectives

7.1.1 General Objective:

Develop a multi-modal transport system to enhance the functional efficiency and the productivity of the Southern Region.

7.1.2 Specific Objectives:

- To upgrade existing road network (both National & Provincial) to meet present day mobility and accessibility standards.
- To achieve an integrated multi-modal (Road, Rail, Air and Sea) transport system in terms of intra & inter regional and international linkages to meet the accelerated growth in agriculture, industrial, service & tourism sectors.
- To strength the regional linkages & improve connectivity with the rest of the country.
- To develop Hambantota as a major international access point for the Southern Region with port & airport development.
- To optimize the functional efficiency in the main urban centres using traffic & land use management.
- To enhance linkages or connectivity from urban centres to rural communities.
- To optimize the use of existing railway for passenger and freight transport.
- To promote air transport and maritime system to enhance tourism and freight transportation.

7.2 Issues & Constraints

Listed below is a summary of the critical issues and constraints that arise from the data analysis. Attention is give to addressing the issues & constraints that have a direct impact on achieving the objectives identified in the above Section.

- Low average speeds on National & Provincial roads within the region
- Poor road condition due to lack of maintenance
- Longer directness in travel and excessive travel times between other regions of the country
- Low road network density in Moneragala & Hambantota Districts
- Potential for higher growth in vehicle ownership levels in Matara & Galle Districts

- Poor access to places of tourists & cultural interests within the region
- No rail connection to Ratnapura, Hambantota & Moneragala Districts
- Under utilization of Air Transport facilities at Koggala & Wirawila

7.3 Provincial Road Network

In order to provide a satisfactory service it is necessary to maintain an average of 25-35 km per hour speed for the local roads. As traffic flow would not be a factor for speed reduction at present, by providing proper geometric standards and maintenance practice, desired speeds could be achieved.

It is necessary to increase the carriageway width to at least 4.5 m for local roads and reserve space for widening of all C & D Class roads. As mixed traffic condition is expected within the Region, adequate space for pedestrians and bicycles should be provided in all road links.

7.4 National Roads within the Province

At present all major roads, except certain parts of A002 - Colombo-Galle-Hambantota-Wellawaya road, leading out of the Region have adequate capacity to handle existing traffic levels. One of the main problems is insufficient space for pedestrians and bicycles, especially within urban and commercial areas. This contributes to the reduction in average travel speeds.

Outside the urban areas, average speeds on National roads are within the acceptable level of 50 km per hr. There are few road links such as A004 beyond Balangoda, A008 and A017 where geometric improvements may not warrant increasing the average speed due to the topography of the area. Some of these road links are running through landslide prone areas. All A-class roads must bring up to a level where average speed of 50 km per hour could be provided within the next 5 to 10 years. All B-Class roads must reach a level of 35-40 km per hour average speed. However, these speed levels may not be sufficient for the next 20 to 25 years. Therefore, it is necessary to reserve space where ever possible for future widening of A & B Class roads to reach at least 80 km per hr and 50 km per hr average speeds respectively. In situations where the topography dose not warrants widening, new high mobility road traces have to be planned.

7.5 Connection to Other Regions

Even though the main urban centers are adequately connected to other urban centers of the country through the existing road network, inter regional mobility between the certain parts of the Southern Region (Especially Moneragala & Hambantota) and other regions are at a very low level. Even the inter district movements within the Region is also restricted due to longer travel lengths. One of the reasons for poor mobility is that the Southern Region is spread over a larger area and the central hills act as a barrier for inter Regional linkages. Due to geographic limitations and the present spread of the National road network, access times from other regions are relatively higher compared to the direct distance. For an example travel times from Western province to Moneragala & Hambantota are excess of six hours due to the central hills or longer travel distance along the existing roads. This isolation due to excessive travel distances and travel times is one of the prime reasons for the slower economic growth in these two districts.

Significant improvements in travel times could not be achieved by improving & widening the existing roads. Use of a faster mode of transport such as air transport or make use of a high mobility road network linkages is vital to improve inter-regional movements. At present, demand for inter regional travel to and from the remote parts of the Southern Region may not warrant any exclusive high mobility road connection. However, a road link that could connect other Districts and Regions and that could provide travel time under five hours to Colombo should be explored within the next 10 to 15 years. Route directness of such a road link would be the key factor for success.

7.6 Connectivity to Tourist Areas

The Southern Region is rich of places of cultural value and scenic beauty that may attract foreign and local tourists. One reason for the less popularity is the scattered nature of these places and poor transport access from main roads. Other main reason is the longer distances and excessive travel times from other regions of the country. Hotels and other tourist facilities are also under developed in the remote parts of the Region. However, it may be possible to increase the tourist attractions by providing enhanced transport connections.

7.7 Passenger Transport & Traffic Management

With the development of urban centres, there will be a significant increase in urban population. This in tern increases the vehicle ownership levels and traffic flows on roads. In order to avoid traffic congestion and improve road safety two fold approaches need to be taken.

First option is to improve public transport service within the region so that the need for private vehicle usage could be reduced. To achieve this it is necessary to provide an efficient bus route network and a reliable service. In addition improved terminal facilities, bust stop locations and user information system need to be provided.

The second option is to provide improved traffic management measures especially within urban areas. Facilities to pedestrians and bicycles is utmost important in this region. Separate pedestrian and bicycle paths should be provided where ever possible and otherwise all urban roads must have sufficient space for pedestrians and non-motorized vehicles.

In order to reduce the traffic congestion that would be expected in the near future and to facilitate easy access to and from the Southern Expressway a by-pass road to Galle town area is proposed. This road could act as the outer boundary for the Galle town area development and would connect all National roads entering the Galle town. With the new by pass road a new transport hub could be established at a location North of the existing railway station & bus terminal so that existing facilities could be used for city centre development. Changing the engine for reversing at the present railway station will not be required with the realignment of the railway line.
Advance traffic management measures such as coordinated traffic signals, one-way operations should be introduced prior to reaching congested levels in the long run.

7.8 Railway Operation

Out of the five Districts in the Southern Region only Galle & part of Matara Districts are served by rail. The Region is served by only 95 km of rail line and 32 stations. Railway is used as a mode of transport for long distance movements at present. Slow and unreliable service is the reason for not having very high demand for railway. Single-track line with limited passing facilities, poor condition of the railway track and signalling system with expansion limitations are the reason for the unreliability and increase in travel time.

The Coastal rail line has the potential of facilitating freight transportation to and from the Southern Region. Especially, agriculture produces from Embilipitiya area such as fruit & rice and cargo from existing Galle port and proposed Hambantota port could be economically transported by rail. This will reduce the burden on roads due to heavy truck movements.

It is necessary to strengthen the track and improve signal and passing facilities to improve the travel times and reliability. Extension of the coast line from Matara to Kataragama via Embilipitiya and Hambantota would result in the developing the South-Eastern rural areas.

7.9 Air Transport Facilities

There is a need to have a designated airport within the country as an alternative to the Bandaranayake International Airport (BIA), Katunayake. A designated airport at relatively closer proximity would be a big saving to the airlines serving BIA at present as they do not have to carry extra fuel to Chennai or Male. Airport & Aviation Services has identified Kuda Oya, Wellawaya as the suitable location for the alternate airport. Development of an airport at Kuda Oya would not only satisfy the above need but also serve a catalyst for the regional development. New airport at Kuda Oya could function as a hub for freight movement while accommodating local flights. In addition the air strip at Koggala could be developed to cater for tourism in the area.

7.10 Sea Ports

In 1997 the Government introduced “National Ports and Shipping Policy” The long term vision of the policy is to consolidate and further development of its position as a competitive shipping center in the South Asia region which would result in the generation of economic activity, employment and income. Macro economic objectives are;

- Facilitate Sri Lanka's sea borne trade
- Generate economic activities and thereby enhance employment opportunities and income
- Ensure an adequate return on investment for the public sector and private sector investors.

Three districts of the region, namely Galle, Matara and Hambantota are bounded from one side by the sea. There are historical evidence that sea ports in the southern region played important roles in the country's economy.

7.10.1 Galle Port

A feasibility study has been completed by SLPA for development of the Galle port with the aim of developing it to be a regional port. The main proposal is to construct a new multipurpose terminal at the south of Gibbet Island. The project will consists of 2 number of multipurpose berths (240 m long and -14m deep), approach canal (160m wide), and a Turning basin.

The Port is located 120 km South of Colombo Port on the South West Coast of the country and is much nearer to main international shipping routes between the east and the west than the Colombo Port and is the only commercial port in the south west coast at present.

7.10.2 Proposed Hambantota Port

Shipping policy of Sri Lanka published in 1997 included establishment of a seaport in Hambantota. The proposal for location of a sea port in Hambantota could be justified based on the following reasons.

- Over 100 ships by pass Sri Lanka daily during the 3700 nautical mile long voyage from Aden to Singapore (From Europe to Far East). This long journey has necessitated the ships to carry a large quantity of fuel, water and other supplies. Establishing a sea port at Hambantota would facilitate these ships to carry lesser amount of fuel and supplies and carry more cargo thus gaining more profits. This vast sea traffic can call at Hambantota in 40 minutes, instead of 4 hour deviation to Colombo as Hambantota is within 10 nautical miles of the world busiest international shipping line.

- A large extent of unencumbered developable land close to the town for port related land based developments is available. This is an important potential over other ports as a fully pledged port city could be planned without any restrictions. Optimum benefit of a port could be obtained when it is integrated into a port city planning where other related activities such as, industries, services and trade are made integral parts. Due to presently undeveloped land availability such an integrated city planning system can be easily introduced without large sums of money being invested in land acquisition.

- Easy accessibility to international information super high way being located close to the southern coast could make Hambantota connected to the East and West with less cost.

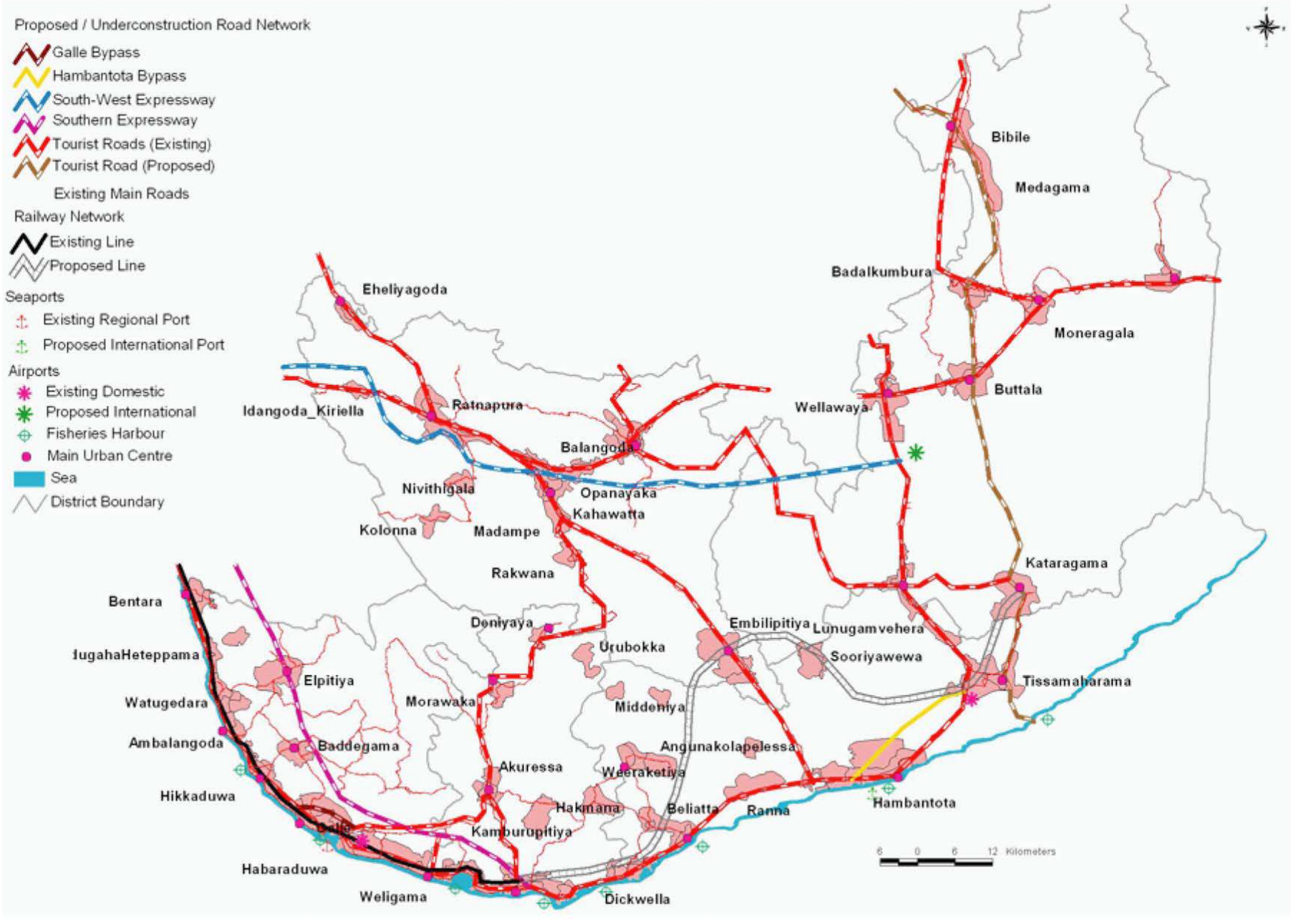
- Hambantota is just within the deep waters - 20 meter contour that can easily accommodate demand for ever increasing modern deep water vessels - post Panamax / Suezmax container ships and even future generation ships. The natural depth along the cost line is a blessing to develop a deep water sea port.

- Hambantota is not affected from South West monsoon and thereby cost of operation and maintenance of the port would be less as it will not face the kind of silting that other ports face. When considering other weather conditions Hambantota is not subject to the cyclonic activities that affect the Bay of Bengal and the North – Eastern Coast of Sri Lanka.

- It will also be very cost effective to develop the port in Hambantota due to favorable geo-technical conditions and potential to construct in the dry area outside the sea.

- It is very well position in the marine gateway to Indian Sub continent, than ay other Indian Port to act as transshipment center. It is well positioned to cater to east and west coast of India, Pakistan, Myanmar and Bangladesh.

- It is also geographically well positioned to serve domestic needs. Present road network well connects it with the Southern, Eastern and Central part of the country. Improvement of these national roads together with completion of proposed highways will make the need for Hambantota port well established.



Southern Region Physical Plan

Figure: 7. 1

Proposed Transport System - Southern Region

Source: SWP_SRPP

National Physical Planning Department

- Due to land availability and proposed infrastructure development extensive industrial development activities that are centered around port such as, oil refineries, power generation, petrochemicals, ship repair, ship building, bunkering and other service industries such as supply of water, food, medicine, logistics centers, distribution parks, export processing zones, Free trade zones etc. can be provided, making a multiple impact on the regional and national economy.

- Location of extensive wild life sanctuaries and forest cover and easy access to east coast and southern coast will provide service men of ships good recreation facilities.

Five alternative locations have been studies for location of the Port. They are;

(i) Site I - Hambantota Bay
(ii) Site II - Karagan Levaya
(iii) Site III - Mirijjawila
(iv) Site IV - Ambalantota
(v) Site V - Kalametiya

After studying social, economic, technical and environmental aspects site number II – Karaganlevaya has been recommended for location of the proposed port. It is located close to the existing Hamabntota town. The site was said to be used for salt production and now is abandoned. It is about 3.5 km long and about 2.0 km wide. There exists a large extent of developable land around it therefore possibility of development of a new port city together with large industrial zones exists.

Three options for siting of the harbour have been studies. These options are;

(i) Option I - Outer Harbour – Construction of the harbour in the ocean as a reclamation project.
(ii) Option II – Inner harbour – Construction of the harbour inside the Karagan levaya with minimum facilities located off shore.
(iii) Option III – A mix of both above two options.

1.1 Strategy

Development Strategy of the transport plan is two fold as listed below;

(i) Connection of the three main land use system proposed in the regional plan (i.e. urban centres, commercial agriculture zone and rural home gardens) mainly by roads and connection of the region with the rest of the country with high mobility roads and rail.
(ii) Exploiting the economic potential of international shipping industry by mainly developing Hamabantota port as an international port and Galle port as a regional port.

1.2 Proposals

A summary of the high priority projects are given in the table 7.1

Table 7.1
Summary of Projects

Project	Benefits
Road rehabilitation - Rehabilitate all roads that do not satisfy minimum standards stipulated in sec. 7.3	Improve mobility and accessibility of the region, savings in vehicle operating cost & travel time.
New road links - Galle by-pass road, Hambantota by-pass road.	Reduction in congestion level in Galle and travel time of vehicle operating costs for road users.
Tourist routes - Create scenic (tourist) routes through the Southern Region connecting groups of places of interest as follows: A Kirinda, Yala, Tissa, Kataragama, Buttala, Bibila that could be extended to Polonnaruwa or Lahugala & Pottuvil B Kataragama, Thanamalwila, Kaltota, Balangoda, Pinnawala, Bogawantalawa that could be extended to Nuwara Eliya.	Icrease in tourist flow to the region and increase in employment generation in the region.

Rail Line extension – Strengthening the existing track and improve signal and passing facilities to improve the travel times and reliability. Extension of the coast line from Matara to Kataragama via Embilipitiya and Hambantota.	The Coastal rail line has the potential of facilitating freight transportation to and from the Southern Region. Especially, agriculture produces from Embilipitiya area such as fruit & rice and cargo from existing Galle port and proposed Hambantota port could be economically transported by rail. This will reduce the burden on roads due to heavy truck movements. Extension of the railway line to Hamabantota would result in the developing the South-Eastern rural areas.
High mobility connection - Provide a high mobility road connection to South-Eastern part of the region.	Possible regional developments due to easy access and improved connections to other regions in the country.
Airport development	Boost the regional economy
Port development	Catalist for the regional development and employement generation.

Chapter -08

Tourism Plan

CHAPTER EIGHT

TOURISM PLAN

8.1 Introduction

Tourism is the 4th largest foreign exchange earner of the Country accounting for Rs... 31.2 billion ($323 million) in 2003. 115,000 people are directly and indirectly employed in the tourism sector. Tourist Guest Nights reached an all time high in 2003 recording 4.7 million with 500,642 arrivals. The tourist expenditure per head per day however has recorded a modest 10 percent increase from US$ 63 in 2000 to US$ 69 in 2003. This would not indicate any gain for the Country as the Sri Lanka Rupee against the US $ Dollar declined by 21 percent between the two reference periods.

Visitor spending and the number of visitor guest nights provide the basis for estimating the current tourist revenue. Tourism as a percent of total GNP in 2003 was recorded as 2.3 percent. It is unlikely that down stream sectors will be vulnerable to fluctuations in tourism. However the aggregate multiplier calculated from input/output tables for 1990 indicates that the Sri Lanka economy would benifit from supplying input needs which are relevant in the planning of tourism in the future.

The graded and supplementary accommodation (Rooms) had increased only by 9 percent between 1997 and 2002. Therefore future levels of tourism activity will depend on the provision of hotel bed spaces (including various facilities). Revenues could be optimized by establishing a strong link with other sectors of the economy.

The present Distribution of graded hotels in Sri Lanka and the Southern Region are given in Table 8.1

Table 8.1
Availability of Hotels in the Region 2003

Hotel Class	Number of Hotels		Southern Region as % of Total
	All Island	Southern Region	
5 Star	13	01	7.6
4 Star	08	01	12.5
3 Star	06	01	16.6
2 Star	31	03	9.4
1 Star	19	06	31.6
Total Classified	77	12	15.6
Total Unclassified	161	53	33.0
Total	238	65	27.0

Source: Ceylon Tourist Board

In 2003, the tourists on vacation or arrivals for pleasure accounted for 81 percent of the visitors to the country. The arrivals on business were 9% whilst 10% of arrivals were for other purposes.

The Southern Region can offer much more for tourists as the region is very rich in tourist attraction sites, particularly the coast line. The coastal line of 272 Km, distributed as follows has been playing a predominant role in attracting vacation tourists.

Galle District	73km
Matara District	48km
Hambantota District	151km

The Southern Region is a core area in Sri Lanka's tourism accounting for 65 hotels or 27.3 percent of 238 scheduled and unscheduled hotels in the Country. The project area under study contributes over 50 percent of exchange earnings in tourism.

As a tourist centre, Sri Lanka has always been a preferred travel destination among European travellers.

Sri Lanka is epitomized as a cheap beach destination among the high income receivers of Western Europe indicating the failure of the authorities to offer

a product at a premium price to the high spending Western European tourists. Sri Lanka has apparently failed to segregate the market and offer differentiated products for different prices. This underscore the need to completely re-evaluate the strategies for tourism development in the region.

8.2 Objectives

(i) To make tourism a key contributor to the growth of the services sector in the region.

(ii) To expand the areas of tourist interests from the typical "beach" tourism to value added tourism such as eco-tourism, adventure tourism, culture tourism, a center of ayurvedic medicine etc.

(iii) To prepare an eco-tourism plan in order to promote the concept of eco-tourism within the region

(iv) To regain lost opportunities and credentials (i.e. Unawatuna beach which was once ranked as the fourth finest beach in the world has now downgraded to the 12th position due to environmental pollution and poor management.)

8.3 Potentials

Southern region has a high potential for development as a major tourist destination on account of the following.

- Presence of high bio-diversity hot-spots and diverse eco systems, some of which are world famous for their richness in bio diversity

- Availability of a large forest cover comprising both low-land rainforests and dry monsoon forests.

- Availability of a variety of attractive places/sites to meet the discriminative tastes of tourists. These include;

  - World renown wildlife reserves
  - A long coastal belt (272 Km)
  - Historical and cultural buildings and sites
  - Extensive inland water bodies

- A climate that helps in sustaining a tropical forest cover

- Availability of world heritage and RAMSAR sites (Galle Fort, Rekawa Lagoon, Madu Ganga etc.)

- Annual and seasonal cultural activities such as Kataragama festival, 'Sri Pada' pilgrimage across the area, etc.,

- Construction of the Southern highway would make most of the tourist areas easily accessible.

- Existence of several agro-ecological zones facilitating the production of different varieties of agricultural products.

Table 8.2
Number of Sites Identified as Environmentally Sensitive in the Region Having Tourist Potential

District	Number of Attractive Sites			
	Forests Reserves	Wildlife Reserves	Water Courses	Historical Sites
Galle	11	6	11	34
Matara	12	13	15	36
Hambantota	10	9	25	46
Monaragala	8	6	30	-
Ratnapura	5	-	17	14

8.4 Constraints

- High incidence of human-elephant conflict
- Poor infrastructure facilities impeding accessibility and mobility
- Poor management of historical sites (i.e. Galle Fort)
- Environmental degradation particularly in urban areas and tourist sites.
- The low quality of facilities available for tourist

- Lack of training centres to develop human resources in tourism.
- Haphazard and unauthorised developments along coastal belt particularly in areas of tourist interest such as; Hikkaduwa, Unawatuna etc.

8.5 Strategies

The strategy for tourism development is discussed under five specific proposals as listed follows.

(i) **Develop the Region with specific themes** for each District

District	Theme
Galle	Historical and eco-tourism
Matara	Historical and eco-tourism
Hambantota	Wildlife and cultural tourism
Monaragala	Wildlife and bio food
Ratnapura	Adventure, Festive/cultural tourism, Jewellery mart

It should be noted that in every district in addition to the assigned theme many other tourist attractions are also available, such as ayurvedic medicine, rich bio food.

(ii) **Develop infrastructure**, including roads and hotels – Most of the tourist sites particularly sites of historical significance and sites rich in bio diversity are not accessible at present. Even accessible sites are difficult to visit due to the poor transport network. The transport plan has given special consideration to make the tourist sites easily accessible. The Southern Expressway will improve the accessibility. The other relevant roads for promoting tourism as proposed in the transport plan;

- **Scenic (tourist) route** through the Southern Region connecting Kirinda, Yala, Tissa, Kataragama, Buttala, Bibile could be extended to Polonnaruwa or Lahugala & Pottuvil.

- **Scenic route** through the Southern Region connecting Kataragama, Thanmalwila, Kaltota, Balangoda, Pinnawala, Bogawantalawa could be extended to Nuwara Eliya.

- **Strengthening the existing rail track** and improving signalling facilities to ensure reliability and reduce the travel time. Extension of the coast line from Matara to Kataragama via Embilipitiya and Hambantota.

- **A new high mobility** connection to the South-Eastern part of the region.

(iii) **Organize urban centres** with well conceived urban design proposals to make them attractive service centres. Due to the distinct topographical features and natural beauty of the towns in the region, every town can be made to look different and aesthetically pleasing. The proposed settlement plan brings out a hierarchical order of settlements with specific roles. An urban design proposal for Galle city is presented in Chapter 13.0 as a model.

(iv) **Produce tourism development plans** for each of the resort areas / potential zones such as, Galle Fort and bay, Hikkaduwa and Unawatuna. The plans will be based on urban design principles to make the areas very pleasing both in terms of natural and built environment. A proposal made for Galle Fort and the neighbouring environment is presented in Chapter 13.0

(v) **Develop tourist areas for up market / niche market** – Although Sri Lanka has been a popular destination particularly for Western tourists, income per tourist remains at a very low level. The strategy proposes to develop products/areas for high spending groups mostly through eco-tourism.

8.6 Projects

8.6.1 Galle District

(i) Galle Fort – Creation of a high quality theme park for entertainment and leisure.
(ii) Improvement of the built environment and infrastructure of the Unawatuna Beach Resort, and make more land available for high quality hotel development. (Ranked earlier as the 4th Finest Beach in the world and now ranked as 12th).
(iii) Introduction of recreation facilities in Unawatuna bay (surfing, boating, snorkeling,).

(iv) Development of a Marina and Underwater Museum in the Galle bay.
(v) Eco tourism development project at Madu Ganga.
(vi) Tourism development at Dedduwa (800 hectares), 18 Hole Golf Course, Race Course, related recreation facilities, and amusement park.
(vii) International Golf -Courses development projects at Kohilawatta and Halwatura Ela in the Ambalangoda area.
(viii) Improvement of the built environment and infrastructure of Hikkaduwa and Unawatuna.
(ix) Redevelopment of Galle city as a "Green, Clean and garden city which would be a model town for other cities and towns to emulate.
(x) Develop natural heritage sites-(Sinharaja and surrounding village habitat).

8.6.2 Matara District

(i) Weligama bay multi purpose tourism development program to cater to both local and foreign tourists.
(ii) Infrastructure development in Matara district (including road improvement, telecommunication and hotel facilities). particularly in areas with a similar climate and topography to that of Nuwara Eliya.
(iii) Kiralakale wet land conservation project for eco-tourism.

8.6.3 Hambantota District

(i) Develop Rekawa, Ussannagoda, Kalametiya ,Kumana as centres for eco-tourism (Nature trails and turtle watching).
(ii) Develop eco-tourism sites with multi-purpose potential ie religious, adventure etc.
(iii) Development of Suriyawewa Hot-spring as a tourist attraction.

8.6.4 Monaragala District

(i) Establishment of eco-agricultural park in Kahakurullanpalasse for the promotion of eco -tourism.
(ii) Eco -tourism development project using more than 75 archeological sites.
(iii) Development of the Elephant Corridor in Moneragala (Handapangala).

8.6.5 Ratnapura District

(i) Establishment of an eco-agricultural park in Embilipitiya.
(ii) Establishment of Gem – Exhibition Park in Ratnapura City.

Chapter -09

Settlement Plan

CHAPTER NINE

SETTLEMENT PLAN

9.1 Introduction

Settlement pattern of any country is primarily governed by three factors such as the economy, availability of social, economic and physical infrastructure and land use controls.

The best human settlement pattern of the country had existed during the ancient period where heavy concentration of the population had taken place in the dry zone keeping environmentally sensitive areas conserved. Particularly wet zone and hill country were regarded as areas of nutrient and water supply for development of dry zone civilization and that conservation of those areas together with efficient water resources management were considered to be fundamental pre-requisites for the sustainability of ancient civilization.

The present settlement pattern of the country is much unplanned. High concentration of population has taken place in the wet zone where highest bio diversity presents. Unplanned urban sprawl has further resulted in fragmentation of productive agricultural lands into non agricultural uses. Dispersed and low density settlement pattern has created inefficiency and ineffectiveness in provision of infrastructure. This unhealthy settlement pattern has been partially responsible for deterioration of standard of living, particularly of the rural population.

Compared to other districts in the region, Galle, Matara and Ratnapura have relatively better infrastructure and also easy accessibility to Colombo. Hence there has been a tendency for the people of these districts to out migrate particularly to the Western Province. On the other hand Monaragala and Hambantota districts have a relatively poor social, economic and physical infrastructure and are located far away from Colombo. Out migration from these districts is relatively low. They also do not attract population from other regions.

The present settlement pattern of the region has many disadvantages as summarized below:

- In Galle, Matara and Rathnapura districts, relatively fast urbanization takes place along main access roads creating a linear development pattern.
- Productive agricultural lands in these three districts are subjected to haphazard land subdivisions for housing development.
- In Hambantota and Monaragala districts population is very sparsely distributed.
- Subdivisions of agricultural lands take place among family members increasing the share of small land holdings thereby creating an adverse impact on the agricultural productivity.
- Dispersed and low density residential development has made the provision of infrastructure inefficient and costly.
- In Galle Matara & Hambantota Districts a heavy concentration of population and Urbanization has taken place along the coastal belt, particularly within a belt of about 1 km from the mean sea level. Lands within this strip are situated at very low elevations (some are even below sea level) making them vulnerable to natural disasters such as tidal waves.

9.2 Basis of the Settlement Plan

The Proposed settlement pattern for the region would be based on the following four main factors:

- National physical planning guidelines.
- Economic strategy plan (Chapter two)
- Environmental Management Plan (Capter three)
- Natural Disasters particularly those associated with Tidal Waves , Cyclones etc. in the Coastal Zone and Earth Slips in the hilly areas.

9.2.1 National Physical Planning Guidelines

National Physical Planning guidelines related to settlement planning are summarized below:

- Develop a second major metropolitan region in the North Central and Eastern part of the country incorporating Anuradhapura, Dambulla, Polonnaruwa and Trincomalee.
- Develop three small scale metropolitan areas centered around Jaffna, Hambantota and Ampara – Batticaloa.
- Develop 15 metro urban centers. In the southern region, it would be Hambantota.
- All the other urban enters will be developed in a hierarchically structured manner.
- Promote high and medium density residential development to optimize the land use.
- Nine first order centres (national urban centers) have been proposed. Hambantota is one of them.

- Twenty eight second order urban centers have been proposed. Galle, Matara, Embilipitiya, Balangoda, Rathnapura and Monaragala are the second order centers proposed for the southern region.
- Development of an integrated multi-mode transport network.
- Strengthening rural-urban linkages
- Prevention of the fragmentation of productive agricultural lands.

The national physical planning guidelines on macro level settlement pattern are illustrated in figure 9.1.

9.2.2 Economic Strategy Plan

The economic strategy plan for the southern region (Chapter Two) has given high priority to two sectors in the economic development process of the region.

(i) Export oriented commercial agriculture and
(ii) Export oriented service sector

9.2.3 Environmental Management Plan

The environmental Management Plan (chapter 03) has zoned 45.5% of total land extent of the region as “Environmentally Sensitive” leaving only 54.5% available for development

9.2.4 Natural Disasters

Natural Disasters associated with Tsunamis & Sea Level rise due to global warming in the coastal belt, Earth Slips and Floods particularly in the Ratnapura District and droughts in the dry zone part of the region, particularly in the Hambantota District.

9.3 Objectives

Objectives of the settlement plan are as follows;

- Protect and conserve agricultural lands
- Conserve environmentally sensitive areas
- Promote concentrated (high to medium density) development as against linear development
- Efficient provision of access and cost effective infrastructure to every site.

9.4 Strategy for Developing a Settlement Plan

The proposed settlement pattern will have three broad zones as follows;

(i) High Density Urban Development Zone in Selected Cities / Towns

Higher urban growth rates would be promoted in selected urban centers so as to create a high density urban system that would make economic development more productive and efficient. The strategy is based on increasing the share of urban population of the region up to 54.0% by 2030 as indicated in table 9.1. These cities and towns would accommodate growing population in the rural sector thereby minimizing land fragmentation. Depending on the economic roles assigned to every district, each town will perform a specialized role. (i.e. Galle city would be mainly a tourist city while Hambantota would be a port city with large scale industrial establishments.) The service sector has been recognized as a major sector in the economic strategy plan and a higher rate of urban growth is necessary to support the expected development in the service sector. Service sector development will eventually support further urban development, so that collectively they will create a strong positive development cycle. The estimated urban population of the region is given in the table 9.1.

Table 9.1
Estimated Urban Population (in Millions)

Districts	Estimated Urban Population								
	2011			2021			2030		
	Total Pop	Urban Pop	%	Total Pop	Urban Pop	%	Total Pop	Urban Pop	%
Galle	1.110	0.526	47.4	1.150	0.612	53.2	1.202	0.707	58.8
Matara	0.762	0.366	48.0	0.791	0.482	61.0	0.825	0.635	77.0
Hambantota	0.569	0.308	54.1	0.915	0.503	55.0	1.293	0.837	64.7
Monaragala	0.468	0.104	22.2	0.557	0.143	25.6	0.655	0.202	30.8
Rathnapura	1.171	0.304	26.0	1.200	0.376	31.3	1.250	0.421	33.7
Total	4.080	1.649	40.4	4.613	2.116	45.9	5.225	2.802	53.6

(ii) Export Oriented Large Scale Commercial Farms Zone.

The economic strategy plan has placed high priority on the development of the agricultural sector. Current problems associated with the agricultural sector are listed under section (iii) below. One of the strategies proposed to overcome these problems and develop a sustainable agricultural sector is to develop large scale commercial farms oriented towards the export market. Such farms would play a key role in the proposed settlement structure where a part of the excess population in the rural sector will find employment. This is expected to minimize land fragmentation. The farms will play a vital role for the sustainability of both the rural sector and the farms by themselves as;

- Providing employment to a part of the excess population in the rural sector.
- Purchasing produce of the rural sector for the export market.
- Transferring technology to the rural sector
- Creating a demand for other services in the rural service centers.
- Establishing research and development facilities on a commercial basis.

(iii) Low Density Rural Settlements / Home Gardens

A large extent of low density rural settlements in the form of home gardens are present in every district of the region. The main source of income of the people is agriculture. The extent of land holdings vary from half an acre to five acres. The major problems in the sector are;

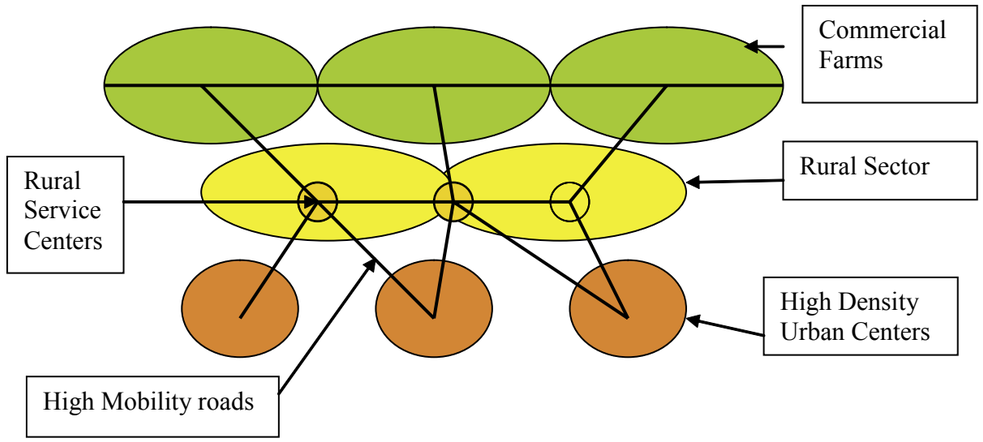
- Land fragmentation due to the lack of other economic activities.
- Low productivity due to small land holdings; non use of modern technology, and the non availability of Research and Development facilities.
- Poor accessibility to infrastructure (both social and physical).
- Lack of income earning sources other than agriculture.
- Social problems associated with the above mentioned factors such as high suicide rates, women headed households etc.
- Labour shortages.
- Absence of an organized market.

The proposed settlement plan is designed to overcome these problems. The main elements of the strategy are;

- Strategic location of the first two zones around the rural sector roads and linking all the three zones by high mobility roads.
- Provide the necessary social and physical infrastructure, particularly accessibility, health and education.

Figure 9.2 indicates the conceptualizes the proposed settlement plan.

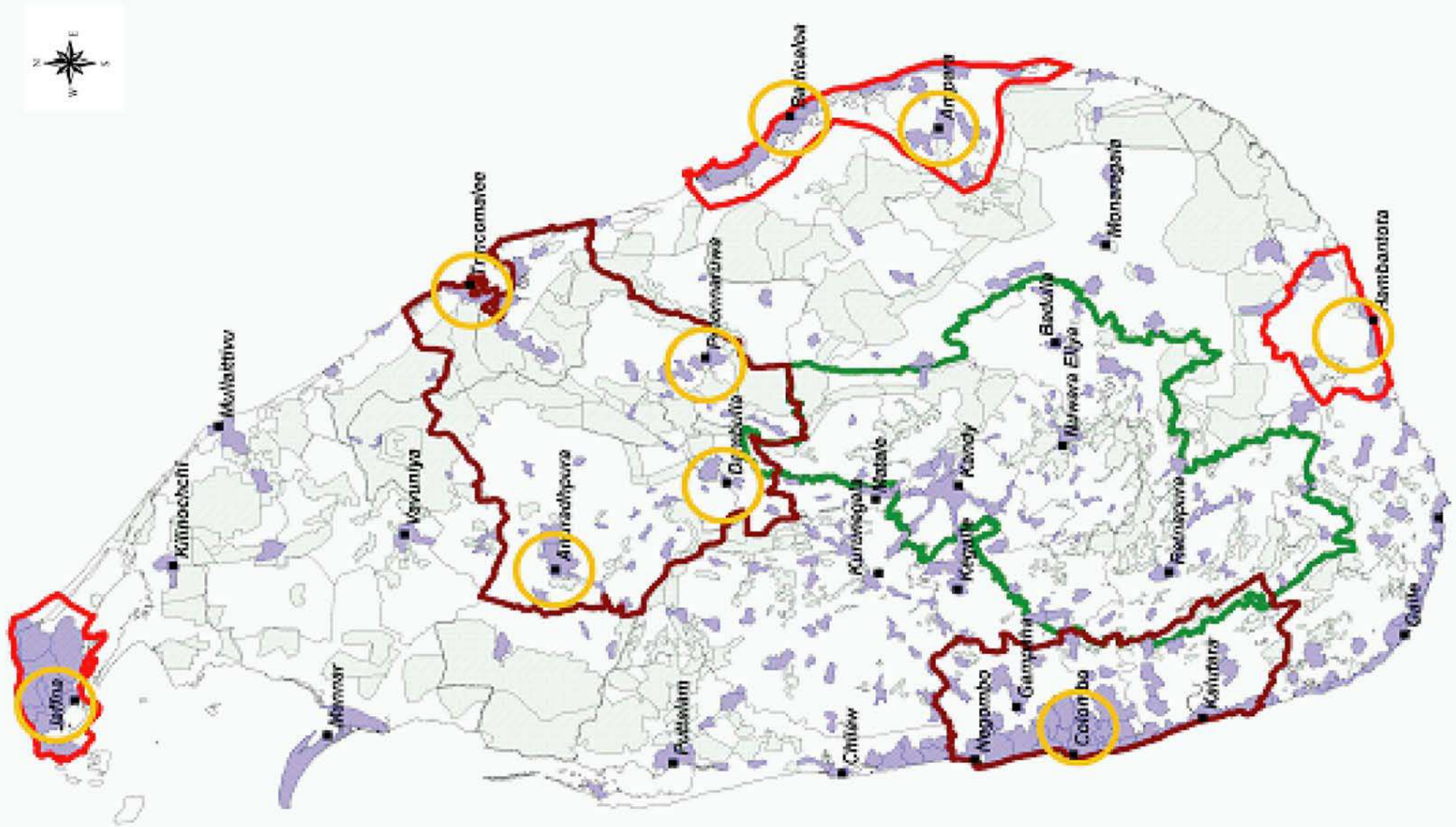
Figure 9.2
Proposed Settlement Plan – Conceptual Diagram



Figures 9.2, 9.3,9.4, 9.5 and 9.6 indicate the proposed settlement plans for Galle, Matara, Hambantota, Monaragala and Rathnapura districts. The proposed settlement structure for the whole Southern Region is given in figure 9.7.

9.4 Urban Hierarchy

In determining the urban hierarchy, factors such as the concentration of population, provision of services to the intended population, existing urban hierarchy, proposed development and the overall regional growth were considered. The aim of the plan is to make Hambantota the major urban centre of the region with a population of 584,000 persons in year 2030. Other growing urban centers would be Galle, Matara, Embilipitiya, and Wellawaya with new economic tasks being assigned to them. The proposed urban hierarchy for the region is illustrated in figure 9.8. Table 9.2 indicates the hierarchy of urban settlements.



Southern Region Physical Plan

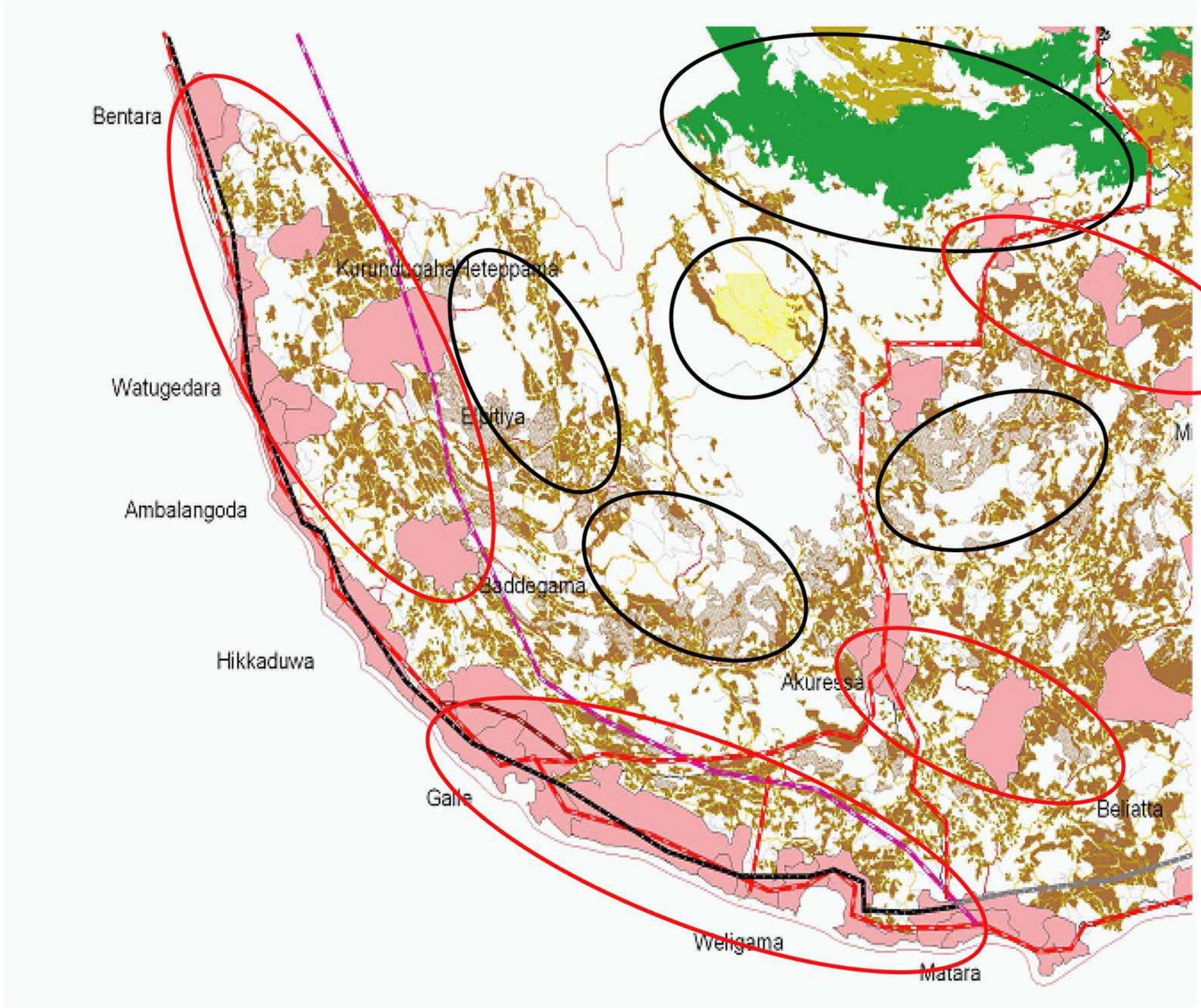
Figure: 9.1

Proposed Metropolitan Regions/Areas - 2030

Source: NPPD

- Metropolitan Region
- Metropolitan Area
- Metro Urban Centres
- Other Urban Centres
- Environmentally Fragile Area
- Wild Life & Forest Reserves

National Physical Planning Department



Southern Region Physical Plan

Figure: 9.2

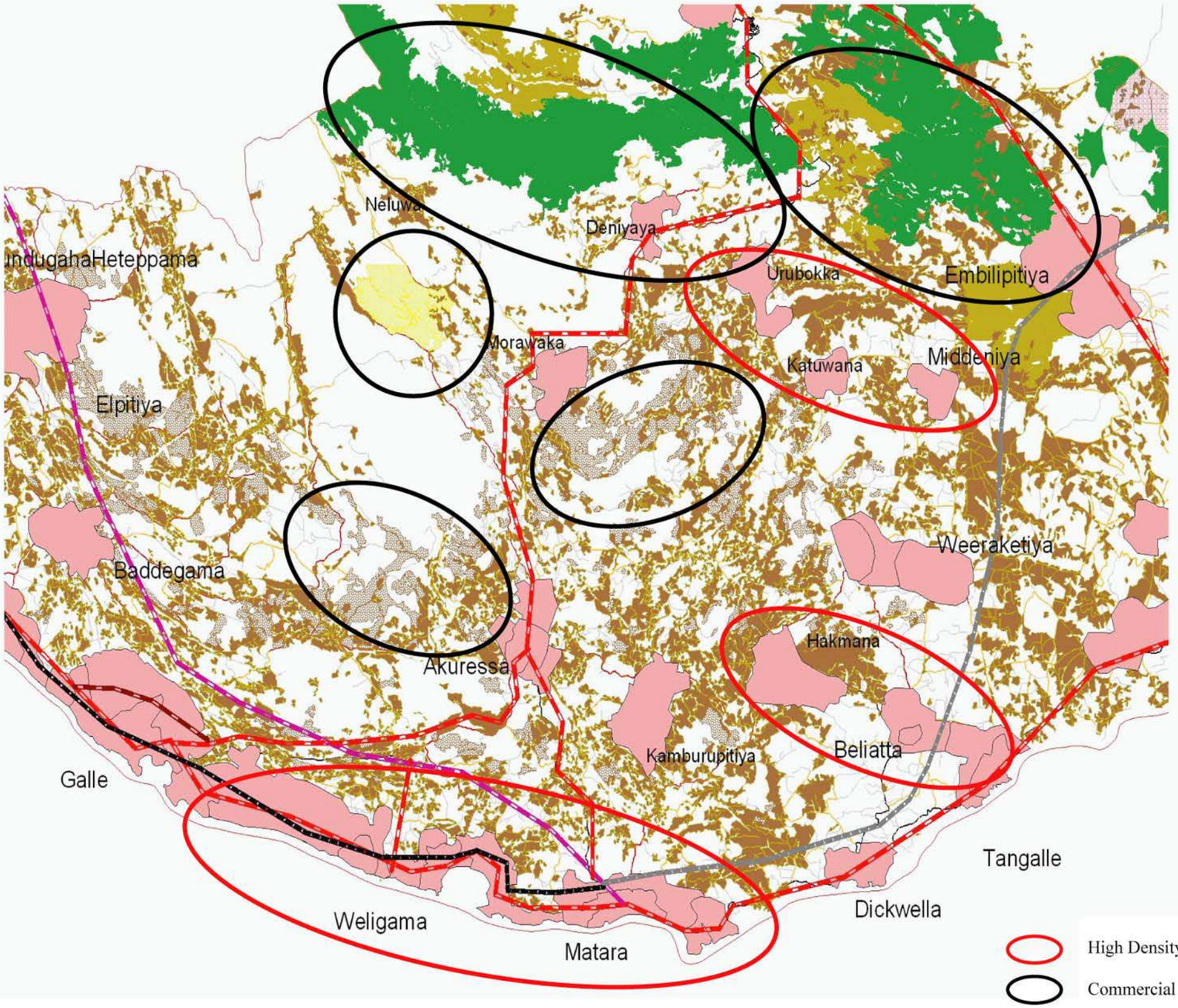
Proposed Settlement Structure Galle District

Source: SWP_SRPP

High Density Urban Zone

Commercial Farming Zone

National Physical Planning Department



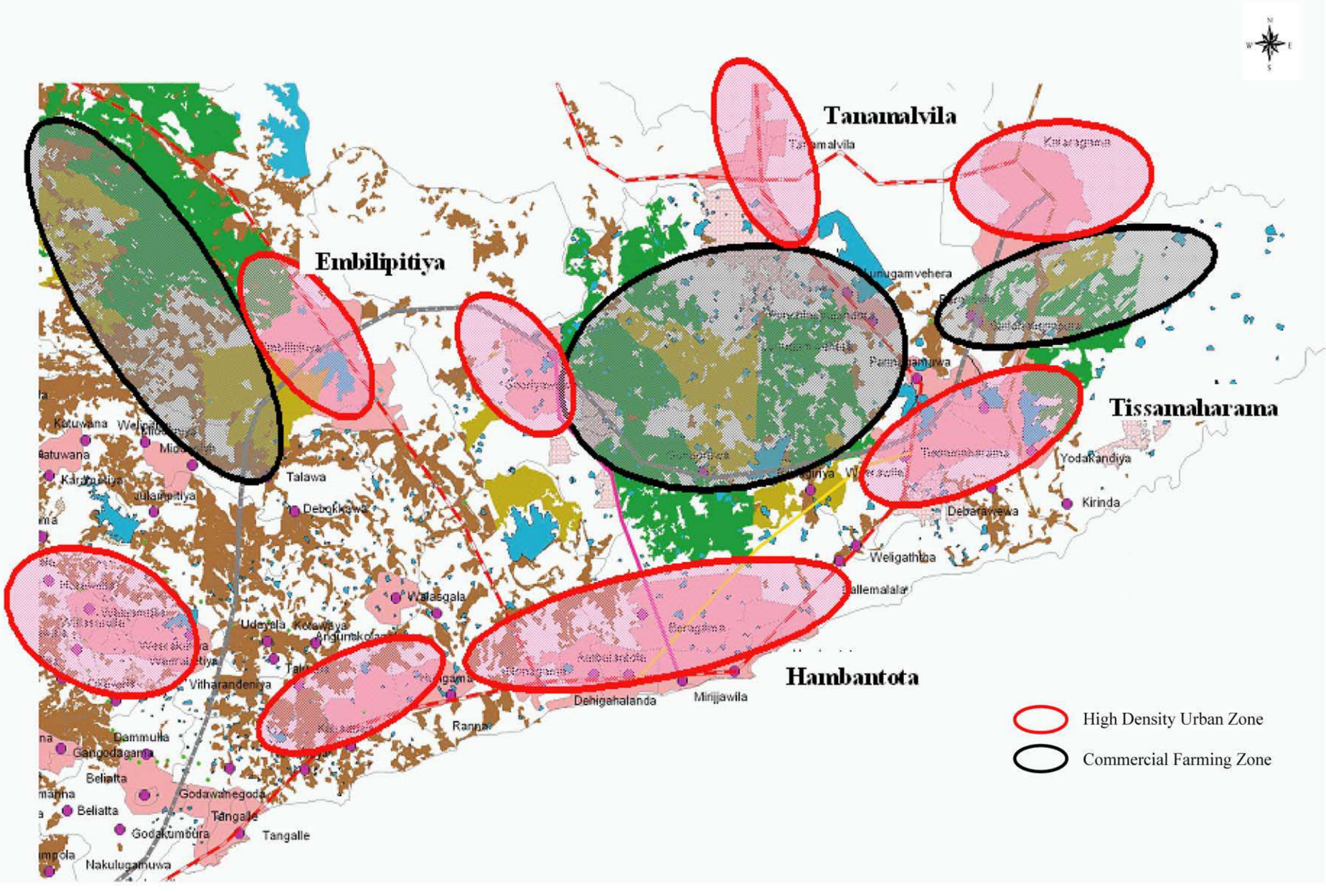
Southern Region Physical Plan

Figure: 9. 3

Proposed Settle-- ment Structure Matara District

Source: SWP_SRPP

National Physical Planning Department



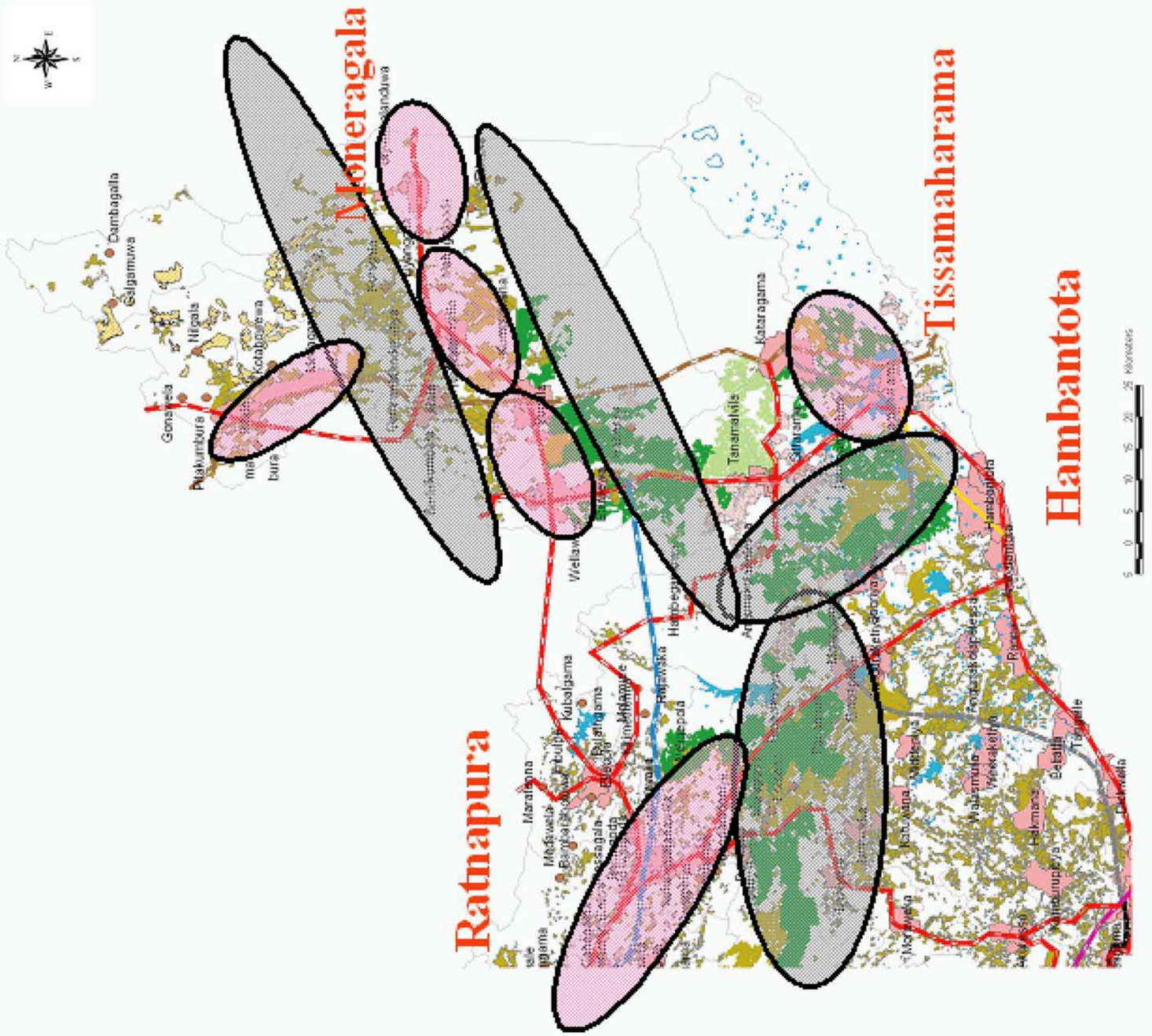
Southern Region Physical Plan

Figure: 9.4

Proposed Settlement Structure - Hambantota District

Source: SWP SRPP

National Physical Planning Department



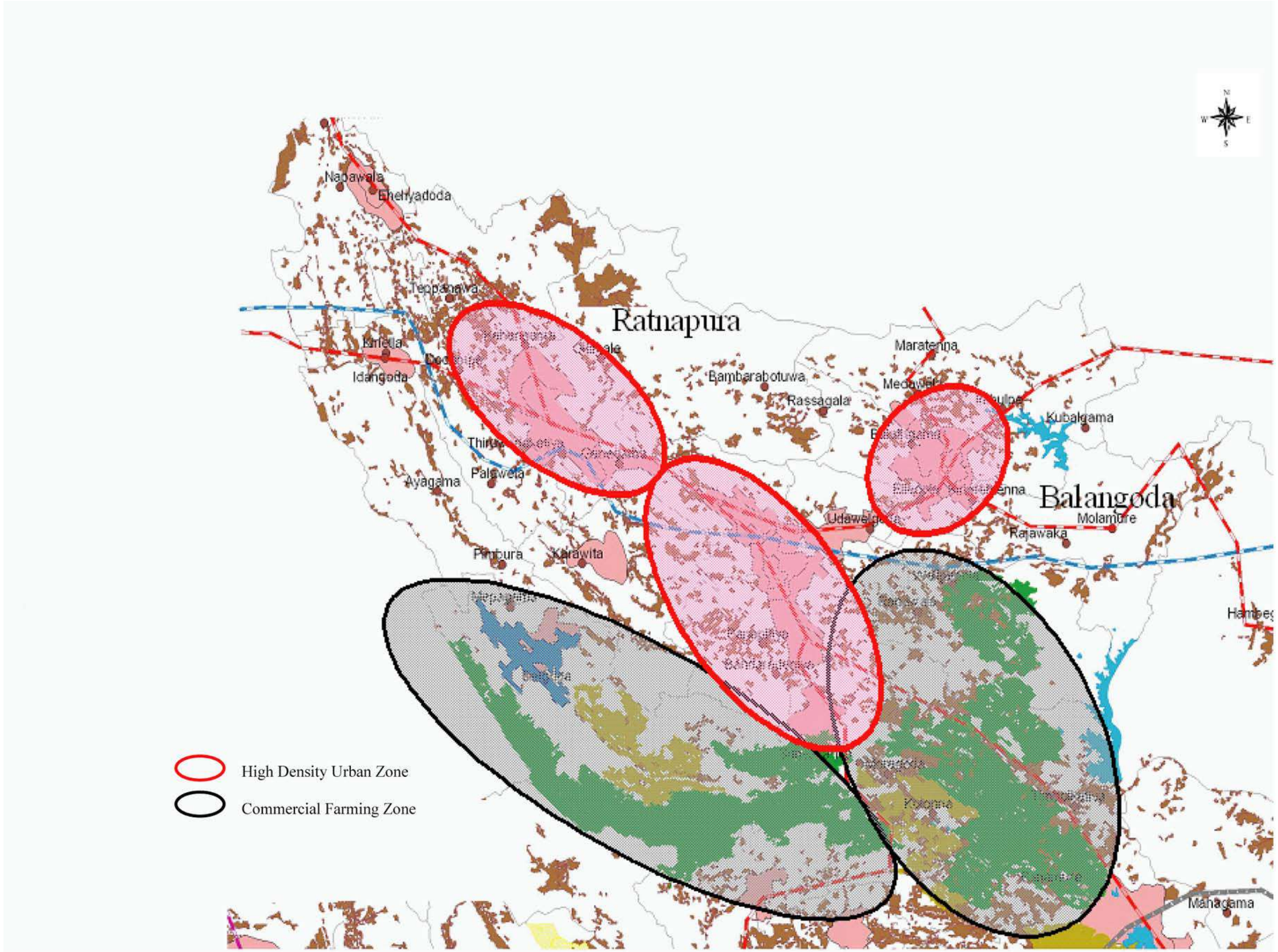
Southern Region Physical Plan

Figure: 9. 5
Proposed Settlement Structure Moneragala District

Source: SWP_SRPP

- High Density Urban Zone
- Commercial Farming Zone

National Physical Planning Department



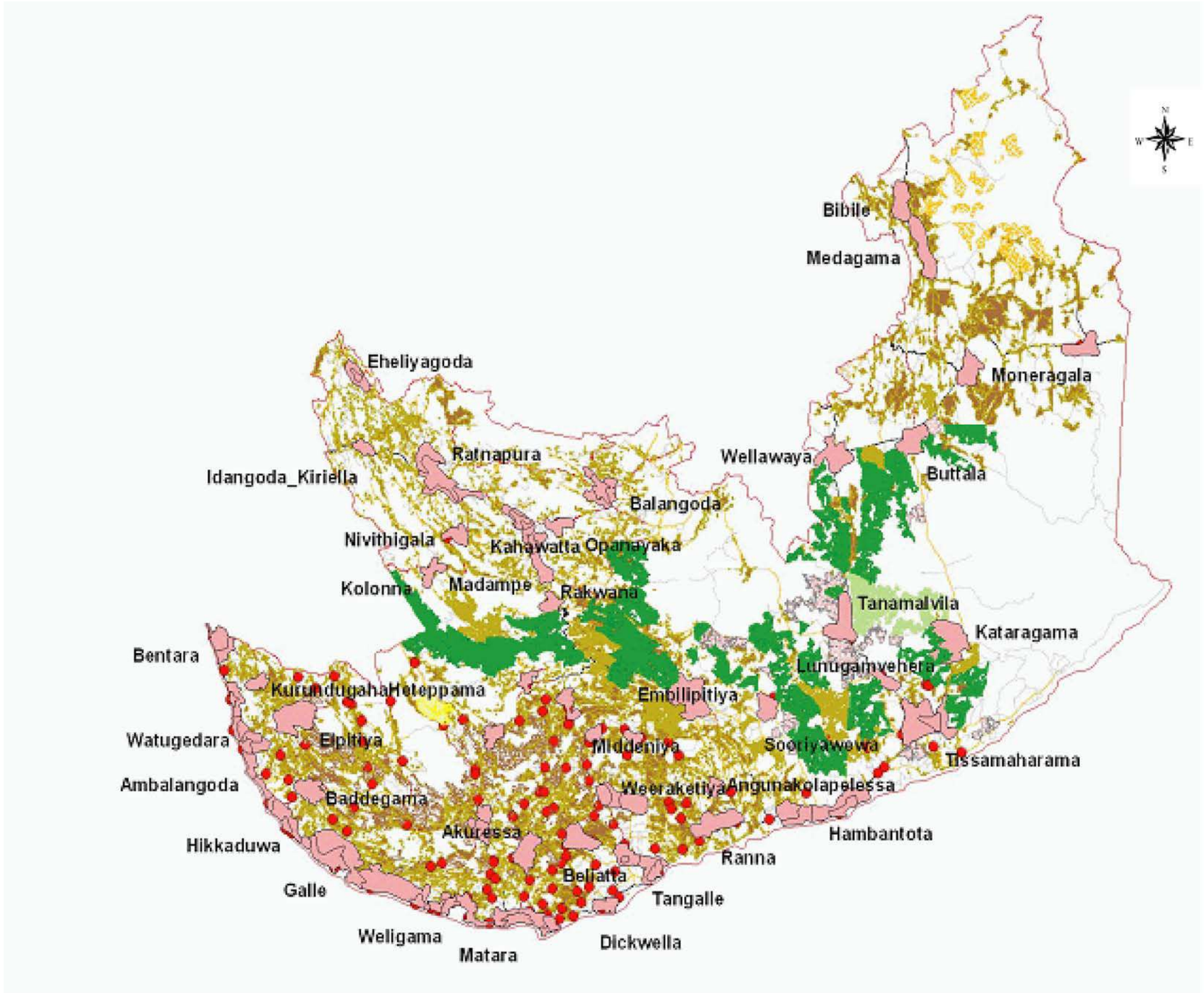
Southern Region Physical Plan

Figure: 9. 6

Proposed Settlement Structure - Ratnapura District

Source: SWP_SRPP

National Physical Planning Department



Southern Region Physical Plan

Figure: 9.7

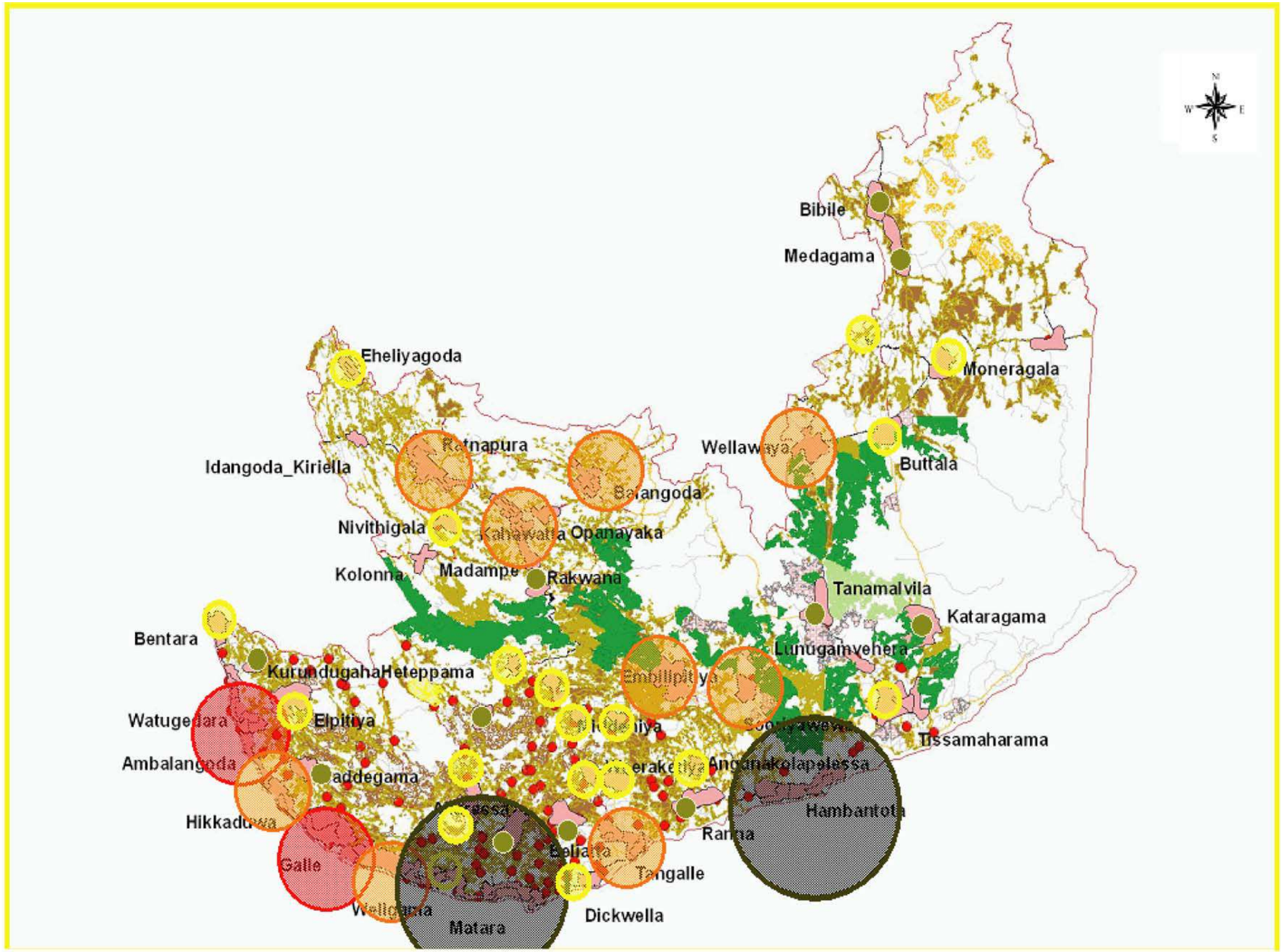
Proposed Settlement Structure Southern Region

Source: SWP_SRPP

- Anicut
- Main Road - A Class
- Main Road - B Class
- Minor Road
- River Basin Boundary
- Proposed Canals
- Streams
- Tank
- Sugar Cane
- Vegetable & Fruits
- Cereals
- Livestock
- Medicinal Plantation
- District Boundary

- High Density Urban Centres
- Other Urban Centres

National Physical Planning Department

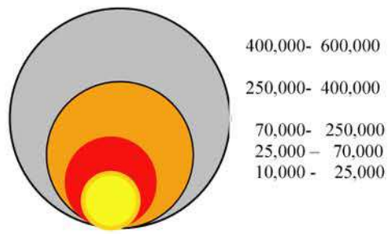


Southern Region Physical Plan

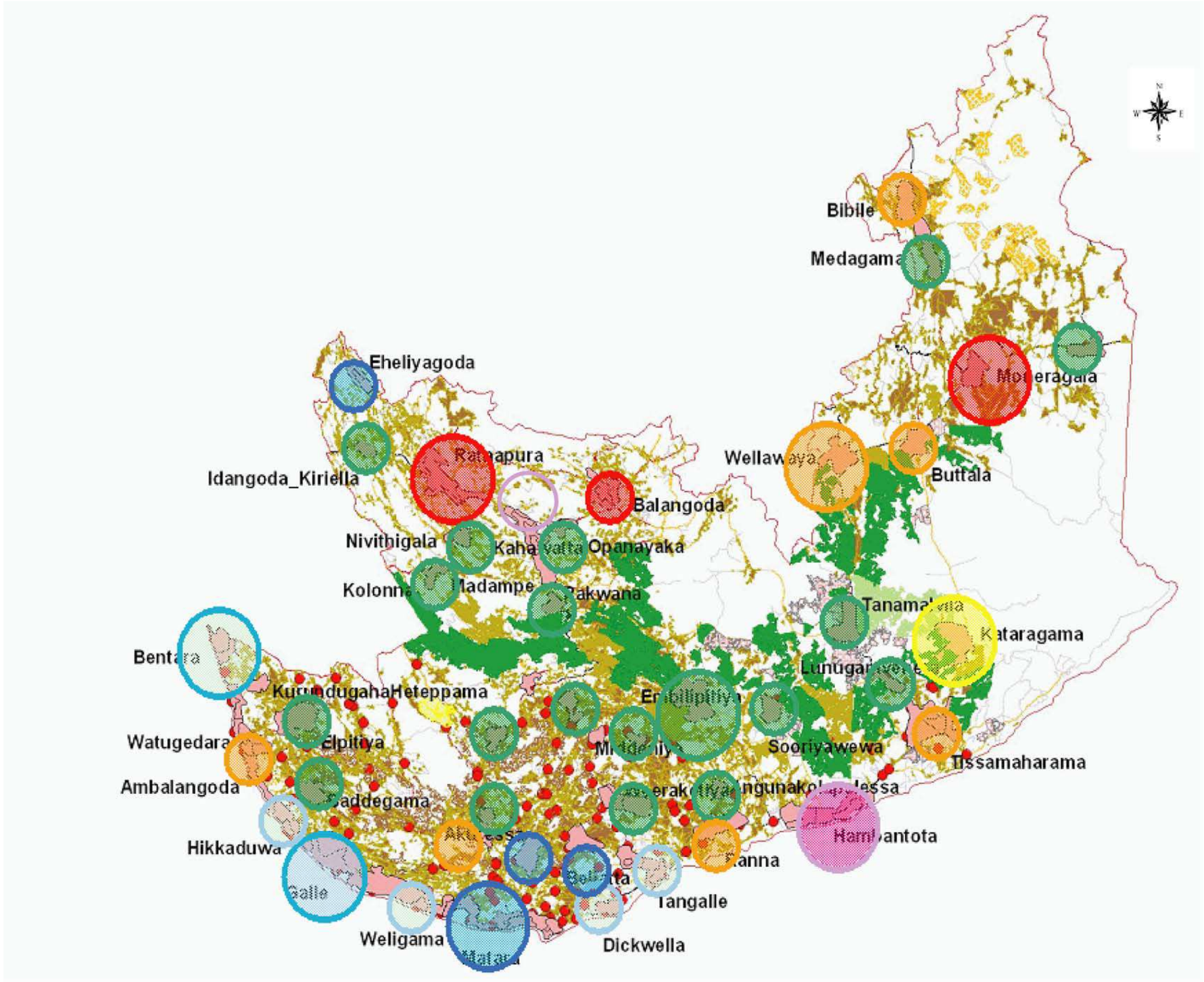
Figure: 9. 8

Population Hierarchy of Urban Centres Southern Region

Source: SWP_SRPP



National Physical Planning Department



Southern Region Physical Plan

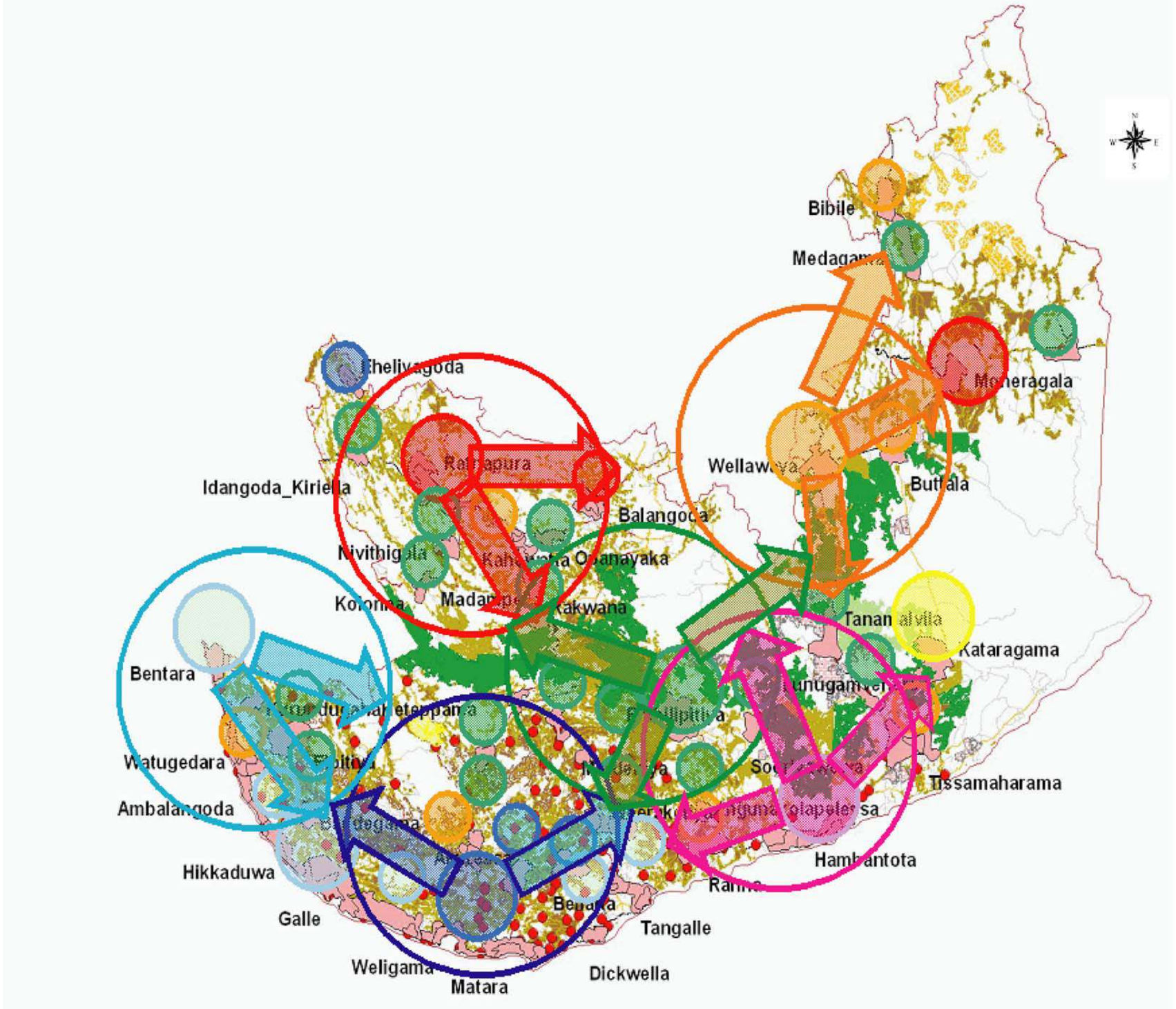
Figure: 9. 9

Functional Hierarchy of Urban Centres - Southern Region

Source: SWP_SRPP

- Administrative
- Commercial
- Tourism
- Port Related / Industrial
- Services
- Agricultural
- Religious

National Physical Planning Department



Southern Region Physical Plan

Figure: 9.10

Urban Form - Southern Region

Source: SWP_SRPP

- Administrative
- Commercial
- Tourism
- Port Related / Industrial
- Services
- Agricultural
- Religious

National Physical Planning Department

The National Physical Plan proposes to develop a second major metropolitan area in the north central and eastern parts of the country incorporating Anuradhapura, Dambulla, Polonnaruwa and Trincomalee while Hambantota is considered a town of second order level. The physical plan for the southern region proposes to make a change in the national policy by creating a major metropolitan area in the south around Hambantota due two major reasons;

(i) The enormous development potentials that Hambantota and rest of the southern Region posses

(ii) Achieve a balance in development at the national level.

Table 9.2
Hierarchical Order of Urban Centres

Urban Centre	Status
1 Hambantota	First Order Centre / Metro Urban
2 Galle	Second Order Centre / Major Urban
3 Matara	- Do -
4 Wellawaya	- Do -
5 Rathnapura	- Do -
6 Embilipitiya	- Do -
7 Ambalangoda	Third Order Centres / Secondary Urban
8 Hikkaduwa	- Do -
8 Habaraduwa	- Do -
9 Beliatta	- Do -
10 Balangoda	- Do -
11 Kahawatta	- Do -
12 Monaragala	- Do -

9.5 Estimated Population

In addition to the factors that are generally considered in population projections weightage was given to future development projects in the region when estimating the future population. The plan aims at making a first order metropolitan region in the south centred around Hambantota, making the southern region another high concentrated urban area in keeping with the national physical planning guidelines. The plans and projects that are proposed in the regional plan will attract a large population to the southern region. Accordingly the projected population of the region is given in table 9.3

Table 9.3
Estimated Population (in Million)

Districts	Estimated Population		
	2011	2021	2030
Galle	1.110	1.150	1.202
Matara	0.762	0.791	0.825
Hambantota	0.569	0.915	1.293
Monaragala	0.468	0.557	0.655
Rathnapura	1.171	1.200	1.250
Total	4.080	4.613	5.225

Based on the estimated population, housing needs of the region have been worked out as shown in table 9.4

Table 9.4
Estimated Housing Needs

Districts	Estimated Housing Needs								
	2010			2020			2030		
	Total	Existing	Balance	Total	Existing	Balance	Total	Existing	Balance
Galle	295260	216560	78700	305230	257040	48190	269940	218180	51760
Matara	220560	168360	52200	227700	190840	36860	236280	197500	38780
Hambantota	169670	126720	42950	256200	147300	108900	350700	233460	117240
Monaragala	131810	94140	37670	154100	115190	38910	178525	137210	41315
Rathnapura	324480	233000	91480	331780	283360	48420	344280	289970	54300
Total	1141760	838800	302960	1275000	993730	281270	1379710	1076320	303390

Chapter -10

Proposed Zoning Plan 2030

CHAPTER TEN

PROPOSED ZONING PLAN 2030

10.1 Introduction

At present the region does not have a land use zoning plan except for some towns. (i.e. Galle, Ambalangoda, Matara, Hambantota.) However these zoning plans are also not yet gazetted.

Proposed zoning plan for the southern region is presented in figure 10.1. The zoning plan indicates only the predominant uses. For implementation of the zoning plan, it is necessary to prepare detail guide plans (DGP) for every zone. The proposed zoning plan is based primarily on the following;

(i) Economic Strategy Plan (Chapter Two)
(ii) Environmental Management Plan (Chapter Three)
(iii) Agricultural Development Plan (Chapter Four)
(iv) Water Resources Management Plan (Chapter Six)
(v) Settlement plan (Chapter Nine)
(v) Potential Natural Disasters particularly Tsunami Tidal Waves, Cyclones, Earth Quakes and Sea Level rising

These plans propose to conserve all the environmentally sensitive areas (that accounts for 47.3 percent of the total land extent of the region), Promote high density urban development in selected urban centers, Develop large scale commercial agricultural farms through the water resources management plan and to connect the existing home gardens / rural settlements with commercial farms and high density urban centres.

10.1 Objectives

The objective of the zoning plan is to maximize the use of land for development of the region while conserving environmentally sensitive areas.

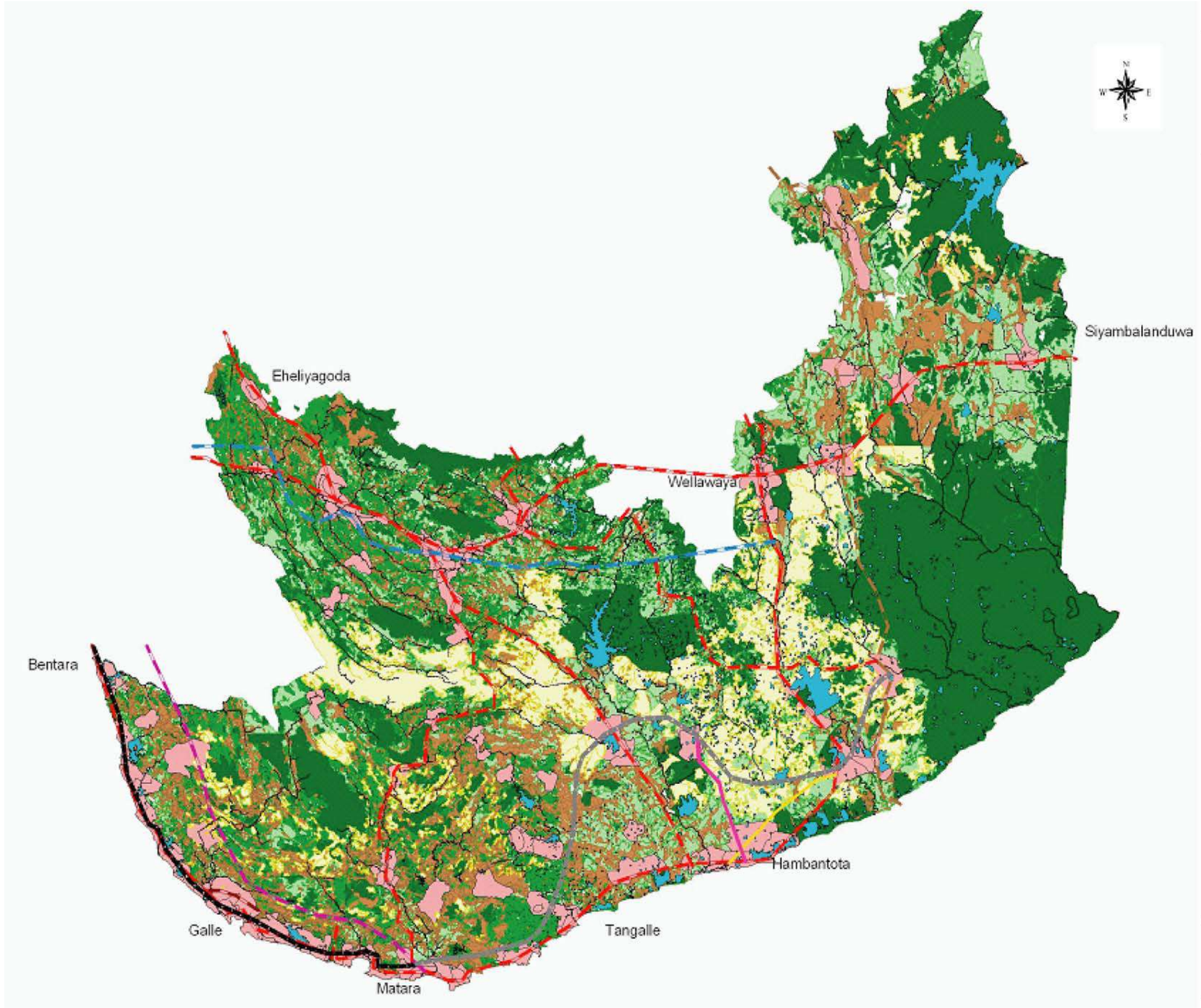
10.2 The Zones

Details of the zones are given in table 10.1.

Table 10.1
Proposed Zoning Plan

	Zone	Extent (Ha)	%
1	Environmentally Sensitive Zone	659,474	45.5
2	Commercial Agricultural Zone	173,680	12.0
3	Plantation Agriculture Zone	136,000	10.8
4	Rural settlements/Home Gardens Zone	202,550	14.0
5	High Density Urban Zone	162,700	11.2
6	Water bodies and others	114,596	8.0
	TOTAL EXTENT	1,334,404	100

Table 10.1 indicates that out of the total land extent of the region 45.5 percent comes under “Environmental Sensitive Zone”. Zoning of the environmental sensitive areas was based on the Gazette Notification dated 24th June 1993 prepared based on National Environmental Act No.47 of 1980 that defines the areas as an environmentally sensitive areas. The balance extent 52.3% has been zoned among other uses. High density urban zone will accommodate a population of 2.8 million persons by 2030 consuming 11.2% of the land extent. High density urban development is proposed so that limited land could be utilized optionally. 12% of the land is zoned for commercial agriculture and the existing home gardens / rural settlements 14.0%) could be managed without being allowing for further fragmentation.



Southern Region Physical Plan

Figure: 10.1

Zoning Plan 2030

Source: SWP_SRPP

Proposed Zones
- Commercial Agriculture Zone
- High Density Urban Zone
- Rural Settliment Zone
- Plantation Agriculture Zone
- Environmentally Sensitive Zone
- Crop Agriculture Zone
- Water Bodies

Proposed / Underconstruction Road Network
- Galle Bypass
- Hambantota Bypass
- South-West Expressway
- Southern Expressway
- Tourist Roads (Existing)
- Tourist Road (Proposed)
- Existing Main Roads

Railway Network
- Existing Line
- Proposed Line

Seaports
- Existing Regional Port
- Proposed International Port

Airports
- Existing Domestic
- Proposed International
- Fisheries Harbour
- Main Urban Centre
- Sea
- District Boundary

National Physical Planning Department

Chapter -11

Physical Infrastructure

CHAPTER ELEVEN

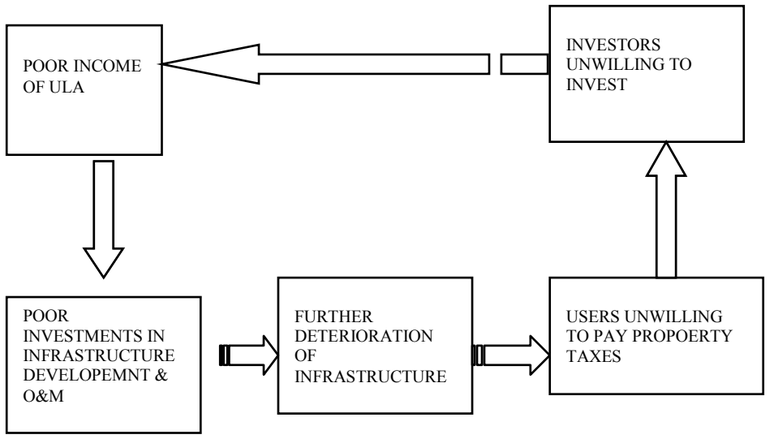
PHYSICAL INFRASTRUCTURE

11.1 Introduction

Urban water supply and drainage, electrical power generation and distribution, and telecommunication and ICT are infrastructures facilities discussed under this chapter. Database and the infrastructure policy of national physical plan are basic information for preparation of the plan. The focus is mainly on urban infrastructure. Present system of low-density urban development and urban sprawls along main roads are the main issues pertaining to provision of infrastructures that has resulted in inefficiency and high unit cost.

Provision of urban infrastructures is also hampered due to inadequate financial resources of urban local authorities and poor operation and maintenance capabilities. This has created a vicious circle as illustrated in figure 11.1

Figure 11.1
Vicious Circle of Urban Infrastructure



POOR INVESTMENTS IN INFRASTRUCTURE DEVELOPMENT & O&M

11.2 Water supply

The urban potable water production in the region is 46.585 MCM/yr currently, and the NWSDB and few ULAs are operating and maintaining those schemes that feed district capitals as well as major urban centres. Majority of piped water supply schemes [WSS] consisted of under capacity treatment plants. Besides, recently rehabilitated and augmented schemes have taken into accounts no mega development projects except natural population growth under normal demographic projections. Bottleneck to development and expansion of facilities is non-availability of reliable raw water resources. The average NRW of the region is 31% , Inspit many rural and urban water supply schemes have suffered from inadequate yields from respective sources during dry season of the year. This situation is grave in Hambantota and Monaragala districts; even the water availability is remarkably high in the region [17553MCM[2]]. Sector development shall therefore be a major issue in regional planning

Potable water demand of the region is estimated as 300 MCM/yr by 2025. Overall urban water supply coverage of the region is 42.6%[3] at present. Water demand of urban areas shall increase multiple folds with proposed development activities. The Hambantota metro shall require new scheme by 2015 in addition to present, short and medium term augmentations under construction. The urban water demand of Hambantota district is more than 44MCM/yr by 2025. The NWSDB has drawn plans to expand coverage to 80% by 2005 and to continue with improvement to reach 100%.

Community participated rural water supply projects were implemented in four out of five districts of the region. In the district of Galle, majority rural communities extract their potable water from individual wells located in home-gardens. Rainwater harvesting [1%] for rural water supply is implemented at selected locations of Hambantota, Monaragala districts. The ground water in many parts of the region contains excessive dissolved iron and fluoride and quality do not comply with relevant Sri Lanka Standards (SLS).

11.3 Rainwater drainage

Region's master drainage system encompasses urban storm water drains and both have interaction to each other. Failures of urban drainage systems, occurrence of frequent flash floods and, existence of environmental health hazards, were reported mainly in secondary coastal towns of the region, however municipalities and some

urban council have successfully implemented Asian Development Bank (ADB) assisted storm water drainage projects. Those towns are Ambalangoda, Galle, Weligama, Matara, Hambantota, Balangoda, and Rathnapura.

However poor maintenance, Inadequate capacity to accommodate sudden flash floods, bottle necks in and encroachments to canals & canal reservations have caused multiplying the adverse effects of Tsunami tidal coastal waves on 26th December 2004, in most of the coastal towns in the region.

The Pradesiya Sabas in the region were not benefited from ADB assisted programs as they did not fulfil project selection criteria of financial stability. The southern region included 33 PS [Pradesiya saba] and 8 ULAs. Eight ULAs are responsible for maintenance and operation of ~ 60 km of lined drains situated within respective urban council limits. It is factually true that cleaning and maintenance of roadside drains in secondary towns are extremely poor. Total length of properly maintained built up drains in towns varies from 20% to 60%.[4]

Urban drainage of the region needs improved and planed maintenance, while imposing appropriate regulatory measures to control encroachment, reclamation of retention basins and reservations of waterways, damages and dumping of garbage into existing drains. Constraints to drainage sector development are poor financial situation of ULAs, [Urban local authority] encroachments into reservation, sand bar formation at sea outfall of storm water drains.

11.4 Waste Water and Solid waste

The urbane centres as well as rural communities of the region, rely strongly on individually own disposal system of sewage, and no town except Hikkaduwa have central sewerage system and treatment facilities. Proposed GKW project to utilize treatment facilities of Koggala EPZ, to treat waste water generated from Koggala urban area has not been implemented yet.

The present modes of disposal of sewage are toilets either with two-compartment septic tank and water sealed off set pit or twin pit on site composting. Urban councils are responsible for disposal and collection of waste but are not in sound financial situation to implement with piped sewage disposal facilities. The Rapid urbanization without adequately improving the infrastructure facilities to dispose and collect urban waste water had created environmental health hazards. Both liquid and solid waste generated in major towns had increased proportionately to population as well as development growth rates. A few urban local authorities (ULA) implemented garbage composting plants and private participation in collection of solid waste.[5] Of which Ratnapura, Balangoda, Ambalangoda started commercial scale production of compost soil conditioner. Scarcity of sites and services for sanitary land fill is a major problem of ULAs. Many urban councils either purchased or received from GOSL vacuum tanks but constructed no properly designed disposal site.

11.5 Electrical Energy

The CEB bears responsibility of Electrical power generation, high-tension transmission, and operation / maintenance of distribution system, but outsourced LV distribution and sale of electricity in part of coastal belt to Lanka Electric Company (LECO). Electrical power consumption of the region in year 2002 is 710.275 GWh and it is 10.4% of gross generation. The 132kv and 66kv HT transmission and G/S stations have been augmented but the firm capacity fully utilized in many districts except Hambantota. The region has no 220kv transmission system at present. The Energy demand of southern region shall increase five fold[6] by 2025 with proposed developments. The Hambantota metro shall demand for further expansion of transmission, distribution and grid substation capacities.

The present power production of the region is 149 MW installed capacity,

Samanala [Hydro power]	- 120MW
Udawalawe [Hydro power]	- 6MW
Hambantota [Wind power]	- 3MW
Matara [Diesel PPP]	- 20MW

Coal thermal power plant of install capacity of 350MW at initial stage and 1000MW second stage shall provide energy need of the region. In addition the region contain 163MW hydro power, 100MW fuel wood thermal power, about 100MW wind power, and solar and mini-hydro potentials. The hydro power potential available with multi purpose irrigation projects given in water resources plan, and Fuel wood power generation and energy forestation need big face-lift in the region and all buffer zones shall be utilized for energy forestation.

11.6 Information Communication

Telecommunication facilities had improved remarkably during past several years but accessibility of rural community to telephones is still inadequate to the extent that regional rural communities are handicapped with connectivity of rest of the country. The exchange capacity needs improvement and expansion to rural areas. Even the international information super highway SEA ME-WE-2 and SEA-ME-WE 3 that connects Asia with rest of the world runs close to southern coast has no landing site that provide connectivity to urban centres in the south. Proposed SEW-ME-WE-4 will also run parallel to existing lines and obtaining of a landing point would provide a big push to commercial activities in the southern region.

11.7 Objectives

The prime requirement of investment promotion and uplifting of economic activities is availability of appropriate infrastructures within the region. Hence the **Development of Sustainable, Durable and Efficiently Managed Infrastructure facilities targeted for service level enhancement and economic growth shall be the overall objective**. The mega industry and service sector projects, Agro-economic growth centres, urbanization, resettlement and migration are priority issues considered under infrastructure plan.

11.7.1 Water Supply Sector

The potable water supply sector had not improved parallel with growth rate of urban population of the region and those schemes that are under operation have suppressed design service level and covered mostly the core urban areas. Average service level of existing urban schemes of the region is [7] 63%.
Provision of equitable access to and uninterrupted supply of potable water with 100% coverage of projected urban population by 2025 is the specific objectives of sector.

The bottleneck to augmentation and introduction of new schemes is inadequate resource capacity. **The efficient management of production and distribution and reduction of overall NRW to 25%,**
and
Assuring of safe drinking water to entire population of the region are secondary objectives.

11.7.2 Urban drainage Sector

Urban sanitation and drainage responsibilities fall within vested powers of urban local authorities;

Urban centres having no threats created from flash floods, erosions, stagnation, and health hazards due to unhygienic sanitation facilities and environment pollution is the specific objective of the sector.

The efficiency of operation and maintenance of urban drainage and sanitation facilities vary with financial capabilities of individual ULAs in the region it has shown different levels of O&M efficiency and performance.

Efficient and effective maintenance management and service delivery, on sanitation, garbage disposal and drainage system operation, become secondary objective.

11.7.3 Power Generation and Distribution Sector

Power generation is mainly a national issue but regional generation could minimize distribution losses in the region and could achieve cost effective price. Therefore generation of power within the region and exploitation of available hydro power potential, wind and fuel wood power generation potential, and local advantages to generate and sell power, are the sector requirements. Of which coal power plant of installed capacity 2350MW [stage one =350MW, Stage two = 1000MW, stage three = 1000MW] at Hambantota shall become priority project of the southern region physical plan. It is estimated that total power demand of the region is 3950 GWh by 2025.

-Development and management of electricity as part of essential national needs, while ensuring cost effectiveness to national economy and enhancing reliability and price stability of power supply, is the specific objective of sector.

-Exploit to maximum sustainable level the energy potentials [conventional and non-conventional] of the region and provide electricity to all rural and industrial agricultural zones.
And
-Facilitate and Provide Fuel wood power generation technologies and resources

for rural electrification.
And
-Energy conservation, efficient management of power transmission and distribution, reduction of line losses and avoidance of interruption are secondary objectives.

11.7.4 Telecommunication sector.

Establishment of ICT research and development facilities to make competitive the regional resources on IT is main objective of sector development in the region;
Therefore the ICT enhancement programmes and installation of IT infrastructure facilities are considered as priority of the region.

Provision of facilities to meet demand density of telephones in the region around 20% by 2025 and to achieve anticipated infrastructures given in Telecommunication Master Plane [TMP] is specific objectives.

11.8 Potentials

i) Availability of adequate water in the region, (i.e. 17553 MCM is available in the region and only 47.64 MCM is presently used for potable water supply in urban areas.) could be effectively utilized to meet the future demands. The Water Resource Management Plan (chapter 06) provides more information.

ii) Community and Public Private sector participation in water sector development activities have given positive results,

iii) Hydro power, fuel wood power and wind power potential exists in the region, estimated potential is [Hydro – 163MW Fuel wood-100MW, Wind -100MW,] In addition private public participation in coal power generation is under negotiation.

iv). Recycling of garbage and production of compost soil conditioner could be effectively carried out, as Bio tea feches high demand in international and local market. Many private investors have already entered in to production of compost soil conditioner.

11.9 Constraints

i) Poor financial situation and Operation and maintenance capabilities of ULAs
ii) Haphazard development and expansion of urban centres,
iii) Negative attitude and poor awareness of public,
iv) Poor reliability of water resources.

11.10 Overall Strategy for development

The strategy for infrastructure development possibly depends on a well-considered settlement plan. High concentration of human settlements in strategically selected urban centres will result in provision of infrastructures efficiently and cost effectively. Hierarchical system of urban settlement and infrastructure development has been worked out in the settlement plan. (Chapter 09)

Overall Strategy for infrastructure development shall be the Combination of infrastructures as priority element of regional development plan [integrated strategy] and phase out project components to match with levels of regional economic development.

Implementation, Operation and Maintenance of infrastructure facilities and projects shall be in accordance with secondary Strategies given below.

- Public Private Participation, [PPP]
- BOO BOT and incentives to Private sector Investors
- Stage wise but Demand Driven Implementation
- Sustainable and interfaced with other major developments programmes of the region,
- Appropriate but locally adoptable technology and techniques.
- Outsourcing of Operational arrangements and redesigning of organizational structures.

11.10.1 Specific strategies for sector development are listed below.

Water Supply Sector

- Implement water sector projects that are listed in the project list, and strengthen community participation of rural water supply with technical and financial assistance.

- Improve institutional and technical capabilities of water sector controlling agencies both private and public.

- Outsource operation, maintaining and distribution responsibilities of water supply to private sector organizations mainly in mega urban centres and major industrial areas of the region.

- Introduce water policy and water management regulation and also encourage the private sector on production of potable water on commercial basis using available resources of ground and surface water.

- Induce new technology and Implement wastage reduction and NRW policy.

- Replace or rehabilitate old distribution / transmission and repair all leaks promptly.
- Adopt potable and wash water dual main system.
- Restrict illegal water usage and make water a commodity of reasonable value
- Introduce energy saving and high production techniques, and maintain properly the Treatment plants,
- Modern monitoring systems to main urban water supply schemes such as Hambantota Metro.
- Rural water supply community participation projects and technical assistance to upgrade services of existing community participated projects.
- Water management and rainwater harvesting for rural water supply projects. Promote private sector participation on above to conserve water.

Urban Drainage sector

- Master plan study of drainage systems of urban centres and implementation of planned development of urban drainage infrastructures mainly at Hambantota, Galle, Embilipitiya, Hikkaduwa, Tangalle, and other major coastal towns. Phase one shall be mainly to address immediate problems.

- Foul water drainage systems for towns having population more than 250000, and contain bad soil conditions. Construction reticulation sewers and treatment / disposal system for Hambantota, Galle, and Matara urban centres.

- Regular maintenance of existing drains, culverts and bridges by respective ULAs, and takes measure to stop dumping of garbage into drain by introducing necessary controls and improving awareness.

- Provide technical, and financial assistance to ULA to establish necessary infrastructure for disposal of liquid and solid waste, Outsource solid and liquid waste collection and disposal in urban areas.

- Introduce rural sanitation program and Provide standard details of septic tanks including new technology onsite sewage treatment. [SLS]

- Avoid haphazard expansion of towns without adhering to proper drainage plan. Avoid reclamation of wet land and retention basins for urban housing developments.

- Impose strict regulatory measures to controlled unplanned development activities and Remove all obstructions and encroachers from reservations of natural waterways.

- Demarcate reservation limits on natural waterways and improve awareness among beneficiaries.

- Implement National strategy for solid waste management and disposal. [2002] , And identify suitable sanitary land fill sites for cluster system and implement solid waste management projects given in the project list.

Power Generation and distribution Sector

- Liberalization of vested powers of CEB so that private sector shall enter into competitive business with state sector on all power related activities.

- Renewable energy potential of the region shall be tapped to it maximum level while introducing non-conventional energy sources for rural and agro centres electrification.

- Community companies to participate in rural electrification and small-scale generation,
- Competitive price for power unit for all private power producers [PPP] and

incentives mainly to major private power produces vital to stability of national economy.

- Implement long-term power conservation and line losses reduction program prepared under planned maintenance and rehabilitation of CEB. Promote rural communities on utilization of non-traditional energy source. [Dendro power, solar power] The fuel wood thermal power plants shall be given priority in Monaragala, Hambantota, and Rathnapura districts

- Promote people's company and private organizations in rural areas on energy forestation. Draw up plans for operation and maintenance of such forests at buffer zones.

Telecommunication sector

- IT base industries and research and development centre at Matara. Construct landing site of SEA-ME-WE 4 at Matara.

- Implement relevant project components of TMP prepared by SLT.

- Increase DEL facilities of region as per targeted demand density.

- Strengthen the current program of expansion of ICT to rural areas and build facilitating centres at all agro-base industrial township.

- Connect all five-district capitals together with FOTS. And establish ICT training facilities at rural level.

11.11 Projects for Implementation

Proposed projects have been, listed according to order of priority and classified according to sectors. The feasibility studies of most of projects have not been completed. These projects could become components of mega projects where applicable.

11.11.1 Urban potable water supply infrastructures development plan

i. Greater Rathnapura water supply to cover Rathnapura municipality and surrounding urban and industrial estates located at Kuruvita, Pelmadulla, etc. The project shall be implemented in two stages where stage one will be package treatment system to meet short-term demand. [US$13m] NWSDB carried out pre-feasibility but needs to explore implementation strategies.

ii. Greater Hambantota Combined water supply system to augment existing Ambalantota / Hambantota scheme and to provide water to new area covering eastern part of Hambantota Metro plus existing Lunugamvehera and environment of Kudaoya airport. The scheme shall augment supply capacity of Thanamalwila WSS-and Existing Lunugamvehera WSS. [Tentative estimate cost-US$26m]

iii. Hambantota West, water supply scheme to meet demands of Industrial and Port development works, Project pre-feasibility study made by Urban Planning Consultant in 2001/02, [estimated cost –US$68.5m] See water resource development plan for more details.

iv. Ehaliyagoda water supply augmentation project using ground and spring water as source.[US$4m]

v. Tangalle and Beliatta water supply augmentation to cover industrial and tourist promotion areas.[US$15m]

vi. Greater Galle water supply augmentation to meet water demand of proposed urban development, tourist, industrial, institutional, domestic/commercial demands at project horizon.[US$11m] This will be implemented by 2015.

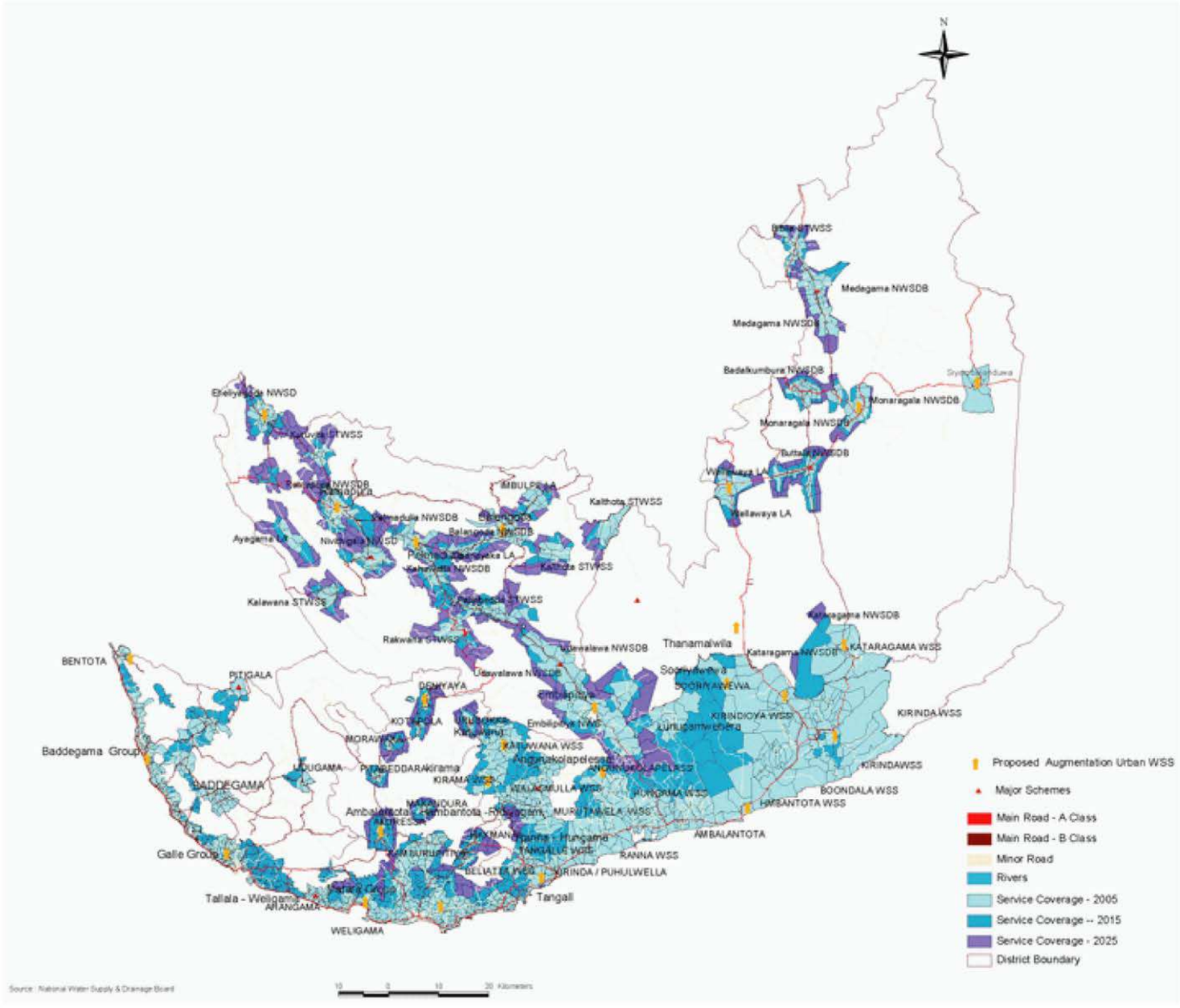
vii. Beruwala integrated new water supply mainly to cover water needs of new tourist and industrial promoting areas and projects. The source shall be Bentara Ganga.

viii. Baddegama water supply augmentation / expansion project to cover new industrial town ships. The NWSDB carried out feasibility and designs for the project but it has to be expanded to cove new industrial townships.[US$12m] Industrial towns shall locate close to new southern highway.

ix. Balangoda urban water supply scheme Augmentation / rehabilitation.

x. Greater Matara Water supply augmentation and rehabilitation project.[US$10m]

xi. Secondary towns water supply augmentation and rehabilitation project. This will include all towns belong to urban hierarchy 2-4. Some of them are Walasmulla,



Southern Region Physical Plan

Figure: 11. 1

Proposed Water Supply Schemes 2005 - 2025

Source: SWP_SRPP

National Physical Planning Department

Weerakatiya, Kiram, Middeniya, Wakawela, Angunakolapelessa, Monaragala, Wellawaya, Siyambalanduwa, [30 towns @ US$1.25m = US$37.5m]

xii. Tissa, Kirinda, and Debarwewa integrated water supply augmentation plus expansion project.[~US$6m]

xiii. Rural water supply RWS projects, and introduction of rainwater harvesting system specially to dry zone [~US$21m] this includes consolidation of existing projects.

11.11.2 Urban drainage infrastructures improvement and development plan.

i. Grater Hambantota storm water drainage project.- This project shall be implemented in three stages as described below, [US$85m]

   a. Stage-1 of the project includes construction of main canal to divert existing natural drainage system of Karagan Lewaya water shade area, and secondary drains to facilitate drainage of the area given below. [i.e. Udamala, Mirijjawila, Kohalan, Beragala and Badagiriya, etc
   b. Stage-11 of the project includes construction of branch channels to main channels of the metro area.
   c. Stage- 111 all roadsides drain and associated structures of urban centre.

ii. Storm water drainage master plan for all urban centres of hierarchy 1-4 [US$2.8m]

iii. Grater Galle storm water drainage augmentation project to reinforce existing system. And to cover new project areas from Habraduwa to Dodanduwa.[US$45m]

iv. Secondary towns storm water drain project implement in three stages and construct minimum of 10km of main drains in each towns subjected to flash floods.

11.11.3 Urban Sewerage / Solid waste management Infrastructure plan.

i. Galle City centre, Port, and Fort piped sewage collection and disposal system with modern treatment facilities. [US$105m]

ii. Hambantota core metro area sewerage project.[US$110m]

iii. Matara and Rathnapura towns selected area sewage disposal projects.[US$60m]

iv. Urban sanitation enhancement project by introduction of hygienic sanitary toilet facilities and disposal equipments and system.[US$ 25m]

v. Integrated solid waste management project for clusters of urban centers and facilitate to ULAs on waste management by providing machines, equipment, technique and lands for disposal sites. Disposal system shall be sanitary landfill or engineered landfill while giving priorities to national strategy. The priority clusters have seed towns of 1)Matara, 2)Galle, 3)Hambantota, 4)Beliatatta/Tangalle, 5)Ambalangoda, 6)Ehaliyagoda, 7)Embilipitiya, 8)Buttala, 8)Tissa/ Kataragama, 9)Wellawaya / Kudaoya, 10)Pelmadulla, 11)Balangoda, 12)Kuruvita, 13)Deniyaya, 14)Elpitiya/ Bentota, 15)Akuressa, 16)Ranna/ Hungama, [US$ 100m]

11.11.4 Electricity distribution / generation infrastructures plan

i. Reinforcement of medium and low voltage distribution system and expansion of medium voltage distribution to new development areas, [especially in Hambantota metro, Kudaoya/ Monagala, Galle Fort and city project area.] These reinforcements lines could easily incorporate in the development plan prepared by CEB[8].[US$ 50m]

ii. The coal coke fired thermal power plant at Hambantota. [Stage 1- 350MW and stage 2 -1000MW] – [US$ 550m]

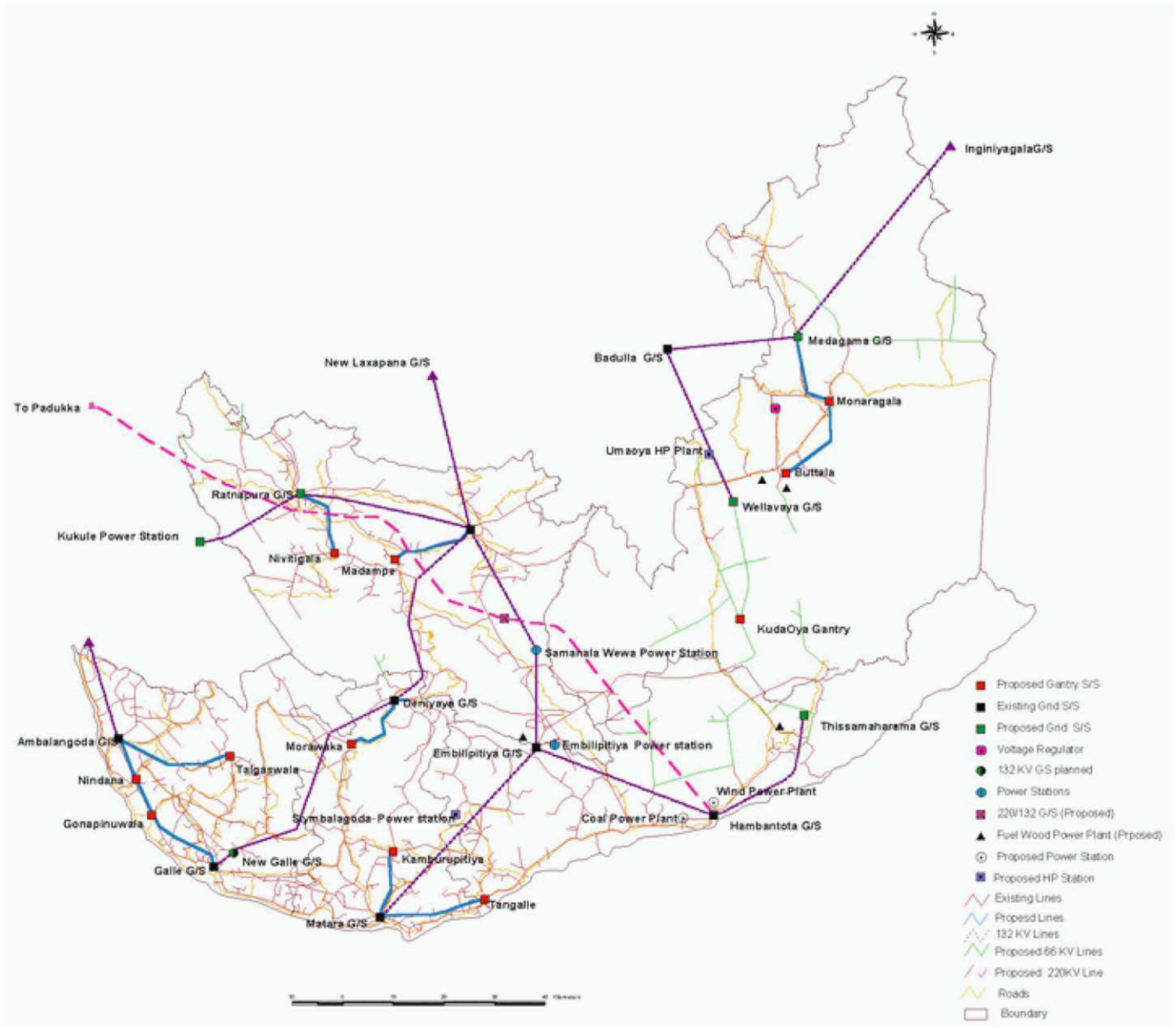
iii. Hydropower projects[9] – Umaoya[90MW], Malwala Reservoir [33MW], Madiripitiya [40MW] and all mini hydro potential available

iv. Thermal power plants [Fuel wood gas] of installed capacity 30MW each at Buttala, and Embilipitiya area. [US$30m]

v. Improve G/S capacity 31.5x3 at Embilipitiya, Hambantota, Deniyaya and construct new G/S at Tissa, Medagama, Galle, [US$35m][10]

vi. 220 KV transmission from Padukka to Hambantota , This line should be completed before stage-2 of the coal power plant.[US$65m]

vii. Three phase LV line extension and replacements.[~8000km]



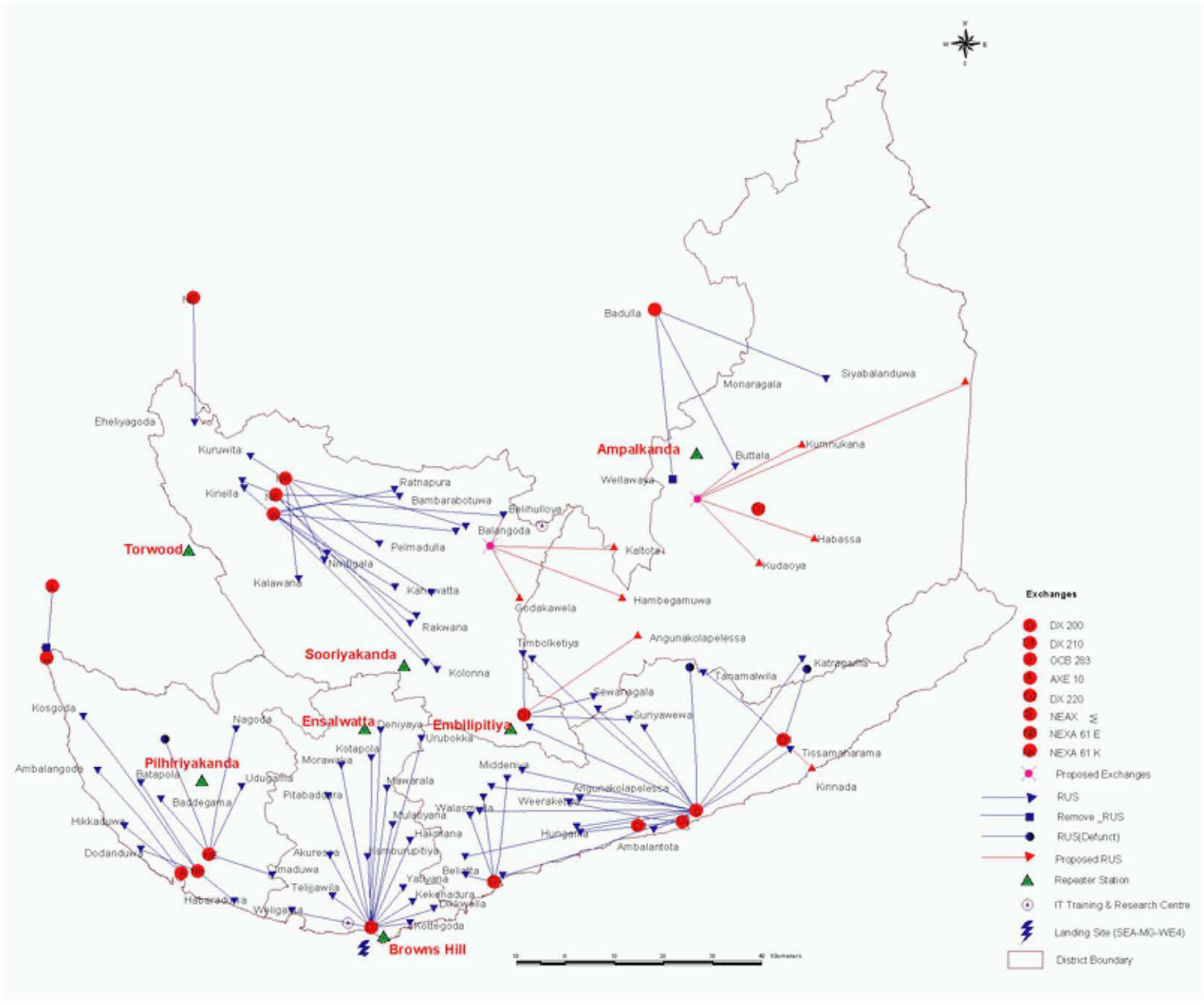
Southern Region Physical Plan

Figure: 11. 2

Proposed Medium Voltage Electricity Distribution Plan 2025

Source: Ceylon Electricity Board

National Physical Planning Department



Southern Region Physical Plan

Figure: 11. 3

Proposed Telecommunication Network

Source: Sri Lanka Telecom

National Physical Planning Department

11.11.5 Telecommunication infrastructures development plan.

i. Establish landing site of SEA-ME-WE-IV at Matara or a location close to Matara.

ii. Establish ICT training and research centre with connectivity to SEA-ME-WE-IV and rest of major towns of the region and Colombo. (FOT connections)

iii. Expand DELs to rural areas and meet the following district demands targets for year 2025,
   a. Galle -186175
   b. Matara -138966
   c. Hambantota -169748
   d. Monaragala - 92192
   e. Rathnapura -197431

   These demands are based on fixed telephones demand density 13.55[11] by year 2025, New DELs at Buttala, Balangoda,

iv. Relevant project components given in [TMP][12] telecommunication master plan already under implementation.

(Footnotes)

[1] Database development – see previous volume of the study -
[2]Galle- 4359, Matara-2043, Hambantota-1595, Monaragala-1254, Rathanapura- 8302
[3] Galle-40 ,Matara-64, Hambantota-49,Monragala-35,Rathnapura-25
[4] UDLIHP project report-1998
[5] some are Ambalangoda, Balangoda, Rathnapura, Hikkaduwa towns.
[6] 3947GWh estimated,
[7] galle-64%, matara-72%, hambantota-62%, Monaragala-72%, Rathnapura-46%
[8] Medium voltage distribution development plan 1999-2007 by CEB
[9] Cost of hydro power projects included in irrigation / diversion projects.
[10] 350Mn Rs per sub-station, 6Mn Rs per km of 123 kv, 13Mn Rs per km of 220 kv,
[11] Extrapolation of national demand forecast of telephones - TMP
[12] Master plan study for Southern area development –Nippon Koei

Chapter -12

Social Infrastructure

CHAPTER TWELVE

SOCIAL INFRASTRUCTURE DEVELOPMENT PLAN

12.1 Introduction

Social infrastructure refers to institutions, organizations and structures that provide services for the better functioning of family, community, society, organizations and institutions, economy, political system, education and health system, etc. Economic growth is just one of the factors of development that cannot be sustained without adequate social infrastructure.

Human resources development forms the foundation of modern economic development and is widely regarded as the pre-requisite of long-term stability of development.

Social equity, primarily in terms of income distribution and access to services (mainly access to health and education) is a key consideration in sustainable development. Recent information on income distribution pattern of the people for the Southern region is not available with the Department of Census and Statistics. Therefore information on the Samurdhi Programme is used for analysis. The Samurdhi recipients are considered by the government as those who fall below poverty line Table 12.1 indicates that over half the population in the southern region are below the poverty line if Samurdhi recipients taken as the indicator of poverty.

Table 12.1
Samurdhi Beneficiary Households by Districts – 2002

District		Number of Beneficiary Households and Amount Received (Rs)							
Name	Total Families	1000	700	400	350	250	155	Total	%
Galle	239,192	240	54,124	14,041	24,836	15,254	57	108,592	45
Matara	186,768	230	56,793	12,943	16,299	13,525	38	99,828	53
Hambantota	134,740	384	34,435	15,797	9,564	9,706	28	69,914	52
Monaragala	99,209	343	31,106	13,006	8,362	4,391	545	57,752	58
Ratnapura	231,071	792	76,063	27,401	26,965	9,154	321	140,788	61
Region	890,980	1989	252,521	83,188	86,026	52,030	989	476,875	54

The human poverty index is developed based on accessibility to physical and social infrastructure, particularly health, education, water & electricity etc. and reflects the improvement of the living standards of the people. Table 12.2 indicates that the Hambantota and Moneragala districts lie towards the bottom end of the ranking.

The same table also indicates that all the districts in Southern Region experience a much lower per capita GDP compared to the national figure, while Monaragala recording the lowest per capita GDP.

The human Development Index (HDI) is a significant tool in measuring the status of development primarily because personal well being has been considered the primary objective of modern economic development. Table 12.3 indicates that all the five districts in the region record HDI score below the national average.

Table 12.2
Disparities of Human Poverty by District

District	Human Poverty Index	GDP Rank	Poverty Rank
Gampaha	30.545	1	17
Colombo	28.728	2	16
Nuwara Eliya	27.685	3	1
Kalutara	27.052	4	15
Anuradhapura	25.300	5	10
Polonnaruwa	24.076	6	3
Kurunegala	23.333	7	8
Badulla	22.215	8	4
Matale	21.581	9	9
Ratnapura	21.313	10	5
Puttalam	19.324	11	12
Galle	19.048	12	13
Hambantota	18.611	13	7
Kegalle	17.391	14	6
Matara	16.208	15	11
Kandy	13.016	16	14
Moneragala	12.404	17	2
SRI LANKA	**17.756**		

Source: Quoted from Background Information for preparation of National Physical Planning Policy – 2001, Report No.07.

Table 12.3
Human Development Index

HDI Ranking of Districts Above and Below the National Average of 0.753			
Above National Average		Below National Average	
Districts	HDI Score	Districts	HDI Score
Kalutara	0.893	Ratnapura	0.751
Kurunegala	0.883	Hambantota	0.742
Polonnaruwa	0.865	Kegalle	0.741
Anuradhapura	0.854	Galle	0.736
Gampaha	0.851	Matale	0.727
Colombo	0.847	Puttalam	0.726
Nuwara Eliya	0.806	Badulla	0.717
		Matara	0.705
		Monaragala	0.692
		Kandy	0.649
Average HDI	**0.857**	**Average HDI**	**0.719**

Source: Quoted from background information for preparation of National Physical Planning Policy – 2001, Report No.07

Housing in modern terms refers to the "living environment" rather than narrowly defining as shelter. Therefore housing is considered as shelter together with associated infrastructure. Housing conditions reflect the living standards of the people.

Table 12.4 shows that housing conditions in the Monaragala and Hambantota districts are relatively poor. Houses of more than half of the population in Monaragala district and approximately half of the Hambantota district are not permanent.

Better housing increases mental satisfaction of the people and thus increases their productivity. Therefore in physical planning, provision of shelter is considered to be a pre-requisite of development.

Table 12.4
Percentage of Occupied Housing Units by Type - 2001

Type	Percentage				
	Galle	Matara	Hambantota	Monaragala	Ratnapura
Permanent	72.3	71.7	58.8	48.1	60.3
Semi-Permanent	26.3	27.3	40.1	50.3	39.1
Improvised	0.9	0.6	0.4	0.6	0.1
Not Classified	0.4	0.5	0.6	1.0	0.5
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Source: Department of Census and Statistics

Community Based Organizations, Many such organizations are found especially in Monaragala district. This social capital will be of importance in the implementation of the project activities. A death donation society is found in almost all the communities of the region. This in many cases is the better functioning CBO. This network is another strong social capital in the implementation of grassroots level development activities. It is important to work out strategies that can be applied to strengthen the CBO the formal leadership and the individual leaders.

12.2 Social Issues

Social issues have direct co relationship with the economic development status. Available information on suicide levels indicate that situation in the southern region is much more serious than that indicated by the national average.

Suicide is one of the human destruction indicators. That reflects the level of social, economic and cultural dis-integration. Lack of integration is one of the causes for the failure of development programs introduced. The other causes are political polarization and administrative bottlenecks.

National incidence of suicide was 40.1 per 100,000 persons in 1996. Four divisions in Monaragala district (Ranged from 41 to 102) and five DS divisions in Hambantota district (Ranged from 45 to 92) recorded a much higher incidents than the national situation.

Backwardness particularly in Monaragala district has been a serious social problem that has direct correlation to the status of development of the economy.

Although it is very difficult to provide statistical representation, sociological studies reveal that due to mass scale killing of people and destruction to agriculture (setting fire to paddy fields & demolition of irrigation tanks in mass scale) by the British during "Wellassa Uprising" has created a long-term backwardness effect in people in Monaragala district.

Welfare Dependency. The other major problem is the welfare dependency of the poorest of the poor and the poor who cannot afford to meet their basic requirements. This is seen as one of the major threats in the implementation of development programs.

Underutilization of Private Lands - The land owned by both the poor and the rich are not used productively. In sociological terms what people want is ownership of land more than its productivity. Rich of the rural communities migrate to cities and those who live in the community have other means of income. Therefore, most of the lands belong to rich are under utilized. Lands belonging to poor are not utilized as they lack know-how, capital, time and the risk taking ability. Further some cultivate or live in lands that belong to land owners as 'ande' farmers. Thus those who cultivate but do not own land have no incentive to get the maximum benefit of the land and protect it.

Poverty - Half the population of the project area is below poverty line. One main problem is that some of the poor do not receive government welfare and some affordable families do receive government welfare benefits.

Disabled People - Roughly about 10% of the population in the project area is termed as visible disabled persons. Of the total disabled persons in the communities as many as 85% belong to the poorest of the poor households. This shows a direct link between disability and poverty which should be given due consideration in the preparation of development plans.

Female Headed Households - According to village level studies, it can be safely estimated that over 10% of the households in the project area are female-headed households. This is high in Hambantota and even within a district it s very high in some communities. It is estimated, based on data of the village studies, that 92% of the female-headed households belong to the poorest of the poor category.

Indebtedness - Majority of the poor in the project areas are indebted to Traders or 'Mudalali'. The Poor whether they engage in agriculture or are providing labour have to meet their basic food requirements, spend on emergencies and on agricultural input. Without obtaining loans (cash or kind) they cannot survive. This has created greater dependency on the 'mudalali' and exploitation of poor by the same source. On the other hand mudalali plays a vital role in the development scenario of the rural community. Without mudalali they cannot get loans, sell their products or buy their requirements.

Poor Education and Health Facilities – Poor education and health facilities have been major social issues particularly in Monaragala and Hambantota districts. Such facilities are unequally distributed in the region where Galle and Matara districts are relatively better off. (Karapitiya base hospital in Galle serves even the population in Monaragala) and Hambantota and Monaragala are worse off. This has a very adverse impact on development of those districts as public servants particularly teachers and technical persons are reluctant to serve in those districts. Therefore there are instances when even having funds for projects implementation, lack of technical persons has resulted in non implementation of projects.

12.3 Social Strengths

Followings are enumerated as social strengths of the region.

(i) Availability of capital in several organizations, such as loan and grant money from the central government, moneys allocated from local and provincial government authorities, moneys from NGOs and other private sector organizations.
(ii) Availability of human resources (young job seekers)
(iii) Availability of water, fertile land, know-how and local market
(iv) Availability of electricity for more than one third of the population
(v) Majority including the poor are linked to centralized mass communication network

(vi) High level of literacy and free education.
(Literacy rate of Monaragala district is 78.0, which is the lowest. It is 89.8 in Galle, which is a very high figure.
(vii) Better health care system provided by the central government and provincial government, reaching even remote areas.
(viii) Better road network and transportation system.

12.4 Objectives

Objectives of the social development plan are as follows;

(i) To ensure access to all the people to physical, social and economic infrastructure
(ii) To eliminate social segregation and poverty in the region by 2030

12.5 Strategy

- The strategy to achieve these objectives is principally linked to settlement plan that is proposed in the chapter eight. Higher rate of urbanization in selected urban centres will generate large number of employment opportunities for rural poor and provide accessibility to infrastructure particularly to health and education. Proposed commercial agricultural farms while providing modern technology to small scale farmers would provide a good market in terms of out sourcing production. Also the expected urban growth would create a good market for rural produce.

- Immediate strategy would be for the government to invest in high standard health and education facilities in selected urban centres particularly in Monaragala and Hambantota district as human skill development is the prime prerequisite in modern economies.

12.6 List of Projects Selected for Implementation

12.6.1 Galle District

(i) Development of high quality education and health facilities in, Karapitiya to meet ISO standard. Karapitiya nodal to be developed to accommodate both private and public investments and to make it a regional centre for such activities. (Karapitiya health and education node)

(ii) Upgrading Galle Technical College to provide job oriented technical courses

(iii) New International Cricket Stadium and multipurpose sports complex

(iv) Establishment of District level Legal and psychological counseling centres, introduction of programs and provision of manpower

(v) Establishment of a human resources development institute at Karapitiya to implement social development programmes such as programs on (a) Skill development and confidence building, Vision building, Leadership and entrepreneurial development, Work quality improvement, Gender equality, Safety Net for Vulnerable Women, Women Empowerment, Family Integration, Community Integration, Institutional Integration, Political Integration , Administrative Integration and Training programs on food processing and food preservation, Special training for handling disabled persons and Disabled Training Institute, Alcohol prevention, Think Tank, Institutional networking, Horizontal coordination, Preschool and day care centre project, Day-care project for elderly, Educational support program for marginalized children, Adult functional literacy project, DSD level multifunctional education complex project, Art gallery and recreation centre, District Museum, District level Disaster management centre and human resource development project

12.6.2 Matara District

(i) Land development for modern private hospital and international school.
(ii) Multipurpose sports complex
(iii) Skills training centre affiliated with University of Ruhuna
(iv) Fully fledged ICT centre affiliated to Ruhunu University
(v) Establishment of Human Resources Development Center similar to one proposed for Galle.

12.6.3 Hambantota District

(i) Establishment of a human resources development institute in Hambantota similar to one proposed in Galle
(ii) Land development for modern private hospital and international school in Ambalantota.
(iii) International golf course and multipurpose sports complex in Hambantota
(iv) Establishment of a human resources development institute in Hambantota similar to one proposed in Galle.
(v) Upgrade schools to national schools level with all the resources in selected urban centres

12.6.4 Monaragala District

(i) Land development for modern private hospital and international school in Buttala.
(ii) Establishment of a human resources development institute in Buttala similar to one proposed in Galle
(iii) Upgrade schools to national schools level with all the resources in selected urban centres.

12.6.5 Ratnapura District

(i) Establishment of a human resources development institute in Embilipitiya town similar to one proposed in Galle
(ii) Establishment of district level multifunctional education complex at Embilipitiya.
(iii) Establishment of Gem Technical college in Embilipitiya

Chapter -13

Urban Designing Proposal for Galle City Part-A, Structure Plan

CHAPTER 13
Urban Design Proposals for Galle City

PART A – STRUCTURE PLAN

A.1 Background

Galle being the capital city of Southern Province with heavy concentration of regional administrative functions is serves as the first order urban centre of the Southern Province. However it has been loosing its functional significance as a first order city particularly due to;

(i) its close location to the city of Colombo and
(ii) relatively fast development of commercial activities in Matara making it the commercial city of south.

Galle will further loose its significance with the implementation of national physical planning guidelines where Hambantota would be developed to be the first order urban centre in the south.

In 1568 the city came under the rule of Portuguese. From 1640 it was ruled by Dutch and from 1796 till independence in 1948 came under the British rule. According to the historical evidence, Galle had been a port even in pre-Christian times. However it gained importance after 12th century. By the time of the arrival of Portuguese it had become a major entreport and rose to its climax under the Dutch rule. Galle was the second most important harbour of the *Verenigde Oost Indische* (VOC), the United Dutch East Asia Company, in Asia. Its strategic location for traffic between Arabic peninsula and East Asia made it an important harbour in Asia. Until 1873 when Colombo harbour was built by British Galle harbour enjoyed its supremacy and then started declining.

In 1867 it was declared as a Municipal Council and from 1915 development activities were controlled under housing and Town Improvement Ordinance. In 1979 Urban Development Authority declared it as an urban development area under the UDA law.

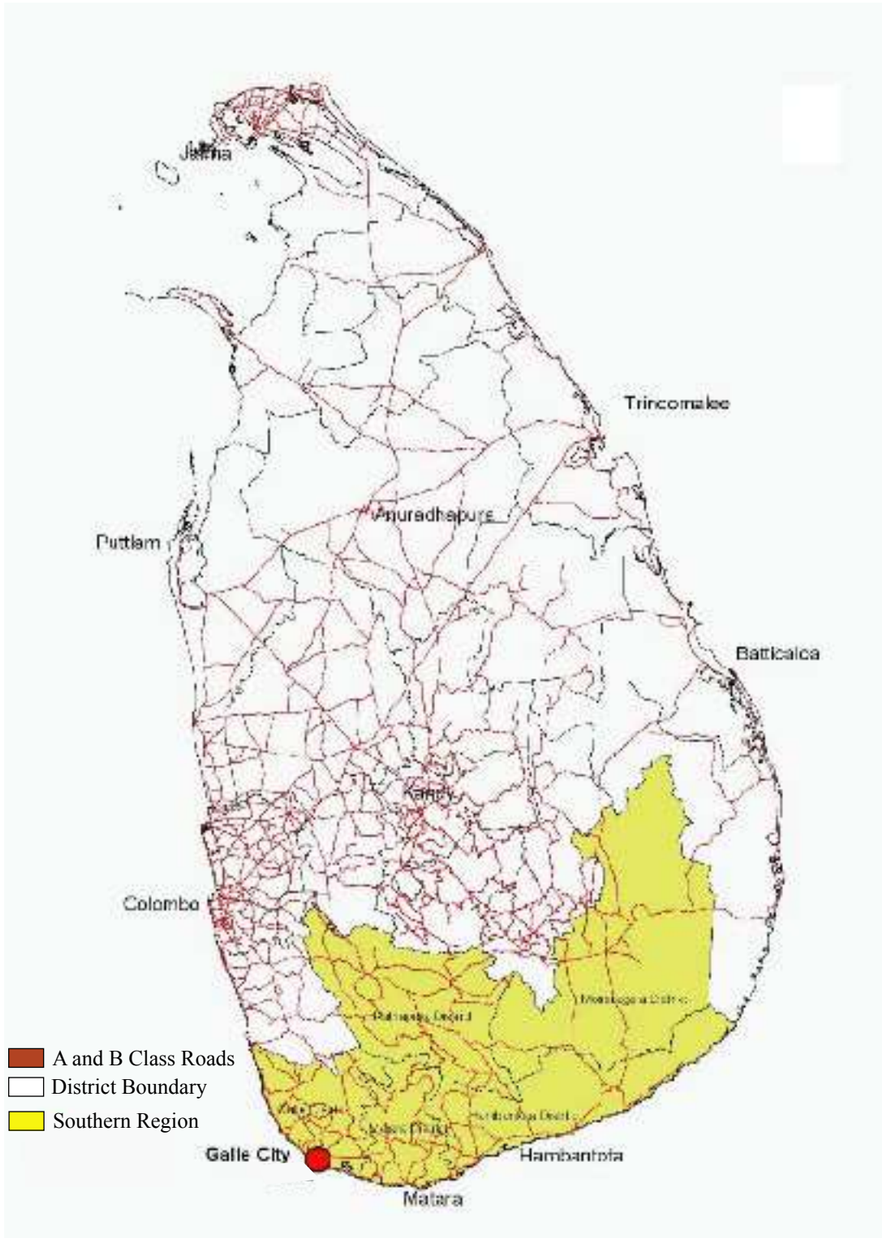


Figure 13.1
Location of Galle City

A.2 Land Use (2002)

The city at present consists of 1742 hectares of land of which about 42% is occupied by residential activities while another 17% covers home gardens. 16% of the land is considered un-developable (low lying lands) Amount of land devoted for commercial and industrial uses is very low which was 2.25% and 1.29% respectively. Figure 13.2 illustrates the land use pattern of the city in 2002.

A.3 Location and Environment

Galle being located in the wet zone consists of very high level of bio diversity. Indian Ocean being located on the eastern boundary with 15 k.m. long beach plays a significant role in regulating the micro climatic condition of the city. It has an annual rainfall between 3000 – 4500 mm and annual temperature ranging from 75 to 85 degrees farenhite. Undulating landscape of the city with elevated ridges spread all over and several water bodies make the landscape of the town spectacular.

Most of the elevated ridges are located between Wakwella road and Baddegama road forming a wide band and bisecting the city. Another set of elevated areas are located between Mahamodera lake and railway line and the third set is located at the south eastern corner of the city. In addition to the Indian Ocean, Gin Ganga estuary, Mahamodera Lake, Bikke reservoir and Moragoda ela are the water bodies that provide significant landscape to the city. Elevations of the city are illustrated in figure 13.3.

Galle city is blessed with numerous natural resources such as, Rumassala hill, Bikke reservoir, Mahamodera lake, Ginganga estuary, 15 k.m long beach particularly beach at Dadella, Closanburg and Kotugoda, Bourna Vista Coral reef, Galle bay, Nugaduwa mangrove wetland and the port and that the city possesses places of very high scenic beauty with greater potential for tourists attraction.

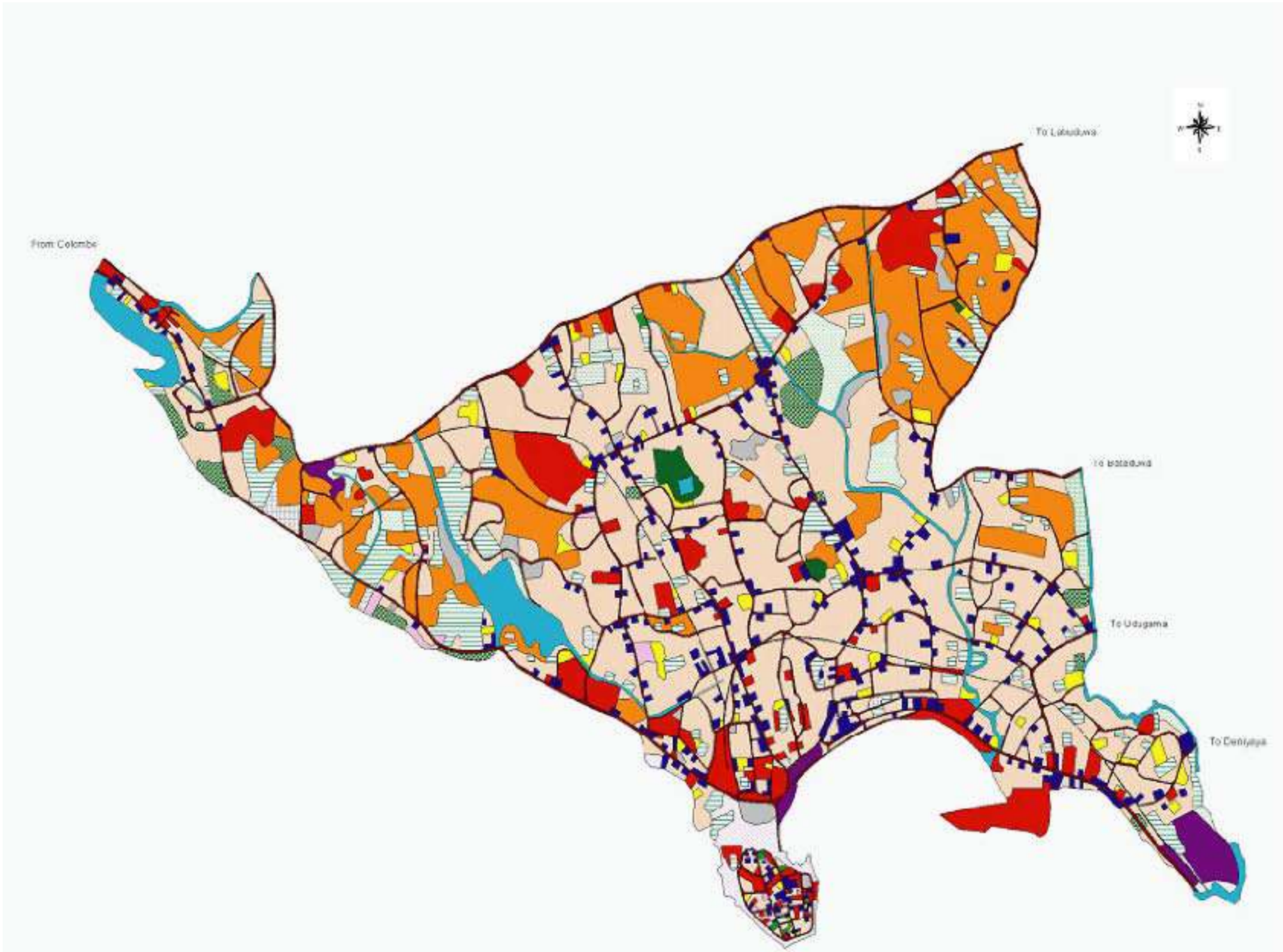
The city had been under the influence of Portuguese, Dutch and British colonial rules and so that it even today consists of several sites and buildings of historical significance. Galle Fort being a world heritage city has the most number of buildings belonging to Dutch colonial rule. Fruits and vegetable markets in the town are also buildings belonging to Dutch period. These buildings have been well studied by various institutions and individuals and adequately documented. Figure 13.4 indicates a classification of buildings in the Fort by architectural type.

Unawatuna Beach

Unawatuna Beach

Mahamodara Lake

Greenaries around Mahamodara Lake



Southern Region Physical Plan

Figure 13.2

Land Use –2004 Galle MC Area

Scale:
Source:UDA

- Residential
- Garden
- Commercial
- Government & Semi Government
- Industrial
- Religious
- Tourist Hotels
- Playground & Garden
- Open Spaces
- Cemetery
- Roads
- Vacant Land
- Marshy
- Internal Water Bodies
- Paddy
- Coconut
- Rubber
- Forest
- Railway
- Paddy (Abandon)

National Physical Planning Department

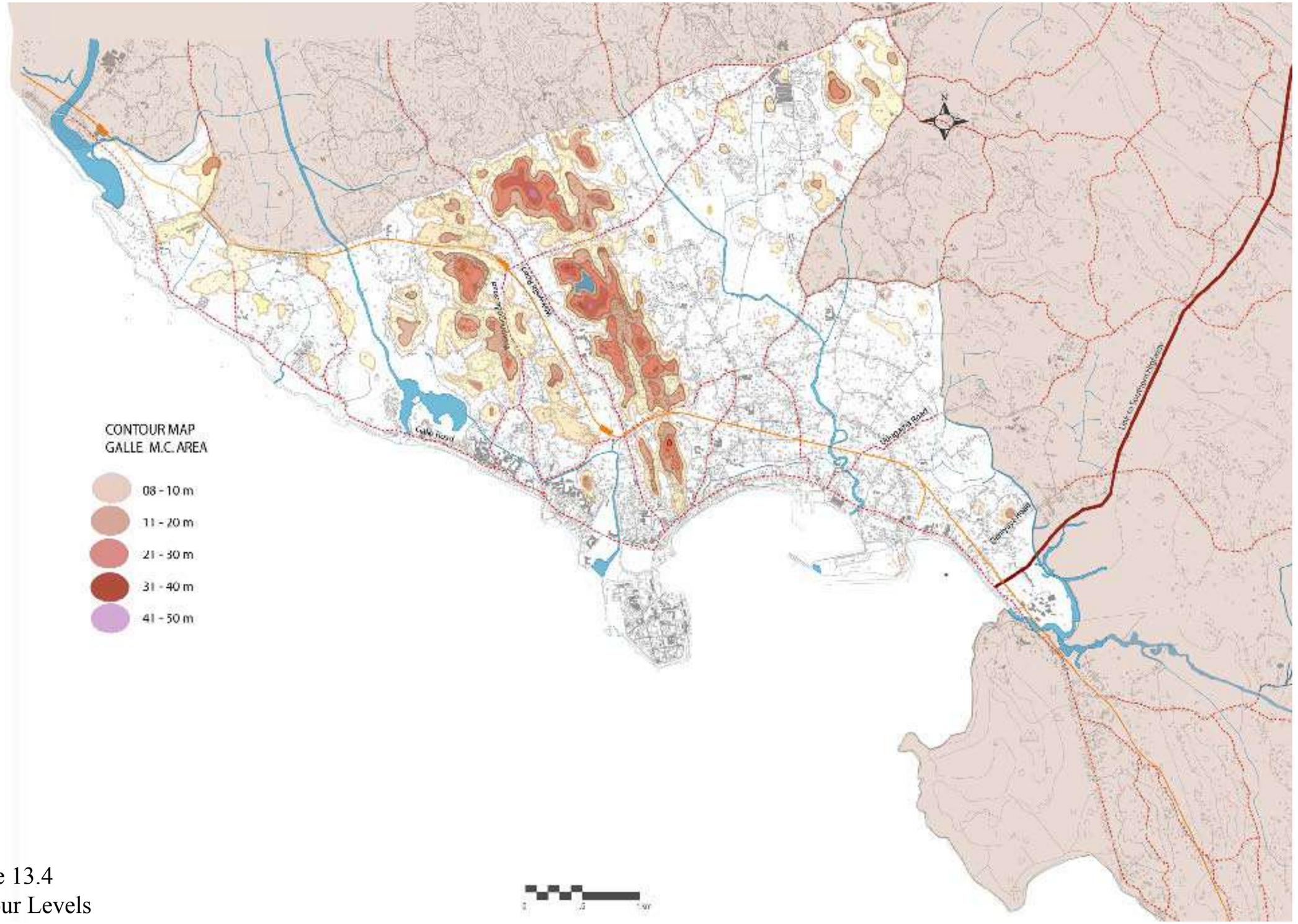


Figure 13.4
Contour Levels

In addition, there are a large number of residential buildings which are of significant architectural and historical values.

A.4 Economy

Economy of the city is mainly dependant on providing economic and social services to its hinterland particularly health and education. Galle district is the main supplier of cinnamon to the world market and also a key supplier of rubber and low country tea. However their significance is not reflected in the city mainly because of direct relationship of export industry with the city of Colombo.

Galle port played a major role of the economy in the past. However it lost its significance very fast due to development of Colombo port. Present proposals of Sri Lanka Ports Authority to develop it as a regional port and marina will likely to make it a key economic activity of Galle once again.

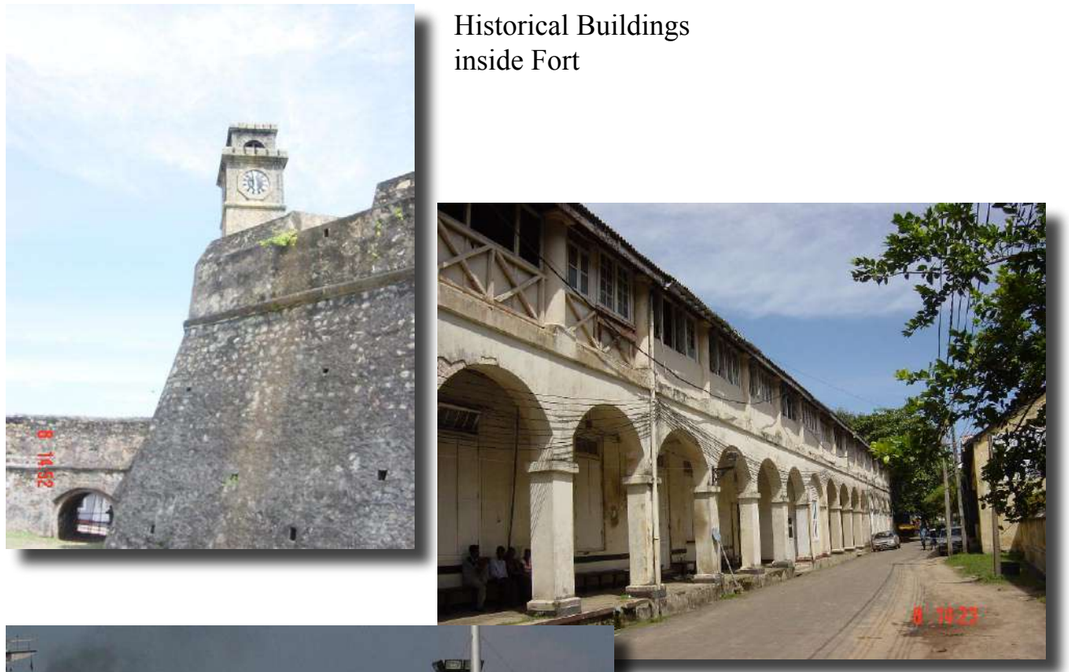
Industrial development of the town is limited only to cement industry, location of which is mainly influenced by accessibility to Port. Other industries are very negligible. Fishery is a key industry with about 100 small boats and 200 multi day boats being registered in the fishery harbour. Due to expansion of the exclusive economic zone fishery will become an economic activity with very high development potential in the near future.

Although tourism has a very high potential it does not provide the due economic benefits to the city due to poor infrastructure and management of historical sites.

Education and health are the two most important services that regulate role of the city to a greater extent. Nine national schools, a technical college, Medical and Engineering faculties of the University of Ruhuna, a branch of Open University and a branch of Sri Lanka Institute of Information Technology are located in Galle. Catchment area of Karapitiya teaching hospital goes much beyond the southern province.

Structure plan proposes for Galle to continue as a service centre as its economic base. The service activities would be primarily based on following three sectors.

- Port and port related services
- Tourism
- Education and health.



Historical Buildings inside Fort

Galle Port

Galle Cement Factory

A.5 Social Aspects

Population growth rate of Galle has been continuously declining recording 1.1 in 1963, 0.8 in 1971 and 0.6 in 1991 which was primarily due to out migration. However a slight increase was record in 2001. Location of good national schools, Medical faculty and Engineering faculty of Ruhunu University, a branch of Open University, Karapitiya teaching hospital, Provincial administrative functions and Cement factory would have contributed to regaining population.

A.6 Present Projects Considered for Implementation

Several major projects have been considered for development in the Galle city, of them following would make a high impact on shaping the future of Galle.

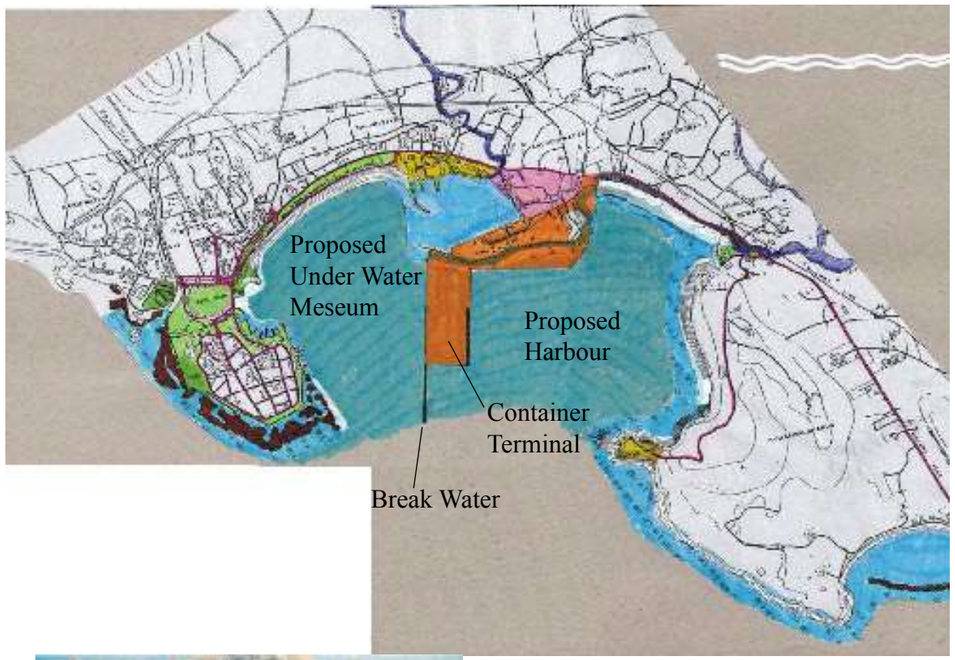
A.6.1 Development of Galle Port as a Regional Port.

At present SLPA concentrates on a short term development plan aiming at making Galle a regional port. The main proposal is to construct a new multipurpose terminal at the south of Gibbet Island. The project will consists of 2 number of multipurpose berths (240 m long and -14m deep), approach canal (160m wide), Turning basin (240 m diameter and -12m deep), berth for small crafts (170 m long and -4.5 m deep), two number of Sheds (4000 m2), Open yard (10,000 m2), Container yard (2.9 hectares), Outer break water (800 m long), Inner break water (350 m long), 4 number of Revetments (500m, 350m, 1050m long), Main access road (1.2km long 4 lane) and Connecting road (300m long and 2 lane). Proposed Port development proposals of the Sri Lanka Ports Authority is shown in figure 13.5.

A.6.2 Development of Galle Bay as a Marina and Underwater Museum

22 number of ship wrecks belonging to Dutch and British period have been identified on the sea bed. 13 of them are located within the bay area and the balance was out side, mostly within the proposed new port area. These ship wrecks have been recognized to be very valuable artifacts for underwater museum and can attract both local and foreign tourists. Marina also facilitates room for harbouring yachts and pleasure boats etc.

Figure 13.5
Proposals fo Development of Galle Port



Marine Artifatcts

A.6.3 Southern Highway

Southern highway which is now under implementation will run about 8 – 10 km east of present Galle road. The link road to the highway starts from the Galle road at the southern boundary of the city, making the city population easily accessible to the highway. The road will shorten the travel time to Colombo by a minimum of one hour and to Matara by a minimum of two hours. Hence Southern highway will create an enormous impact on development of Galle city in the near future.

A.6.4 High mobility Railway

After the Tsunami tidal waves devastated the Southern Coast the Government decided to develop a new high mobility railway system parallel to the Southern Highway. It is proposed that the travel time from Colombo to Matara will be 90 minutes and from Colombo to Galle 60 minutes. Hence once developed it will change the entire development pattern of Galle. Particularly out migration to Colombo will be reduced significantly.

A.6.5 Shifting of Administrative functions from the Fort

Shifting of administrative functions from the Fort has been a long felt need, in order to conserve the World heritage Galle Fort as a major tourist destination. The process has now begun where a high rise building was constructed recently on the former good shed site next to Railway Station to accommodate most of the administrative functions of the Fort.

A.6.6 Academic Institutions

Construction of Engineering Faculty of the Ruhunu University (at Wakwella) and a branch of Open University (at Labudwa) and Technical college at Labuduwa was recently completed and now are under operation further expanding the educational service of the city.

A.6.7 Water Supply

Greater Galle Water Supply project which is now under construction will be completed in 2004. The project will have a capacity of 32,000 m3 per day. The project will meet the water requirement of Galle city.

A.7 Problems

- Haphazard and unregulated development activities have suppressed the development potential of the city. (Ex. Location of the international cricket stadium in front of world heritage Dutch Fort destroying the view of the fort from the city centre, development of commercial buildings on the narrow strip on the sea side from the town center upto the out fall of Mahamodara lake, totally blocking the view of the Indian ocean, Alteration of historical buildings in the fort destroying the historical value of the fort etc.)

- Lack of infrastructure particularly storm water drainage, sewerage and solid waste management.

- Traffic congestion particularly during the school hours due to the traffic created by school vehicles.

- Inadequate sports grounds, which was aggravated due to development of international cricket ground opposite the fort preventing the schools to use it.

- Unauthorized developments in Rumassala hill destroying the value of it as a tourist attraction.

- Location of public institutions all over the city making them inconvenient for public to access.

- Built environment of the city particularly the bus station and other buildings in the city center have destroyed the visual environment of the city.

- Unauthorized reclamation of wetlands (particularly around Mahamodera lake and the mangrove forest in Nugaduwa), destroying bio diversity and aesthetic beauty of the city.

- Natural Disasters - Galle, according to historical evidence never underwent natural disasters. However, on 26th December 2004 Tsunami tidal waves divastated Galle City. Galle City was identified to be one of the worse affected places in the Island. Bus station and the commercial hub of the city were totally destroyed. The impact of Tsunami tidal waves had a multiple effect in Galle City due to some haphazard and improper developments that created several traps as listed below

Effect of Tsunami Tridal Waves

View from Fort towards Townhall

Off Main Street

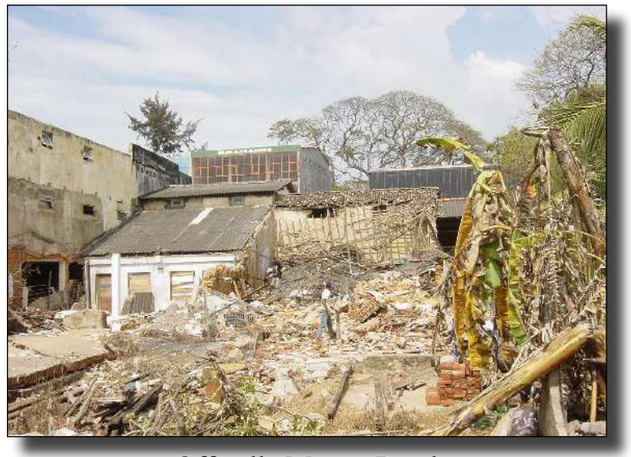
Galle Matara Road - Adjecent to Galle Bay

Galle International Cricket Stadium

Off Galle Matara Road

Bus Depot

Around Moragoda Ela



Off galle Matara Road

Fishing Harbour - Adjecent to Galle Bay

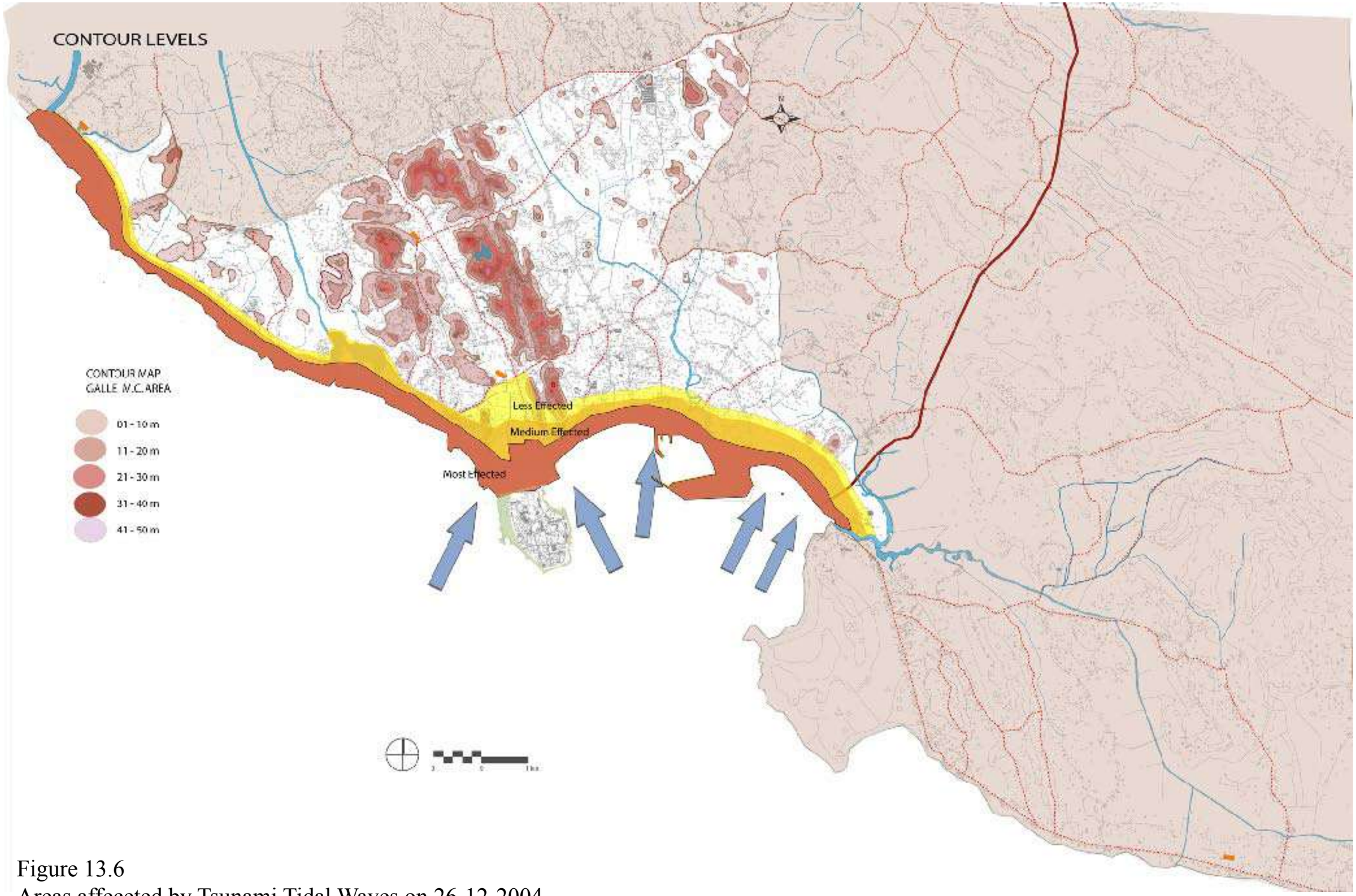


Figure 13.6
Areas affeceted by Tsunami Tidal Waves on 26-12-2004

(i) Location of public spaces - Although Galle consists of a large extent of hilly areas developments particularly places of gathering of people in large numbers such as; bus station, Railway Station, "Pola", Educational Institutions & Commercial Establishments were concentrated close to Sea Coast.

(ii) Galle Bay - Tsunami tidal waves are infact defined as "Bay tidal waves" because impact of waves is much higher in areas having a bay. Unfortunately most of the public gathering palces and commercial establishments in Galle were located facing the bay.

(iii) Rumassala Hill and Fort - Existance of Rumassala Hill and Fort at much higher elevations created a kind of funnel Effect so that the waves went through the bay at much faster speed.

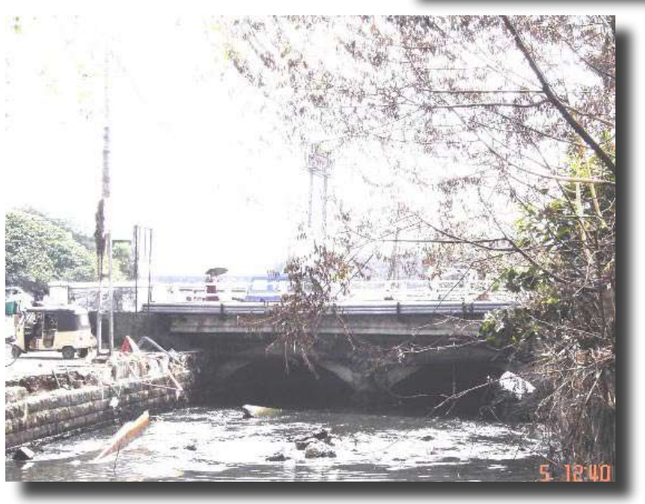
(iv) Moragoda Ela - Moragoda Ela that was recently upgraded under Urban Development and Low Income Housing Project (UDLIHP) with ADB financial assistance runs between the Railway Station and Bus Station to the Sea. At the Sea out fall the month has gradually become wider creating a shape of a funnel. The tidal waves that came through the canal created a funnel effect increasing the pressure and speed of the waves destroying the bus station.

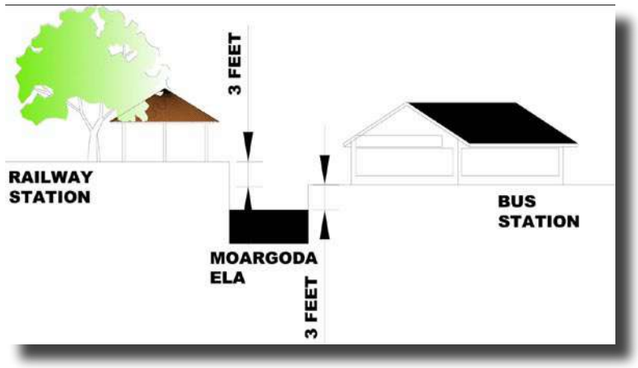
(v) The Bridge over Moragoda Ela - The Bridge over Moragoda Ela on Galle road due to its arch shape could not allow much of the water of the tidal waves to pass through. During normal floods in the past it functioned well, but was not designed to take the waves of such an unexpected "Tsunami". Therefore the tidal waves that came through the canal "having a funnel effect" over flew at the bridge mostly towards the bus station.

(vi) Level Differences - From Galle road towards the country side the bus station is located relatively at a lower elevation than the railway station (about 1.-0 metre), resulting the Tsunami tidal waves that came much faster with the "funnel effect" overflew towards the bus station than the towards the railway station.

(vii) International Cricket Stadium - International Cricket Stadium is located opposite the Bus Station. The main building of the stadium created a big barrier between the town and the open spaces of the fort. This building prevented the tsunami flood water return to the sea quickly as it has caused creating a kind of water pool in the town center.

Trap - 02
Funnel Effect -
Moragoda Ela Out fall





Trap - 04
Bus Station been located at lower elevation & inadiquate width of Moragoda Ela

Trap - 06 Poor Accessibility & Conjestion

Trap - 05
Galle International Cricket Stadium

(viii) Accessibility and Congestion - Buildings at the town centre, particularly the commercial hub in Pettigalawatta were so conjested there were no room for people to evacuate to safe places. The Ocean was not visible as the row of shops created a barrier and that people on the street could not see the danger they were facing with until they were hit. The narrow congested roads that were not easily accessible were of little use during such a sudden natural disaster. Simillar situation happended in Katugoda also where the narrow strip of land between the Galle road and the ocean was full of buildings, mostly encroaching on to the sea beach created a barrier keeping the ocean out of the sight of the people on the road and on the residential area.

Figure 13.6 illustrates the areas affected by the Tsunami tidal waves. Construction of a bund along the bay to the required height (minimum of 3.0 meters) would be an engineering solution to face the future treats of another Tsunami. However it will create an adverse impact on the aesthetic aspect of the city totally damaging the economics of tourism industry.

A.8 Opportunities

- Galle Fort being a world heritage site is the most valuable potential of the city which if properly planned and managed can be made to be a major tourist destination and an economic activity.

- Galle Port will also be a major economic activity, especially with the implementation of proposals of the Sri Lanka Ports Authority to make the port as a regional port and a marina.

- Dharmapala Park, main open space in front of Fort, Fort, Port and proposed marina, Rumassala hill, Mahamodara Lake, a large extent of mangrove wetlands behind cement factory and adjacent location of world famous tourist beach at Unawatuna can make the Galle city an attractive destination for foreign tourists.

- Galle district being the main supplier of cinnamon to the world market Galle city can be a nuclear where cinnamon based industries particularly extraction of Cinnamon oil from bark and leaves would be established.

- Cocentration of higher education and health institutions at karapitiya has created a conducive environment to further develop karapitiya to be a specialized sub centre for health and education

- A large extent of lands owned by public sector is available at the town centre. (more than 100 acres) These lands at present are occupied by Sri Lanka Railway Department, Mahamodara Hospital, Prison, Nurses training school and Technical college. All these establishments are identified for re-location making those lands available for re-development projects.

A.9 Structure Plan

A.9.1 Objectives

- Make Galle city a major tourist destination of the region
- Integrate bio diversity and scenic beauty of Galle with the urban design so as to make it a pleasant and dynamic city.
- Increase mobility so as to achieve optimum utilization of land.
- Provide maximum protection to people during natural disasters particularly related to tidal waves

A.9.2 Structure Plan

Structure plan for Galle city is illustrated in the figure 13.7. The plan guides future development pattern of the city. The planning principles behind the structure plan are;

- Evacuate people to safe places during natural disasters as quick as possible.
- Re-develop the city to achieve fast economic growth without damaging the Galle heritage.
- Intergrate environmental considerations.

Salient features of the structure plan are listed below.

(i) Transport

- **Development of a multi model transport centre**. The proposal envisages deleting the present railway line to town centre and making Colombo – Matara railway line re-aligned. This will liberate about 65 acres of prime urban land available for development. Present bus station and railway station will be moved to a newly liberated plot of land, which is conveniently located adjacent to two main roads of the city (Wakwella road and inner circular road). Development of a ferry service by using Mahamodara lake and its canal network to the town centre and a cycle path cum pedestrian walk way from the bus and rail terminal to the town centre will make the multi modal transport centre more people friendly, pleasant and efficient. (This will minimize unnecessary traffic entering core of the city.) Once the high mobility railway line is developed along the southern highway, the present railway can serve as a light rail.

- **Development of an Inner by pass road**. The inner circular road starts at Kaluwella from Galle road and runs around the outer boundary of the city centre and joins the link road to the southern highway at Magalle forming a clear boundary of the high density urban core. RDA has already designed the link road to the southern highway that starts from Galle road at Devata close to the proposed new port development. The purpose of this by pass road is to keep the Galle road at the town centre free from vehicular traffic.

- **Development of an Outer by pass road -** The outer circular road will start at Gintota from the Galle road and joins the link road at about two k.m before the intersection creating a good by pass and providing a good impetus for development of the newly added areas to the city. This by pass road will open up a large extent of land for development in the hinterland and would also provide an easy access to link road.

- **Internal main roads**. Two internal main roads are proposed by widening existing roads to improve accessibility.

- **Other Internal Roads**. Several internal roads have been identified for widening and connecting to above roads so as to create a kind of a radial pattern of roads.

(ii) Extension of the Municipal Boundary

Municipal boundary will be extended by amalgamating immediate GS divisions that indicate fast urbanization trends. The new extension will add 3785958m2 of new lands to the municipal area with a population of about 11,000 persons in 2003. It will also include some of the important land use functions to the city that are currently located in the immediate vicinity, such as Engineering faculty and Medical faculty of Ruhunu University, Vocational training centre, technical college, Mangrove conservation area and Rumassala hill etc.

(iii) Zoning

The proposed Zoning Plan for Galle city is very broad based. It is firstly based on the economic role of the district and then future development perspective of the entire region. The considerations are briefed below.

- Future economic role of the district
- National Physical Planning Guidelines
- Main Objectives of the Structure Plan (Sections A.9.1)

Zoning plan provides the broader future land use system. The Zoning Plan is worked out in such a way so as to make some zones (i.e., Environmental conservation areas and recreation areas) more rigid and some zones (High Density Mixed Development Zone and Low and Medium Density Residential Development Zone) more flexible. The plan consists of following zones.

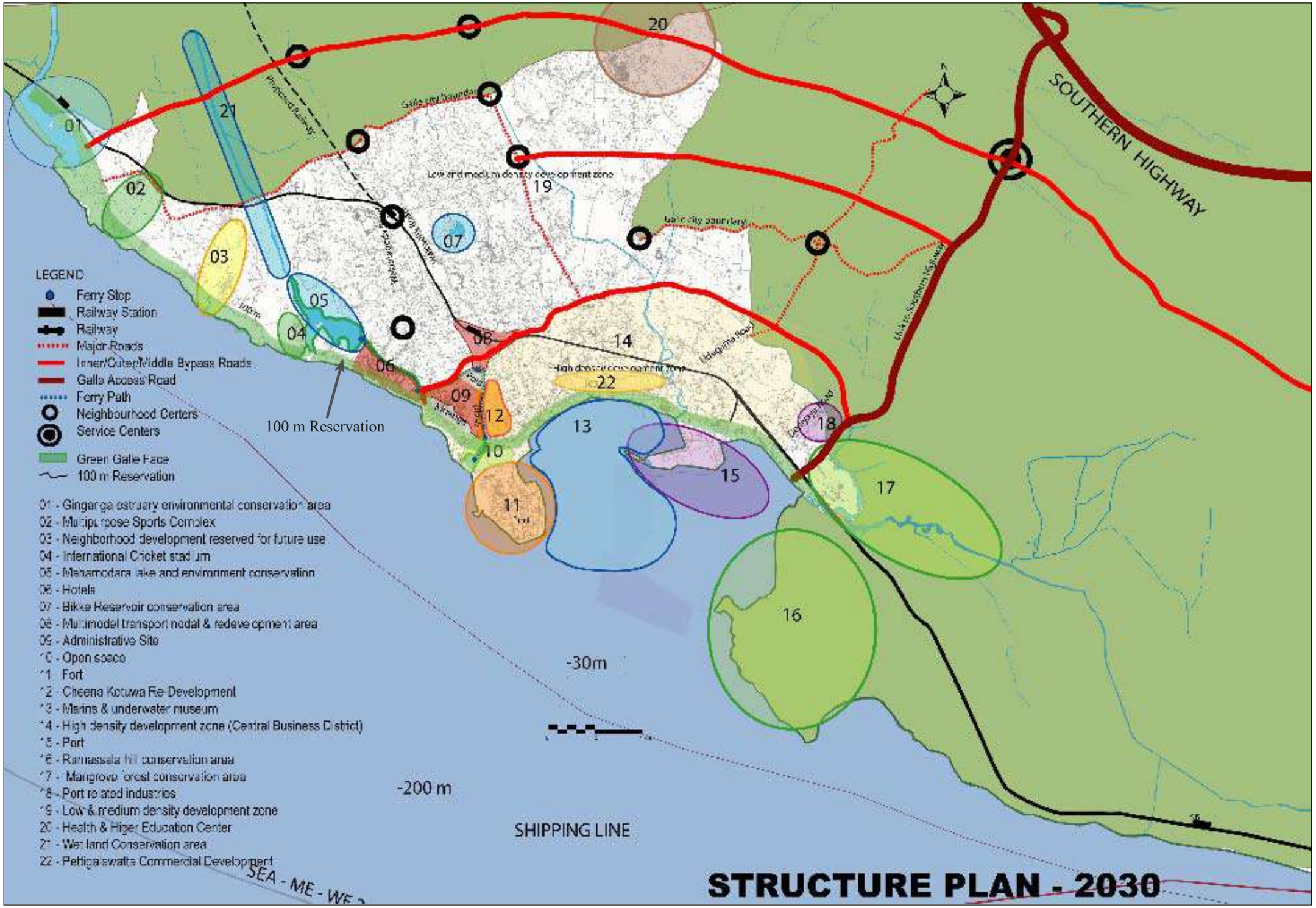
Table 13.1
Major Zones

Zones	Approx. Extent (Ha.)	P.C. of Total
Integrated Tourism, Recreation and Environmental Conservation Zone	657.8	30.43
Port and Port related activities zone	36.6	1.69
Multimodel Transport center & Mixed Development Area	28.0	1.29
High Density Mixed Development Zone	318.2	14.72
Low and Medium Density Residential Zone	1093.7	50.61
High Density Health and Education Zone	27.0	1.25
Total (Including Areas outside the City limits	2160.92	100.0

* **Note** : The total extent is different from other published sources, due to inclusion of Galle city.

(a) Integrated Tourism, Recreation and Environmental Conservation Zone

This zone comprises land use zoning numbers 1, 2, 3, and 10 as indicated in Table 13.1. The zone will play a key role in shaping the future development direction of Galle. Proposed projects under this zone are listed below.


SOUTHERN HIGHWAY
LEGEND
Ferry Stop
Railway Station
Railway
Major Roads
Inner/Outer/Middle Bypass Roads
Galle Access Road
Ferry Path
Neighbourhood Centers
Service Centers
Green Galle Face
100 m Reservation
100 m Reservation
01 - Gingaga estuary environmental conservation area
02 - Multipurpose Sports Complex
03 - Neighborhood development reserved for future use
04 - International Cricket stadium
05 - Mahamodara lake and environment conservation
06 - Hotels
07 - Bikke Reservoir conservation area
08 - Multimodel transport nodal & redevelopment area
09 - Administrative Site
10 - Open space
11 - Fort
12 - Cheena Kotuwa Re-Development
13 - Marins & underwater museum
14 - High density development zone (Central Business District)
15 - Port
16 - Ramassala hill conservation area
17 - Mangrove forest conservation area
18 - Port related industries
19 - Low & medium density development zone
20 - Health & Higer Education Center
21 - Wetland Conservation area
22 - Pettigalawatta Commercial Development
-30m
-200 m
SHIPPING LINE
SEA - ME - WE
STRUCTURE PLAN - 2030

- Shifting of international cricket grounds to Mahamodera area. The proposed new land for development of a new international cricket ground is conveniently located overlooking the Indian Ocean and Mahamodera Lake. The land is 55914m2 in extent and is a flat land. Also it has easy access to the proposed inter model transport centre. Since the land is somewhat at a low elevation in relation to the Galle Road during Tsunami on 26th December 2004, it went under water, it needs earth filling and other engineering solutions.

- Multipurpose sports complex at Dadella. A multipurpose sports complex has been a long felt need for Galle. The site identified is situated at Dadella next to the cemetery, overlooking the Indian Ocean. It has a main road access from Galle road. The extent of the land is 293604m2.

- Development of a theme park at the historical Galle Fort by converting historical buildings into cafeterias, hotels and other entertainment uses and developing infrastructure and conserving the heritage. The theme would be "Historical Experience".

- Integration of the present open spaces in front of Fort and in the Town hall premises (Dharmapala Park) to make a large contiguous public open space.

- Converting the former pola and commercial area adjusted to the bay that was devastated by Tsunami to a public open space (Galle Face Green) and continue the "Galle Face Green " close to Cement Factory. Since the Government has declared a reservation of 100.0 meters along the ocean (where no construction is permitted) the entire sea front boundary is proposed to be developed as a green belt mostly with mangroves that act as a natural barrier against tidal waves and with other urban open spaces with recreational oriented land uses.

- Creation of an urban water front recreational facilities starting from Gintota river estuary up to world famous Unawatuna beach. This will consists of walkways, cafeterias, hiking, underwater activities etc.

- Conservation of the large mangrove wetland habitat that is situated at Nugaduwa behind cement factory. This mangrove habitat has very high bio diversity and scenic beauty.

- Development of marine and underwater museum.

- Development of cabanas around Mahamodara Lake and Development of five star hotels.

- Conservation of Rumassala hill and making it a hiking site.

- Conservation of Bikke Reservoir as a bio diversity conservation site. (this is already under implementation with foreign assistance)

- Restoration of Mahamodara lake and its canal system with improvement of accessibility to it for eco tourism and research activities.

(b) Port and Port related activities zone

This zone too will play a key role in economic development of Galle. The zone will accommodate proposed activities of Galle Port (See Section A.6.1) so as to achieve the objectives of SLPA to make Galle a regional port.

(c) Industrial Development Zone

The industrial zone makes adequate lands available for expansion of present Cement Industry and Similar future projects.

(d) High Density Mixed Development Zone.

This zone comprises Central Business District (CBD). It will consist of some of the major projects proposed for immediate investments as listed below.

- Multi-model transport Centre to accommodate bus, rail and water transport systems.

- Administrative Complex to house all the floor space demand of public institutions.

- Re-development of "Pettigala commercial area that was devastated by Tsunami on 26th December 2004.

- Redevelopment of the "Katugoda" commercial area that was also destroyed by Tsunami to accommodate destroyed commercial and Indutrial Establishments, while continuing the "Galle Face Green" up to Cement Factory.

- Re-Development of "Cheena Kotuwa" behind the present bus station.

(e) Low and Medium Density Residential Zone

This zone accommodates most of the demand for residential and related land uses in the future. The character of low density nature could be changed to high density based on the achievement of the Development Plan.

(f) High density Health and Education Zone

This zone accommodates high order education and health facilities so as to make Galle the hub of higher education and health facilities in the southern region. Hence this zone would also act as a nuclear of economic development of Galle. In addition to the existing institutions already located in this zone. (i.e. Karapitiya Teaching Hospital, Medical Faculty of Ruhuna University) it is proposed to shift Mahamodara Hospital and Galle Technical College also to this zone. It is proposed to establish other specialized health services, such as; Children's Hospital, Maternity Hospital, etc. The zone accommodates private hospital too. It is also proposed to establish specialized education institutions, such as; information Technology Management, etc. At present Karapitiya hospital premises is very sparsely developed and Re-development of that site could accommodate most of the public sector requirements for health activities. A large extent of privately owned vacant lands are also available in the vicinity.

(iv) Urban Re-development sites

Four major urban re-development sites are proposed as listed below.

- **Present bus station site**. During the Tsunami Tidal Waves bus station became a trap and a grave yard for hundreds of people (see section A.7) Hence this site is proposed to be a public open space and a part of the proposed central urban square. No construction is recommended on this site.

- **100 meter reservation** - 100 metre coastal reservation along the western city boundary will be maintained as a green belt - Galle face green. No construction is permitted. Starting from the railway station upto the cement factory at Katugoda, the present Galle road will be abandoned and amalgamated with the 100 meter open space. A new Galle road is proposed from the Railway station behind the present bus station and widening old Matara road and behind the present Kotugoda commercial area

- **Existing Prison site**. The prison is proposed to be relocated. Although Tsunami tidal waves hit the Prison Buildings no damage occurred. The front boundary wall built during the British period prevented potential damages by tidal waves to the buildings & the people inside. Some of the Buildings of the Prison Complex are of very high architectural value and that it is proposed to utilize the Building for recreational related activities.

- **Present Technical College site and Nurses Training School.** This sites will be amalgamated with the prison site to make a one contiguous site to accommodate administrative complexes and commercial activities.

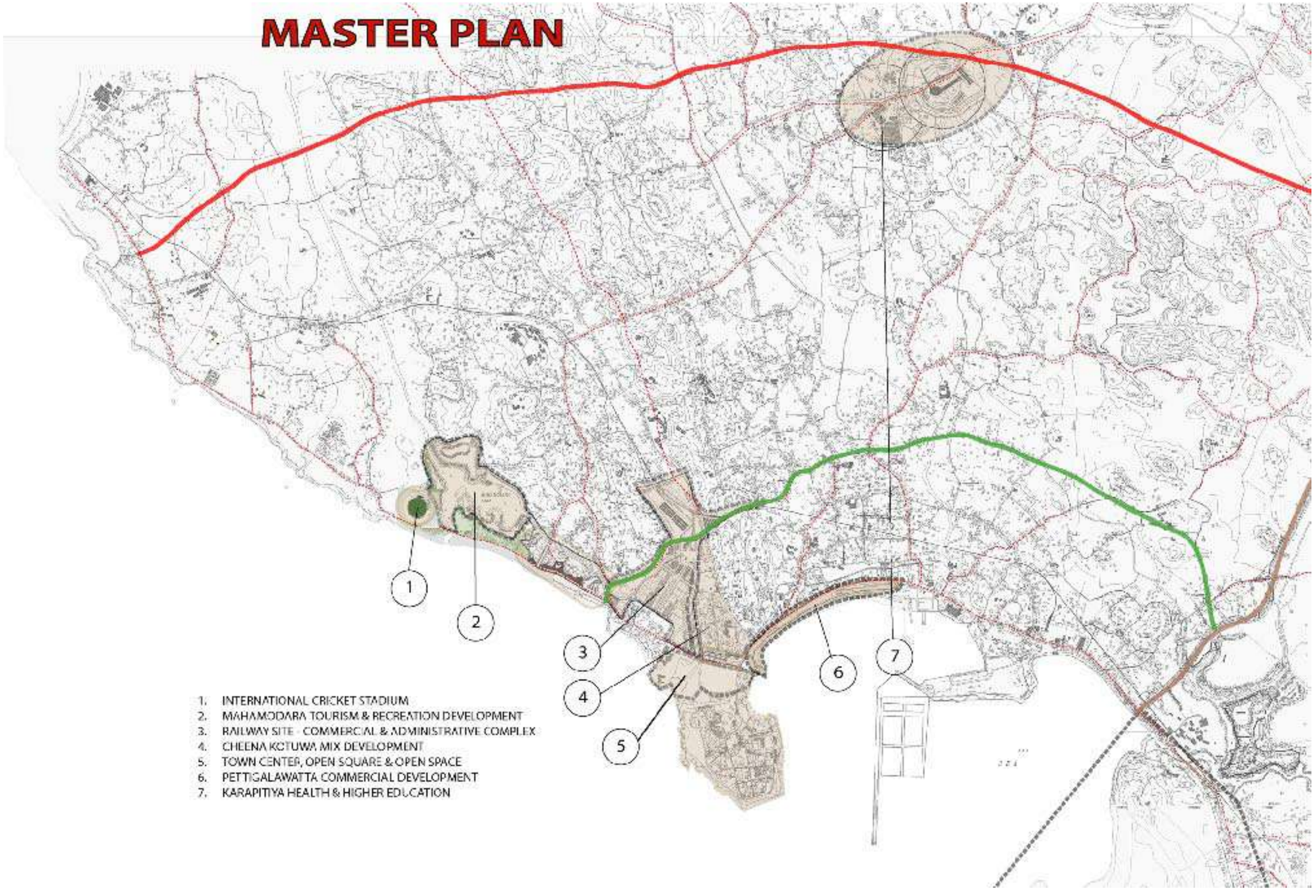
- **Railway lands**. With the development of multimodal transport centre, about 65 acres of land mostly owned by Sri Lanka Railway Department would be available for development. These lands would be developed to create a new urban structure accommodating most of the public and commercial needs of the new Galle city.

- **Pettigala Watta and Katugoda -** These two areas where bulk of the commercial establishments were concentrated were devastated by tsunami tidal waves. After keeping the 100 meter reservation, two commercial complexes are proposed to accommodate affected commercial establishments and some residential facilities.

- **Cheena Kotuwa -** The Lands behind the present bus station have very high commercial value, requiring Re-Development. Presently it mostly consists of single storey residential uses. It is proposed to re-develop "Cheena Kotuwa" for commercial uses with adequate parking facilities.

(v) Neighborhood Centers

Nine neighborhood centers have been proposed in the low and medium density residential zone. The aim is to concentrate commercial and social activities to


MASTER PLAN
1
2
3
4
5
6
7
1. INTERNATIONAL CRICKET STADIUM
2. MAHAMODARA TOURISM & RECREATION DEVELOPMENT
3. RAILWAY SITE - COMMERCIAL & ADMINISTRATIVE COMPLEX
4. CHEENA KOTUWA MIX DEVELOPMENT
5. TOWN CENTER, OPEN SQUARE & OPEN SPACE
6. PETTIGALAWATTA COMMERCIAL DEVELOPMENT
7. KARAPITIYA HEALTH & HIGHER EDUCATION

cater to the surrounding community and also those who by pass Galle city center. Activities proposed in the neighborhood centers are;

- Retail Outlets
- Food Outlets/Restaurants
- Dispensaries/Health Centers
- Schools
- Playgrounds / Children's Play areas
- Light / Service industries

Well established neighborhood centers will prevent haphazard development of such activities in residential zone and that the residential environment would be enhanced. It would also prevent large concentration of people at the town centre of Galle vulnerable for natural disasters, particularly tsunami tidal waves.

(vi) Service Center

In addition to neighborhood centers, a service center is proposed where proposed outer bypass road meets link road to Southern Highway. The main purpose is to serve those who bypass Galle down town to get to the Southern Highway. The activities proposed in the service centre are;

- Fuel filling stations
- Vehicle service Centers
- Dispensaries / Health Centers
- Restaurants / Food Outlets
- Supermarkets / Retail Outlets

PART B
URBAN DESIGN PROPOSALS

B.1 Introduction

Cities play major role in economic development of modern economies. However in order to make the optimum benefits of urban economies the cities should be well-designed to make them efficient, functional and interesting and to have a sense of place. The tool used to create such cities is “Urban Design”

The primary concern of urban design is physical form of the city. It is a representation of economic and social development of the city with a pre-determined urban form aiming at spatial distribution of investments in an aesthetically pleasing order to make them functional and efficient. The physical form of cities is primarily regulated by;

- Economic role of the city
- Natural environment
- Land use controls
- Socio-cultural elements
- Transport network etc.

B.2 Urban Design Strategy for Galle City

B.2.1 Structure Plan

Urban Design Strategy is primarily based on the structure plan. The key elements of the structure plan are summarized as;

- Transport – Inner circular road, outer circular road, link road to southern high way and new multimodal transport centre
- Zoning – Inner city (city centre), environmental conservation zone, integrated tourism and recreation zone, historic zone, health centre nodal point
- Economy – high order service centre
- Location of urban functions – high density commercial and town centre activities, historical zone, recreation zone etc.
- Density – High density at the town centre and low and medium density in the periphery.

B.2.2 Design Objectives

The objective of the urban design proposal is to create a tropical garden city, integrating the following elements;

- Natural environment
- Historical heritage
- Economic significance

With the concept of "Friendliness" – to provide comfortable and convenient living with more interaction among people.

B.2.3 Urban Design Proposals

(i) Urban Pattern

Urban Pattern is the framework for land use and infrastructure in a city that gives a sense of order. It can take many forms depending on the topography and deliberate planning. (i.e. grid pattern, radiating from a central point, circular, linear, cluster etc.) Road network and Zoning plan play a key role in urban pattern

It is somewhat difficult to propose a new urban pattern for Galle because the city has already developed to a reasonable extent and a large extent of land is privately owned. Any attempts for land acquisition would create a social unrest. Also topography of the city with highly undulating landscape restricts to form a formal pattern. However taking the present road net work, link road to southern highway (that is already designed by the RDA) and proposed multimodal transport centre, a radial urban pattern is proposed for Galle city as illustrated in figure 13.8, 13.9, 13.10 and 13.11.

The proposal envisages development of two circular roads – the inner circular road and the outer circular road both connecting Galle road with the link road to Southern Highway. The inner circular road stars at Kaluwella from Galle road and runs around the outer boundary of the city centre and joins the link road at Magalle forming a clear boundary of the high density urban core. The outer circular road will starts at Gintota from the Galle road and joins the link road about two k.m. before the intersection. creating a good by pass and providing a good impetus for development of the newly added areas to the city. The other existing local roads would be improved to emphasize the radial pattern that start from the town center. Development of Karapitiya nodal and multimodal transport centre nodal will also be based on a radial road pattern.

Proposed Zoning Plan creates a distinguished urban form for Galle City. (Figure 13.6) It proposes very interesting land use zones with design themes as illustrated in table 13.2.

Table 13.2
Themes for Urban Form

No	Zone	Theme
1	Galle Fort	Historic
2	Galle Bay	Urban Water Front / Adventure
3	Mangrove Forest and Rumassala Hill	Tropical Landscape / Adventure
4	Sports Complexes and Water Front	Recreation / Fitness
5	Unawatuna Bay	Leisure
6	Karapitiya Node	Health / Education
7	City Centre	Vibrant / business

Different themes have been proposed for different zones so as to provide a framework within which all planning, urban design and architectural decision making is to be made at design, implementation and operation stages.

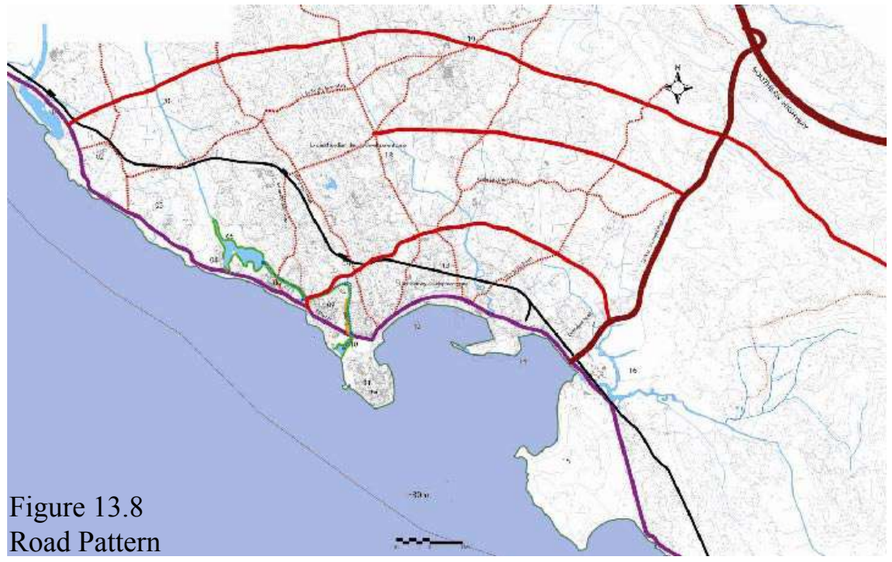
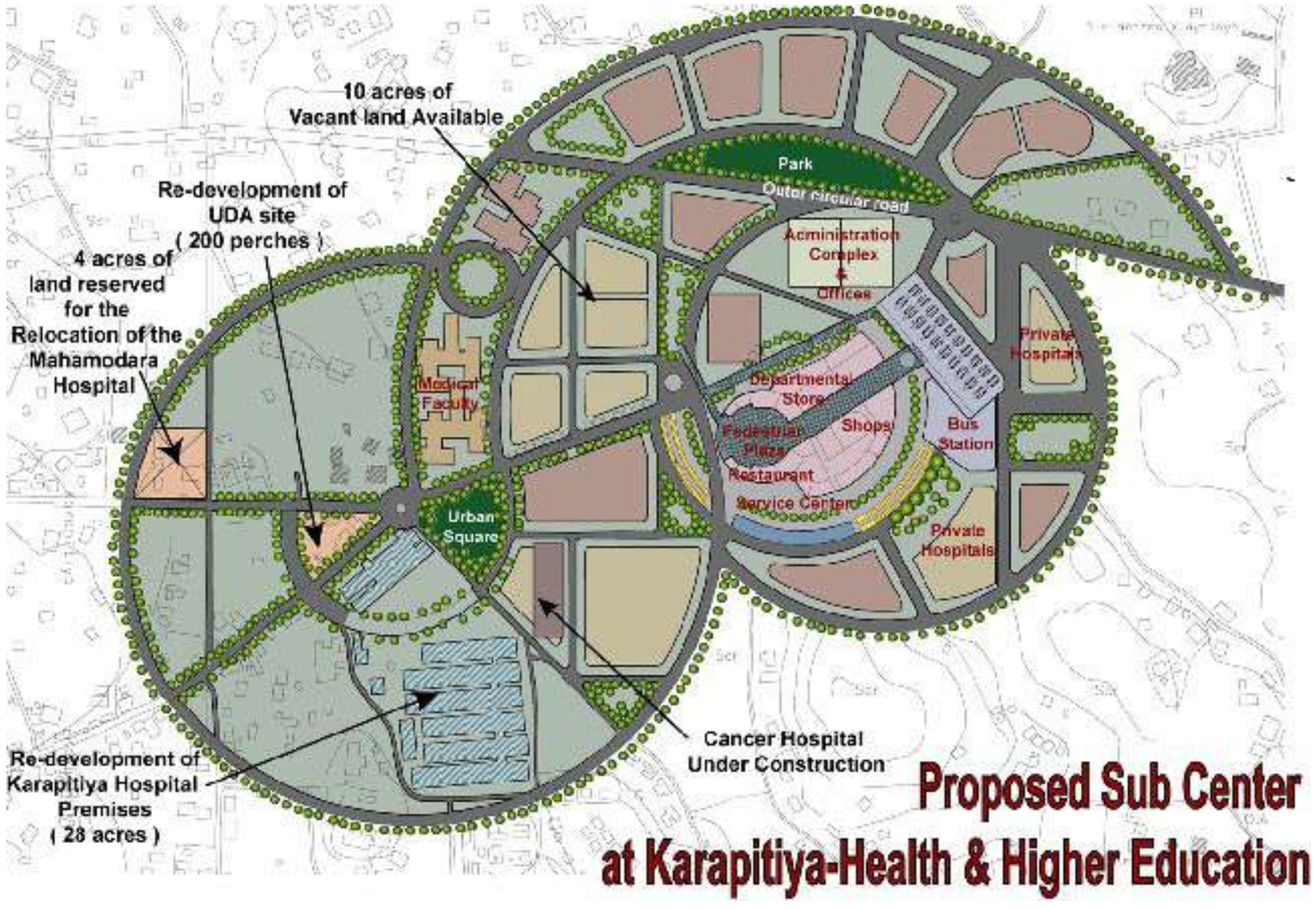


Figure 13.8
Road Pattern

Figure 13.9
Rail Way land Redevelopment & Cheena Kotuwa Re-Development
A new Urban Pattern

Railway Lands that could be liberated for urban re-development.



Under utilized lands in Karapitiya that can be used for development of proposed sub centre.

Figure 13.10
Health & Higher Education Nodel at Karapitiya
A new Urban Pattern

Pettigalawatta
After Tsunami tidal waves.

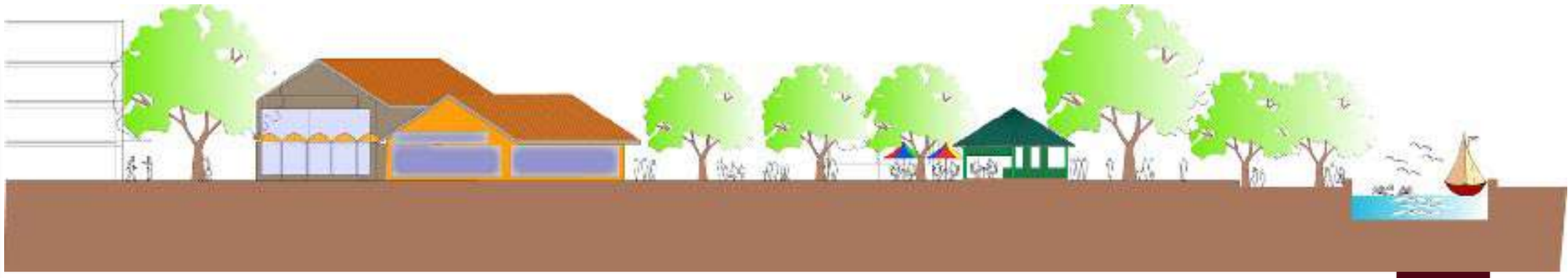


Figure 13.11
Street Scape
At new urban center at Railway site.

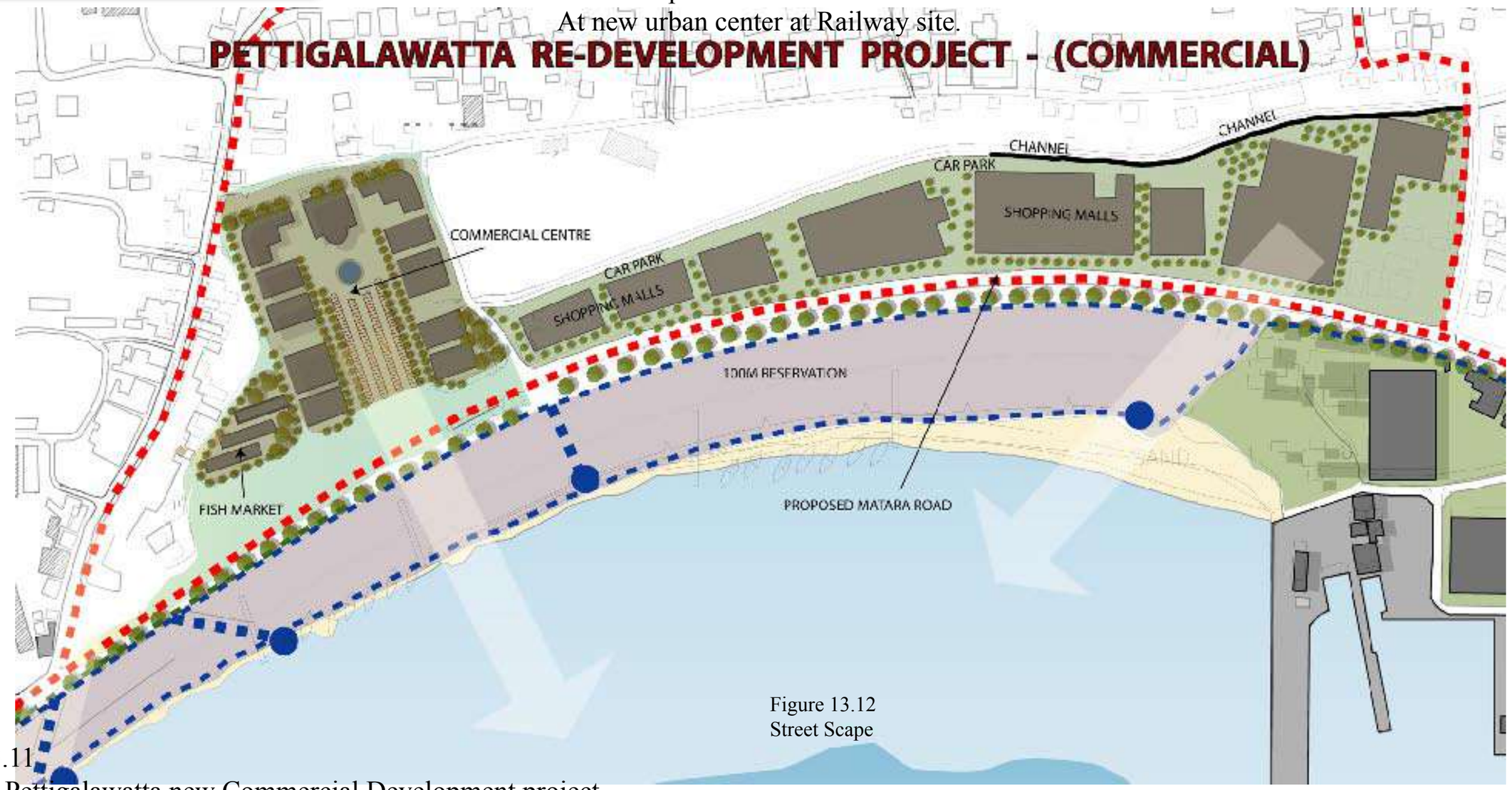


Figure 13.12
Street Scape

Figure 13.11
Proposed Pettigalawatta new Commercial Development project.

(ii) Streetscape

Streetscape relates to elements like building edge, scale, landscaping, materials and street activities. A good combination of these elements gives the street character. Some of the roads to give specific characters in the city are as follows;

- Wakwella road – One of the main radial roads to the city from the sub urban area that runs through the city focusing historic fort. The road is also running adjacent to the proposed multi model transport centre. The road will be given a very formal urban character with well paved walkways, side drains, tree planting and street lights. (See sketches)

- Old Matara road – This road is one of the busiest roads in the town with a heavy concentration of business activities. Since the strcuture plan has proposed to do away with the existing Galle road and to develop old Matara road as the main Galle road, it will be re-designed accommodating both vehicular traffic and pedestrian traffic.
  The street will have a new character with three new commercial complexes (Cheena Kotuwa, Pettigala watta and Kotugoda). Therefore the street will have a new character with new Buildings, Pedestrian Walks, Parking & Streetscapes.

- **Present Galle - Matara road** - This road will be amalgamated with "Galle Face Green" as it is within the 100 meter reservation. This road will be pedestrianized to create one of the most functional and attractive pedestrian walks of the city. The walkway on the sea side will constitute part of the proposed linear park along the Galle bay towards Unawatuna. Walkway of the land side would be well paved, planted and lighted.
- **New Street From Galle road to the proposed multi model transport centre** – This road will be made the most vibrant street in Gall. Since it will be a new road it has no constraints for designing. The streets here would be of grid pattern and focused towards interesting elements. Towards Galle road view towards the Indian Ocean will be created and towards the transport centre, the Ferry Station would be focused.

(iii) Building Form

Building form is the way in which buildings are grouped together to give the area a character. It forms the sky line of a city with varying heights, designs and texures.

Proposed building form is mainly influenced by the Galle road which is the spine road of the city. It makes clear definition of urban edge and almost all the interesting urban activities of the city are located either side of the Galle road such as;

- Indian ocean water front
- Ginganga estuary
- Proposed multi purpose sport complex
- Proposed international cricket stadium
- Light house hotel
- "Kittange" jewelry village
- proposed administrative complexes at Railway site
- Entrance to proposed multimodal transport centre
- Town hall
- City centre
- Proposed urban square
- Galle Port
- Galle harbour and proposed marina
- Water Front linear park
- Proposed fish market and retail centre
- Rumassala hill
- Cement Factory
- Entrance to the Mangrove forest conservation area
- Entrance to the link road to southern highway

Hence Galle road will be made the main promenade of the city creating the city's sky line and building form. In addition two more building forms are proposed for Multimodal transport centre and Karapitiya nodal. Figures 13.13 illustrates the design proposal for building forms.

(iv) Pedestrian Network

Pedestrian network is one of the most interesting elements of a good urban design. It creates a network of walkways that encourages pedestrians to walk from place to place. In order to make the system more user friendly, it is necessary to link points of interest such as parks, transport nodes, retail activities etc.

Figure 13.13
Proposed Building Form
At the new urban centre at Railway Land.

Pedestrian network plan is illustrated in figure 13.14. The objective of the plan is to make Galle a pedestrian friendly city. To create a sense of pedestrian friendliness three pedestrian walkways would be developed. Innovative hard and soft landscaping (i.e. planting, paving, lighting, street furniture, sculptures) is proposed along these walkways to make them more user friendly and interesting. The main walk way planned is from the proposed multi-modal transport terminal to the formal plaza along the canal. Since this pedestrian link runs along the canal and directs pedestrians from the transport nodal to the town center and to the formal plaza and historical fort connecting interesting places of the city, it would invite people to walk. The line of shade trees on either side of the walk would keep pedestrians comfortable even during hot weather periods.

The second major walk way starts from the port premises (close to present Pola) and runs along the Galle bay and crosses the Rumassala hill and ends at the world famous Unawatuna beach, connecting proposed under water museum, proposed fish market and other water front developments, tropical rain forest, coral reef etc.

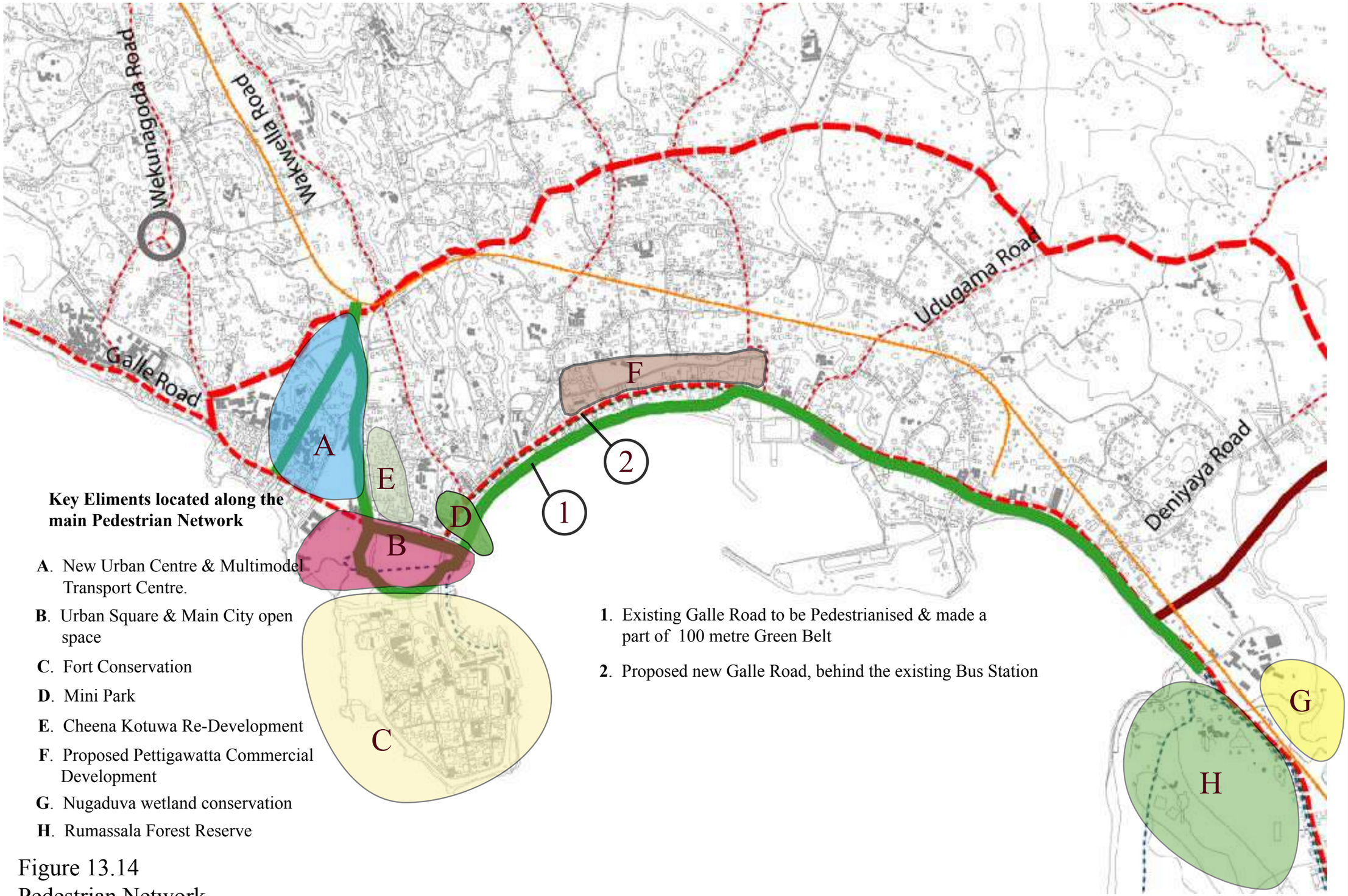
Inner circular road will also have a pedestrian walk that mainly connects the town center activities.

(v) Vehicular Access

Good design of vehicular movement makes cities very efficient. The primary consideration is to minimize conflicts between vehicular traffic and pedestrian traffic and to make sure smooth flow of traffic.

The accessibility plan is illustrated in figure 13.15. The objective behind the plan is to minimize conflicts and increase efficiency. The strategy to achieve the objective is to develop a multi-modal transport system that consists of following proposals;

- To connect all the through traffic with the link road to southern highway by passing the city centre.
- Create an inner circular road to define the city centre / core area.
- Re-align the railway to Matara to minimize delays that are experienced at present and to integrate bus transport with rail transport efficiently.
- Create under passes and over passes at critical locations (i.e. i.e. Over pass at Kandewatta road and Wakwella road intersection over the new railway crossing point and linked with upper Disckson road over the existing tunnel)
- Create cycle paths ferry service for both leisure and convenient traffic.
- Create user friendly pedestrian walkways linking interesting leisure and economic activities



Key Eliments located along the main Pedestrian Network

A. New Urban Centre & Multimodel Transport Centre.

B. Urban Square & Main City open space

C. Fort Conservation

D. Mini Park

E. Cheena Kotuwa Re-Development

F. Proposed Pettigawatta Commercial Development

G. Nugaduva wetland conservation

H. Rumassala Forest Reserve

1. Existing Galle Road to be Pedestrianised & made a part of 100 metre Green Belt

2. Proposed new Galle Road, behind the existing Bus Station

Figure 13.14
Pedestrian Network

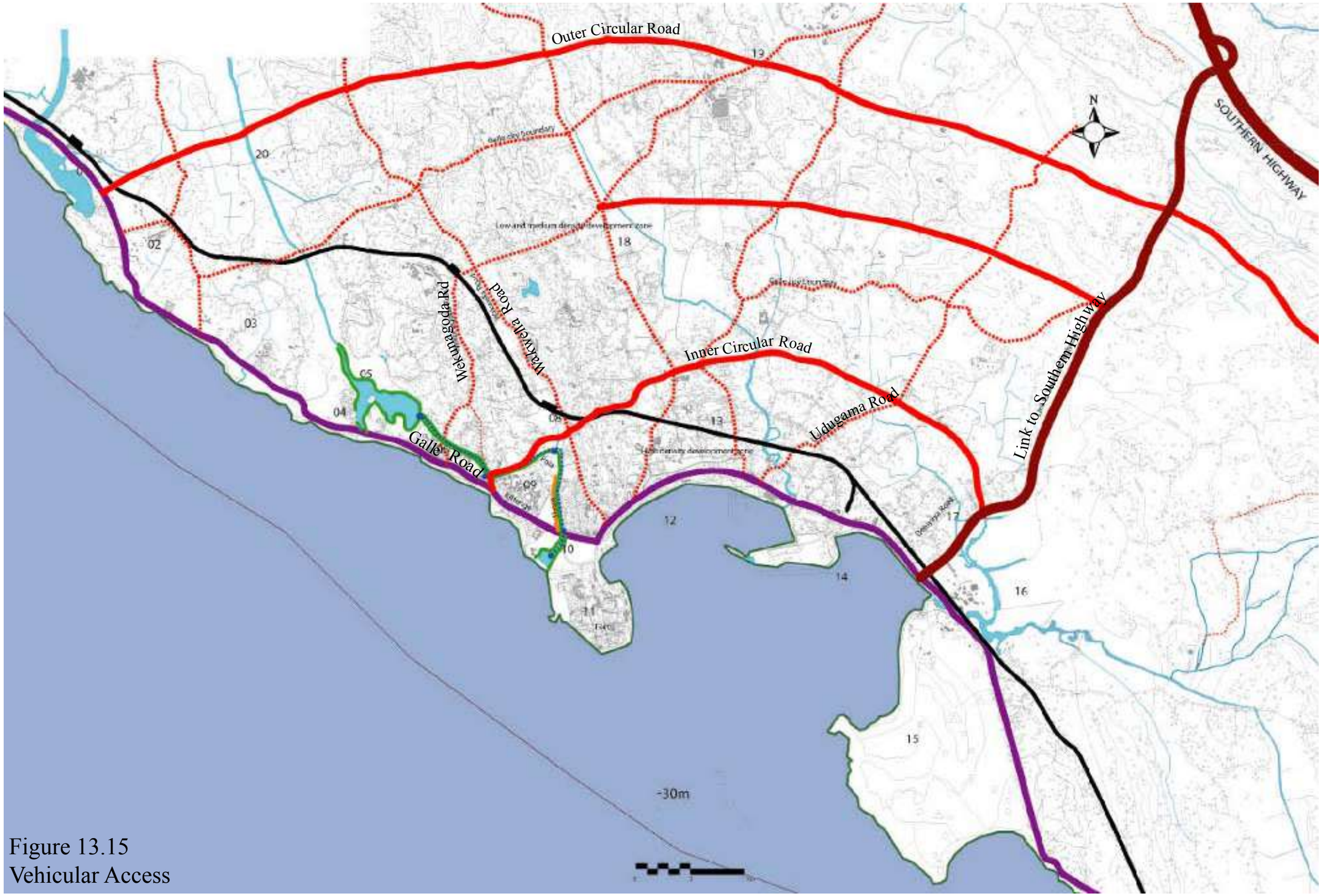


Figure 13.15
Vehicular Access

(vi) Open Spaces

Public Open spaces play a key role in good urban design as it creates a mental satisfaction of people and regulates micro climatic conditions of cities to a reasonable extent. It provides a visual relief and public resting places. The urban design proposal has created a network of organized open spaces with different themes for leisure and recreation. The open spaces plan is illustrated in figure 13.16. The objective of creating this network is two fold, the first being to provide high quality recreation areas and the second being highlighting bio diversity of Galle. The open spaces plan has seven themes as;

- Nature – this includes Bikke reservoir, Ginganga Estuary, Mahamodera lake, Rumassala hill and Nugaduwa mangrove forest.
- Sports – this includes development of international cricket grounds, multi purpose sports complex and two local level sports grounds.
- Parks, Gardens and Urban Squares – Existing open space in front of the fort would be amalgamated with the present bus station site and the Dharmapala park. And an integrated plan accommodating a formal urban square, a mini garden and a park would be created. In addition the existing pola site that was destroyed by Tsunami will be develop to be a mini park.
- 100 meter reservation - 100 meter reservation along the coast will be made a green belt - "Galle Face Green" and would be meaningfully connected with the other open spaces and interesting land uses. Urban Square and the minipark as explained above will be two interesting elements of the green belt.
- Neighborhood – Small scale children's play areas through out the city in all the wards.
- Ocean – The sea beach would be made fully visible and accessible through out the city and walkways along beach will make it further interesting.

(vii) Roofscape

Roofs of buildings could create a powerful image of a city. The shapes, materials used and colors make them interesting to look at. Roofs of Fort will be highlighted in this respect. Buildings in the city would be mostly encouraged to confirm to the similar roof style.

(viii) Conservation of Built Heritage and Natural Environment

Conservation of built heritage and natural environment forms an integral part of a good urban design. World heritage Dutch fort is the focus of built heritage of Galle. The objective of conservation of the historic Fort is to make it an international tourist destination generating good source of income to the city while conserving and maintaining the historical heritage. The conservation theme is based on the theme "Urban Historic". The design proposals are presented in figure 13.17. The proposal includes;

- Renovation – renovation of damaged areas of the fortress and removal of unauthorized constructions and opening up of interesting civil works such as drainage system caves etc.
- Paving – paving of roads and walkways by using historical designs and materials.
- Greening – maintenance of a very high level of turfed area and introducing organized planting of trees.
- Tourism – converting public buildings and other possible private buildings into hotels, eating places and entertainment areas.
- Activities – activities that are related to the historical theme to promote tourism are promoted.

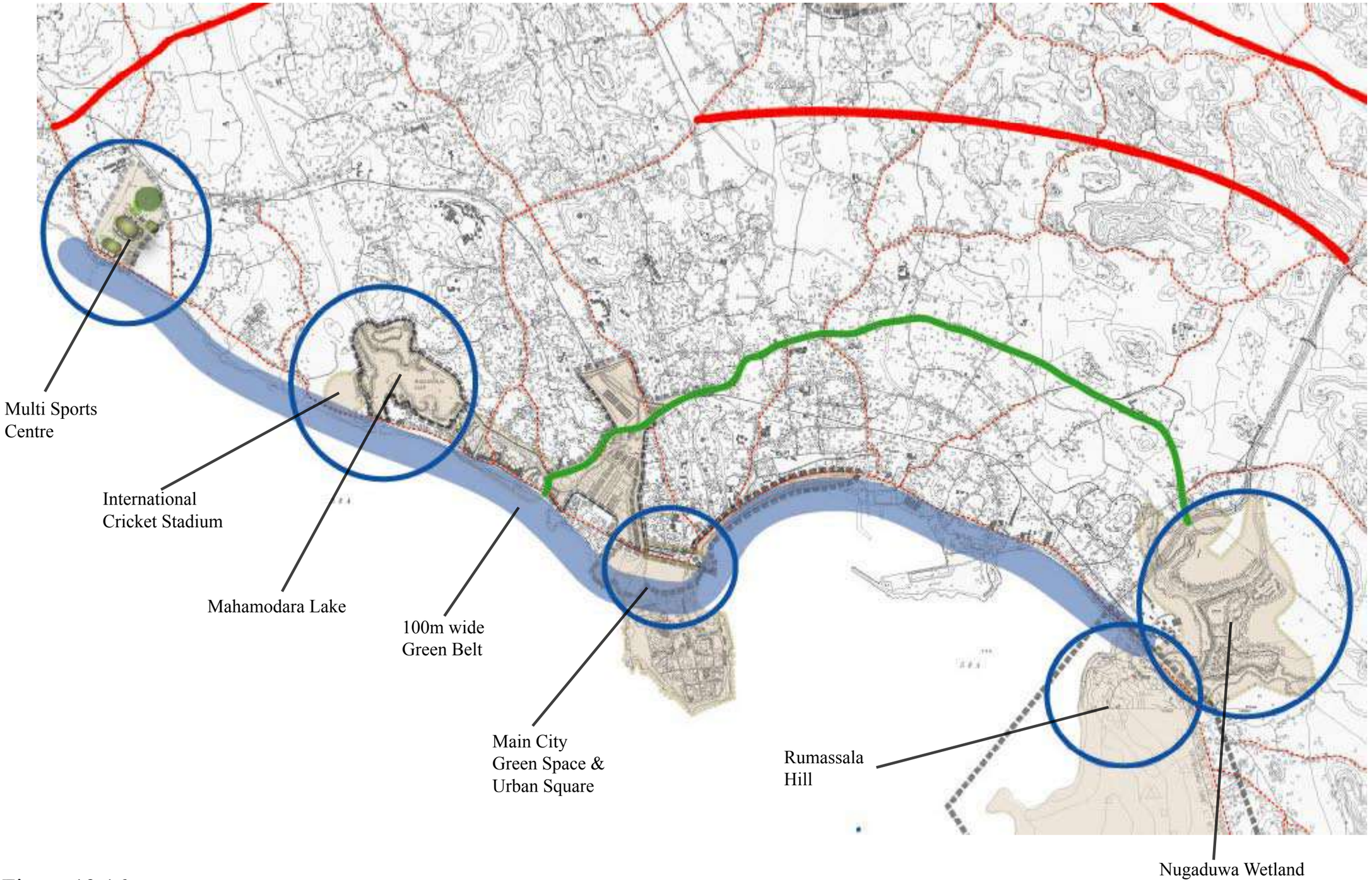
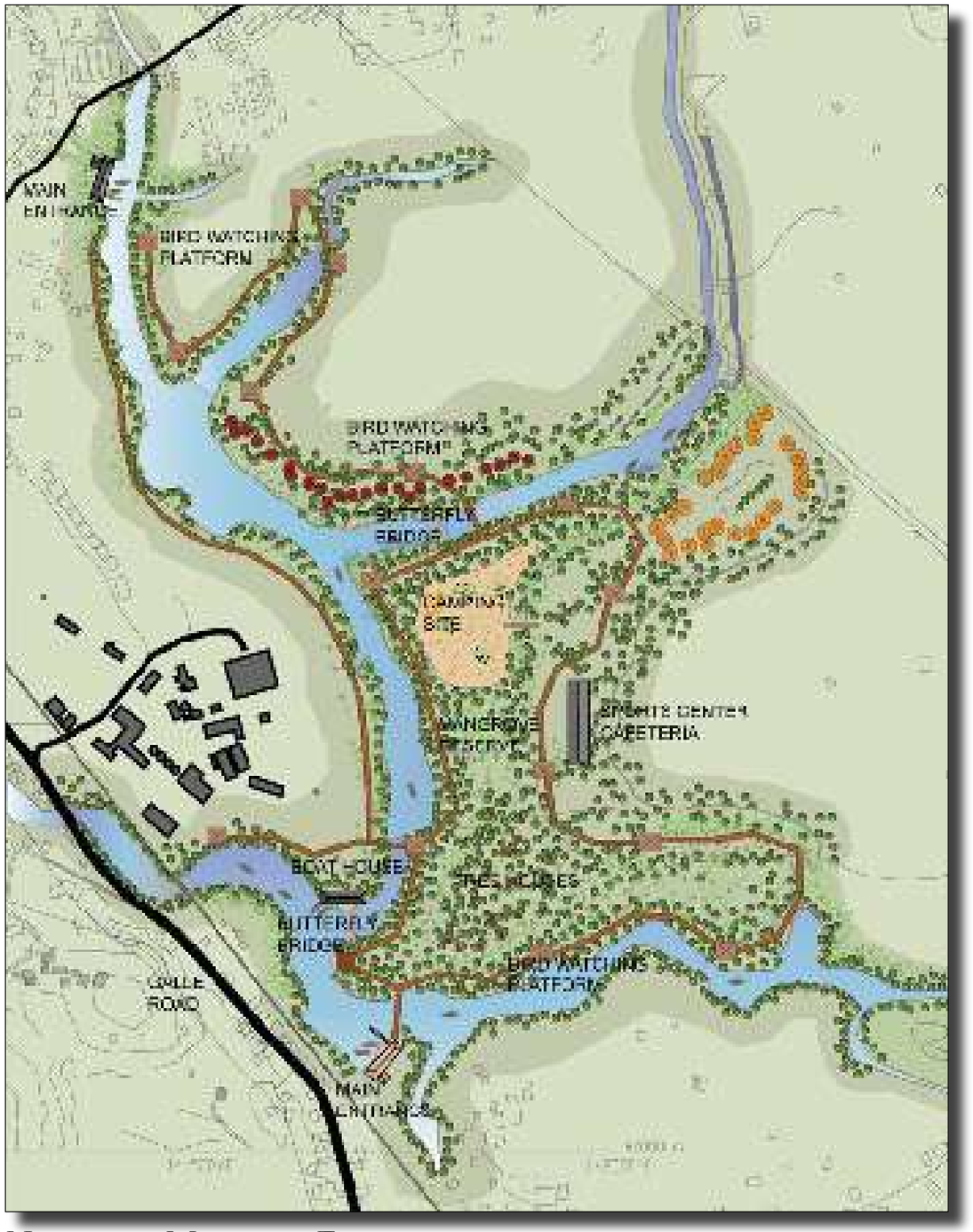


Figure 13.16
Open Spaces



Nugaguwa Mangrove Forest Conservation Project

Rumassala Forest
Conservation Project

- Proposed reserve
- Remove illegal structures
- Promote eco-tourism
- Create a wildlife observation/adventure park Information Centre – myth and history, educational exhibitions on Coral Reefs, Nature trails, Shop, café and restaurant, Facilities stop, Picnic areas
- Elevated walking paths
- Snorkeling, scuba diving
- Sound Art

1. Existing road
2. Visitor parking
3. Look out point
4. Information Centre
5. Picnic grounds
6. Hotel development
7. Parking
8. Beach
9. Road to Welle Devale

Mahamodara Lake
Conservation & Recreation Project

Urban Square & Public Open Space at the Town Center

LEGEND

- Existing Local Roads to be Improved
- Walking Path
- Walking Stops
- Cycle Path
- Cycle Stop
- Ferry Path
- Ferry Stop
- Centralised Parking
- Water Bodies
- Sites of Heritage value
- Ship Wrecks
- Trees
- Views/Vistas
- Entry/Exits
- Vehicular Routes
- Overpass

0 100 200 300 400 500 m

- Relocation of Railway
- Inter-modal Transport Terminal: Rail, Bus, Ferry, Cycle Hire and Walking Paths
- Informal Markets
- Commercial Centre
- Visual permeability; Vistas to the sea and Fort
- Formal Plaza, Urban Park and Galle Fort Green
- Creating Urban Edges; Mixed Use Building
- Landscaping strategy
- Parking strategy
- Walk

(ix) Establishment of Vistas

Establishment of vistas in order to highlight elements of importance makes cities memorable. The urban design proposals are worked out to highlight important elements of the city such as, Galle Fort and Rumassala hill.

(x) Lights and Shades

Lights and shades create an interesting environment during night times in cities and that they invite people to visit cities during night times without letting the cities to dye. Some of the lighting patterns used in urban designs are as follows;

- Modern buildings – White or warm white light
- Historic buildings – Warm lights
- Symbolic structures – Powerful white lights to stress their symbolic significance
- Roads and streets – Different lights and lamps to male walking interesting.
- Parks and open spaces – White lights to bring out the actual color of the greenery.

Chapter -14

Physical structure Plan

CHAPTER FOURTEEN

PHYSICAL STRUCTURE PLAN

14.1 Introduction

Physical structure plan of the region is an amalgamation of all the plans that are presented from Chapters one to fifteen. The plan is presented in figure 14.1 is a spatial representation of future investments in the region. The zoning plan that was discussed in detail in chapter ten is the primary tool for future land use orientation. While major environmental sensitive areas will remain undisturbed, other zones are connected with high mobility road and rail transport system. This transport system connects high density urban centres, commercial agricultural farms and rural settlements. The objective is to increase the productivity and efficiency of the three major land use systems.

High mobility transport system will also connect the region with the rest of the country. The proposed two scenic roads that are designed to connect tourist areas could also be connected to Polonnaruwa, Pothuwil and Nuwara Eliya respectively, which are three other major tourist areas of the country.

14.2 Vision

The vision of the physical plan is to make the Southern Region a vibrant region of the country by 2030 with a sustained economic growth of (6%)

14.3 Goal

The Goal of the physical Plan is to harness the resources available in the region to capture opportunities in the national and international markets aimed at alleviating poverty and increasing the living standards of people to a level comparable to the fast developing nations in Asia.

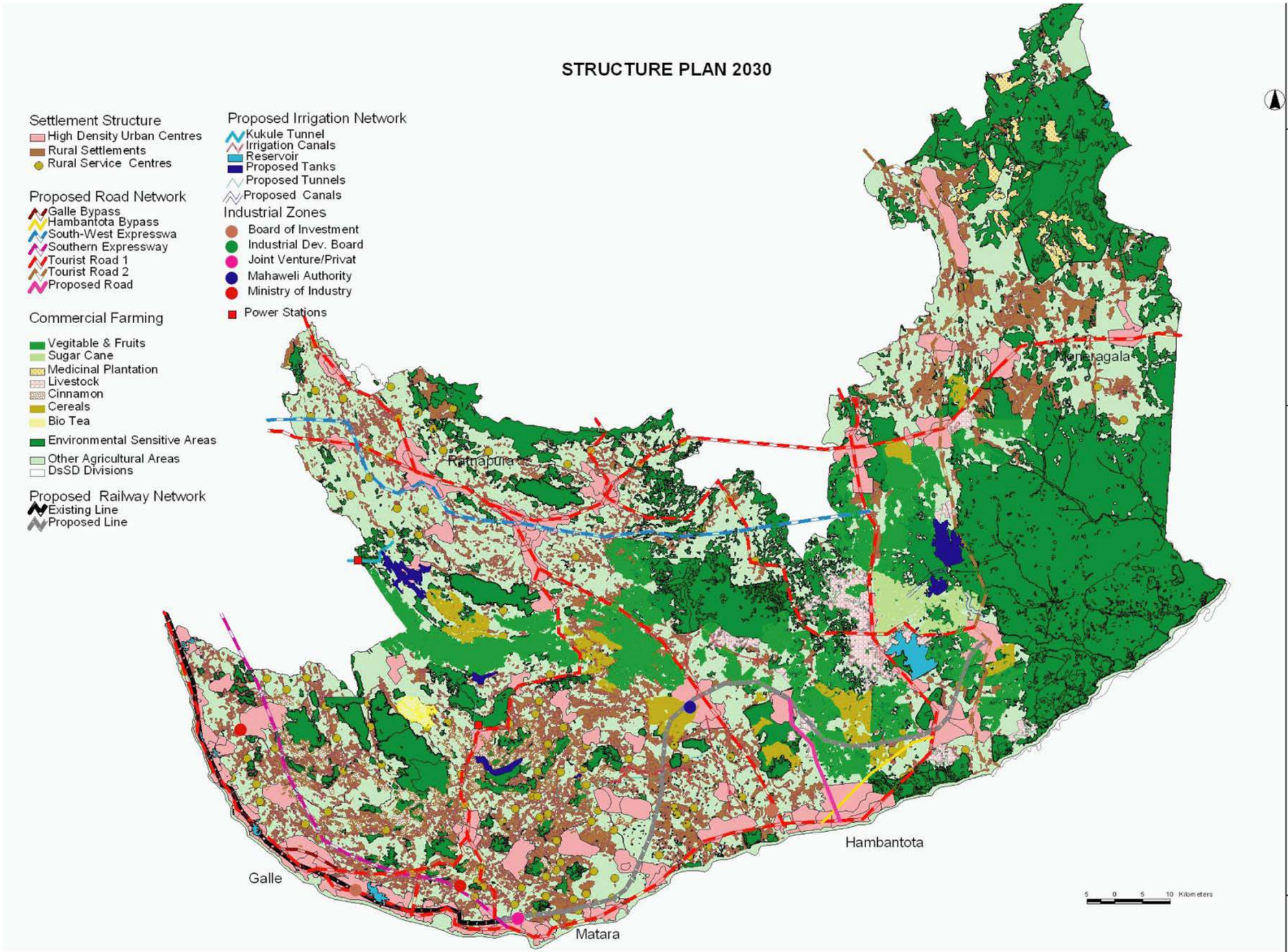
14.4 Objectives

(i) Conserve environmentally and aesthetically sensitive areas and historical sites.
(ii) Create a sustainable land use system
(iii) Provide adequate water to all the sectors
(iv) Increase the yields and value addition and agricultural produce. (Agricultural, fisheries and livestock)
(v) Develop a hierarchical order of settlements so as to conserve land, energy and other resources.
(vi) Achieve higher rate of urban growth 2.3 % by 2020 and 2.6 % by 2030.
(vii) Create “Green, Clean and aesthetically pleasing” cities and towns
(viii) Create efficient system of mobility and exchange of goods and services
(ix) Create adequate employment opportunities
(x) Create a competitive and skilled labour force
(xi) Provide high quality social infrastructure particularly health and education.
(xii) Develop an efficient system of supply and distribution of physical infrastructure such as potable water supply, electricity, telecommunication, waste water management and solid waste management.
(xiii) Create investment opportunities for both local and international investors.
(xiv) Exploit the advantage of geographical location of the region particularly in the international perspective for optimum economic benefit.

14.5 Strategy

The strategies for the development of the region has been discussed in the previous chapters by sectors. Hence the physical plan is an amalgamation of all the strategies discussed under each chapter.

The primary concern is to optimize the land use system so as to achieve the objectives of the plan. Table 14.1 indicates the present generalized land use system. Accordingly about 50% of the land cannot be developed as they are classified as environmentally sensitive. Therefore the strategy for land use planning was based on three principles as indicated below.



Southern Region Physical Plan

Figure: 14. 1

Structure Plan 2030 Southern Region

Source: SWP_SRPP

National Physical Planning Department

(i) Built up areas – Densification of the built up areas to achieve high density urban development in strategically selected urban centres according to a hierarchical order.

(ii) Undeveloped areas – This zone at present consists mostly of chenas and scrub. The strategy is to develop most of these lands for large scale commercial farming aimed at the export market. The development will be based on a good water resource management system.

(iii) Underdeveloped lands – These lands at present consist mostly of rural settlements with home gardens where small land holdings, continuous land fragmentation and low productivity have been the main problems. The strategy is to connect these areas with the first two zones physically and economically so as to stop further fragmentation and to increase productivity and efficiency.

Table 14.1
Existing Generalized Land Use Classification -2003

District	Undevelopable areas (Hectares)		Developable areas (Hectares)		Total land extent
	Built-up areas	Sensitive areas	Undeveloped areas	Under-developed areas	
Galle	560	64954	18032	81614	165160
Matara	445	44097	18380	65328	128250
Hambantota	9	126760	57410	57410	262550
Monaragala	54	317293	195179	73404	585930
Ratnapura	192	106370	100942	120436	327940
Southern Region	1260 (0.09%)	659474 (45.5%)	410904 (28.4 %)	302233 (20.85%)	1449000

Table 14.2
Proposed Generalized Land Use Classification -2030

District	Undevelopable areas (Hectares)		Developable areas (Hectares)		Total land extent
	Built-up areas	Sensitive areas	Commercial Farms	Home Gardens	
Galle	28600	64954	13480	37000	165160
Matara	27000	44097	11900	40750	128250
Hambantota	47100	126760	51100	37600	262550
Monaragala	33100	317293	73200	47100	585930
Ratnapura	26900	106370	24000	40100	327940
Southern Region	162700 (11.2%)	659474 (45.5)	173680 (12.0)	202550 (14.0%)	1449000

The structure plan for the region is presented in figure number 14.1

Chapter -15

Action Project

CHAPTER FIFTEEN

ACTION PROJECTS

1. List of Projects by Chapters

Chaper Three - Environmental Management Plan

(i) Conservation and Re-forestation of forests and forest reserves and catchment areas in Galle, Matara, Hambantota and Monaragal districts.

Chapter four - Agriculture, Livestock and Fishery Plan

Galle District

(i) Introduction of new improved paddy varieties that were tested at Bombuwela and Ambalantota by the Department Agriculture, in Ginganga basin

(ii) Cultivation of traditional rice varieties, which have medicinal properties (e.g. Gonabaru, Suwandal, Ma Wee, Kalu Heenati etc) in Ginganga basin. These rice have a very high market value within a closed market (e.g. Upper middle class health conscious middle age community, Healthy food stores, Health resorts etc).

(iii) Rehabilitation of the existing Cinnamon plantations and increase of the extend of cultivation in areas such as Kurundugaha hetepma, Madu ganga area, Elpitiya, Pitigala, Meetiyagoda, Baddegama and introduction of modern post harvest processing techniques for in-situ production of value added Cinnamon barks, bark oil and leaf oil.

(iv) Development of Labudoowa farm as a seed production farm (perhaps with a private sector management) to cater the seed requirement of Galle and adjoining districts

(v) Study the problems associated with 10,000 hectares (that is at present abandoned) of rain fed agriculture and integrated cultivation of suitable high value cash crops

(vi) Increase the fish productivity of large inland water bodies from their present level of 1% to 10% of the potential through release of high productive fingerlings, controlled fishing, etc. in Rathgama, Madampe and Koggala lakes.

(vii) Promotion of rearing of small ruminants (e.g. goats) in the hill part of the district (tea growing area) as a backyard livestock industry for an additional income

(viii) Establishment of free-range poultry farms (with local birds-Gam Kukula) to produce eco-farm eggs (Gam Biththra) containing low cholesterol and high fiber in old tea estates in Ellpitiyta, Batapola and Pitigala

(ix) Establishment of an artificial insemination center for the district to upgrade the cattle industry in the district.

(x) Increase yield of tea from 1400 k.g. / ha (which is 30% below the national average) to estimated average of 220 kg / h

(xi) Increase productivity of Rubber from 648 kg / ha to national average of 911 kg / ha with the target of achieving 1500 – 2000 kg / ha of optimum potential yield. 12015 hectares of present rubber cultivation areas to be targeted with infill of underdeveloped areas. Develop new nurseries. Provide improved machineries to make sheet rubber in place of crape rubber to increase value addition.

(xii) Develop coconut plantation as a plantation of regional significance due to large industrial base from it's by products. Increase productivity of present 12,850 hectares of land with infilling and better practices

(xiii) Re-develop Galle, Hikaduwa and Dodanduwa fisheries harbors to international standards with high quality infrastructure (particularly with ice plants and cold stores to ISO standards) and develop two new harbors at Dodanduwa and Ambalangoda to accelerate development of deep sea fishery. Redesign build environment of fishery harbors to symbolize them as significant economic sectors.

(xiv) Establish a One Stop Shop for fish and fish products in Galle town

Matara District

(i) Increase yield of tea from 1400 k.g. / ha (which is 30% below the national average) to estimated average of 2200 kg / h (20,000 hectares of present tea plantation) be prioritized.

(ii) Increase productivity of Rubber from 648 kg / ha to national average of 911 kg / ha with the target of achieving 1500 – 2000 kg / ha of optimum potential yield. 5600 hectares of present rubber cultivation areas to be targeted with infill of underdeveloped areas. Develop new nurseries. Provide improved machineries to make sheet rubber in place of crape rubber to increase value addition.

(iii) Develop coconut plantation as a plantation of regional significance due to large industrial base from it's by products. Increase productivity of present 16,180 hectares of land with infilling and better practices. Increase desiccated coconut as a good value added product.

(iv) Establishment of commercial forests in abandoned private lands in Hakmana and Mulatiyana DS divisions (500 hectares) in order to improve the land productivity and provide self employment opportunities for rural youth
(v) Rehabilitation of the existing Cinnamon plantations and increase of the extend of cultivation and introduction of modern post harvest processing techniques for in-situ production of value added Cinnamon barks, bark oil and leaf oil
(vi) Promotion of rearing of small ruminants (e.g. goats) in the hill part of the district (tea growing area) as a backyard livestock industry for an additional income
(vii) Establishment of free-range poultry farms (with local birds-Gam Kukula) to produce eco-farm eggs (Gam Biththra) containing low cholesterol and high fiber
(viii) Establishment of an artificial insemination center for the district to upgrade the cattle industry in the district
(ix) Re-develop Purana Wella and Mirissa existing fisheries harbors to international standards with high quality infrastructure (particularly with ice plans and cold stores to ISO standards) Redesign build environment of fishery harbors to symbolize them as significant economic sectors.
(x) Establish a One Stop Shop for fish and fish products in Matara Town.

Hambantota

(i) Establishment of an artificial insemination center for the district to upgrade the cattle industry in the district
(ii) Redevelopment of part of Weerawila farm for export oriented vegetables and fruits production under intensive agriculture suing water efficient methods such as drip and sprinkler irrigation.
(iii) Redevelopment of rest of Weerawila farm as a nucleus livestock farm to provide breeding, artificial insemination and other services to improve the livestock industry in the district
(iv) Cultivation of 30,000 hectares of new and abandoned lands with vegetables, high value cash crops and fruits for export market
(v) Development of 5000 hectares of new and abandoned lands for production of functional foods such as black gram, green gram, millets, sesame for local and export healthy food market
(vi) Development of 1000 hectares of new lands around Ridiyagame and Hambantota as grasslands for cattle and buffaloes
(vii) Promotion of traditional small ruminants (goat) industry in Hambantota area and establishment of meat processing unit and cold room facilities and linking with chain super markets
(viii) Value addition to traditional curd industry in Hambantota and linking the industry with chain super markets and hotel sector
(ix) Re-develop Kirinda, Tangalle and Kudawella existing fisheries harbors to international standards with high quality infrastructure (particularly with ice plans and cold stores to ISO standards) Redesign build environment of fishery harbors to symbolize them as significant economic sectors and development of new fishery harbors at Hambantota and Kalamatiya.
(x) Inland fishery in Ridiyagama, Hambegama, Lunugam vehera, Kalametiya, Yoda wewa, Maw ara and Tisa wewa tanks increase the fish productivity from their present level of 1% to 10% of the potential through release of high productive fingerlings, controlled fishing, etc
(xi) Expansion of Angunukolapelessa fingerlings development centre

Monaragala

(i) Improvement of Sevanagala and Pelwatta sugar plantations with introduction of better soil and moisture conservation practices and increase the plantation area by another 4000 hectares in Siyambalanduwa and Madulla area and infill the uncultivated 2600 hectares of land in Sevanagala sugar plantation.
(ii) Development of large scale farms (10,000 hectares) for production of pesticide free vegetable and fruits for export market
(iii) Development of 10000 hectares for production of cereal crops (black gram, green gram, finger millet, corn etc) based on organic farming principles
(iv) Development of 1000 hectares of new lands in Siyambalanduwa D S Division for cattle, buffaloes, goat and free ranged poultry farming. (including grass lands, hay and silage production) Dry farm area most suitable, Zones 3 & 4.
(v) Develop inland fishery in large reservoirs such as Lunugamvehera, Muthukandiya, Senanayake Samudraya, Hambegamuwa, Kiriibban wewa and another 14 medium tanks through formation of Fishermen Organizations and establishment of inland fishery processing center for value addition such as production of fish fingers, fillets, dry fish etc.
(vi) Establishment of commercial timber forests and energy plantations in Buttala and Thanamalwila DS divisions
(vii) Development of 2000 hectares of grasslands for improving productivity of free-range cattle industry in Hambegamuwa, Thanamalwila area

(viii) Establishment of fish breeding and fingerling production centre at Lunugamvehera
(ix) Expand rubber plantation by another 5000 hectares
(x) New plantation of cashew in 2000 hectares

Rathnapura District

(i) Development of large scale farms (30,000 hectares) for production of organic vegetable and fruits for export and local market.
(ii) Development of 5000 hectares for production of cereal crops (black gram, green gram, corn etc) based on organic farming principles
(iii) Establishment of commercial timber forests and energy plantations in Embilipitiya DS divisions
(iv) Development of 2000 hectares of grasslands for improving productivity of free-range cattle industry
(v) Development of 5000 hectares of new lands for cattle, buffaloes, goat and free ranged poultry farming. (including grass lands, hay and silage production)
(vi) Establishment of free-range poultry farms (with local birds-Gam Kukula) to produce eco-farm eggs (Gam Biththra) containing low cholesterol and high fiber
(vii) Develop inland fishery in large reservoirs such as Chandrika wewa, Uda Walawe through formation of Fishermen Organizations and establishment of inland fishery processing center for value addition such as production of fish fingers, fillets, dry fish etc
(viii) Development of fish breeding and fingerling production centre at Uda Walawe

Chapter Five - Industrial Development Plan

Galle District

(i) Convert Koggala EPZ to mixed industrial zone to accommodate non polluting / low polluting industries.
(ii) Major aggregate quarrying industry (in Ambalangoda, Dodanduwa and Habaraduwa.)to cater major construction works (Galle port and Colombo port)
(iii) Expand land development for cement industry in Nugaduwa & Eramudugaha Marsh Area (--100 hectares)
(iv) ICT centre in Galle.
(v) Infrastructure improvement of small and medium sizes existing industrial estates

Matara District

(i) Relocate all high polluting industries to Charley Mount and Udukawa industrial estates after developing waste water treatment plants.

Hambantota District

(i) Oil refineries and Petrochemicals in the proposed new industrial estate
(ii) Coal Power plant in Hambantota
(iii) Metal Quarrying in Weerawila to cater to Hambantota port, air port, industrial estate and such large projects
(iv) Off shore sea sand harvesting project to cater to construction industry
(v) Mineral sand extraction
(vi) Further expansion of salt industry (Palatupana, Mahalevayua and Kunukalliya)
(vii) International Port and Ancillary services
(viii) Construction of second international air port of Sri Lanka at Wellawaya (Kuda oya)
(ix) Expand Bata atta industrial estate
(x) Energy forestation in buffer zones
(xi) Plantation of managed forestry
(xii) Development of infrastructure of the existing Beliatta industrial estate.
(xiii) Industrial estate to accommodate large scale industrial establishments

Monaragala District

(i) Development of Wellawaya (Kuda Oya) new international air port
(ii) Establishment of agro processing park at Buttala and organizing out growers to supply agricultural raw materials to the processing park

(iii) Industry to manufacture of animal feeds from maize, other cereals and agricultural by products such as sugarcane tops etc

Rathnapura District

(i) Establishment of one stop international gem shop
(ii) Develop a medium size industrial estate for food processing, canning and by products of milk

Chapter Six - Water Resources Management Plan

Galle

(i) Reconstruction of irrigation schemes damaged by floods in May 2003 (60 Schemes in Hiniduma, Niyagama, tawalama & Elpituiya)- cost Rs 20M.
(ii) Construction of Jasmine Dam and Mediripitiya reservoir in Ginganga Basin to divert water to Hambantota Distric.

Matara

(i) Reconstruction of irrigation infrastructure damaged by 2003 May floods. (45 Schemes) in 12 DS Divisions- Cost Rs 15M
(ii) Refurbish 37 Main Drainage Pumps in 3 Pumping Stations in Nilwala Ganga Flood Protection Scheme (Life Period 20 Years Completed) Cost Rs 100MReconstruction of irrigation infrastructure damaged by 2003 may floods. (130 structures)
(iii) Construction of Digili Oya multipurpose Reservoir project. Would protect Akuressa Town from frequent flooding, Purest drinking water supply to Akuressa , Telijjawela & augment Matara town supply during low flows periods & small hydro power for minor industries.
(iv) Siyambalagoda reservoir construction to divert water to Hambantota Kirama ara & Urubokka Water deficit areas
(v) Hulandawa – Bingahamara Multipurpose Reservoir capacity construction. 850 MCM,(Hydro Power 50 MW, assured Drinking water to Matara and Irrigation), Complete flood protection to Akuressa, Kadduwa, Matara, &Augmentation to Ruhunu Basins of Walawe, Kirindi Oya & Menik Ganga to meet future shortages.
(vi) Nilwala diversion (for hydro power generation and irrigation in Kirama & Urubokka)

Hambantota

(i) Construction of Veheragala Reservoir (Capacity 75MCM) in Menik Ganga basin for diversion to Kirindi oya to meet immediate water deficit of 70MCM
(ii) Uma Oya Diversion to Kirindi Oya (Multipurpose project) Hydro Power 90 MW, annual water supply of 192MCM to Lunugamvehera Reservoir to cultivate abandoned tracts 2,600 lands & 400 Ha new lands Project. This project would resolve all water shortages in Hambantota district for future planning.
(iii) Augmentation of Bolana intake with six new tanks in Ruhunu basin to provide 100 MCM of water (Study carried out by ID 2003). Pumping during high flows included in the design.
(iv) Restoration of 40 abandoned tanks to conserve water
(v) Udawalawe Left bank extension Project – 5,340 Ha
(vi) Raising Udawalawe reservoir by 0.7 meters to capture spill water & better synchronize reservoir operation with Samanalawewa.
(vii) Construction of Kekiri Obada reservoir (capacity 3.9MCM) in Kirama Oya basin to increase cropping intensity to 200 % from 80% present 1510 Ha & meet water supply to Tangalla, Walasmulla, & Kirama Townships
(viii) Additional water supply intake upstream of Liyangastota anicut to augment supply to Ambalantota & Hambantota. No additional salinity intrusion structures would be required across Walawe Ganga
(ix) Divert part of runoff in Rakwana Ganga to Chandrika wewa & Udawalawe R B canal to save water to LB canal extension.(Annual runoff 167 MCM)
(x) Granary Area Program to cover 18,000 hectares in 9 Major schemes in Hambantota district to increase Production with increased cropping intensity

Monaragala

(i) Upgrading Productivity Enhancement of Muthukandiya reservoir Irrigation settlement scheme and dry farm settlement area (5000 hectares)- studied by North East Irrigation & Agriculture Project 2003 for funding by World Bank
(ii) Construction of Heda oya reservoir for water conservation
(iii) Construction of Nakkala reservoir I Kumbukkan oya
(iv) Restoration of 130 abandoned tanks in the District for conservation & new settlements, Kumbukkan oya , Heda oya& Wila oya basins

(v) Extension of Muthukeliya anicut project in Menik Ganga basin to augment 6 small tanks - 210 Ha new lands – Cost Rs 77MN.
(vi) Granary Area Development Project in Etimale, Buttala & Handapanagala schemes 1500 Ha to increase Production levels & cropping intensities.

Rathnapura District

(i) Construction of Malwala reservoir multi purposes project (flood protection, hydro and irrigation)
(ii) Kukule ganga high dam development for hydro power and trans basin development at Hambantota and Monaragala
(iii) Reconstruction of damaged irrigation structures during 2003 may (---------- structures)

Chapter Seven - Transport Plan

Galle District

(i) Alternate by pass of the city centre from Gintota to Magalle.
(ii) By pass road for Galle city centre to link Southern Highway and exit to other national roads
(iii) New transport centre (bus and rail terminal)
(iv) Improve A 17 Galle, Deniyaya, Madampe road as a tourist route
(v) Development of the Galle Port as a regional port
(vi) New international air port at Wellawaya (Kuda Oya)

Matara District

(i) Improvements to rural roads to improve the connectivity with national roads.
(ii) Railway extension to Hambantota and Embilipitiya

Hambantota District

(i) New road / rail ink to connect Embilipitiya and Hambantota.
(ii) Improvements to rural roads to improve the connectivity with national roads.
(iii) Development of a tourist route to connect Kirinda, Yala, Tissa, Kataragama, and Buttala which could be extended to Polonnaruwa via Bibila or Pottuwil Via Monaragala.
(iv) New by pass road behind proposed sea port
(v) Railway extension to Hambantota and Embilipitiya
(vi) Development of Hambantota Port

Monaragala District

(i) High mobolity road connection from Western province through Ratnapura district to Monaragala district that could be extended to Ampara district (eastern Province) if necessary.
(ii) Railway extension to Hambantota and Embilipitiya
(iii) Kuda Oya Air Port Development

Rathnapura District

(i) Tourist route from Bogawanthalawa, Balangoda, Laltota, Thanamalwila to Kataragama.
(ii) Improvemnets to Udawalawe – Thanamalwila road.

Chapter Eight - Tourism Plan

Galle District

(i) Galle Fort – Creation of a high quality theme park for Entertainment and Leisure.
(ii) Improvement of built environment and infrastructure of Unawatuna Beach Resort, and make more lands available for high quality hotels development. (One time fourth Finest Beaches in the world now ranked 12)
(iii) Introduction of recreation facilities in Unawatuna bay (surfing, boating, snorkeling,)
(iv) Development of Marina and Underwater museum in Galle Port
(v) Maduganga eco tourism development project.
(vi) Tourism development at Dedduwa (800 hectares), 18 Hole Golf Course, race course and related recreation facilities, and amusement park.
(vii) International Golf Course development project at Kohilawatta
(viii) Improvement of built environment and infrastructure of Hikkaduwa

Matara District

(i) Weligama bay large scale tourism development to cater to both local and foreign tourist

Hambantota District

(ii) Improvements to Yala wild life sanctuary
(iii) Restoration of Tissamaharama ancient city.

Monaragala District

(i) Establishment of eco-agricultural park in Kahakurullanpalasse and promotion of eco tourism
(ii) Eco tourism development project using more than 75 archeological sites.

Rathnapura District

Rathnapura District

(i) Establishment of gem village for gem museums, jewelry and sales out lets.

Chapter Nine - Settlement Plan

Galle District

(i) Housing development project at Walanhadoowa
(ii) City centre urban square and public park opposite Galle Fort

Matara District

(i) Town centre re-development

Hambantota District

(i) New capital city development (port city) to facilitate all the urban needs

Monaragala District

(i) Development of Buttala as a second order city

Rathnapura District

(i) Re-development of Embilipitiya town to be a second order town in the region.
(ii) Re-development of Rathnapura old town
(iii) Infrastructure development of Rathnapura new town

Chapter Eleven - Physical Infrastructure Development Plan

Galle District

(i) Integrated solid waste management of Galle and Hikkadduwa towns
(ii) Greater Galle water supply augmentation
(iii) Galle new electricity grid sub station
(iv) Sewer network and treatment plant for core area
(v) Urban storm water drainage augmentation
(vi) Baddegama Water supply scheme augmentation
(vii) Bentara Elpitiya new water supply scheme
(viii) Hiyare reservoir rehabilitation and water supply to Akmeemana town. (1300 m3 per day)

Matara District

(i) Integrated solid waste management in major towns
(ii) Greater Matara water supply augmentation

Hambantota District

(i) Combine potable water supply
(ii) Piped sewerage system to the new capital city

Monaragala District

(i) Monaragala water supply augmentation scheme
(ii) Buttala – Wellawaya new water supply scheme
(iii) Power transmission to Medagama, Wellawaya and Monaragala.
(iv) Cultivation of dendro in 15,000 hectares for energy production
(v) Develop energy forests around buffer zones

Rathnapura District

(i) Greater Rathnapura water supply scheme
(ii) Balangoda new water supply scheme
(iii) Embilipitiya integrated water supply scheme
(iv) Secondary town water supply scheme
(v) Hightension line extension to Balangoda and Rathnapura.

Chapter Eleven - Social Infrastructure Development Plan

Galle District

(i) Development of high quality education and health facilities in, Karapitiya to meet ISO standard. Karapitiya nodal to be developed to accommodate both private and public investments and to make it a regional centre for such activities. (Karapitiya health and education node)
(ii) Upgrading Galle Technical College to provide job oriented technical courses
(iii) New International Cricket Stadium and multipurpose sports complex
(iv) Establishment of District level Legal and psychological counseling centres, introduction of programs and provision of manpower
(v) Establishment of a human resources development institute at Karapitiya to implement program on Skill development and confidence building program, Vision building, Leadership and entrepreneurial development program, Work quality improvement project, Gender equality Project, Program on Safety Net for Vulnerable Women, Women Empowerment Program, Family Integration program, Community Integration program, Institutional Integration Program, Political Integration program, Administrative Integration Program, Training programs on food processing and food preservation, Special training for handling disabled persons and Disabled Training Institute, Alcohol prevention project, Think Tank project, Institutional networking project, Horizontal coordination project, Preschool and day care centre project, Day-care project for elderly, Educational support program for marginalized children, Adult functional literacy project, DSD level multifunctional education complex project, Art gallery and recreation centre, District Museum, District level Disaster management centre and human resource development project

Matara District

(i) Land development for modern private hospital and international school.
(ii) Multipurpose sports complex
(iii) Skills training centre affiliated with University of Ruhuna
(iv) Fully fledged ICT centre affiliated to Ruhunu University
(v) Establishment of Human Resources Development Center similar to one proposed for Galle.

Hambantota District

(i) Establishment of a human resources development institute in Hambantota similar to one proposed in Galle
(ii) Land development for modern private hospital and international school in Ambalantota.
(iii) International golf course and multipurpose sports complex in Hambantota
(iv) Establishment of a human resources development institute in Hambantota similar to one proposed in Galle.
(v) Upgrade schools to national schools level with all the resources in selected urban cetres

Monaragala District

(i) Land development for modern private hospital and international school in Buttala.
(ii) Establishment of a human resources development institute in Buttala similar to one proposed in Galle
(iii) Upgrade schools to national schools level with all the resources in selected urban cetres.

Rathnapura District

(i) Establishment of a human resources development institute in Embilipitiya town similar to one proposed in Galle
(ii) Establishment of district level multifunctional education complex at Embilipitiya.
(iii) Establishment of Gem Technical college in Embilipitiya

Chapter Thirteen - Urban Design

(i) Historical Theme park tourism development in Galle Fort
(ii) Town centre urban square
(iii) Pedestrian walkways – from new multi model transport centre to fort, Fort open space to Rumassala hill, Old Matara road, New Matara road.
(iv) Ferry service on Mahamodera lake
(v) Redevelopment of present bus station site

15.1 Projects Prioritizing

Projects were prioritized based on the following criteria

(i) Export Potential
(ii) Foreign Exchange Earning / Saving
(iii) Population served
(iv) Environmental Conservation
(v) Social Equity
(vi) Poverty reduction

A matrix was developed and identified projects in all the sectors were given values based on the current market rates. The projects that obtained highest values were prioritized. Details are given in Annex "A"

Accordingly the following projects were placed first priority

15.2.1 Galle District

(ii) Control of coastal erosion by erecting coastal structures in Bentota, Hikkaduwa and Galle.

(iii) Increase yield of tea from 1400 k.g. / ha to estimated average of 220 k.g. and introduction of bio-tea in 1000 hectares.

(iv) Rehabilitation of existing cinnamon plantations and increase the extend of cultivation in areas such as Kurundugahahettappma, Madu ganga areas, Elpitiya, Pitigala, Meetiuyagoda, Badegama.

(v) Re-develop Galle, Hikkaduwa and Dodanduwa fisheries harbors to international standards with high quality infrastructure (particularly with ice plants and cold stores to ISO standards) and develop two new harbors at Dodanduwa and Ambalangoda to accelerate development of deep sea fishery. Redesign build environment of fishery harbors to symbolize them as significant economic sectors.

(vi) Inter modal transport network connecting Galle Port to the expressway and to the region. (By pass road for Galle city centre to link Southern Highway and exit to other national roads, New transport centre)

(vii) Integrated tourism development project. (Galle fort - creation of a high quality theme park for entertainment and leisure, Port-underwater museum and marina, Linear park along the beach up to Unawatuna, conservation of Rumassala mountain for hiking)

(viii) Galle port development as a regional port.

15.2.2 Matara District

(ii) Increase yield of tea from 1400 k.g. / ha to estimated average of 220 k.g. and introduction of bio-tea in 1000 hectares.
(iii) Rehabilitation of existing cinnamon plantations and increase of the extend of cultivation and introduction of modern post harvest processing techniques for in – situ production of value added cinnamon barks, bakr oil and leaf oil.

(iv) Re-develop Purana Wella and Mirissa existing fisheries harbors to international standards with high quality infrastructure (particularly with ice plans and cold stores to ISO standards) Redesign build environment of fishery harbors to symbolize them as significant economic sectors.
(v) Fully fledged ICT centre affiliated to Ruhunu University
(vi) Railway extension to Hambantota and Embilipitiya

15.2.3 Hambantota District

(ii) Development of energy forests.
(iii) Integrated commercial agriculture to grow fruits, vegetables, high value cash crops, functional food and animal husbandry.
(iv) Augmentation of Bolana intake with six new tanks in Ruhuna basin for potable water supply.
(v) Veherahena reservoir (75 mcm) in Menik ganga and diversion to Kirindi oya.
(vi) Uma oya diversion to Kirindi oya
(vii) Re-develop Kirinda, Tangalle and Kudawella existing fisheries harbors to international standards with high quality infrastructure (particularly with ice plans and cold stores to ISO standards) Redesign build environment of fishery harbors to symbolize them as significant economic sectors and development of new fishery harbors at Hambantota and Kalamatiya
(viii) New city development to accommodate large scale industrial estates, port related activities and other urban needs.
(ix) Hambantota new port development.
(x) New road / rail ink to connect Embilipitiya and Hambantota
(xi) New by pass road behind proposed sea port

(xii) Railway extension to Hambantota and Embilipitiya

15.2.4 Monaragala District

(ii) Development of elephant corridor
(iii) Restoration of 130 abandoned tanks
(iv) Muthukandiya reservoir development and re-development of dry farm area.
(v) Integrated commercial agriculture to grow fruits, vegetables, high value cash crops, functional food and animal husbandry
(vi) Gem mining
(vii) Development of energy forests and timber forest
(viii) Second international air port development
(ix) High mobility road connection from Western province through Ratnapura district to Monaragala district that could be extended to Ampara district (eastern Province) if necessary.

15.2.5 Rathnapura District

(ii) Integrated commercial agriculture to grow fruits, vegetables, high value cash crops, functional food and animal husbandry in Embilipitiya
(iii) Construction of Malwala reservoir 5 km upstream Kaluganga for flood protection
(iv) Greater Ratnpura water supply scheme for supply of potable water.
(v) High density housing development at Rathnapura new town
(vi) Gem based jewellery industry

15.3 Five Main Projects for Immediate Implementation

Based on the same criteria the five projects that obtained highest values were selected for immediate implementation. The projects are listed below.

(i) Water Resources Management - Veheragala diversion, Uma Oya diversin and Nakkala reservoir in Kumbukkan Oya.
(ii) Development of Hambantota Port
(iii) New Southern Highway connecting the southern region with rest of the country.
(iv) Integrated Galle city development
(v) Establishment of commercial farms in Monaragala, Hambantota and Embilipitiya

15.4 Selection of Action Projects for Detailed Designing

The five projects that are listed under section 15.3 are the highest priority projects needed to be implemented to achieve objectives of the plan and therefore all the five projects are recommended to be undertaken on a priority basis for detail designing.

However it is proposed to select integrated Galle city development project immediately for detail designing as it involves relatively low cost and less time taking and it brings about immediate results.

15.5 Phase out recommended projects for implementation depending on an acceptable criteria

Phasing out of the high priority five projects is presented in the figure 15.1. The phasing out program is based on the following criteria.

(ii) Expected priority placed by the government on southern region development
(iii) Estimated benefits of the projects
(iv) Requirement for acceleration of implementation in the light of target economic growth proposed in the plan

Figure 15.1
Projects Implementation Schedule

Projects Activities	Time Schedule				
	2005	2006	2007	2008	2009
Water Resources Management					
Project Feasibility Studies	■				
Financing Programs		■			
Designing and Tendering			■		
Implementation			■	■	■
Hambantota Port					
Project Feasibility Studies	■				
Financing Programs		■			
Designing and Tendering		■	■		
Implementation	■	■	■	■	■
New Southern Highway					
Project Feasibility Studies	■				
Financing Programs		■			
Designing and Tendering			■		
Implementation		■	■	■	■
Integrated Galle City Devet.					
Project Feasibility Studies	■				
Financing Programs		■	■	■	
Designing and Tendering	■	■	■		
Implementation	■	■	■	■	■
Commercial Farms					
Project Feasibility Studies	■				
Financing Programs	■	■			
Designing and Tendering	■	■			
Implementation	■	■	■	■	■

Chapter -16

Industrial Frame Work For Plan Implementation

CHAPTER SIXTEEN

INSTITUTIONAL FRAME WORK FOR PLAN IMPLEMENTATION

16.1 Introduction

An efficient institutional framework becomes the most important part of the whole process as achievement of the plan objectives depends on efficiency of its implementation. Present institutional framework of the country in plan execution is somewhat in a confused state due to existence of a large number of institutions at national, regional and local level. This has resulted in waste of limited financial resources. Another main problem in the present system is poor project prioritization and therefore the country cannot get optimum benefits of limited financial resources. When proposing a system of plan implementation the team studied the possibility of continuation with the present system and proposing a new system.

16.2 Existing System

All the national level institutions as common to other regions have their overall jurisdiction over the region. In addition the planning region comes under the purview of three Provincial Councils as follows;

(i) Galle, Matara and Hambantota districts – Southern Provincial Council
(ii) Monaragala – Uva Provincial Council
(iii) Rathnapura – Sabaragamuwa Provincial Council

At local level the region consists of three (3) Municipal Councils, six (6) Urban Councils and fifty nine (59) Pradeshiya Sabhas. In addition a large number of NGOs particularly in Monaragala and Hambantota districts implement projects without any control by any public institution.

Although many efforts in the past had been tried out to develop better coordination among the institutions at three levels they have failed due to many reasons. Some of the reasons are;

- Existing political system – There have been instances where political authorities at three levels represent different political parties preventing fruitful coordination.

- Projects prioritization – Funds are not allocated depending on well established prioritizing criteria but purely on geographical and some political criteria, resulting waste of limited funds.

- Technical Staff - Absence of technical staff particularly in Monaragala and Hambantota districts has had an adverse impact on execution of projects even in situations where funds were available.

In addition, existence of three provincial councils to cover the region obviously creates problems related to coordination and project prioritization. It is very difficult to prioritize projects based on regional perspective and channel funds on such priorities.

16.3 Southern Development Authority (SDA)

Southern Development Authority was established on 2nd August 1996 under the act number 18 of 1996. Designated area of authority of the SDA is "coordinating the planning and implementation of development projects. Powers and functions of the SDA are formulated to implement the coordinating function. Therefore although it was named as an authority, it can have no authority over other institutions and therefore it has become just another institution of less significant in development processes of southern region. This is well illustrated by the present development programmes of SDA which are mostly oriented towards social welfare and coordination programmes.

The organizational structure of the SDA is obviously established to carry out coordination role. It has three main divisions namely Administration & Finance, Policy Planning and Plan Implementation. Administration & Finance division is typically engaged in recurrent activities. Policy Planning division has nine sub divisions to look after different sectors. Plan implementation division has four subdivisions by districts.

Having studied the existing system the conclusion arrived at was that none of the existing institutions is capable of implementing the southern regional physical plan

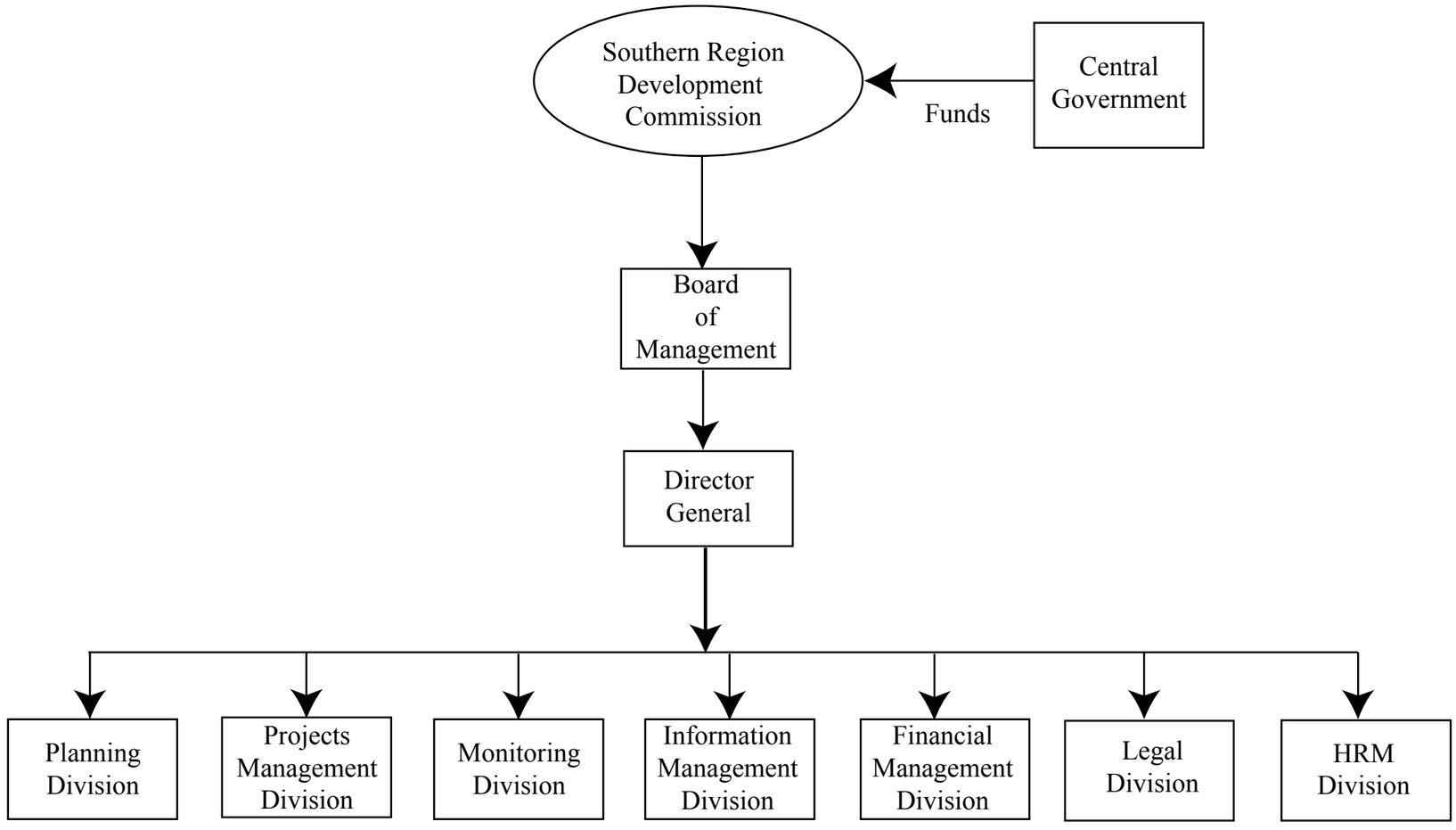
taking the whole region as a single entity and therefore a new institution is needed to implement the plan to achieve its objectives.

16.4 Proposed Institutional Framework

Implementation of the southern region physical plan requires an institution with adequate authority over any administrative boundary within the region, financial capability and man power. What is proposed is to establish an institution somewhat similar to Mahaweli Development Authority. This needs constitutional changes at the national level. One of the possibilities is to introduce structural changes to SDA changing its role from mere coordination to plan execution.

The proposed institution is named as Southern Development Commission. (SDC). It is proposed that entire region be declared under SDC and that SDC will have powers over all the national, regional and local institutions in the region for the purpose of plan implementation. All the public funds should be channeled through SDC. Figure 16.1 indicates the proposed structure.

Figure 16.1
Orgarnization structure of southern region Development Commission



The Board of Management will consist of representatives from the General Treasury,Board of Investment, National Physical Planning Department, Urban development Authority, Land Ministry, Chamber of Commerce and Two representatives appointed by H.E. President