THE MEGAPOLIS

WESTERN REGION MASTER PLAN - 2030
SRI LANKA

From Island to Continent

Western Region Megapolis Planning Project

MINISTRY OF MEGAPOLIS AND WESTERN DEVELOPMENT


WESTERN REGION MEGAPOLIS

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Chapter 01

Introduction

1.1 Project Background

The Western Megapolis is envisioned and conceptualized as the prudent Grand Strategy for achieving two decisive inter-dependent transformations required in Sri Lanka's forward march to achieve the status of **'A High Income Developed Country'**. The spatial transformation of urban agglomerations in the Western Region is to be achieved through structural transformation of the National Economy as a whole, while comprehensively addressing the burning issues brought about by past trends of adhoc urbanization.

Western Megapolis has three broad national goals:

- To address the issues resulting from the congestion pressures being exerted on the urban physical infrastructure, urban services amenities, and the environment.

- To create the enabling environment for propelling the nation to the status of a high income developed country tunneling through the middle income trap, by way of leveraging the economies of agglomeration, through development and transformation of the physical and institutional infrastructure and the national economic structure.

- To optimally harness the benefits of knowledge-based innovation-driven global economic environment characterized by such developments as the new industrial revolution and emergence of smart cities.

The implementation of this grand strategy involves two fundamental transformations. The first is the much needed structural transformation of the economy where the manufacturing sector as well as the high tech tradable services, should comprise the major component of the economy, with exports accounting for at least one third of the GDP. The other transformation that needs to be effected in parallel, (and indeed, what would drive the above structural transformation) is the spatial transformation of the Western Region.

Fig.1.1 Existing Views of Colombo City (Source: insightguides, gatewaylankatours)

The planning philosophy that guides the formulation of objectives and strategies for realization of those national goals is based on the four fundamental pillars namely 'Economic Growth and Prosperity', 'Social Equity, Safety and Security', 'Environmental Sustainability' and 'Individual Happiness'.

1.2 Urban Development in Sri Lanka – A Historical Perspective

It is important to view the present Megapolis development exercise in the historical perspective of urban development not only in the city of Colombo but also of the proud heritage of Sri Lanka's ancient cities.

Sri Lanka has a history of city-dwelling dating back to the era of King Ravana as evident from references to prehistoric cities such as Shirshagrama. In the 2500 years of recorded history, written uninterruptedly in our historical chronicles - Mahawansa as well as other chronicles, Anuradhapura had been the capital city for 14 centuries. The ancient city of Anuradhapura stands out for the wisdom of city development demonstrated by ancient Sri Lankans just as much as for its unparalleled global record of the longest survival as a capital.

The recorded plans of the City of Colombo date back to 16th Century. The Portuguese and the Dutch drew up some development plans respectively in 1554 & 1656.

Fig.1.2 Existing Views of Colombo City (Protocol-travel.com)

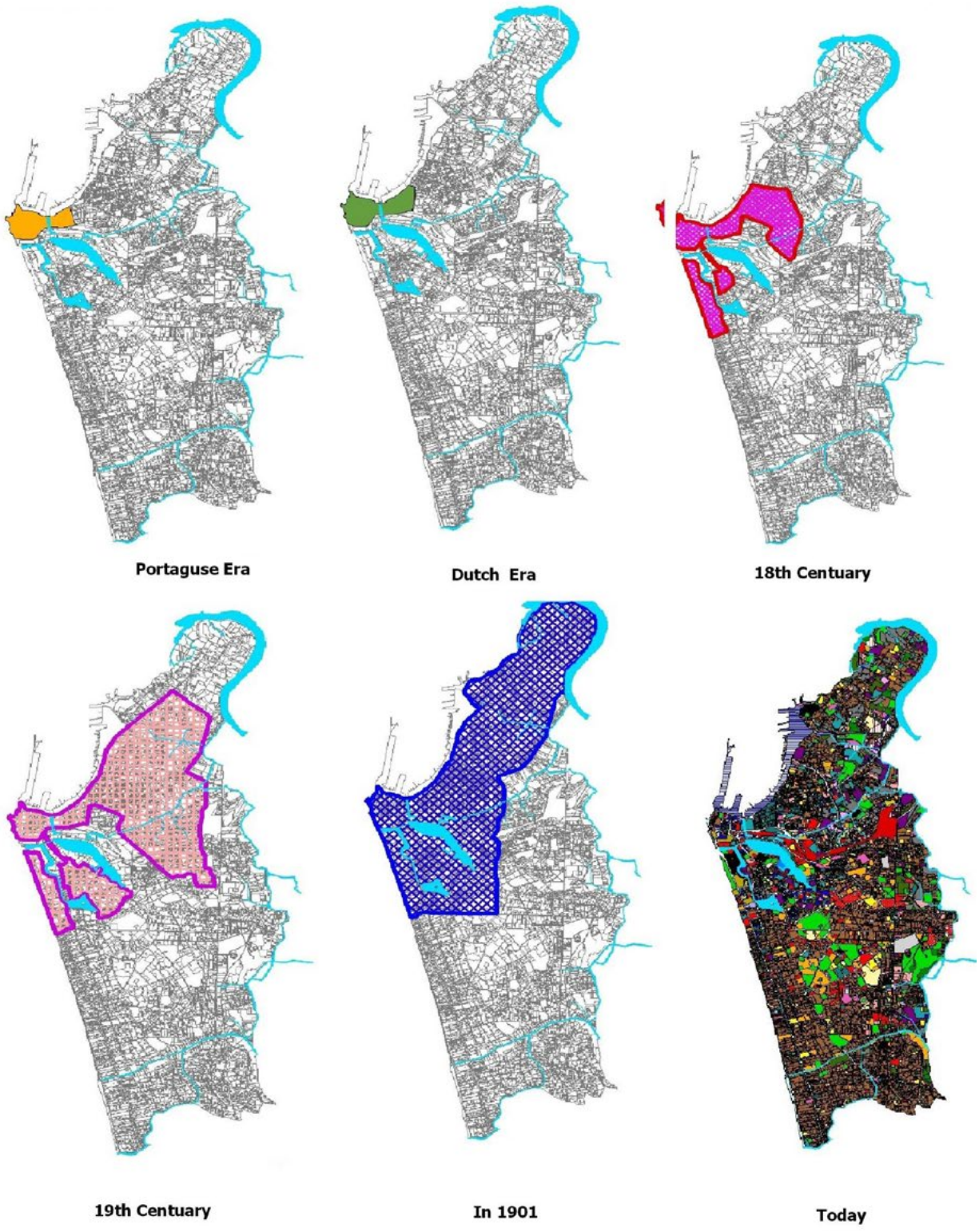


Fig.1.3 Recorded Plan for City of Colombo

Fig.1.4 Patrick Geddes Plan - 1921

In 1921 the British Town Planner Patrick Geddes, who is considered a prominent contemporary authority on Town Planning, developed a 'Garden City' conceptual plan for Colombo. (Fig 1.4)

Fig.1.5 Patrick Abercromby Plan

This was followed by a few other planning attempts. The Patrick Abercromby Plan in 1949 covered the Colombo Metropolitan Region as a whole, and emphasized decentralization of the city's activities and creation of satellite towns around Colombo, with Ratmalana as an Industrial Centre, Ragama as a Logistics Centre, and Homagama as a residential area.(Fig. 1.5)

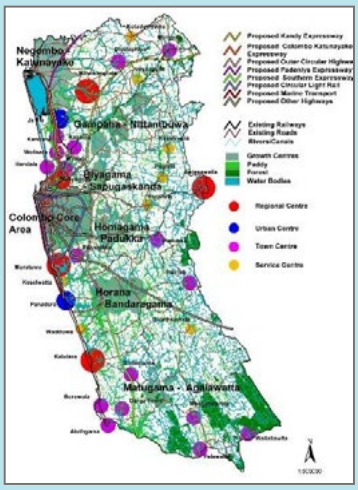


Fig.1.6 Colombo Metropolitan Regional Structure Plan - 1998

The Colombo Master Plan undertaken with UNDP assistance resulted in formation of the UDA in 1978. The City of Colombo Development Plan in 1985 recommended shifting of from Mono-Centric to Poly-Centric City Development and shifting of the Administrative Capital to Sri Jayawardenepura.

Fig.1.7 Western Megapolis Plan by CESMA- 2002/03

The Western Megapolis Development Plan (Fig. 1.7) which envisioned development of the entire Western Province as a Single Megapolis was initially conceptualized in 2002. A highlight of the Colombo Metropolitan Development Plan of 1998 was identification of the Inner and the Outer necklaces.

The Western Region is one of the five planning regions in the country proposed by the National Physical planning Department, which had the mandate for preparing and implementing regional physical plans.

The National Physical Planning Policy that was established in 2011 to minimize the regional disparities by providing a framework to achieve an integrated and mutually complementary sectoral and regional development pattern and spatial structure for the future development of the country.

The Policy was translated into a National Spatial Structure Plan that identified and demarcated areas need to be protected and designated areas for the activities of each of the economic sectors, and the required infrastructure and consequent land uses in order to achieve a sustainable development. It is also aimed at maintaining a high standard of life and quality environment for the present generation, and maintaining the same for future generations. The Plan demarcated five metro regions to house future urban population and urban activities. Out of the five regions, Western Region was identified as the most prominent one.

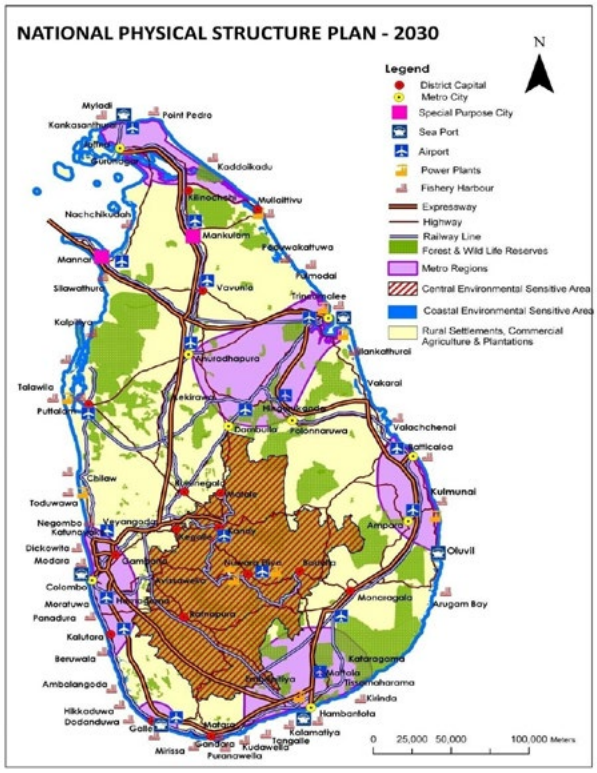


Fig.1.8 National Physical Plan 2030. (Source: NPPD)

1.3 The Structure of the Report

This report contain information on each subject matter but will focus on key planning information with regards to proposed development directions for the Western Region. Also the report will elaborate how it will grow the economy, distribute employment and population, plan each part of the region according to their character and role, identify catalyst and mega projects, and prepare plans for transportation and infrastructure to overcome current and anticipate future issues. It will also prepare the framework for the planning regulation that will guide the physical development in the Western Region in the medium and long term.

- **Introduction & Overview**

This chapter will give readers an overview of the background, the project as well as the purpose of the planning report.

- **Dimension of Growth**

This chapter provides an overview of the projected economic and demographic growth and changes in the next 15 years, which will be taken as the basis for the spatial plan of the Western Region.

- **Vision & Programme**

This chapter summarizes the vision, goals, objectives, strategies & key projects, which will be used as the basis for the regional and city planning.

- **Regional Structure Plan**

This chapter provides the regional spatial plan integrating the allocation of living areas, economic generating uses, green and blue areas as well as the location and alignments of key infrastructure and transportation.

- **Social Infrastructure Development**

This chapter address the issues of housing, education , health sector & safty & Security of WRMP.

- **Transportation Plan**

This chapter identifies transport issues, proposes the long term approach and the key projects to address the traffic problems.

- **Environment &Infrastructure Plan**

These chapters address the issues of water management (including drainage, flood control, sewerage and water supply), waste and environmental management and integrated energy and resources management.

- **SME and Tourism Development**

This chapter address the issues in SME industries and Tourism.

- **Key Mega Projects**

This chapter provides a brief summary of the mega projects which will be launched as the key drivers of development in Western Region.

- **Western Region Megapolis Development Authority (WRMDA)**

This Chapter elaborates on the establishment of the WRMDA, its roles, responsibilities, and the organization structure.

- **Planning Regulation**

This chapter provides an overview of the current planning regulation and how it will be integrated, streamlined and standardized in the long term.

- **Way Forward**

Way forward identifies immediate tasks to be taken to implement the Western Region Megapolis Master Plan.

Aerial view of Colombo City

Chapter 02

Overview of Western Region

2.1 Location and Land Area

The total land area of the Western Region is 3684 sq. km, and consists of several districts including: Gampaha in the north, Colombo in the middle and Kalutara in the south and some parts of Rathnapura, Kegalle and Galle. Western region is the most densely populated in the country and is home to the legislative capital of Sri Jayawardenepura Kotte.

The region covers a flat area along the coastline, with areas of undulating terrain towards the eastern and southern part. Paddy fields, marsh land, coconut and rubber plantations dominate the landscape of the region. Present population (2012) is around 5.8 million, with about 2 million living in the City of Colombo and its suburbs, while majority of the population are living in villages scattered across the flat areas.

2.2 Role of Western Region

While the Western Region only constitutes about 6% of the total land area in Sri Lanka, it accommodates the highest population, which is about 28% of total population of Sri Lanka.

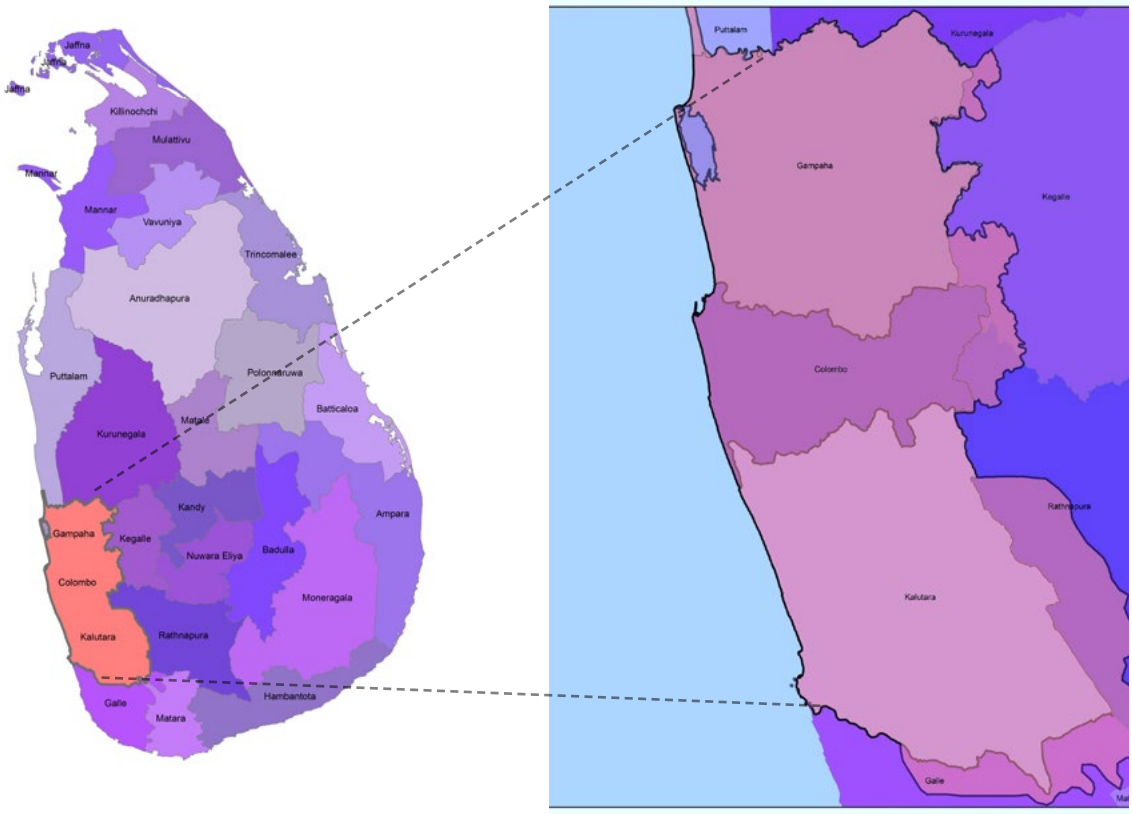


Fig.2.1 Western Region Location Map

In terms of GDP contribution, the Western Region produces more than 40% of the total GDP of Sri Lanka, thus is the main contributor to the country's economy. Around half of the country's universities in Sri Lanka are located in Western Region.

Colombo, the Commercial Capital and Sri Jayawardenepura Kotte, Administrative Capital of the country are located within the Western Region, so the role of the Western Region becomes very important not only as the administrative and the economic centre of the country, but also as the "leader" and role model in every aspect for the rest of the country.

With its strategic location along the international shipping route and in the middle of Europe and Australia, Colombo has been advancing as an international gateway to Sri Lanka. Its functioning as one of the regional services hubs serving the southern part of Indian Continent and the smaller countries in the Indian ocean.

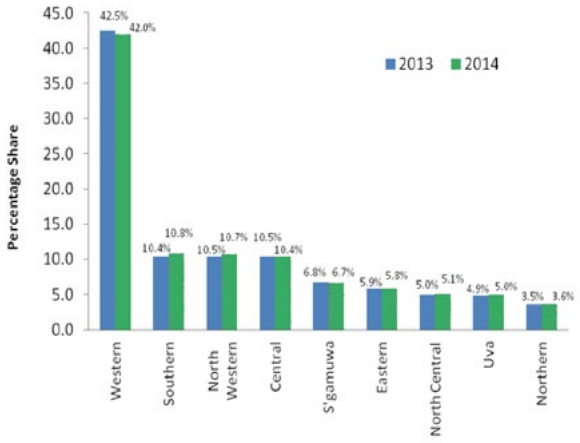


Fig.2.2 Share of PGDP in the Overall GDP (Source: www.cbsl.gov.lk)

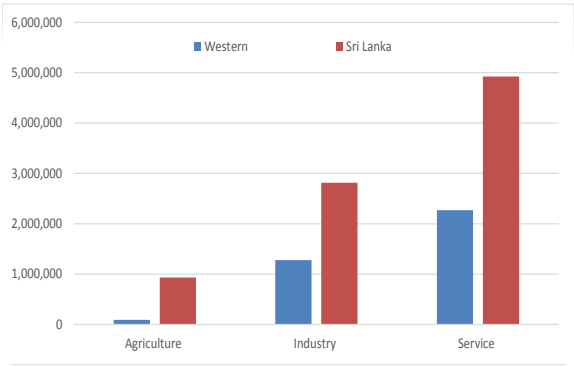


Fig.2.3 Sectoral GDP Share of Western Region & SriLanka (Source: cbsl.gov.lk)

2.3 Physical features of the western region

2.3.1 Climate

The entire region belongs to the wet zone except for a small area close to the Northern boundary (which is a part of the Intermediate Zone). The average annual air temperature ranges from 26.2-29.7 ^{0}C. The average annual minimum and maximum temperature varies from 22.2-26.7 ^{0}C and 29.9-32.7 ^{0}C, respectively. The period between November to January and April to June are considered as the coolest and hottest periods of the Region (DCS, 2012).

The mean annual rainfall ranges from 1,500 to over 4,500 mm. Within the Region, the coastal belt and Gampaha district receive relatively low rainfall compared to Kalutara and Colombo districts. Over 70% of rainfall is received from the South-West Monsoon and Second Inter Monsoon. The Western Region is usually wet and humid, where the mean monthly day time and night time relative humidity of the Region ranges from 68-77% and 83-91%, respectively.

2.3.2 Topography and Geology

The topography of the landscape is generally flat in the coastal areas, with a rolling and undulating terrain towards the South-Eastern part of the Region, where the altitude increases up to about 100m. The geology of the Region is dominated by Precambrian rocks of the South-Western group, consisting of Schists, Gneisses,

and granulites of Metasedimentary origin, as well as Migmatite and Granitic Gneisses. Red-yellow Podzolic soils are the main soil type in the Western Region, with sub-groups.

Soil in the Colombo and Gampaha districts include the sub-group with soft or hard laterite rolling and undulating terrain, which also occurs to a lesser extent in the Kalutara district. The ill-drained lands in the lower coastal plain of the Region include bog and half-bog soils with flat terrain (i.e. in Muthurajawela and Attidiya marshes). The beach areas from Negombo to Mount Lavinia consist of a narrow stretch of Latesols and Regosols on Old Red and Yellow sands. Narrow strips of Alluvial Soils occur along the floodplains of Kelani River, Dandugam Oya and Kalu River.

2.3.3 Hydrology

Out of the total extent of the Western Region, 91 km^2 (2.5%) is occupied by inland water bodies. Out of 103 river basins and 36 major river basins of Sri Lanka, five major river basins, namely Kalu river basin and Kelani river basins, Attanagalu Oya river basin and Maha Oya river basins and Bentota Ganga river basin are located in the Western Region.

2.3.4 Land use

The land use system of the Region is dominated by home gardens followed by rubber plantations, paddy lands, coconut plantations and natural forests. In Gampaha district, the dominant form of land use is home gardening followed by coconut plantations, paddy farming and rubber plantations. Gampaha district has the lowest extent of natural forests in a district. In Colombo district, rubber plantations are the dominant form of land use followed by home gardens, paddy farming, built up lands and coconut plantations. In the Kalutara district, the land use pattern is dominated by rubber plantations followed by home gardens, paddy farming and natural forests.

2.4 Ecological Features and Sensitive Habitats in Western Province

2.4.1 Biogeography

Sri Lanka is divided in to 15 bio-regions (MFE, 1999) based on climate, geo-physical conditions and the distribution patterns of fauna and flora. The inland area of the Western Province belongs mainly to the lowland wet zone bio-region (region 4 with an altitudinal variation of 0-1,000 m, annual rainfall of 2,500-5,000 mm, tropical lowland wet evergreen forest and a high percentage of endemic species among both fauna and flora) while a small fraction in the northern region falls within the intermediate zone (region 3). The coastal zone belongs to the Chilaw to Hikkaduwa bio-region (region 12 with coastal marshes, lagoons, estuaries, pockets of mangroves, rocky habitats, sandstone reefs and sandy beaches).

2.4.2 Forest Cover

Out of all nine provinces of Sri Lanka, the Western Province has the lowest natural forest cover (7%). Out of the three districts that make up the Western Province, the highest forest cover is found in Kalutara district, followed by Colombo

Fig.2.4 Rock Outcrop Forest - Pahiyangala

Fig.2.5 Mangrove Forest - Negombo

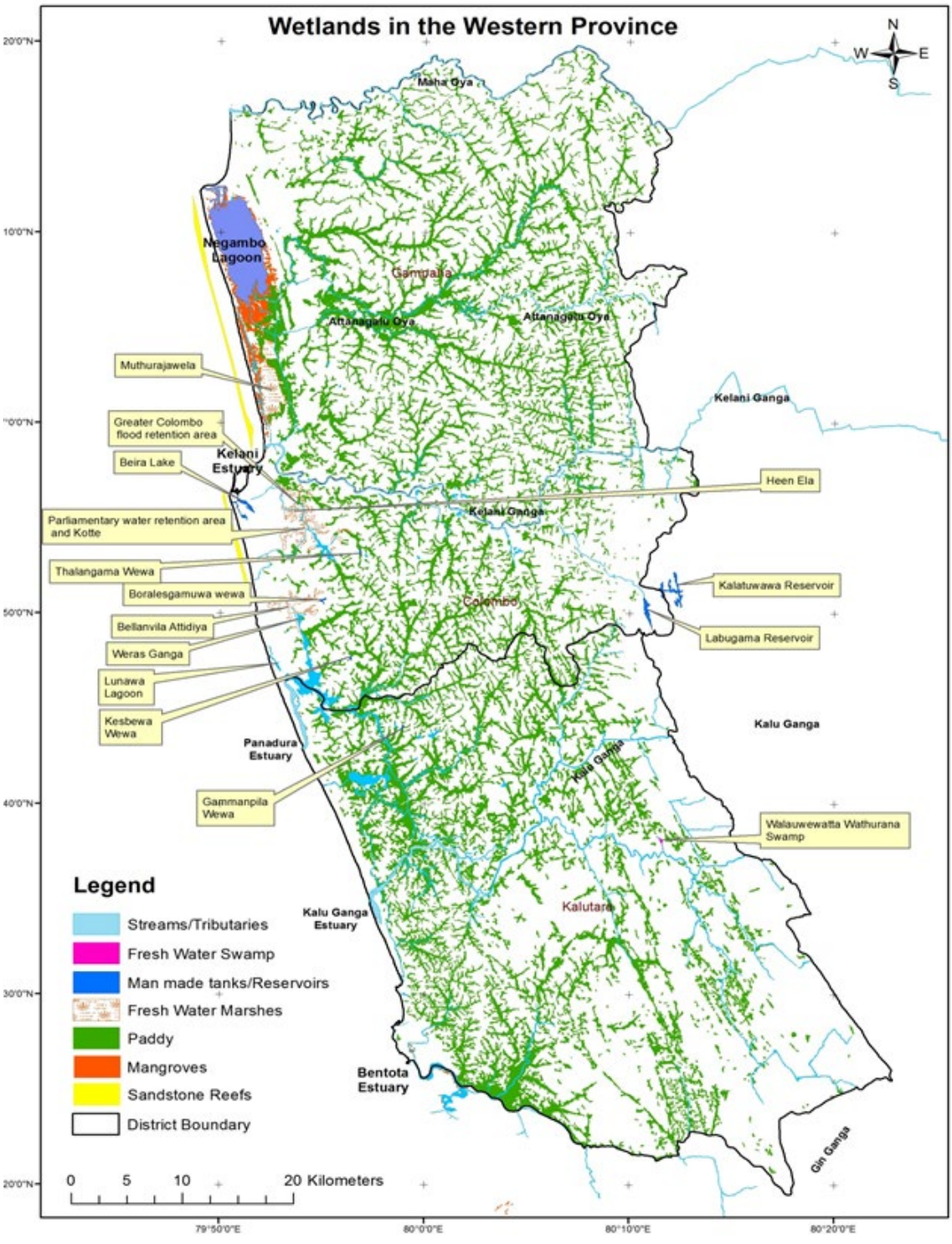


Fig 10.6: Wetlands in Western Region

and Gampaha districts There are also number of plantation forests scattered throughout the province, many of which are monocultures of either exotic or native species and few mixed species plantation forests. The total forest cover in Gampaha, Colombo and Kalutara are 2,577ha, 2085ha and 22,721ha respectively, which includes natural forests, plantation forests and mangrove forests. These figures convert to 1.92%, 3.11% and 14.41% of forest cover in Gampaha, Colombo and Kalutara respectively.

2.4.3 Terrestrial Habitats

A number of vegetation types can be seen in the Western Region. Of these, the dominant natural vegetation type found in the Western Province is lowland wet evergreen forest. In addition other unique forest formations such as swamp forests (Waluwatta-Wathurana forest), rocky outcrop forests (Pahiyangala Forest) and riverine forests (forests found on the river banks of Attangalu Oya, Kelani River, Kalu River, Bolgoda River and Gin River) can be seen in the Western Province. Further, a number of forest plantations have also been established in the Western Province. Many of these plantation forests are monocultures of exotic species such as *Pinus caribaea, Albizia spp., Swietenia spp.,* and *Mahogany spp.* or indigenous species such as *Dipterocarpus zeylanicus*. The largest *Dipterocarpus zeylanicus* Plantation of Asia (Kirigala Forest Reserve with an extent of 22.8 ha) is also found in the Western Province.

Even though the natural habitat coverage of the Western Province is extremely low compared to the other eight provinces, it is one of the richest provinces in terms of species diversity, especially threatened, endemic and restricted range species. Nearly 50% or more of the total number of species of many taxonomic groups (especially butterflies, dragonflies, freshwater fish and birds) is recorded from the Western Province.

However, it should be noted that more than 75% of the natural forest patches in the Western Province have not been inventorized properly and therefore the representation of species in the Province is likely to be much higher than what is reported presently.

2.4.4 Environmental Sensitive/Important Areas already under Legal protection

Some of the areas in the Western Province are legally protected under the Forest Ordinance, Fauna and Flora Protection Ordinance and the National Environmental Act. There are 21 already declared Forest Reserves and 41 proposed Forest Reserves within the Western Province. In addition, there are 4 Sanctuaries and one National Park, namely Bellanvila Attidiya, Muthurajawela, Maimbulkanda-Nittambuwa, Sri Jayawardenapura Kotte Sanctuary and Horagolla National Park declared under the Fauna and Flora Protection Ordinance. In addition to the above, several environmentally sensitive areas have been declared as Environmental Protection Areas under the National Environmental Act. These include Muthurajawela Buffer Zone, Thalangama Tank, Walauwatta Wathurana, Bolgoda North and South, Dedigama Kanda.

It is imperative that these protected areas continue to be protected in the future with strict implementation of the respective laws in order to ensure that proposed development in the region, does not lead to incursions into these protected areas or impact adversely on them in any way.

Fig.10.1 Lowland Rain Forest – Morapitiya, Runakanda

Fig.10.2 Swamp Forest – Walauwatta,Wathurana

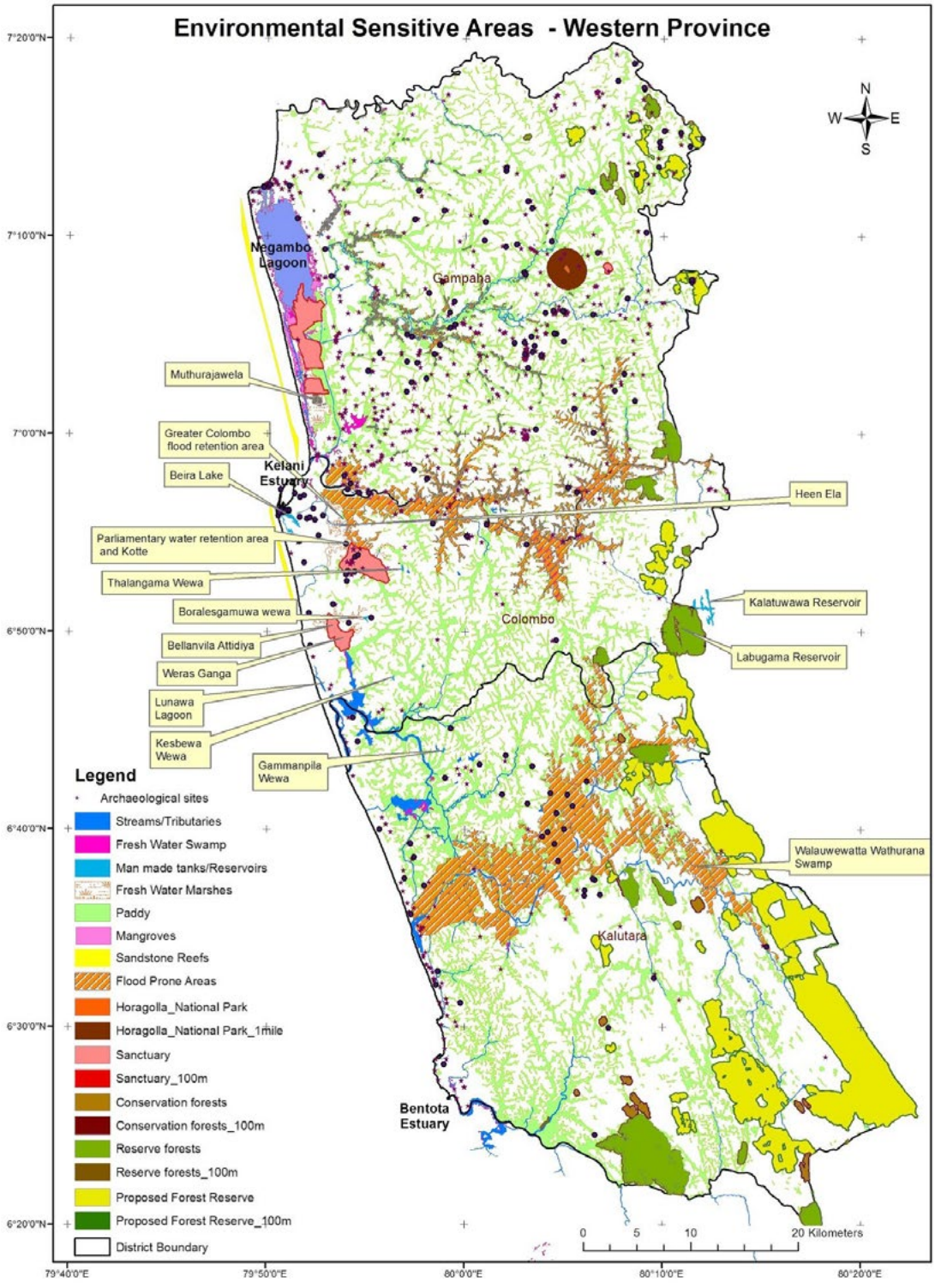


Fig.2.6 Environmental Sensitive Areas _Western Region

2.5 Marine Assets

Ocean is one of the key sources for unlimited resources. Marine based resources supported the human life even from pre historic era. Sri Lanka, being an island nation, ocean has become a key influential asset for the social, economic and environmental aspects. Western region is blessed with attractive coastal belt and many resources within it.

2.5.1 Non Living Resources

Sand

The sand is a vital commodity for the construction industry and is used for road base fillings, surfacing, building constructions, etc.

Based on the cement consumption, sand demand for 2013 has been estimated to be 12.27 million meter cubes. The GSMB currently keeps records of all licenses issued for sand mining and transportation, and according to these records the approximate annual sand supply is 7.13 million meter cubes. The difference may be due to various reasons. Illegal sand mining is one of the major factors and GSMB does not have proper monitoring and recording system for estimation. Approximately 40 percent of this sand is used in the Western Region.

There is a difficulty in fulfilling the current demand alone with the land base resources. On above grounds, the Subcommittee on Marine Assets was assigned to check the Supply and demand of sand for construction activities in the Region.

River Sand

Restricted river sand mining has been permitted in the region and 323 mining licenses have been issued to Kelani Ganga, KaluGanga and Maha Oya (Fig. 2.7). Approximately four million cubes of sand are mined per year.

Offshore Sand

The main offshore sand deposit in the island is found between Kalutara and Kalpitiya. This deposit has been dredged over four decades and mainly used for land and harbor terminal filling. SLPA, SLLRDC, CCD and CRMD have been issued mining licenses for sand dredging (Table 2.1). Out of the reserves identified under these licenses 423 million meter cubes more are available for dredging (Fig. 2.8).

Id *	Source	Description	Year	App. No.	Applicant	Area (sq. km)	Reserve (Million m^3)	Extracted Qty. Million m^3)
1	GSMB	Sand	2013	EL/2013/987	CC&CRMD	58		
2	GSMB	Sand	2013	EL/2013/979	CC&CRMD	100		
3	GSMB	Sand	2013	EL/2013/975	SLPA	54	60.0	15.0
4	GSMB	Sand	2011	EL/2010/763	SLPA	46 (52)	50.0	10.5
5	GSMB	Sand	2013	EL/2013/980	CC&CRMD	100		
6	GSMB	Sand	2013	EL/2013/981	CC&CRMD	100		
7	GSMB	Sand	2013	EL/2013/982	CC&CRMD	100		
8	GSMB	Sand	2013	EL/2013/984	CC&CRMD	100		22.3
9	GSMB	Sand	2013	EL/2013/983	CC&CRMD	100		
10	GSMB	Sand	2013	EL/2013/985	CC&CRMD	100		
11	GSMB	Sand	2013	EL/2013/986	CC&CRMD	100		
12	GSMB	Silt with Monazite & other Heavy Minerals	1997		NARA	450	400.0	
13	GSMB	Sand	2001	EL/2001/385	CCD			
14	GSMB	Sand	2010	EL/2010/755	SLLRDC	100	264.7	2.0
15	GSMB	Sand	2001	EL/2001/376	CCD	52	47.9	2.3
	*	Please Refer to the Map						
		Data is not available with institution						

Table 2.1 Off-shore sand and mineral resources availability within Western Region oceanic boundary

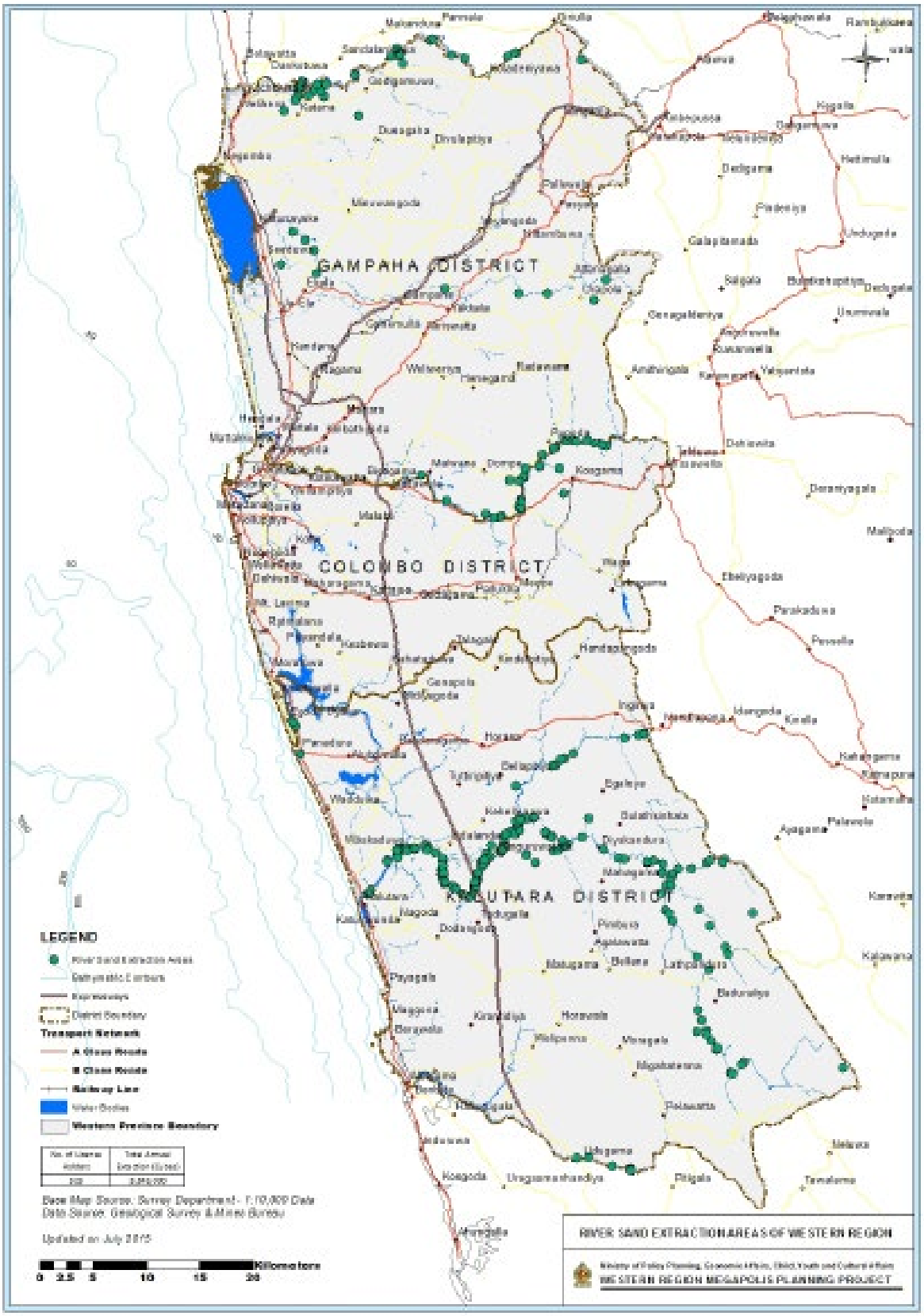


Fig.2.7 River Sand Extraction Areas within Western Region

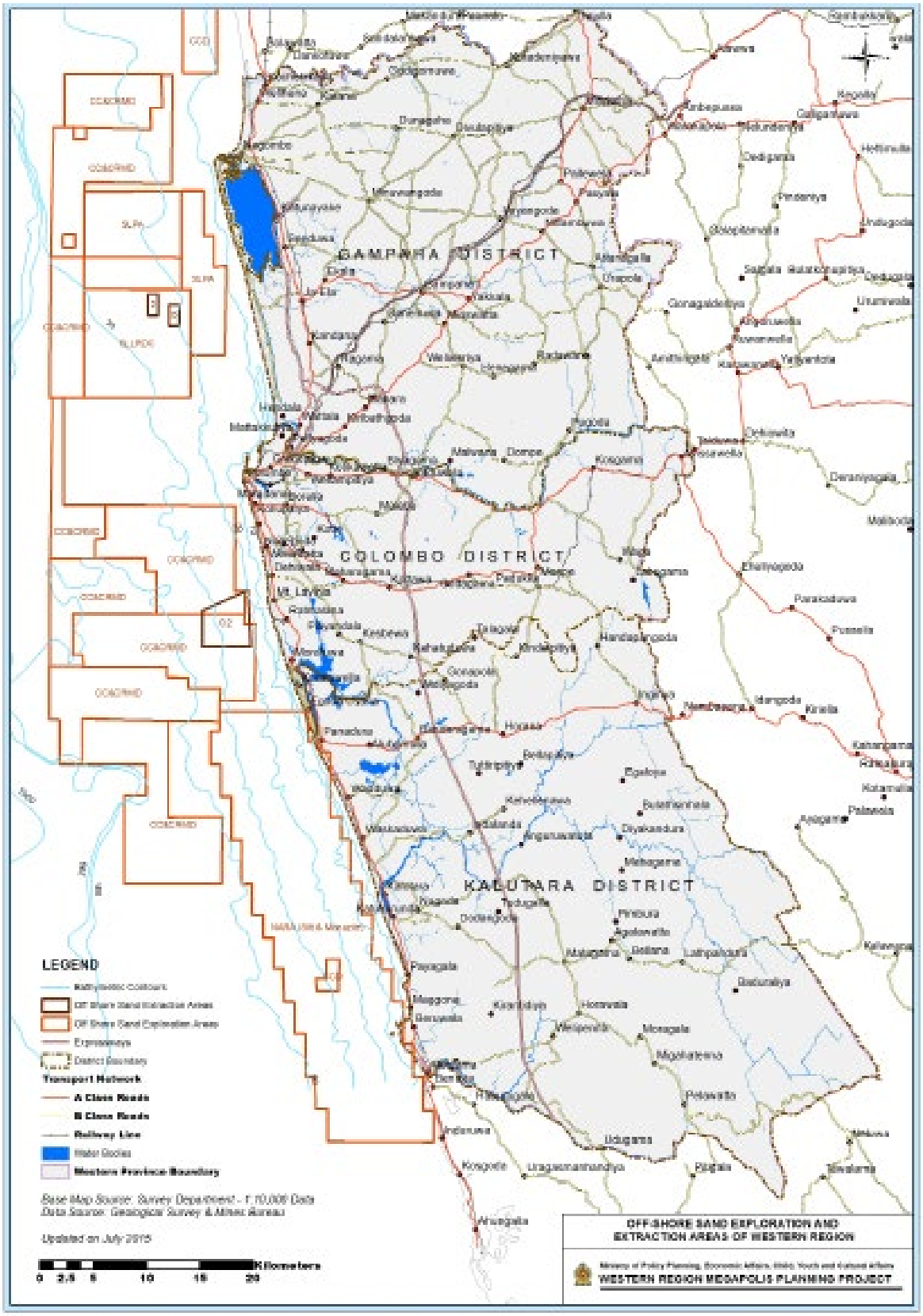


Fig.2.8 Distribution of Off-shore Sand and Mineral Resources (Exploration and Extraction Zones

Inland Sand

Inland sand mining is limited in the western region (Fig. 2.11). Only nine mining licenses have been issued and less than 10,000 cubes of sand are mined per year.

Aggregates

Aggregates are quarried in Colombo suburbs, mainly around Kaduwela, Padukka (Fig. 2.12). 218 mining licenses of different categories have been issued by Geological Survey and Mines Bureau.

Mineral sands

In 1991, the United Nations Revolving Fund for Natural Resources Exploration (UNRFNRE) assisted Sri Lanka to explore offshore Beruwala, located southwestern Sri Lanka between Panadura and Bentota (Fig. 2.9), in search of economic concentrations of heavy minerals. Under the terms of the Project Agreement, the project was designed to be conducted in two phases. The Minimum Work programme or Phase I was a commitment to expend not less than $360,000 to determine the extent of heavy mineral sands containing monazite, ilmenite, rutile and zircon. In a Subsequent Phase or Phase II programme, conditional upon the availability of funds, the UNRFNRE was to define more precisely the quantities and grades of the economic minerals contained in the sands identified in Phase I.

The offshore survey was carried out by the Geological Survey of Canada, (Atlantic) under a contract with UNRFNRE. The Minimum Work programme utilized high resolution seismic reflection, sidescan sonar and echo sounder systems which were towed simultaneously from the MV Puffin II, a harbour tug leased from Master Divers of Colombo. Eleven hundred (1100) line kilometres of high resolution data were collected over more than 450 square kilometers of the inner continental shelf between approximately 10 and 50 m water depth. Sixty-eight (68) surface sediment samples were collected to assist in the interpretation of the geophysical data.

The results of the exploration activities indicate that the sediment cover is typically thin (<1 m) throughout much of the study area. Thickest sediment accumulations (up to 14m thick) are found in channels and depressions eroded into seafloor bedrock by rivers during periods of lowered sea level. The survey has delineated approximately 400 million cubic metres of dredgeable sediment contained in 11 potential resource areas (Fig. 2.10). The surface area of these deposits range from 0.5 square kilometres to 27 square kilometres with each deposit having a continuous sediment cover of more than 2 metres of dredgeable sediment. The 11 potential resource areas comprise 3 interconnected onshore to offshore distributary systems (the Panadura, Kalu and Bentota resource areas) consisting of submerged river channels infilled with sediment, and interconnected inshore and offshore basins previously fed by sediment transported by the paleo-rivers.

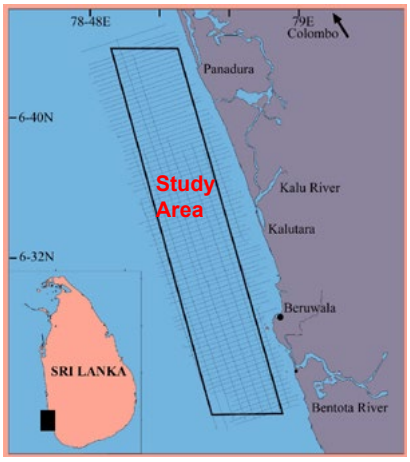


Fig.2.9 Survey Area of Mineral Sands under UNRFNRE Project

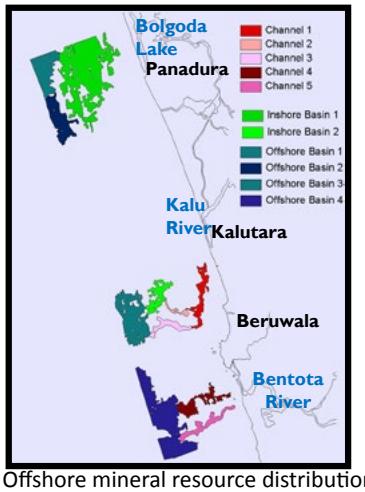


Fig.2.10 Offshore mineral resource distribution identified under UNRFRE Project

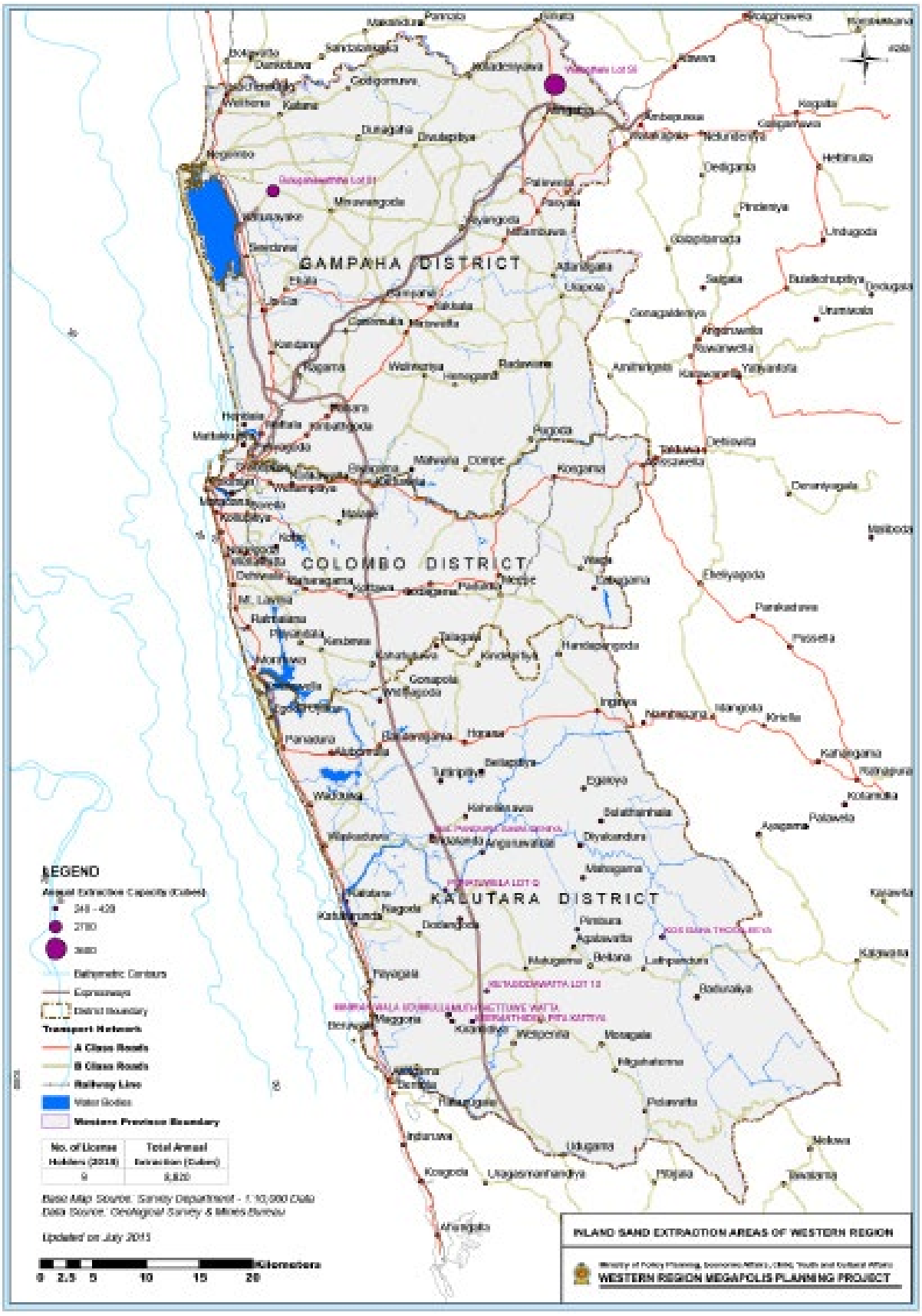


Fig.2.11 Inland Sand Extraction Areas within Western Region

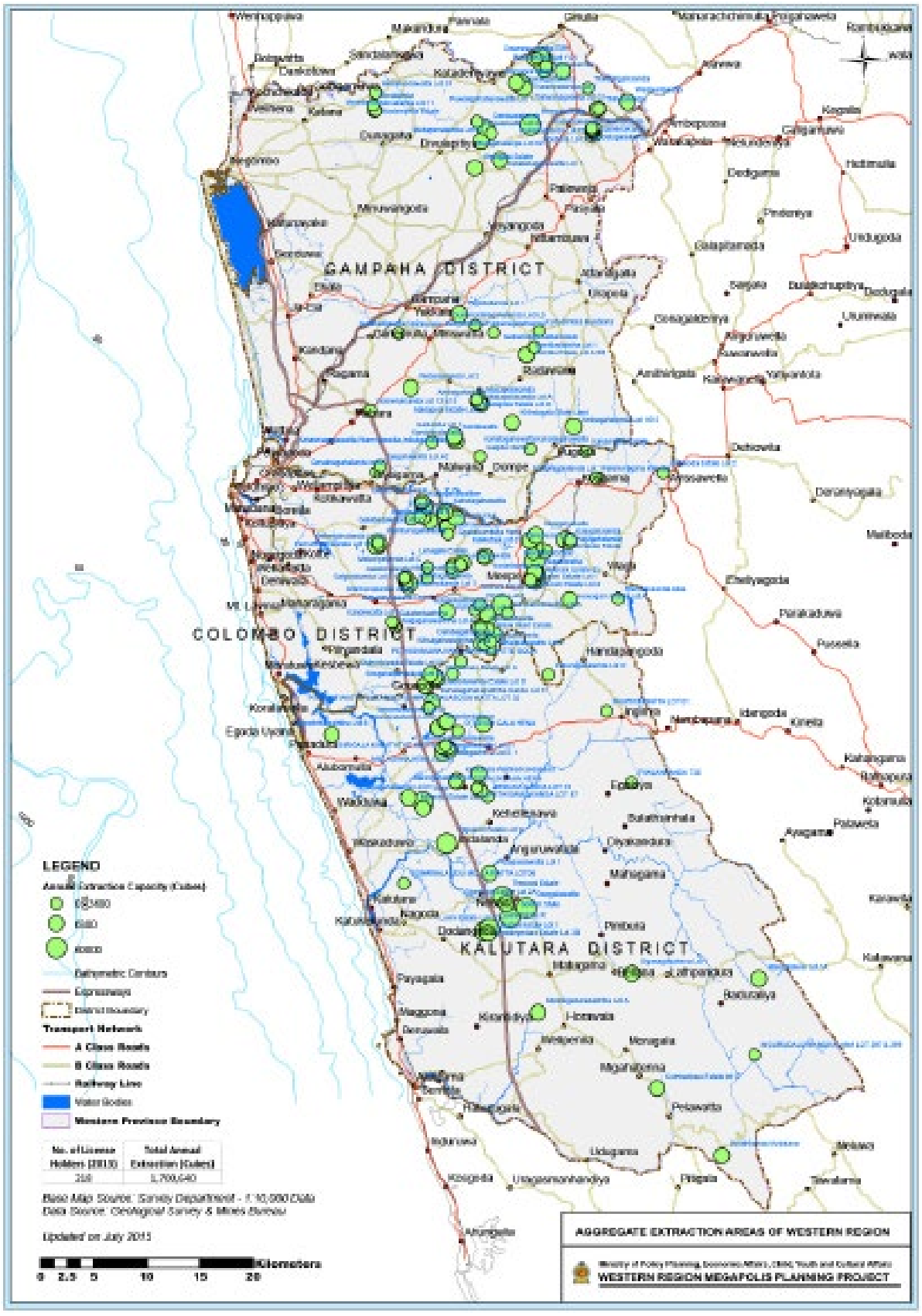


Fig.2.12 Aggregates Extraction Locations within Western Region

The surficial samples were analyzed by Gamma Ray spectrometry and the calculated monazite concentration in the sediments ranged from 0.01 % to 1.09 %. The results of the grab samples are insufficient for calculations of tonnages and grades which are reliable enough for development decisions. However, the surficial data and information on the size and thickness of dredgeable sediments in the basins and channels confirm a high potential for economic quantities of heavy minerals in the project area. On this basis, it is postulated that the identified basins and channels contain approximately 400 million cubic meters of sediment with potential for heavy mineral sands of monazite, ilmenite, rutile and zircon. Since the higher concentrations of heavy mineral sands occur at the base of the sediment pile, the above estimate is considered to be very conservative.The surficial samples were analyzed by Gamma Ray spectrometry and the calculated monazite concentration in the sediments ranged from 0.01 % to 1.09 %. The results of the grab samples are insufficient for calculations of tonnages and grades which are reliable enough for development decisions. However, the surficial data and information on the size and thickness of dredgeable sediments in the basins and channels confirm a high potential for economic quantities of heavy minerals in the project area. On this basis, it is postulated that the identified basins and channels contain approximately 400 million cubic meters of sediment with potential for heavy mineral sands of monazite, ilmenite, rutile and zircon. Since the higher concentrations of heavy mineral sands occur at the base of the sediment pile, the above estimate is considered to be very conservative.

A follow-up (Phase II) sampling program was recommended to determine the grain size and heavy mineral content of the sediments that infill the eleven potential resource areas offshore. Vibro-coring or recirculation drilling would provide a cost effective method of sampling sediments to more than 2 meters depth below the seabed. Sample locations should be chosen only along existing Phase I geophysical survey lines to ensure correlation with Seismic unit types. Full mineralogical and geochemical analyses should be conducted on subsurface samples.The actual resource economics need to be re-evaluated by integrating Phase II mineralogical results and grade assessments with Phase I sediment volume estimates for the identified potential resource areas. Any analysis program should also assess the potential use of the offshore sediments as industrial aggregate. Exploiting the offshore sands for both heavy mineral content and aggregate may improve the resource economics.

A full Environmental Impact Assessment should be carried out prior to any proposed commercial extraction of offshore heavy minerals off southwestern Sri Lanka (UNRFNRE Report).

2.6 Living Resources

The following section provides information on existing conditions of the sensitive marine biological resources within the proposed sand extraction area between Beruwala and Negombo. The near shore area, the waters over the continental shelf is rich in different types of living resources due to the high productive nature of the area influenced by the nutrient run offs from the two major rivers, Kelani and Kalu and the two lagoons, Negombo and Bolgoda. The sand stone reefs and rocky reefs provide shelter for many species of fauna and flora including small invertebrates, fish, turtles, lobsters, etc. The inshore waters rich with reef and sea grass habitats are spawning and foraging grounds for many commercially important fish and shellfish species.

Fig.2.13 Multi-day Fishing Boats in Beruwala Harbour (www.olankatravels.com)

2.6.1 Coral reefs

There are no prominent coral reefs in the western coast particularly in the proposed area. There are sand stone reefs running in north – south direction which are very significant for the coastal stability in the area. Sandstone reefs are conglomerates of sandstone and old coral limestone and form platforms and flat surfaces that are raised above the surrounding seabed. These indicate locations of former coastlines (Swan 1983). Small coral reef patches are scattered in various places on these sandstone reefs. Although living corals colonize these sandstone reefs to varying degrees, live coral cover is generally below 10% (Rajasuriya & De Silva, 1988). There are few isolated reef habitats located off Galleface, north of Kelani river and across the Kelani river mouth. In addition, there are two reefs (Vatiya and Madigala) located in the proposed area. (Fig 2.14) The Vatiya reef is on the 30m depth contour and extends from Panadura to Colombo and the Madigala reef is on the 20m depth contour. The other sensitive habitat in the proposed area is the Negombo Suda Reef (25km north and 15km offshore). This reef has 14% live coral cover. It is reported that river sand accumulation in this area appears to have adversely affected the live coral cover on these reefs.

2.6.2 Sea grass beds

Sea grass beds often occur in association with coral reef ecosystems or estuaries and lagoons. In the proposed area, significant abundance of sea grass are found in association with the Negombo lagoon. There are small patches of sea grass present in the intertidal reefs (e.g. Barbarian reef off Beruwala) and on other rocky reefs.

2.6.3 Turtle nesting beaches

Out of the 7 species of marine turtles found in the world, five are reported from around the seas off Sri Lanka and all five species are reported to come ashore for nesting. These five species – the Olive Ridley (Lepidochelys olivacea), the green turtle (Chelonia mydas), the leatherback turtle (Dermochelys coriacea), the loggerhead turtle (Caretta caretta) and the hawksbill turtle (Eretmochelys imbricata) are also listed as either endangered or vulnerable in the IUCN Red List (Amarasooriya and Dayaratne, 1997). An amendment to the Fauna and Flora Protection Ordinance in 1972 and Fisheries Act have provided legal protection to all species of marine turtles in Sri Lanka.

Turtles are believed to have a life-span greater than 80 years. Most of the species are highly migratory, moving between nesting and feeding grounds, which can be thousands of kilometers apart. The only time marine turtles leave the ocean is when the females come ashore to nest. In Sri Lanka, turtle nesting beaches are located all around the coast. Two species namely Chelonia mydas and Dermochelys coriacea occasionally visit for nesting in the beaches from Wellawatta to Beruwala and Uswatakeiyawa, Talahena and Poruthota towards Negombo in the proposed area (Amarasooriya 2000). However Amarsooriya (2000) has categorized these nesting beaches as Class 6 nesting beaches (nests of 1-2 species reported and average nesting per year not exceeding 5).

These species are believed to be migrating long distances to reach the beaches for nesting. However the migratory routes have not been clearly determined. The beach in Kosgoda-Induruwa area which is 16 km South of Beruwala has been identified as a turtle rookery where all five species come frequently for nesting and is classified as a Class 1 nesting beach (Fig 2.15).

2.6.4 Fisheries resources

Fishing is one of the main livelihoods of communities living in the coastal belt of the study area. Fisheries take place in the coastal waters and lagoons targeting small pelagic and demersal finfish and shellfish resources. 19 - 20 % of total coastal fish catch comes from the coastal waters from Beruwala to Negombo. Live aquarium fish are also collected from reefs in the proposed area for export.

Fig.2.14 Deep Coral Habitats Distribution along Western region

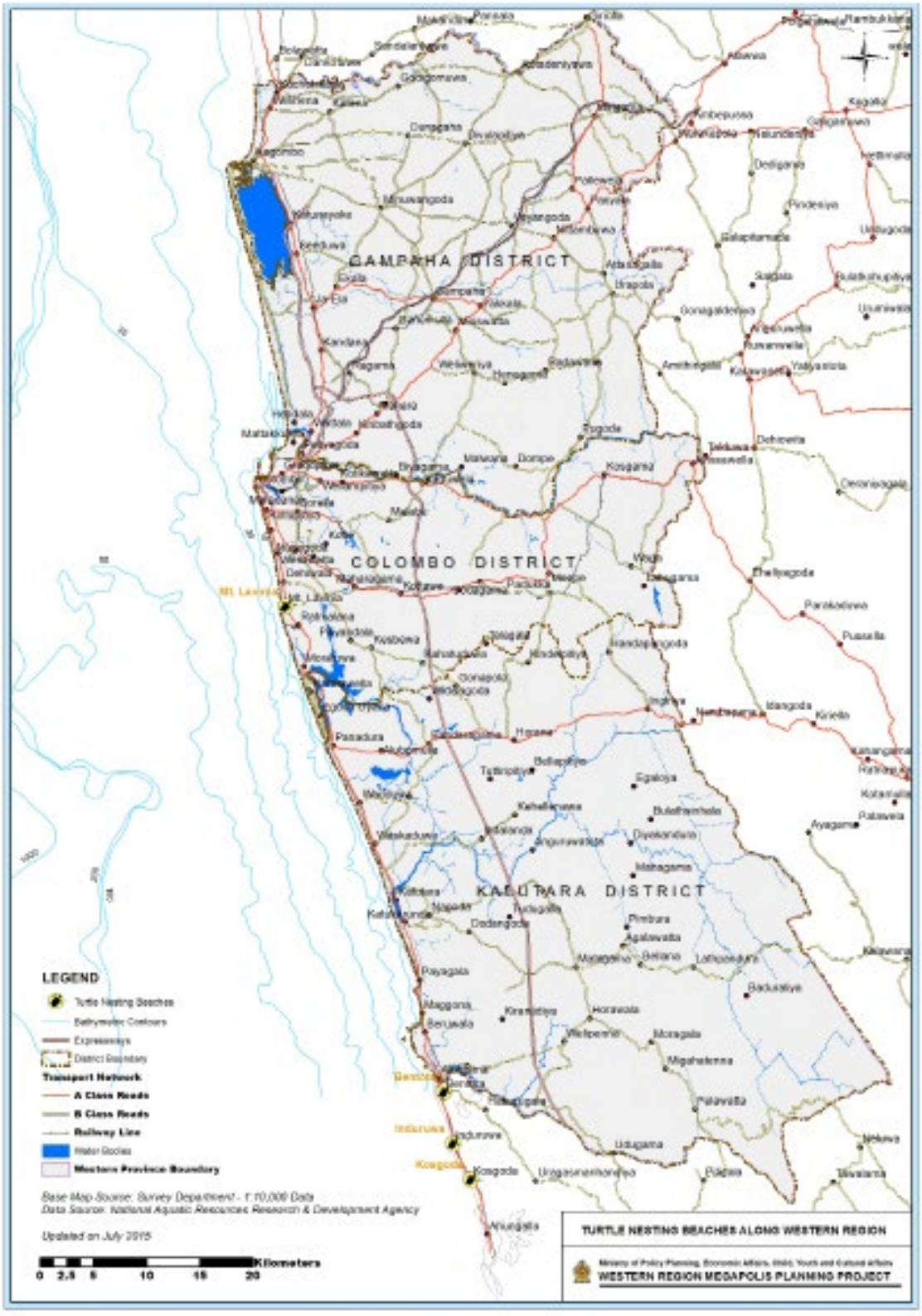


Fig.2.15 Turtle nesting Beaches within Western Region

Small Pelagic Fish

Pelagic fish are those species that live in the water column, either close to the surface or in mid water. The dominant small pelagic groups are sardines (Clupeidae), Anchovies (Engrulidae), scads (Carangidae), flying fish (Exocoetidae), and wide range of other free swimming types.

Fishing takes place generally in waters over the continental shelf. Small mesh gill nets and beach seins are the common fishing gear used in small pelagic fisheries. Beach seine fishing is restricted to a belt of 1-2 km from the shore and takes place in non-monsoon months from October to March. Beach seine operating sites are scattered along the shore between Negombo and Beruala. Small-mesh gill-net fishing which is the main fishing method for catching small pelagics operate up to 25-30 km from the shore. The estimated small pelagic fish catch in 2013 was 8,320 Mt from Negombo, 600 Mt from Colombo and 6,160 Mt from Beruwala fisheries districts. There are over 1500 fishermen engaged in small scale fisheries from this area.

Lobster

The spiny lobster fishery is a high valued small-scale artisanal fishery in Sri Lanka. Six species of spiny lobsters; Panulirus penicillatus, Panulirus versicolor, Panulirus homarus Panulirus ornatus Panulirus lonqipes and Panulirus polyphagus have been identified from Sri Lankan coastal waters (de Bruin 1962; Jayakody 1997) and five species are reported from the west coast. P. homarus dominates (more than 90%) the catches. This species inhabits inshore waters from the surf zone to depths of 20m, particularly in sandstone reefs and rocks which provide shelter. It is only very rarely that any lobsters are found on the open plateau. The sand-stone reef lying at depths of one foot to six fathoms between the Galle Buck Light House and Mount Lavinia Hotel is reported to be one of the most productive areas (Bruin, 1962). The lobster catch from Negombo to Beruwala was 150 Mt in 2014.

Fig.2.16 Lobsters caught in Kalutara

Shrimp

There is a well-established shrimp fishery in the western coast from Colombo to Chilaw. The fishery is conducted using bottom trawls in the three well-known trawl grounds situated just north of Colombo, south of Negombo lagoon mouth and in Chilaw. Shrimps are demersal, usually buried in the muddy bottom of these grounds.

32 species of panaeid shrimps have been recorded from the waters of Sri Lanka (De Bruine (1970a) and Siddek (1978), out of which four commercially important species are caught off Colombo and Negombo. These are Penaeus indicus, P. semisulcatus, P. monodon and P. merguiensis. These species spawn in the sea and the larval stages migrate to estuarine waters to spend their early life in estuarine waters until they reach maturity. The shrimp resources taken in the trawl fisheries off Colmbo and Negombo belongs to the same stock that spends its larval and juvenile stages in the Negombo lagoon. The estimated shrimp production from Colombo and Negombo in 2014 was 3,220 Mt and 60 Mt respectively.

2.7 Other Resources (Ship Wrecks)

As WRMPP has been extended to manage oceanic resources along Western Region, potential resources other than minerals and living resources are documented for planning. Ship wrecks are identified as one of the key assets which are identified as marine archaeological sites in this report.

Maritime Archaeology Unit (MAU) established under Central Cultural Fund is the state responsible organization in Sri Lanka to undertake explorations on shipwrecks and similar assets. There is a single study on shipwreck sites along Western Region which has been concluded in March 2014 for a coastal strip stretched from Colombo to Panadura. MAU officials informed that the shipwreck sites along coastal belt of Beruwala and Negombo are yet to be explored. 14 ship wreck sites are identified by the MAU survey and mapped for WRMPP.

Identified shipwrecks are dated back to Second World War period and stretched from 3km to 25km of linear distance from coastal belt. Basic information of shipwreck sites as identified by MAU is listed in the Table 2.2.

In addition to the above, there are number of wreck sites available from Beruwala to Negombo which have not been explored yet. The necessity of detailed study and proper documentation of marine assets along Western Region to avoid destruction of under-water assets by the development activities.

Fig.2.17 Shipwreck site (www.lanka.com)

No	Shipwreck Name	Distance from Coast (km)	Visual Depth (meters)	Sunk Date	Remarks
1	MV Pecheur Breton	6 km from Mount Lavinia	16m - 32m (bottom)	01.07.1994	No archaeological value
2	Delhi Coal Wreck	9 km from Mount Lavinia	26.6m		High bio diversity value
3	Nilgiri Tug	7.5 km from Mount Lavinia	32m	1997	High bio diversity value
4	MV Medhufaru	4.2 km from Mount Lavinia	29m	05.06.2009	
5	Toilet barge	14 km from Dehiwala	32m	Unknown	High bio diversity value
6	Thermopylae Sierra	3.5km from Angulana	23m	2012	High bio diversity value
7	Battery barge	11 km from Dehiwala	46m	Unknown	High archaeological value
8	Thaproban East	15 km from Dehiwala	31m	Unknown	High bio diversity value
9	SS Perseus	25km from Colombo	40m		
10	Car Wreck	17 km from Dehiwala	32m	18.03.1983	High bio diversity value
11	SS Worcestershire	15 km from Dehiwala	57m	16.02.1917	High archaeological value
12	Panadura Boiler Wreck	2 km from Panadura	12m	Unknown	
13	MV Astoria	12 km from Dehiwala	19m	25.09.1997	

Table 2.2 Identified shipwreck details along Western Region

Fig.2.18 Marine Archaeological Sites/ Ship Wrecks in Western Region

2.8 Archaeological Sites & Monuments

There are as many as 157 archaeological sites scattered across many villages in the Gampaha district, 92 sites in Colombo district and 42 in Kalutara district , that have been identified and mapped by the Department of Archaeology as depicted in the map.

There are however many serious threats to these sites such as looting and vandalism, treasure hunting, negligence, improper maintenance, encroachment and pressures due to urbanization. There are also potential threats to these sites through natural disasters such as floods, earthquakes, cyclones etc.

It is strongly recommended that the inventorisation and documentation of the archaeological sites within the Western Region is completed along with photography and GIS maps, as early as possible. It is also proposed that site management plans are prepared and implemented for the significant sites and that periodic monitoring of the sites are carried out by the Department of Archaeology. Adequate funds should be provided to the Department of Archaeology for this purpose.

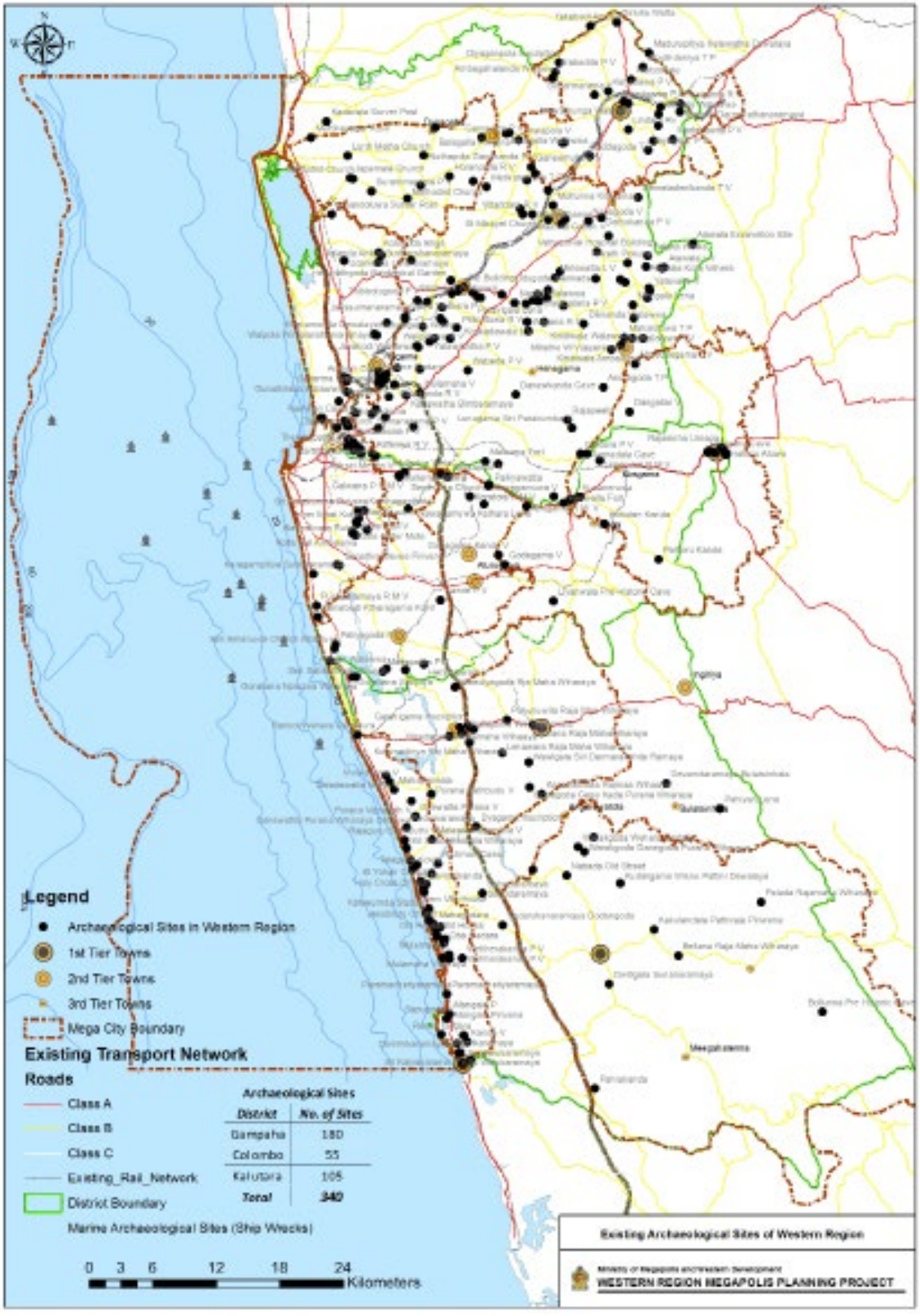


Fig.2.19 Existing Archaeological Sites in Western Region

Fig.2.20 Solid Waste Disposal and Traffic Congestion are two leading issues in Western Region, especially in Colombo

2.9 Issues, Constraints & Opportunities

Western Region is endowed with beautiful environment, fertile land, abundant of water and attractive coastal areas. Experiencing a healthy economic growth in the past 10 years, Western Region is on the path of progress and development. However, like many other places, economic development also brought about some issues which needs to be addressed in the Master Plan.

2.9.1 Key Issues

The rapid economic growth in the past 10 years has brought employment and wealth, but also urban and environmental issues, such as traffic jams, pollution, unmanaged garbage, etc.

One of the main environmental issues stems from the unplanned industrial development, which mushroomed and covered wide areas across Colombo and Gampaha Districts. Many of these industries are located within residential zones and discharge their liquid waste to the nearby wetlands, creating severe pollutions in the region. It is obvious that the lack of planning and enforcement in industrial developments, coupled with high demand in manufacturing sector has driven the mushrooming of industrial establishments in residential and rural areas. Hence, consolidation of industrial development and provision of waste treatment infrastructure is very important to reduce industrial pollution in Western Region.

The lack of planning and enforcement has also resulted in the conversion of some wetlands into development, especially in rural areas, where Development Plan (DP) is not available. Going forward, it is critical to prepare a comprehensive plan for the whole of Western Region, so that such issues will not happen in the future.

Solid waste processing and disposal is another critical issue in the Western Region, as the current processing facility is far from being adequate and most of the land-fill sites being illegal dumping grounds without proper environmental protection measures. Till to date, there is only one small engineered landfill site for the whole of Western Region, which is highly insufficient to allow for proper processing and disposal of the solid waste. Moving forward, this is a sector which needs special attention.

The transport demand has increased remarkably over the past few years, especially in the Colombo Urban, which consists of the Colombo Municipal area, Suburbs and the adjacent area, which heavily depend on urban transport.

Due to the increase in traffic demand, the speed of vehicles on the roads has declined resulting in higher vehicle operating costs for vehicle owners and environmental deterioration on the entire community. These impacts negatively affect not only the economic development in the western region, but also that of the country because roughly half of the country's economic activities are concentrated in this area. In addition, the nation's largest international seaport and airport are located within the area. The total person trip demand would increase 1.75 times and the trip demand made by private modes of transport

would increase rapidly due to the anticipated increase of household incomes. Current traffic congestion becomes serious during the morning and evening peak periods within and around the boundary of CMC and is expanding its area. Furthermore, traffic congestion will worsen due to the anticipated increased demand if appropriate countermeasures are not taken. Less utilization of high occupancy vehicles, a lack of facilities for pedestrians and bus passengers, an insufficient capacity of public transport and poor enforcement of traffic rules aggravate the situation.

2.9.2 Constraints

The Colombo City Core and its immediate surrounding area is densely developed. As such, to acquire land for infrastructure improvement and road widening in the City will be challenging. This aspect has to be considered in the overall transportation & infrastructure planning, which will require substantial amount of land in the City to execute transport projects and improve mobility in the City.

Another constraint in Western Region is the extensive network of wetlands, which needs to be preserved as flood retention areas, and to protect the wetland ecosystem. This has to be considered and integrated as non-urbanizable areas in the future plans. Without an environmental sensitive planning approach, large portions of the wetland network will be destroyed. On the other hand, wetlands are important asset base for balancing the natural disaster risk.

Apart from the wetlands, there are also environmental sensitive areas along the coastline and forested areas in the south. These include the Muthurajawela conservation zone, the southern coastal belt and the forests in Kaluthara District. These environmental sensitive areas have to be protected and well integrated in the Master Plan.

2.9.3 Opportunities

Western Region is a vast region. Apart from the densely developed central city of Colombo and the wetlands, there are still many less developed areas where new large scale developments could take place. These include the plantation areas around Avissawella, Mirigama and Horana as well as the less developed areas east of the current Katunayake airport.

In the central city of Colombo, there are also pockets of land that could be vacated for redevelopment. The state owned land and less developed areas suitable for new development in Western Region have been identified and mapped in figure 2.25.

Apart from land availability, the existence of the wetland network in Western Region helps in balancing development with open spaces and nature. In many cases, the wetlands have become one of the attractive features and characters in Western Region. Wetlands also provide opportunity to develop an extensive greeen linkages accross the Western Region.

Also the existing infrastructure network linked

Fig.2.21 Existing Environmental Sensitive Areas in Western Region

Fig.2.22 Southern Expreeway links Western Region directly with Southern Province

with outer regions provide an important economic opportunity for the Western Region. Supply of goods and services through expressway corridors provide upper hand in port and airport related activities which has direct economic benefits to the country as a whole.

2.9.4 Threats

Wetlands are attractive features in the Western Region. However, in the past, some of the wetlands have been converted into development due to lack of planning and weak enforcement. Further conversion of environmental sensitive areas to urban uses needs to be prevented and restoration of the wetland is recommended to be undertaken gradually to ensure the integrity of the network and its ecosystem.

In many cases, developments are not planned or designed with wetland integrated as public space. As such, in many parts of the city, there are wetlands facing the rear / side of the development without proper public access. This may lead to difficulty in maintaining the cleanliness of the wetland over the long run.

Also the international changes in the Asian region has direct impacts to Western Region as it affects to the country. Competitive regional ports in South India has negative impacts on Colombo Port which is a threat to Western Region. Similarly, development in aviation and logistics sectors of South Asia cause similar threats.

Fig.2.23 Colombo Port Expansion is needed to compete with other regional ports

2.9.5 Conclusion

Considering the above issues, constraints, opportunities and threat, it is obvious that forward planning and stronger enforcement is needed in Western Region. This includes the infrastructure and transport planning to solve current issues and anticipate future growth.

In addition, a special effort needs to be made to ensure that wetland in Western Region is conserved and are well integrated as public spaces in urban areas.

Apart from that, strong economic base is a prerequisite for the future development of Western Region. Based on the current demographic and employment data, Western Region needs strong economic base for the employment generation as it is projected in the future. Development of necessary economic drivers through special attention on demanding industries, SME sectors, IT and technology driven industries and port-airport expansion are important to overcome the threats and weaknesses of the region.

SWOT analysis will summarize the contextual analysis of Western Region. Western region is currently holds the comparative advantage in most sectors in the country. SWOT analysis has identified the relevant sectors of growth and fundamental strategies to develop the region and the country as a whole which depicted in next chapters.

Fig.2.24 Wetlands and Marshes need attention to link the community life as public spaces

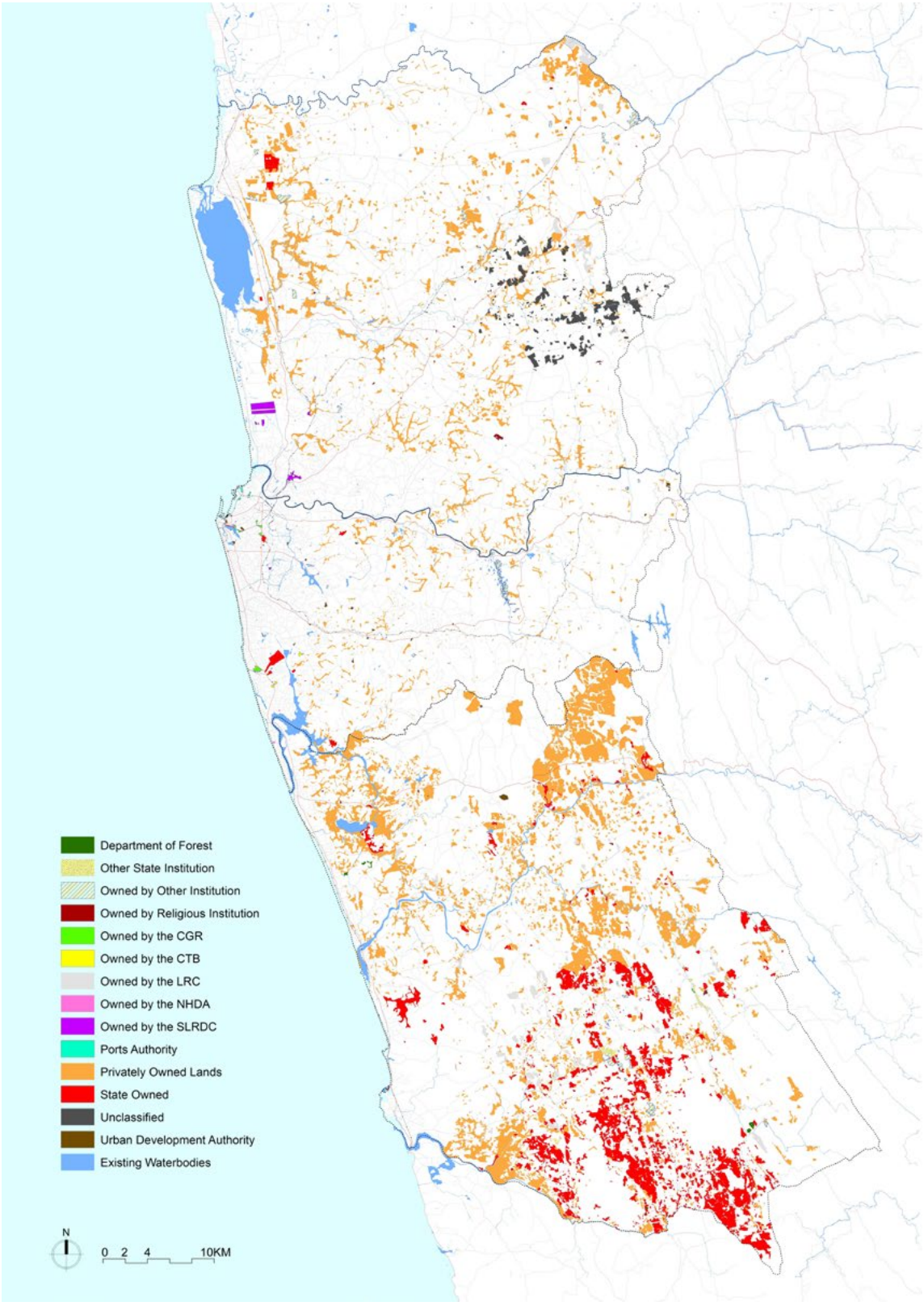


Fig.2.25 Existing Opportunities in Land Ownership in Western Region

2.10 SWOT Analysis

2.10.1 Strengths

- Absolutely peaceful environment with guranteed security -No threats of terrorism
- Strategic geographic location international shipping route
- Strong regional linkages (External & Internal)
- 100% coverage of reliable electricity
- Substantial coverage of land & mobile telecommunication
- Substantial coverage of high speed broadband connectivity
- Major economic driver of the country
- Availability of developable lands
- Colombo is a major port of call for more than 30 main lines including almost all the top container carriers and more than 15 feeder carriers.
- Location of main business centers Banks and financial hub of the Country
- Location of an International and domestic airports with expansion potentials
- Relatively high per capita income
- Educated labor force and talented youth
- Archeological and cultural landscape / large number of archeological sites to be preserved and potential to make tourist attraction
- Location of world renowned universities & schools
- Location of world class hospitals and health institutions
- Social infrastructure is fairly well distributed according to the population distribution.
- Efficient Health care network
- Educated youths and high percentage of literacy rate
- Social harmony and integration potentialities with less discrimination
- Rich natural resources of the province with large potentials for tourism attraction.
- Relatively flat terrain.
- Availability of fertile and cultivable landmasses
- High Density built-up area
- Five important rivers and valuable water bodies flowing through the region
- Conducive climatic conditions
- Rich Biodiversity area and connection to Sinharaja tropical rain forest(world man and biosphere site)
- Availability of extensive bio diversity and natural resources. Forest water bodies, water falls, lagoons, bays, wetlands, mangroves and marine resources are located within the region.
- Location of designated ecosystems and sanctuaries.
- Diversified agriculture (plantation, Spices, vegetables, export crops etc.)

2.10.2 Weaknesses

- Lack of an appropriate land policy
- Ad-hoc land development
- Mono centric urban spatial structure
- Use Airports for military purposes
- High electricity tariff in Asia
- Underutilized bandwidth of data connection
- Poor public transport system
- Increase of private vehicles on roads
- Low attention on tourism and fishing sectors
- Tourism and infrastructure development assessment not compatible
- Siting of industries in ad-hoc manner
- Rigid policies and rules
- Lack of skilled laborers/ skilled labor migration/ brain drain
- Underutilized economic infrastructure (Port and Airport)
- High land prices due to govt. institutions interventions Inadequate of water for development
- Abstraction of ground water
- Low-lying areas under seasonal flooding
- Lack of proper drainage system and flooding in the metro cities
- Land fragmentation
- Encroachments of the environmentally sensitive areas
- Political interference on encroachments
- Existence of polluting industries.
- Polluted rivers and water bodies
- Traffic congestion during peak hours and increase in air pollution

2.10.3 Opportunities

- Creation of Polycentric Urban Structure
- IT/BPO Software Product Engineering and Financial Services Outsourcing
- Colombo as Shipping & Naval Hub
- Construction of a City around the Airport (Airport City)
- Non-polluting value added Industrial Development
- Encourage migration of population into the Province
- Export Agriculture and horticulture
- Development of compact city development
- Development of Cruise tourism, Eco tourism, Cultural and leisure tourism
- Potential for Export market oriented industries and value added process
- International shopping malls

2.10.4 Threats

- Construction of Ports in India
- Competition with neighboring countries
- No continuation of national policies
- No Legally established system for national level policy preparation and institutionalization/ Na-tional think tank system
- Poor Law enforcement
- Local professional are not appraised in development efforts
- Professionals tempted to migrate out of country
- Deliberate drive for Social unrest
- Crimes
- Unskilled youths
- Politically motivated development efforts
- Land speculation

Fig.2.26 Nelum Pokuna Performing Arts Theatre

Chapter 03
Dimensions of Growth

3.1 Economic and Employment Projections

The economy of Sri Lanka and the Western Region has grown steadily since 2004, and it is projected to grow more rapidly provided that peace and stability are maintained. With a GDP/capita of more than 4000 USD, Sri Lanka is considered a middle income country.

Considering the high growth momentum, the GDP for Western Region is projected to reach over 214 billion USD by 2030. By 2020, the government targets the per capita income in Sri Lanka to triple to around 12,000 USD. This will see per capital income in Western region grow to US $ 4.7 billion from present US $ 24.5 billion. This is assuming an average annual growth rate of 7-8%.

The economic development in the next 15 years is crucial as the country has to move from labour intensive to skill intensive industries and to a knowledge based economy. Positioned as the economic hub of the southern part of the Indian Continent, a few high value added economic sectors have been identified as the key economic drivers in the next 15 – 20 years, including:

- Information Technology, Science, Bio-Medical and Nano sectors.
- Port, airport, logistic corridor and other transport related enterprises and value added trade.
- Financial and services sector
- Tourism, including the MICE tourism sectors
- General manufacturing - Mineral
- Growth of SME sector into a transformation stage

The present employment level of app. 2.2 Mn comprising both skilled and unskilled labor; will be increased by adding another 2.1Mn skilled employments.Meanwhile the unemployment rate is also projected to decrease from 2.1% to about 0.9% by 2030. Figure 3.1 depicts the GDP growth of country & Western Region from 2014 to 2030.

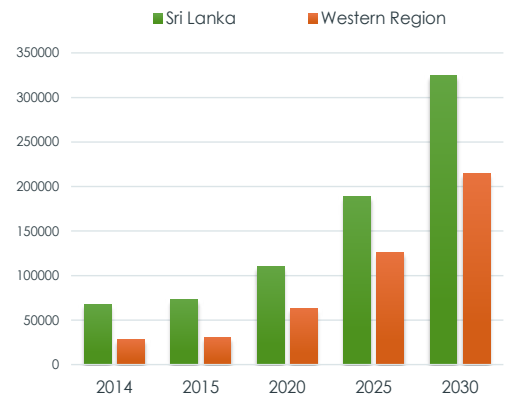


Fig.3.1 Projected GDP Share (US $ Million) 2014- 2030

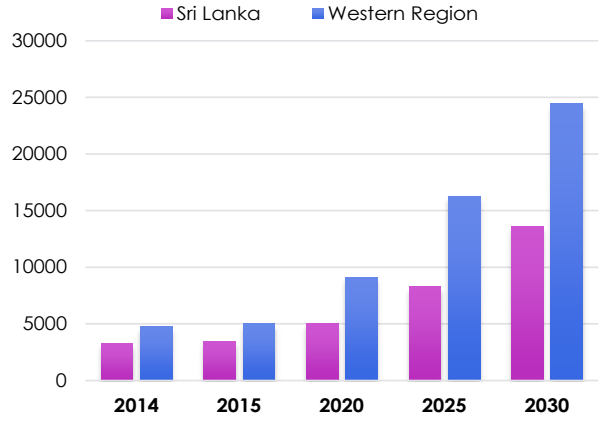


Fig.3.2 Projected Per capita income (US $)

3.2 Economic Model

A public – private partnership strategy will be the main focus of development approach followed in executing the Western Megapolis. While roles of the provision of essential infrastructure, overall planning and implementation, and monitoring of implementation performance will be the main public sector responsibilities, mobilization of investment funds, direct responsibility of investment based on high-tech technologies and, production and export will be the responsibilities of private sector. Currently available natural resources such as sand, mineral, water, agricultural products, plantation products will be put to best use.

Four basic objectives were used in developing the Economic Model for WRMP Plan namely,

- To assess the level of per capita income to be realized by 2030 to materialize the national policy target of US $ 12,000 per capita as pronounced by the Prime Minister in the Government's Policy Statement in Parliament;

- To estimate the level of GDP and per capita in Western Region Megapolis with the objective of meeting the national target by 2030;

- To estimate the level of investment that requires to achieve the GDP and per capita targets by 2030; and

- To identify the potential investment areas and projects achieving the overall objectives of Megapolis Development plan.

Initial estimates show that the objective target of US $ 12,000 per capita GDP of Sri Lanka by 2030 could be easily achieved only if Sri Lanka maintains the present level of annual rate of growth of 7.4 percent is increased to a level of 11.5 percent during the period 2015 – 2025 and maintain this upper level thereafter.

Accordingly, the average rate of growth that needs to be achieved during the period 2016 – 2030 will be approximately 10.8 percent per annum to reach the expected rate of growth by 2030. In order to materialize the above achievements, the country will be compelled to increase the present level of annual investment of 29% of GDP in 2014 to a much higher level of 40% of GDP by 2022 and maintains that rate throughout the period. Also, the level of direct private foreign investment will need to increase up to 12 % of GDP (Note: The present level of direct foreign private investment is around 3.7 % of GDP), taking into account foreign private investment will be determinant factor of future GDP.

The key economic indicators that would help to realize the estimated values of GDP, per capita income, level of investment and foreign private investment in Sri Lanka; are presented in table 3.1. The magnitude of total investment required during the above period is estimated as US $ 20.1 billion in 2014, increasing to US $ 41.8 billion in 2020, US $ 75.4 billion in 2025 to US $ 129.9 billion in 2030.

Table 3.1
Key Economic Indicators planned for the period - Sri Lanka (2014- 2030)

Indicator	2014	2020	2025	2030
GDP at 2015 prices (US $ Mn)	67,678	109,927	188,504	324,864
Annual Rate of Growth of GDP (%)	7.4	10.9	11.5	11.5
GDP per capita (US $)	3,273	5,039	8,262	13,614
Investment as a % of GDP	29.7	38.0	40.0	40.0
Foreign Private Investment	2,504	10,993	22,620	38,984

Source: (Own estimates projected on the basis of Central Bank of Sri Lanka published data upto 2013)

Table 3.2
Key Economic Indicators planned for the period -Western Rrgion (2014- 2030)

Indicator	2014	2020	2025	2030
GDP at 2015 prices (US $ Mn)	28,425	63,095	126,346	214,767
Annual Rate of Growth of GDP (%)	4.7	17.5	14.0	10.0
GDP per capita (US $)	4,731	9,120	16,278	24,445
Foreign Private Investment (US $ Mn)	739	8,833	21,479	36,510

Source: (Own estimates projected on the basis of Central Bank of Sri Lanka published data upto 2013)

Since there is no detailed and clear database to develop the economic model for Western Region; the share of GDP of Western Province estimated by the Central Bank of Sri Lanka, has been used as the basis of estimating the key economic indicators for the Western Region. According to the Central Bank of Sri Lanka, the share of GDP of Western Province experienced a deteriorating trend from the level of 45 % of national GDP in 2010 to 42% in 2014. However, in the preparation of economic indicators for Western Region Megapolis for 2030, consultant ignored this past trends of Western Province GDP and estimated respective economic indicators (GDP, per capita income and investments) assuming that the Western Region economy will be the driving force of the whole country and take the leadership in determining its overall growth. Therefore, the projections made are independent , level of investment and the estimated capital output ratios are the only determinant factors. Since the foreign private investment will be most important variable, it was assumed that the latest and high capital intensive technologies will be used in the production and the resultant capital output ratio will be much higher, indicating that the level of output will be several times of the capital investment.

Results of the WRMP model show, the average per capita income of Western Region will be US $ 24, 444 in 2030, which is almost double the level of average per capita income of the country at present. To achieve this per capita income level, the rate of growth of GDP in the Western Region need to increase the present rate of 4.7% to 17.5% in 2020 with higher take off and thereafter, with gradually reducing rate to 10% by 2030 as after the economic peak period with the strengths of all types of labour, capital and resource investment, less effort want to be taken for the smooth flow of strengthened economy but the maintenance strategies for that economy is a must. Table 3.2 presents relevant key economic indicators of Western region.

The high rate of growth momentum forecasted for the first few years of project implementation period, will be essential to take-off the economy from its present low productive status to a promising high growth achievement. It is important to select and implement few projects that could generate sufficient capacities of economic growth, while reducing the growth constraints within a short period. Depending on the present economic ills of the western Region, more and more investment attraction by providing highly skilled and efficient labour pool with high-tech equipped industries is a necessity for the development.

The results of the developed WRMP model together with general economic indicators for the country is presented in the following diagrams; which represent the economic growth of WRMP during the period 2014–2030.

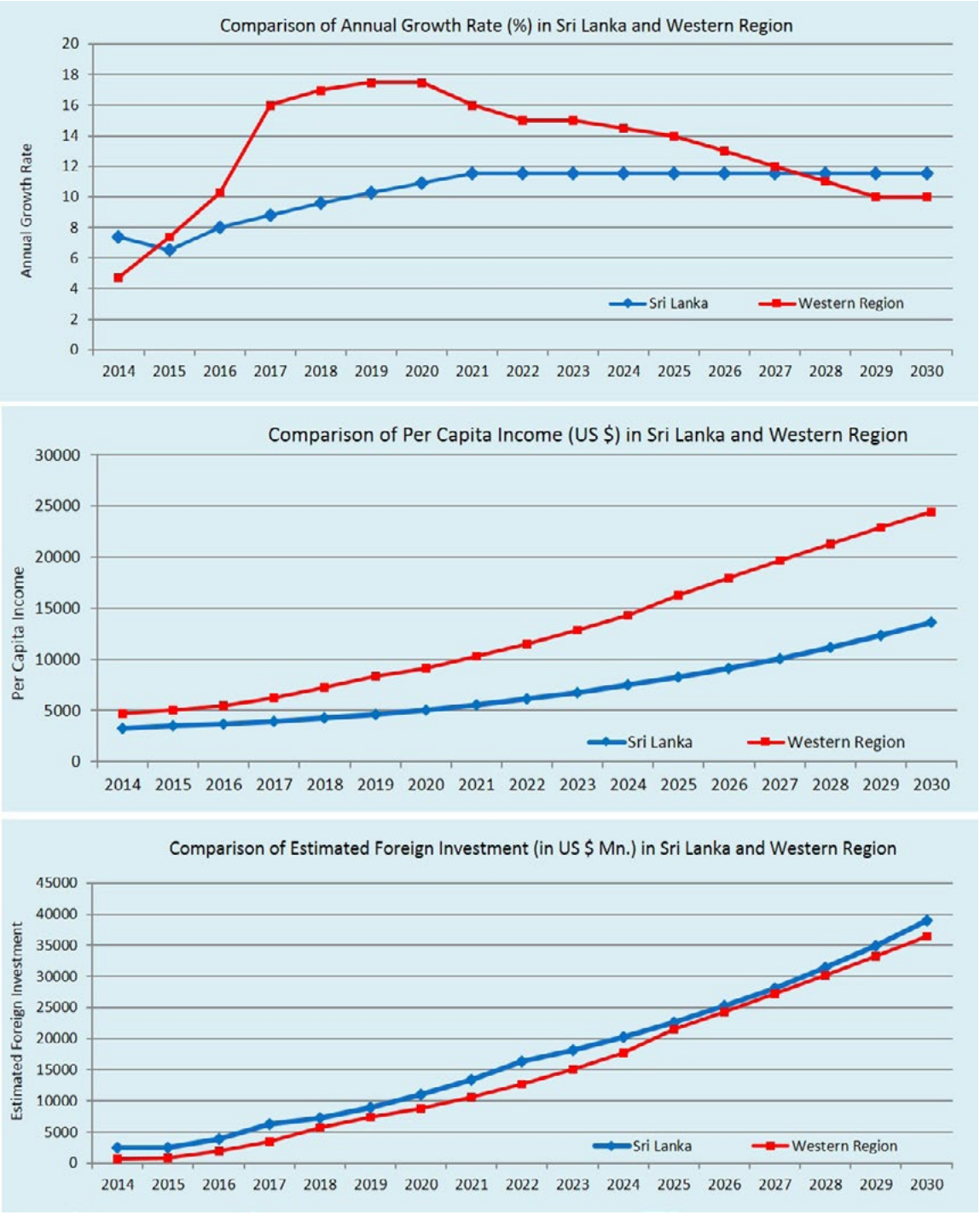
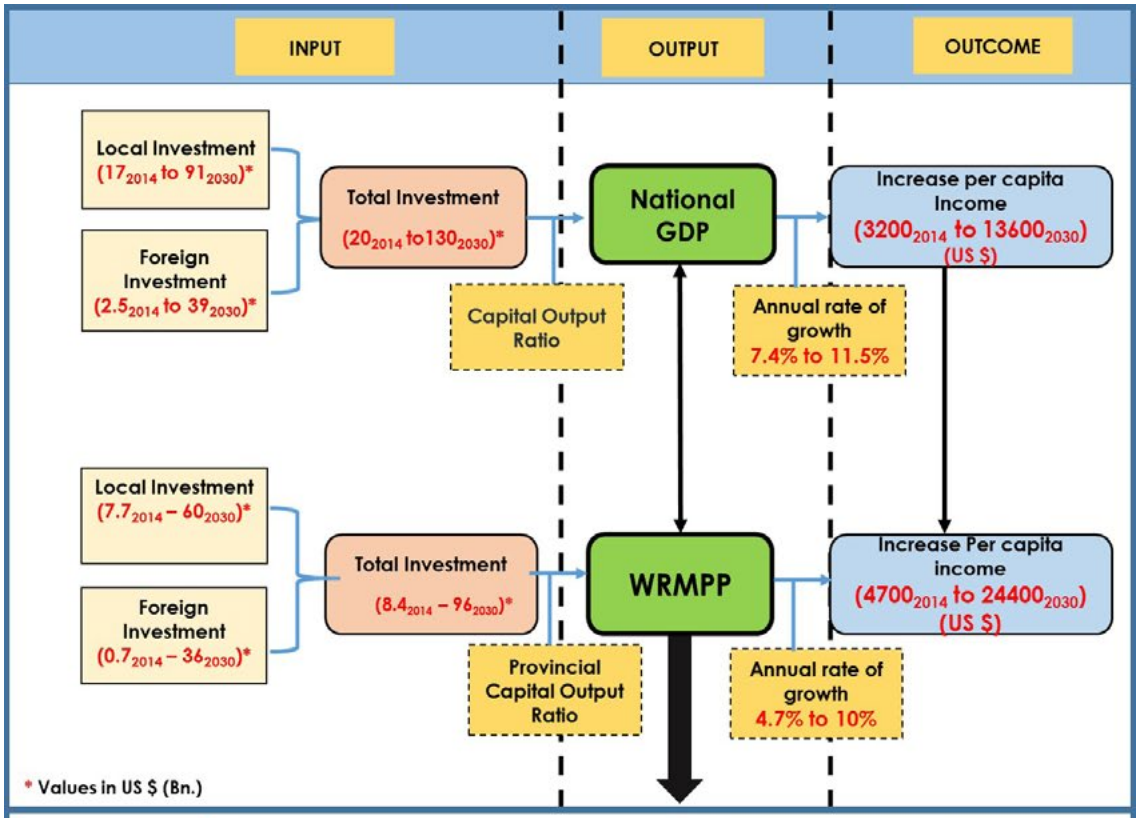


Fig.3.3 Economic Projection
Source: WRMPP Projections (2014-2030)



Pre conditions

- Policy changes
- Increase productivity
- Legal and Regulatory changes
- Addressing labor and employment issues
- HR supply and skills development
- Reduce cost on food & Services
- Reduce Cost of land
- Reduce and relaxation of custom duties and ground handling changes
- Foreign financing
- Speedy and efficient judicial system

Growth Sectors (Including proposed projects)

Proposed projects	Estimated investment (US $ Bn.) (app.)
Transport, Energy and Water	16
Housing, Townships and Relocation of Administrative offices	19
Environment and Waste Management	1.5
Aero, Maritime and Trade Hub	5
Central Business District	15
Industrial and Tourist cities	0.3
Science and Technology City	0.5
Eco Habitat and Plantation City	3.7
'Tranquility' - The Spiritual Development Facilitation	0.06
Total	**61.06**

Expected Outcomes (Western Region)

	Present Statistics (2012 Census data)	2 030 (At 2015 prices)
Employment Generation	2,214,165	1,639,179 (Skilled labor)
Poverty reduction	Poverty level 2%	Reduce present level to minimum of 1% of population
Income increase of Lower middle Group	Rs. 15,000 – 25,000	3 times the present level of income
Minimize regional disparities		Backward regions would get direct and indirect benefits of the development.

Fig.3.4 Flow Diagram Showing the Economic Model

3.2.1 Pre-conditions for Development

• Productivity Increase:

Increase in productivity of both capital and labour invested in megapolis project is a pre-condition for achieving targets spelt out in the plan. This exactly may not be an increase hither to expected out of general investment activities but an increase to the tune of what had been achieved by recently developed countries such as Singapore, Malaysia and Japan during their stages of fast growth. The expected high productivity increase shall represent through an incremental capital–output ratio indicating a high increase in output with a given investment input during short period of time. This means the replacement of traditionally accepted labour intensive, adaptive technology to high-tech capital intensive technologies in all areas of production.

• Policy Changes:

There are essential policy changes that require revision. The existing government policy is based on provision of employment opportunities mainly in the public sector. This cannot be continued and there is no scope for the public sector to provide employment to youth. Future employment will be generated by the private sector but be determined with the type of investment and skills required for the investment. There are other policies that will require changes.

• Legal and Regulatory Changes:

To achieve the objective of high growth targets, no doubt that it is essential to revise and sometimes to replace several legal and regulatory changes. It is often expressed that the present practice of time consuming legal issues. Those regulatory changes to the stock exchange procedures and customs clearing procedures could also be considered under such changes.

• Addressing Labour and Employment Issues:

There are several labour and employment related issues to be introduced to existing policies. One important element will be the change in employment termination laws and recruitment policies. Present termination laws are very rigid and sometimes payment of full termination cost including compensation. The recruitment regulations are so rigid that even though employees are recruited on contract basis, their employment on a continuous basis for 6 months requires making them permanent.

• Reduce cost on food and Services:

Main price determinant factor of food and services in the country is government taxes. In addition to import and sales taxed there are a series of other taxes that affects the determination of food prices and services. Accordingly, the cost of food in the household budget is now equivalent to almost

70 – 75 % of lower middle income group and, in general about 60 % of total population. Due to this fact, there is no effective market for industrial goods in the local market.

- Reduce Cost of Land:

The present market price of land not only in the CBD area but also in the other distant zones is high and seems to be non-affordable to investors. They cannot make an acceptable rate of return once they include the cost of land into total cost of investment. The land market is artificially inflated and therefore, the authorities have to come out with alternative systems of transferring land to investors so that return on investment be ensured.

- HR Supply and Skills Development:

Supply of skilled labour is a critical issue. Depending on the nature of projects selected for implementation, the issue of supply of skills become a real problem. Solution to the problem could be analyzed only through a concrete program of skills development but, it is not clear whether the present skills development programs could meet the envisaged demand or skilled labour.

- Reduce & Relaxation Custom Duties and Ground Handling Charges:

High custom duties and heavy ground handling charges at the port and airport reduce the competitiveness in both port and air port activities of the country. The custom duties and complicated clearance systems discourages entrepreneurs both at the import and export ends. The ground handling charges at the airport is the major reason for discouraging charter flights for bringing high income tourists to the country. Reduction of both custom duties and clearing practices and airport handling charges may improve the competitiveness of both import and export trade.

- Foreign Financing:

A large proportion of total investment has to come as foreign private investment. At present, direct foreign private investment is only 3 – 4 percent of GDP and this need to increase to at least 12 percent of GDP, to meet the total investment challenges.

- Speedy and Efficient Judicial System:

Time taken for resolving legal issues between investors, especially cases filed in the commercial courts, have to be resolved early. For that matter, action has to be taken to speed-up resolving judicial issues so that the cost of investment could be reduced considerably.

3.3 Demographic Projection and Distribution

The existing population of the Western Region is around 5.8 million, which represents 28% of the Sri Lanka's total population.

While the demographic growth was not as fast as projected before, an estimated maximum population of around 9 million can be expected within the Western Region by 2030 and beyond as a result of the fast economic development envisioned in the next few decades.

The above population growth is projected assuming a "pro-business" labour policies allowing multi-national talents to work in Sri Lanka.

The demographic projection is presented in figure 3.5. The projection indicates that an additional 3 million people would be added to the Western Region over the next 15 years with an annual growth rate of around 2.3%.

A higher number of new population is expected to reside in Gampaha District where employment opportunities are very high in the logistics and manufacturing sectors. Larger addition of population is also expected in the Colombo District due to the higher number of employment in the services and technology sectors and the densification of development in Colombo City.

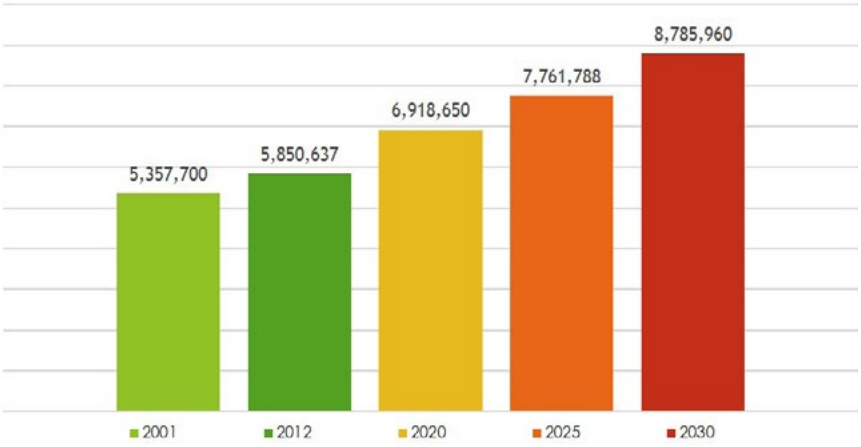


Fig.3.5 Projected Population Growth (2012-2030)

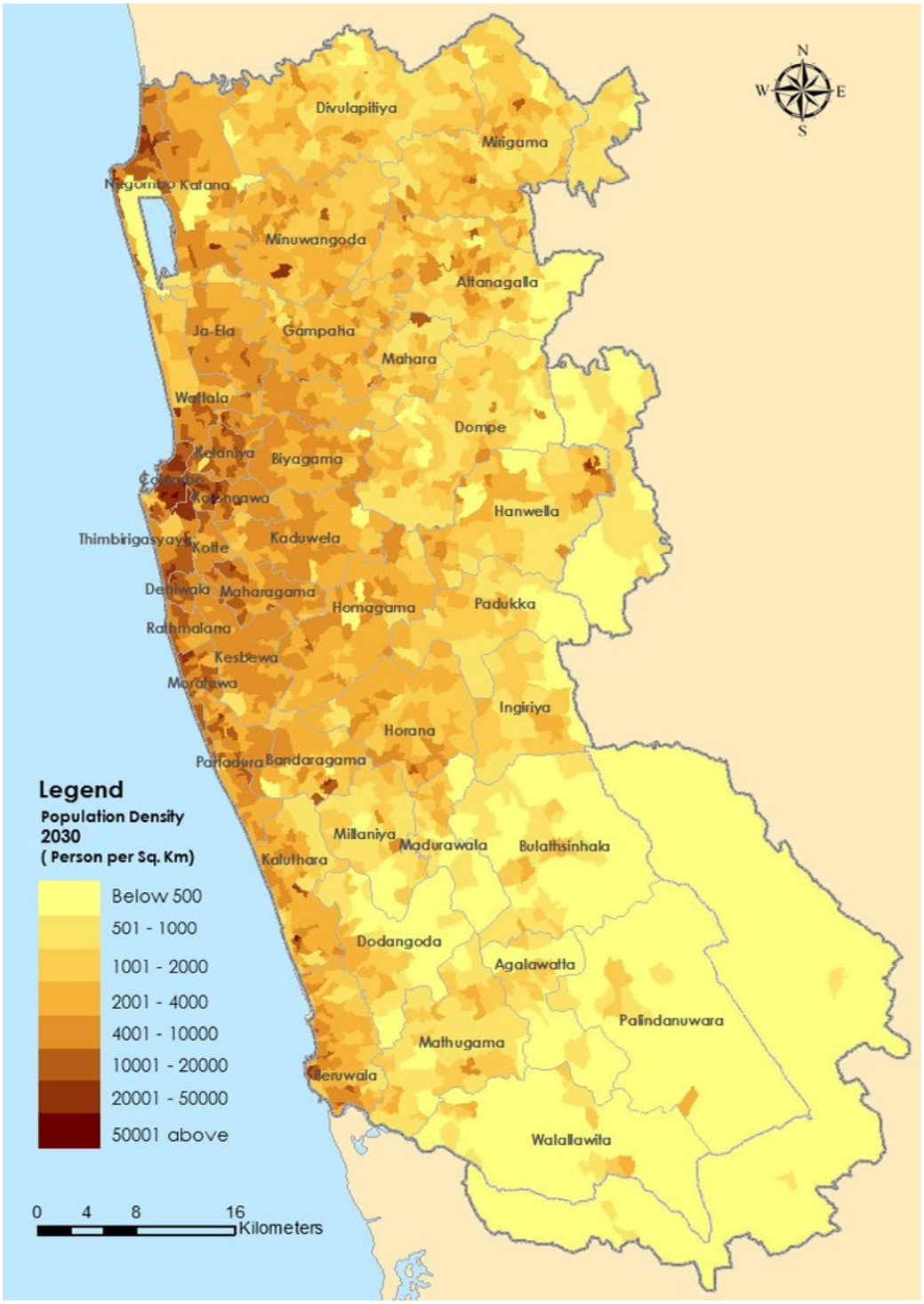


Fig.3.6 Projected Population Density of Western Region 2030

3.4 Employment and Population Distribution

In the past 10 years, the population growth in Western Region was marginal but the level of urbanization was considerably high, especially in Gampaha District. This is probably due to land availability and its proximity to employment centres, such as the one in Colombo city, the airport, the industries and the port. To date the population in Gampaha District is almost as high as the Colombo District and in case the trend continues, Gampaha District's population may surpass Colombo District in terms of future population.

In the future, however, as Sri Lanka is transforming from skill-based economy into knowledge-based economy, more jobs will be created in the services and financial sectors as well as in the technological sectors. These types of employment will likely be created in Colombo City and its fringe areas and this will tilt the balance again in favour of Colombo District to have the highest population in Western Region.

On the other hand The population in Gampaha District will also grow due to new employments created in the airport, port, logistics and manufacturing sectors.

The projected employment and population distribution in Western Region is as shown in the following table:

Planning Area	Population 2030	Employment 2030
CBD	1,442,657	581,818
Colombo Fringe	1,383,346	529,911
Katunayake Aero City	892,959	374,087
Mirigama Industrial City	264,277	110,539
Horana Industrial City	381,137	156,470
Baduraliya Forest City	458,885	180,053
Gampaha Residential Zone	1,185,259	461,156
Malabe Knowledge City	508,185	195,622
Logistics Corridor	617,249	244,806
Muthurajawela Tourism Zone	508,271	213,865
Avissawella Plantation City	407,137	167,168
Southern Tourism Corridor	736,608	284,610
Western Region	**8,785,970**	**3,500,105**

Hamilton Cannal

Chapter 04
Vision

4.1 Vision Framework

The overall development philosophy guiding conceptualization, planning, and implementation of all specific objectives, strategies, projects and programmes in pursuance of the above is based on the Four Fundamental Pillars,

- Economic Growth and Prosperity
- Social Equity and Harmony
- Environmental Sustainability and
- Individual Happiness

Sri Lanka, being an island nation has been strategically positioned from the past. Western region is centered in driving country's development which instated the theme;

"FROM ISLAND TO CONTINENT"

Vision for Western Region Megapolis was proposed considering the economic, socio-cultural and environmental characters of the region as well as its aspiration to progress in an inclusive and sustainable way.

"GREEN AND INCLUSIVE GROWTH WITH INTEGRATED DIVERSITY".

This vision reflects the desire of the people in Western Region to harmonize the "diverse" character of Sri-Lanka in terms of race and culture which is the strength and the identity of the Sri Lankan people, if cultivated positively. It also reflects the desire to grow economically, grow inclusively and grow green & sustainably.

To ensure that the vision could be translated into the Master Plan, a **VISION** framework is

proposed, defining the **GOALS** as the sub-set of the Vision, setting measurable **OBJECTIVES** for the goals, proposing **STRATEGIES** to achieve the objectives and **PROJECTS** as a result of the recommended strategies.

Based on the above; goals, objectives, strategies and projects are proposed.

4.2 Regional Positioning

Colombo with its strategic location alongside one of the busiest sea-routes of the world connecting South-East and East Asia and Oceania to Middle East and Europe, has the potential of building upon its already prominent standing as an important sea-port in the region to a Strategic Maritime Hub serving the Southern part of Indian sub-continent as well as all neighbouring countries bordering the Indian Ocean and beyond.

Sri Lanka has been a prominent maritime and trading hub in the Indian Ocean for over two millennia of record history, primarily due to its strategic location in the Indian Ocean. Its potential to re-emerge as a Strategic Maritime and Trading Hub is further enhanced by re-emergence of the Indian Ocean as the economically most vital Ocean in the 21st century, having lost its standing to Atlantic Ocean in the 19th century and to the Pacific Ocean in the 20th century.

The potential for enhanced maritime, trade and logistics activities will be largely complemented and synergized by parallel development of an Aviation Hub. The potential as a Maritime, Aviation and Trading Hub would be further strengthened by the 'time-zone' benefit.

Sri Lanka's investment friendly policies, its cosmopolitan society, high education level, good living quality as well as environment quality have also position the country as a favorable investment destination in South Asia.

Considering the above and looking at the steady economic growth in South Asia, it is rightful for Colombo and Western Region to position itself as one of main Regional Hubs in South Asia, serving the southern parts of India and the smaller states in Indian Ocean.

On the other hand, the unique landscape of Western Region with water bodies, wetlands, and lakes also position Western Region as the greenest Metropolis in the region.

Fig 4.1 Maritime Routes of the Indian Ocean

Fig 4.2 Aviation Route Map of the region

Western Region Megapolis




- GREEN AND
- INCLUSIVE GROWTH WITH
- INTEGRATED DIVERSITY

VISION 2030

PLANNING FRAMEWORK

Economic Growth and Prosperity

Efficient Infrastructure

Social Equity & Harmony

Environmental Sustainability

Individual Happiness

TARGETS

1. Total population projection is 8,785,970
2. Per capita income is projected as US$ 25,000.00 per annum
3. GDP Growth Rate 16.8% (current price)
4. Total employment projected as 3.5 million (about 4.0 million total jobs)
5. Total New Housing Units requirement is 1,442,267
6. Port is expected to be a competitive regional port. (Currently positioned as 34th, expected to be within top 10 international ports)
7. To become 02nd level ranked logistics hub as per the Logistics performance Index (LPI). (Sri Lanka positioned as 89th – 2014 ranking)
8. Proposed to become Financial Hub in South Asia.
9. To increase the existing forest tree cover and protection of all the wetlands
10. 100% reliable electricity supply and 100% portable water supply
11. Solid waste free environment
12. Increase the contribution of SME Sector to the economy up to 80% within the region

KEY STRATEGIES

1. Grow port/logistics, aviation, tourism, high-tech industries, finance and services sector as the key economic drivers.
2. Strengthen SME and other supporting industries to serve the key economic drivers.
3. Attract FDI by creating sizable projects and improving the rank in Ease of Doing Business.
4. Develop new generation of model cities on green fields to set benchmark on the liveability.
5. Promote and develop public transport and green transport infrastructure.
6. Reorganize/relocate scattered polluting industries to ensure proper waste and water management.
7. Improve education and skill development of workforce in line with economic transformation.
8. Promote affordable housing as integral part of the new model cities and build relocation housing for slum areas in Colombo.
9. Promote the use of renewable and alternative energy by incentive schemes.
10. Protect environmentally sensitive areas by law and assign compatible uses as buffer.

STRATEGIC INTERVENTIONS/PROJECTS

1. Transport, Energy and Water
2. Housing, and Relocation of Administration
3. Environment and Waste Management
4. The Aero Maritime Trade Hub
5. Central Business District
6. Industrial and Tourism Cities
7. Science and Technology City
8. Eco Habitat and Plantation City
9. The Smart City Development
10. Project for Spiritual Development Facilitation

4.3 Goals & Objectives

Goal 01 Creating jobs and investment :

Create a dynamic regional spatial structure that promotes economic productivity, attracts investments, enhances business opportunities and creates jobs.

Objectives:

- To restructure the regional economy to achieve 10 % of economic growth in line with its natural resources and natural assets in 2030
- To promote high economic growth based on port, airport, logistics and tourism HUBs
- To increase the GDP contribution of SME from 50% to 60% within the WR
- To promote value added export oriented agriculture in sustainable manner in order to encourage SME entrepreneurs in the eastern segment of WR.
- To improve the socio-economic conditions in the region while protecting the natural environment, including the ecological sensitive areas and marine & coastal ecosystems;
- To create an attractive and conducive economic environment for direct foreign and private sector investment
- To increase service sector and industrial sector contributions to GDP by 60% and 42% maintain by 2035 respectively.
- To maintain the agriculture sector contributions of 8% to GDP by 2030 respectively.
- To reduce the unemployment rate from 4% to 2% by 2020, and maintain the same up to 2035 by creating approximately 2.1million new employment opportunities.
- To reduce the percentage of households below the poverty line from 2.2% to 1%by the end of the plan period.
- To promote WR as high-end tourist destination and increase tourist arrivals to 4,500,000 by 2035.

Goal 02: A resilient region:

A sustainable and resilient region that protects the natural environment and creates a balanced approach to the use of land and its natural resources

Objectives:

- To encourage sustainable use of natural resources especially forestry and coastal resources
- To safeguard the fragile ecosystems such as lagoon, wetlands, remain segment of tropical rain forests of the region
- To assure minimal environmental impacts during the implementation of the development projects
- To promote sustainable urban environmental management in the proposes development areas
- To develop eco-tourism and agro tourism opportunities in forestry reserves and other green areas.

Goal 03: Efficiently Connected

Efficient and integrated connectivity and mobility systems that facilitates the connectivity and movement of people and goods

Objectives:

- To develop an integrated multi-modal transport system to enhance the functional efficiency and the productivity of the WR.
- To develop integrated connectivity system to strength the intra and inter regional connectivity within the WR and with the rest of the country.
- To optimize the functional efficiency in the proposed urban structure with integration of traffic & land use.

Goal 04:Smart Livable Places

Accommodating growth in modern smart compact polycentric urban villages

Objectives:

- To Create healthy and active livable neighborhoods and maintain identities of settlements
- To provide a diversity of housing in defined locations that cater for different households and are close to jobs and services
- To fulfill the present demand for housing in the designated areas for human settlements in the proposed megapolis plan
- To develop housing development in harmony with the Environment
- To provide adequate affordable and quality housing for all communities
- To develop Safe, Healthy and livable Neighborhoods in designated compact cities
- To promote sustainable neighborhoods that have mixed-income housing, jobs, amenities, services and transit.
- To ensure that housing opportunities are accessible to all residents without discrimination.

Goal 05: Value added Sea Resources

Protect and sustain the marine waters and its resources in ecosystem-based manner

Directions:

- To develop marine waters and sea front to attract tourist for water based recreation activities
- To explore shipwrecks in the western coast and facilitate interested persons, such as divers, treasure hunters, historians and tourists to visit such places.
- To strengthen the fisheries infrastructure to increase the contribution to the GDP through a sustainable and responsible fisheries industry
- To explore mineral resources for commercial purposes.

Goal 06: Reliable and Efficient Services delivery

An integrated reliable and efficient regional social and physical infrastructure system

Objectives:

- To upgrade and improve the health infrastructure to promote high quality health care at all levels with easy access to people.
- To make people more health conscious and enable them to adopt healthier life styles.
- To develop the WR as internationally reputed education and knowledge hub in Asia.
- To provide required educational infrastructure to the people of WR in order to increase the level and quality of education.
- To develop human resources to meet the future skilled labor requirements for the development of the province and the social development of the younger generation to facilitate the formation of a secure civil society.
- To revitalize all tertiary and technical/ vocational education system, both formal and non-formal, in the WR to suit the future labor needs arising from the envisage mega development.
- To provide sufficient and safe drinking water to 85% of the households of WR by 2020 and to 100% by 2035
- To provide potable water supply to 100% of the urban population
- To provide water for industries and other non-residential activities
- To provide adequate sanitation facilities to 75% of the households in the WR by 2020 and to 100% by 2035.
- To provide efficient and reliable power and energy supply in order to support the proposed socio economic development programs in the WR.
- To encourage the use of the solar power for home lighting.
- To provide of an efficient and reliable information and communication system in order to support the envisaged socio economic development in the WR.

Goal 07: Better Governance & Regulated Development

Achieve outcome-based delivery system through better governance, planning, regulation and funding mechanisms

Objectives:

- To provide of rational planning and building regulations in order to support the envisaged socio economic development in the WR.
- To setup a transparent and public access mechanism for implementation of regulations
- TO create the new Authority powers to implement the plan & its projects and monitoring of the plan's delivery

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Chapter 05
Regional Structure Plan

5.1 Introduction

Regional Structure Plan forms the basis and framework for further detailed planning of the entire Western Region that will guide the physical development of Western Region over the next 15 years.

Regional Structure Plan is prepared based on the strengths, weaknesses and a specific role of the area in the context of the region. Based on the contextual analysis, there were four (04) options developed. Regional Structure Plan is the outcome of evaluation of planning scenarios by using rationale criterion. Structure Plan is detailed into Planning Area Division Plan to complete the planning zones for the whole region. Planning area division plan thus prepares the different parts of the region to be planned according to its role and characteristics.

The Regional Structure Plan will step further, to assign broad land uses and density based on the existing land use, the role of different planning areas and the employment and population distribution.

Fig.5.1 Inter and Intra Regional Linkages has socio economic, cultural and religious relationships

5.2 Evaluation of Planning Scenarios

Based on the outcomes of four (04) working groups, suggestions and recommendations were provided for the future development of Western Region. Since SWOT analysis identified the current potentials and strengths of the region, 04 planning options were developed as possible solutions for 2030.

5.2.1 Planning Option 01

Option one targets the compact poly-centric urban settlements with maintaining unique sense of place and identity.

Core area is concentrated within Colombo city including compact city development around Kiribathgoda, Kaduwela, Maharagama and Kesbewa. Moderate density areas and low density residential development is proposed in the peripheral townships. Southern part of the region consist of sensitive rain forests with predominant agricultural activities are proposed to preserve. Coastal belt from Kocchikade down to Bentota is dedicated for tourism development.

Airport and Harbor is used as the key economic drivers of the region with extended development as port city and airport city which are connected through city corridors. Colombo core area is proposed to develop as business and entertainment center with high density settlements for work and live with concentrated infrastructure.

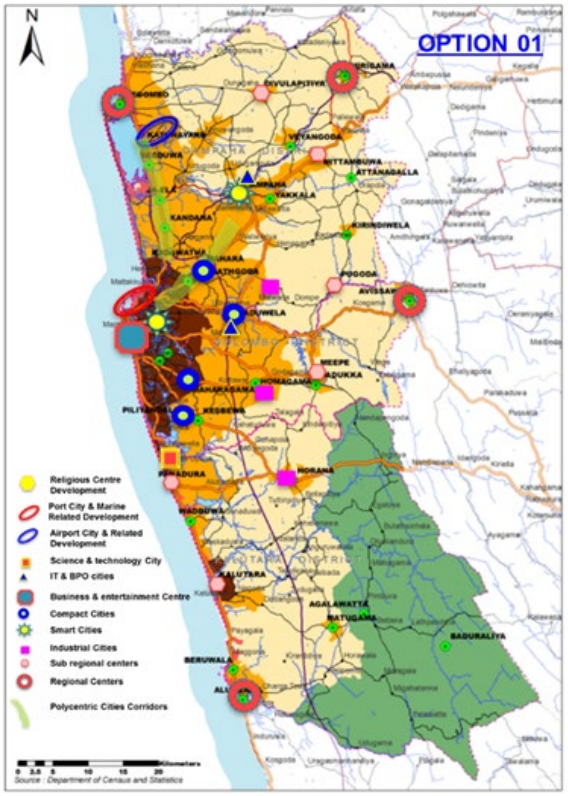


Fig.5.2 Planning Option 01 - Polycentric Urban Development

5.2.2 Planning Option 02

Proposed to divert the mono-centric model adopted for Colombo city development in past development plans. High-density & Predominantly Finance & Commerce related development in the core. Promote coastal belt for tourism, fishing and other marine related development.

Regional centres in District Level and TOD Centres in the periphery of the core area. Selected specialised cities based on current development pattern & existing infrastructure availability. Proposed high mobility road corridors in east- west direction linking peripheral road with existing main roads. Future development is expected to orient into peripheral towns as such Mirigama, Nittambuwa, Kirindiwela, Hanwella, Padukka, Horana and Matugama.

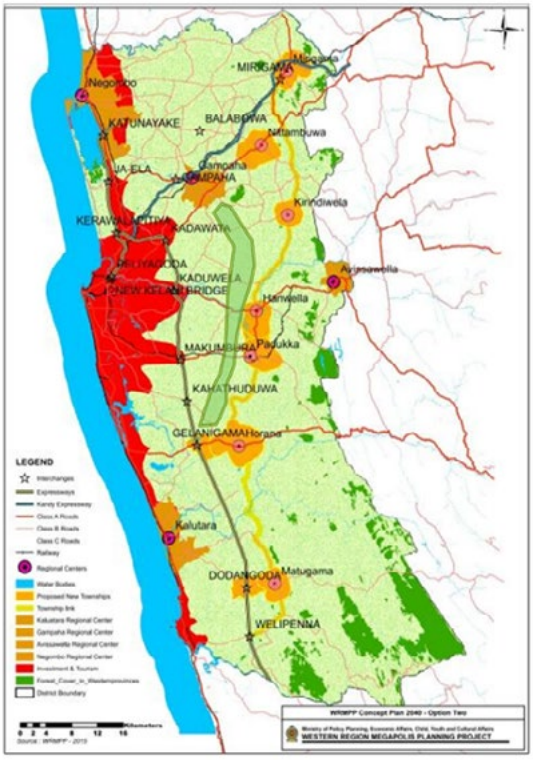


Fig.5.3 Planning Option 02 - Peripheral Townships Development

5.2.3 Planning Option 03

Structure Plan was introduced as a necklace concept following its geometrical form. Two ring roads are identified as the inner necklace and outer necklace respective.
peripheral region which will incorporate the Outer Necklace Townships which are self-contained low density residential townships along the outer ring road, on the undulating areas further away from the Colombo Core.
Suburban region which will incorporate the Inner Necklace Townships which are medium density residential townships along the inner ring road and immediately adjacent to Colombo Core as self- contained townships where most of the population will be accommodated.
Colombo Core at the heart of the Western Region as the center of the Megapolis, where major facilities and amenities will be located.
Regional centers are linked with technology and industrial corridors while sub centers are linked through business corridors.

Fig.5.4 Planning Option 03 - CESMA Plan prepared in 2003

5.2.4 Planning Option 04

Cluster based approach for the development of region with special attention on environmental protection while economic growth. Major development zones include Aero City zone, Logistics and Freight zone, Core area, Industrial zone and Tourism zone.

Environmentally sensitive areas are conserved with Muturajawela marsh and Bolgoda lake surrounding, plantation based city in Avissawella, Forest city in Baduraliya. Science and technology based development is proposed along Kaduwela, Malabe and Kaduwela towns based corridors.

Overall development objective is to protect environmentally sensitive areas as the base and dispersed development in the outer regions of Colombo. Marine development zone is identified with the purpose of managing marine assets and wise use of off shore mineral and biological resources.

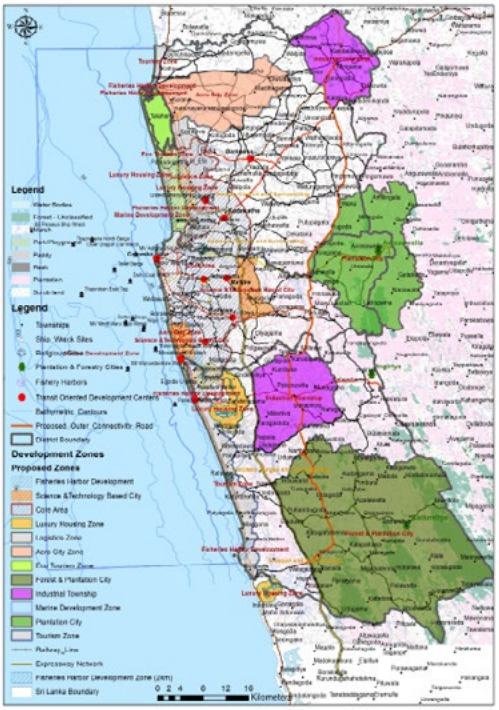


Fig.5.5 Planning Option 04 - Functional Zoning of the Region with specialized activities

5.3 Evaluation of Planning Options

The different options are considered objectively for selecting the best suited option for the Western Region. By considering the anticipated development objectives of Western Region and identified proposals by 04 working groups

Criteria for selecting the best possible option for future development of the region is classified as follows.

- Development of Polycentric Settlements
- Efficient Connectivity & Mobility Systems
- Economic Growth and Prosperity
- Protection of Natural Environment both Land and Marine based
- Creation of Socially Inclusive Society with Cultural Equity

Above themes are reclassified under different sub criterion and each planning option was objectively evaluated by the expert groups. The evaluation results are depicted below.

5.4 Evaluation of Planning Options - Results

No	Theme	Criterion (Description)	Option 01	Option 02	Option 03	Option 04
1	Development of Polycentric Settlements	Poly Centric Settlement Development within region	✓	✓		✓
2		Upgrading of Underserved settlements	✓		✓	✓
3		Middle class Housing Development		✓		✓
4		Densification of Higher Order Urban Centers	✓		✓	✓
5		Viable Size of the Mega Towns	✓			✓
6		Reduce Urban Sprawl	✓		✓	✓
7		Comply with National Physical Plan	✓		✓	✓
8	Efficient Connectivity & Mobility Systems	Improved Connectivity of Town Centers	✓	✓		✓
9		Ease Traffic Congestion in Core Area				✓
10		Promotion of Public Mass Transport	✓	✓		✓
11		Inter-Regional & Intra Regional Network of Roads & Rail		✓	✓	✓
12		Regulation of Private Vehicle Use within the Core Area			✓	✓
13		Introduce Modernized High Speed Railway Network System	✓		✓	✓
14		Create Efficient Mobility System for Goods Transportation	✓		✓	✓
15	Economic Growth and Prosperity	Facilitate the Development of SME Sector	✓			✓
16		Infrastructure availability for Investment Promotion	✓	✓	✓	✓
17		Promotion of Less Polluting Industries	✓			✓
18		Encourage Local Business Development	✓		✓	✓
19		Support Live, Work & Play Environment	✓	✓		✓
20		Develop Competitive Logistics Hub in South Asia	✓			✓
21		Develop Competitive Naval Hub in Asia	✓			✓
22		Develop Global Airport	✓		✓	✓
23	Protection of Natural Environment both Land and Marine based	Improvement of Natural Assets and Low Carbon Footprint from the Development	✓	✓		✓
24		Air, Water, Noise Quality Improvement		✓	✓	✓
25		Conservation of Natural Assets (land and marine based)	✓	✓		✓
26		Climate Change Mitigation and Adaptation				✓
27		Landscaping and Beautification	✓	✓	✓	✓
28		Waste Management and Reduction of Waste Generation	✓		✓	✓
29		Discourage Over-Exploitation of Natural Resources	✓		✓	✓
30		Management of Coastal Resources and Wise Use of Ocean	✓			✓
31		Discourage of Polluting Industries within the Region		✓		✓
32		Sustainable use of resources for the benefit of people in the region	✓		✓	✓
33		Management of Watersheds, Water bodies	✓	✓		✓
34		Conservation of Wetland Network	✓		✓	✓
35	Creation of Socially Inclusive Society with Cultural Equity	Conservation of Archaeologically valuable Buildings/Sites	✓			✓
36		Improvement of Health Condition of the People	✓	✓		✓
37		Develop Spiritual Quality of People	✓			✓
38		Improve the Education System and School Network		✓		✓
39		Improve the Social Security Nets and Low Crime Rates	✓	✓	✓	✓
40		Facilitate needs of Every Social Class including Foreigners	✓	✓		✓
41		Development of Livable Residential Neighborhood	✓	✓	✓	✓
42		Maintain Unique Sense of Place and Identity	✓		✓	✓
43		Maintain a disciplined Society	✓		✓	✓
44		Creating spaces for Youth Entertainment	✓	✓		✓

Table 5.1 Evaluation Results of Different Planning Options

5.5 Selected Option

Results of the evaluation suggests that option 04 has the most of the required information as it has selected as the preferred option for future development of Western Region. Option 04 has been improved with the inputs given by experts and key development zones are listed as follows.

- Aero City Zone - Katunayake
- Logistics Corridor - linking Airport and Harbor
- Eco Zone - Muthurajawela
- Industrial Townships - Mirigama
- Core Area Zone - centered in Colombo Port and surrounding suburbs
- Science & Technology City - Malabe
- Industrial Townships - Horana
- Coastal Tourism Belt
- Plantation City - Avissawella
- Forest & Plantation City - Baduraliya
- Tourism & Luxury Housing Zone - Dedduwa Lake & surrounding, Bolgoda Lake & Surrounding
- Marine Development Zone - Exclusive Economic Zone bounded from Kochchikade to Aluthgama

The existing natural assets, physical and economic situation and future development potential are the key components for selecting broad zones. Each and every zone has its own character and it is planned to keep the remaining patch of Western Region as the intermediate zone. Intermediate zone has low density character by containing the development pressure within proposed zones. But for the planning purposes, whole region is classified under different zones and presented as Planning Area Division Plan. Also the planning boundary of individual zones are expanded to outer regions without containing into Western Provincial boundary. Planning boundary is determined based on the functional linkages and potential roles that can be adopted for the benefit of whole region as well as the country's development.

Fig.5.6 Conceptual Animation of Colombo City Expansion in 2030

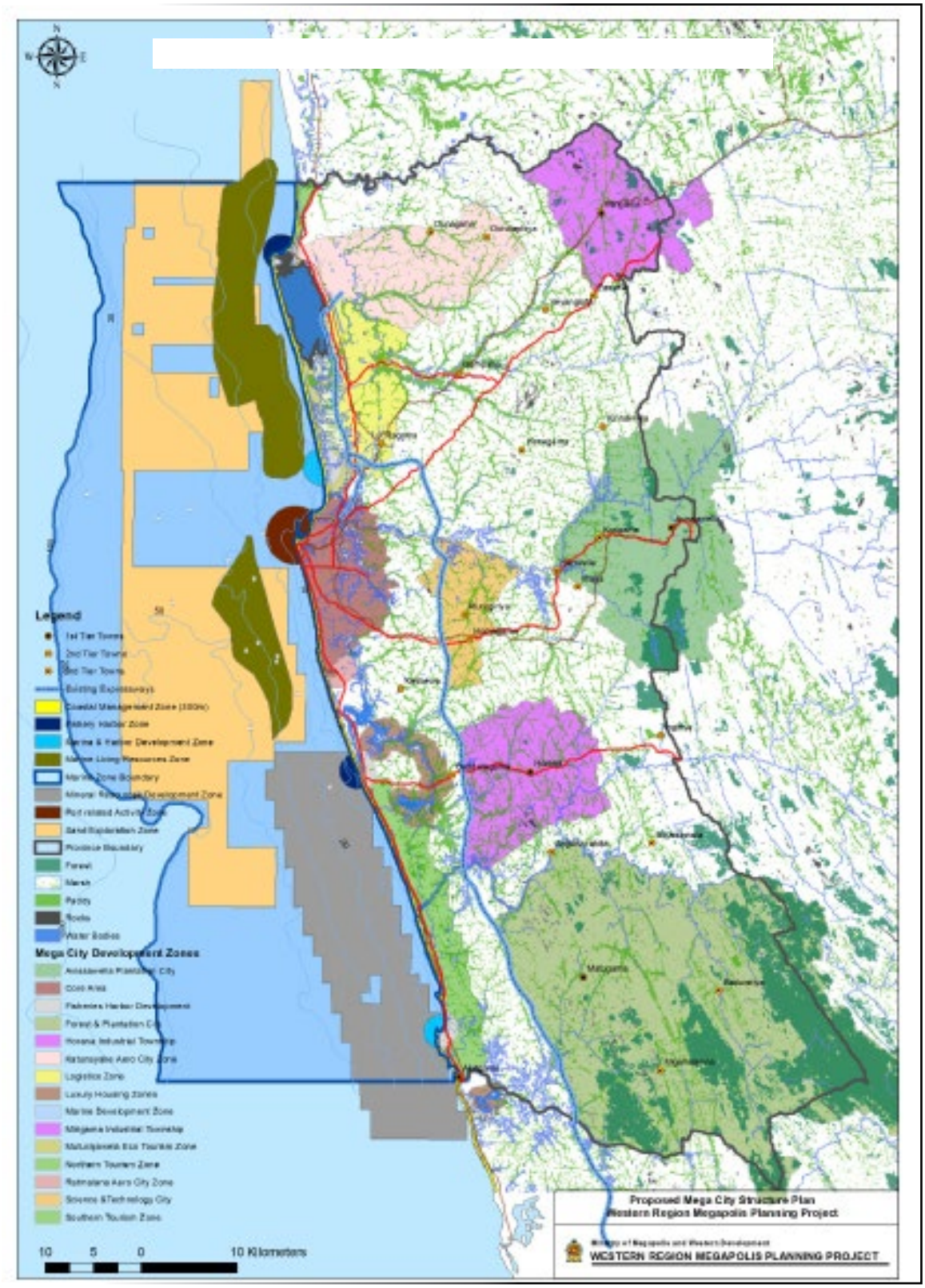


Fig.5.7 Selected Option for Western Region Development - 2030

5.1 Planning Area Division

1. **Northern Coastal belt:** It consists with the Muthurajawela conservation area and the tourism zone along the Northern coastal belt.

2. **Aero City:** It consists with the airport zone which includes aviation related business clusters and complement the residential development with supporting facilities.

3. **Logistics Corridor:** It consists with the logistics corridor for warehousing and transshipment facilities with the support of residential areas in the surrounding.

4. **Mirigama Industrial City:** It consists with a new industrial estate for electronic and related clusters, SME clusters and the surrounding new residential development.

5. **Plantation City:** It consists with plantation areas around Avissawella with pockets of residential development. Plantation related businesses shall be the economic driver of this area.

6. **Central Business Distric (CBD):** CBD is the business centre, international gateway and the heart of the region with a very high density development and good quality environment and infrastructure.

7. **Inner Core Area:** Inner core is expected to be the high density commercial and mixed residential development area.

8. **Outer Core Area:** Outer core is expected to be the medium density residential and mixed commercial development area receiving spillover demand from the Colombo core.

9. **Science and Technology City:** It consists with IT Parks, Science Parks and Medical Technology Parks, Nano parks with the support of residential areas and related facilities. It needs to be planned to attract skills to work and live in these areas.

10. **Horana Industrial City:** It consists with 3 new industrial parks and new residential areas with its supporting facilities.

11. **Forest City:** Forest city aimed to create certain types of residential and tourism enclaves among the well protected agriculture and forested area.

12. **Southern Coastal Belt:** The Southern coastal belt will became a tourism area, and will also function as good residential areas, well connected by rail and highway to Colombo.

13. **Marine Zone:** The Marine zone is the sea area along the Western Region where sands, minerals and corals are located. This area needs a special plan to protect the environment while strategically utilizing the resources.

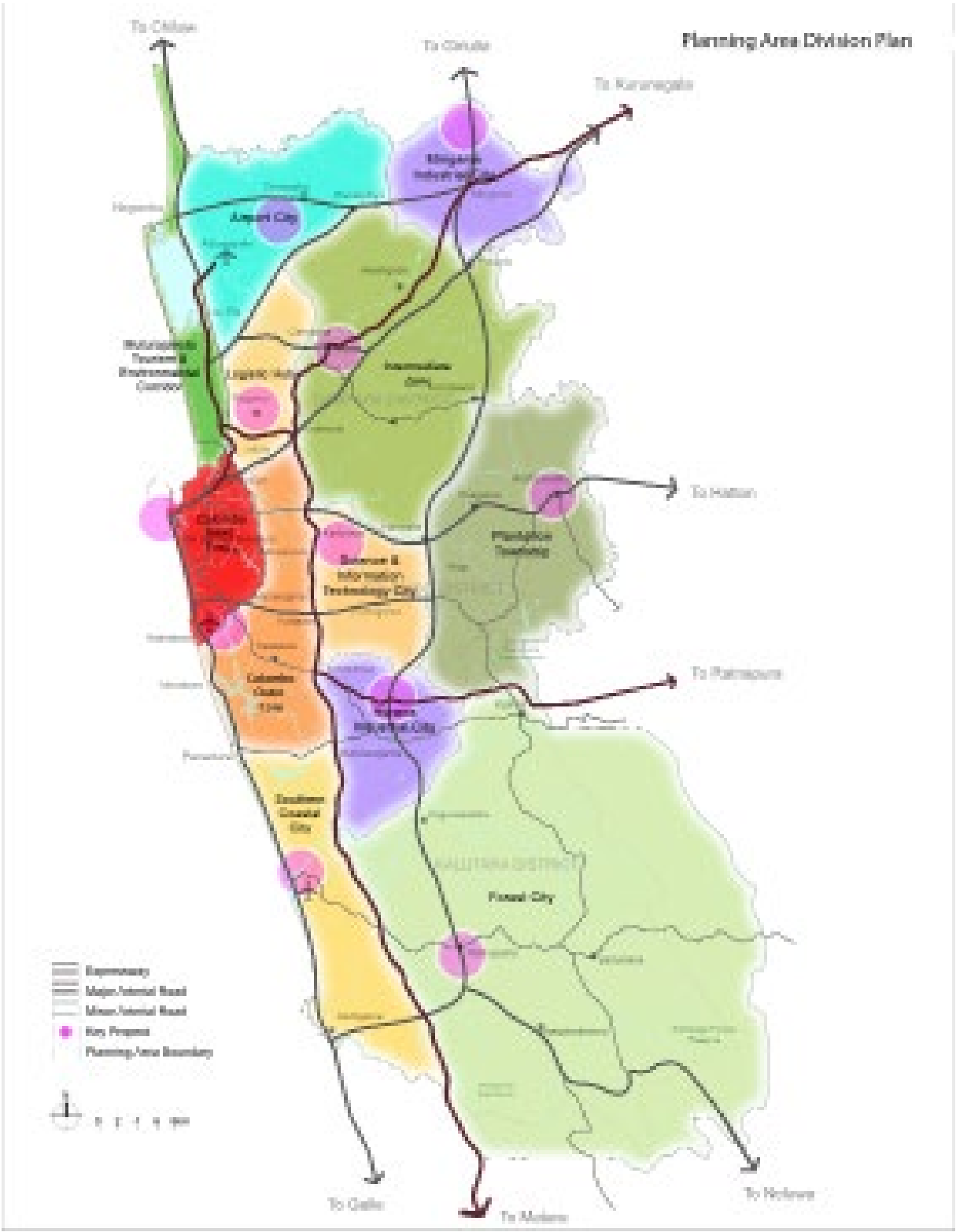


Fig.5.8 Proposed Planning Area Division Plan

Based on the planning area division, existing land use information, site constraints, and future employment and population distribution, the Regional Structure Plan for Western Region is proposed with the following key components:

- Commercial Centres and Hierarchy
- Residential Areas
- Industrial Areas
- Green & Environmental sensitive Areas
- Transportation & Traffic management

Commercial Centres and Hierarchy

Commercial centres distributed across Western Region to ensure the easy access to commercial services who are living in the urban areas. The commercial centres are structured in the following hierarchy:

Colombo CBD (National/Regional Level Commercial Centre)

This centre is planned for the international business and financial institutions as well as a centre for regional commercial and trading services.

Outer Core

Outer core are located in the periphery of the city. They serve the Colombo suburb, to have higher population and purchasing power in the long term. The Outer core centres include Homagama, Panadura, Kaduwela, Aturugiria, and Ragama.

Regional Centres

Regional centres are the largest commercial and service centres which serving a population of more than 200,000 within its service radius. Although it varies in size, the centre is expected to have banking and comprehensive commercial services. These include Negombo, Mirigama, Gampaha, Avissawella, Horana, Kalutara and Mathugama.

Town Centres

These are commercial centres serving for different towns across the Western Region.

Apart from the above, smaller scale commercial developments can be permitted within the residential areas to ensure easy access to commercial services. Special low density commercial corridor for tourism development is also proposed along the coastal area. This will encourage and shape the development of tourism belt along the Southern and Northern coastal areas.

These include Divulapitiya, Pasyala, Bulathsighala, Ingiriya, kirindiwela, kosgama etc.

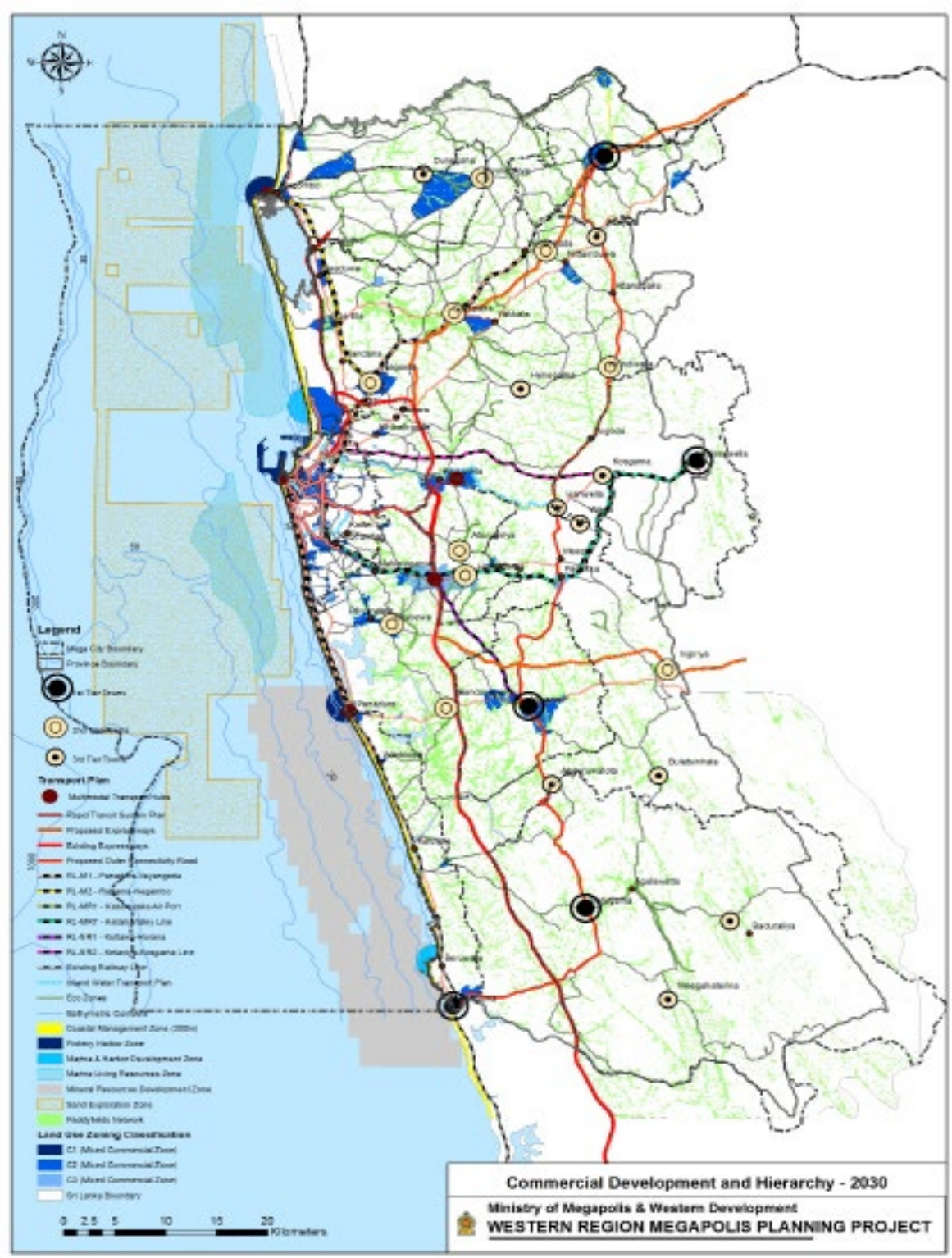


Fig.5.9 Proposed Commercial Plan

Residential Development

Residential areas are broadly classified into 3 categories:

Medium Density Housing Area

This area is within Colombo and its immediate surrounding areas declared for multi-storey housing. The demand of such apartments are expected to increase with the highest land cost in Colombo, its immediate surrounding areas and around some of the Regional Centres and employment centres.

Low Density Housing Area

This is a Mixed Low Density housing area, mostly located away from Colombo and its immediate surroundings . It allows for both landed housing development as well as low rise apartments, which will give flexibility for land owner to develop their property.

Good Class Low Density Housing Area

This is the housing area with minimum plot size of 500 m^2 and higher green coverage, mostly located at prime areas in Colombo or scenic areas outside Colombo with good access to highway and employment centres.

Apart from the 3 housing categories, high density housing developments are expected and encouraged to take place within the commercial mix use areas in the city. These are mainly good class condominiums and apartments to serve the young professionals and experts working in the central city area.

Meanwhile a very low density residential development is also expected to take place in the rural and agricultural areas, where small quantum of development is allowed.

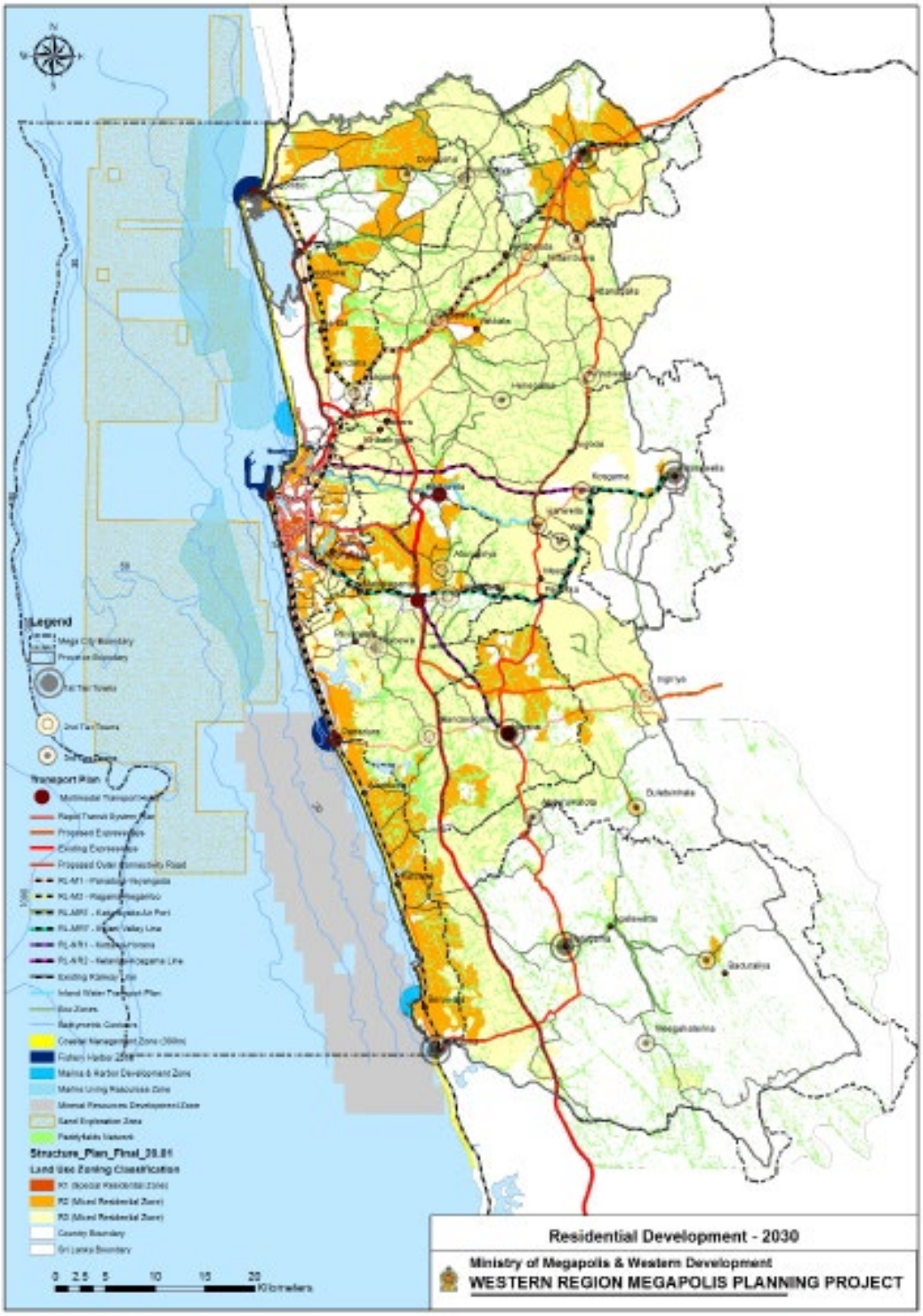


Fig.5.10 Proposed Residential Plan

Industrial Development

The rapid Industrial development in Western Region have not been adequately planned and regulated in the past. As a result, there are many small industrial clusters were setup across the region without any proper infrastructure support and they lead to environmental pollution and create negetive impacts ofnsurrounding residential areas.

Larger industrial clusters are proposed in 4 areas:

- Around the Katunayake Airport (Airport City Industrial Cluster)
- Near the Colombo Port (Logistic Corridor)
- Around Mirigama (Mirigama Industrial Cluster)
- Around Horana (Horana Industrial Cluster)

These larger industrial clusters expected to consolidate and upgrade industrial development in Western Region and ensure proper infrastructure that will minimize pollution to the surrounding areas.

Apart from these 4 larger industrial clusters, Science and Technology cluster is proposed at the outer core. These are prepared for higher technology industries, research and development activities as well as education and medical centres. In contrast to the larger industrial clusters, these clusters will developed in a park and is expected to attract the top international investors in technology.

Meanwhile, the existing industrial clusters will be consolidated. Some of the existing industries will be relocated and some will be converted over time into clean and service based industries to ensure its compatibility with the surrounding developments.

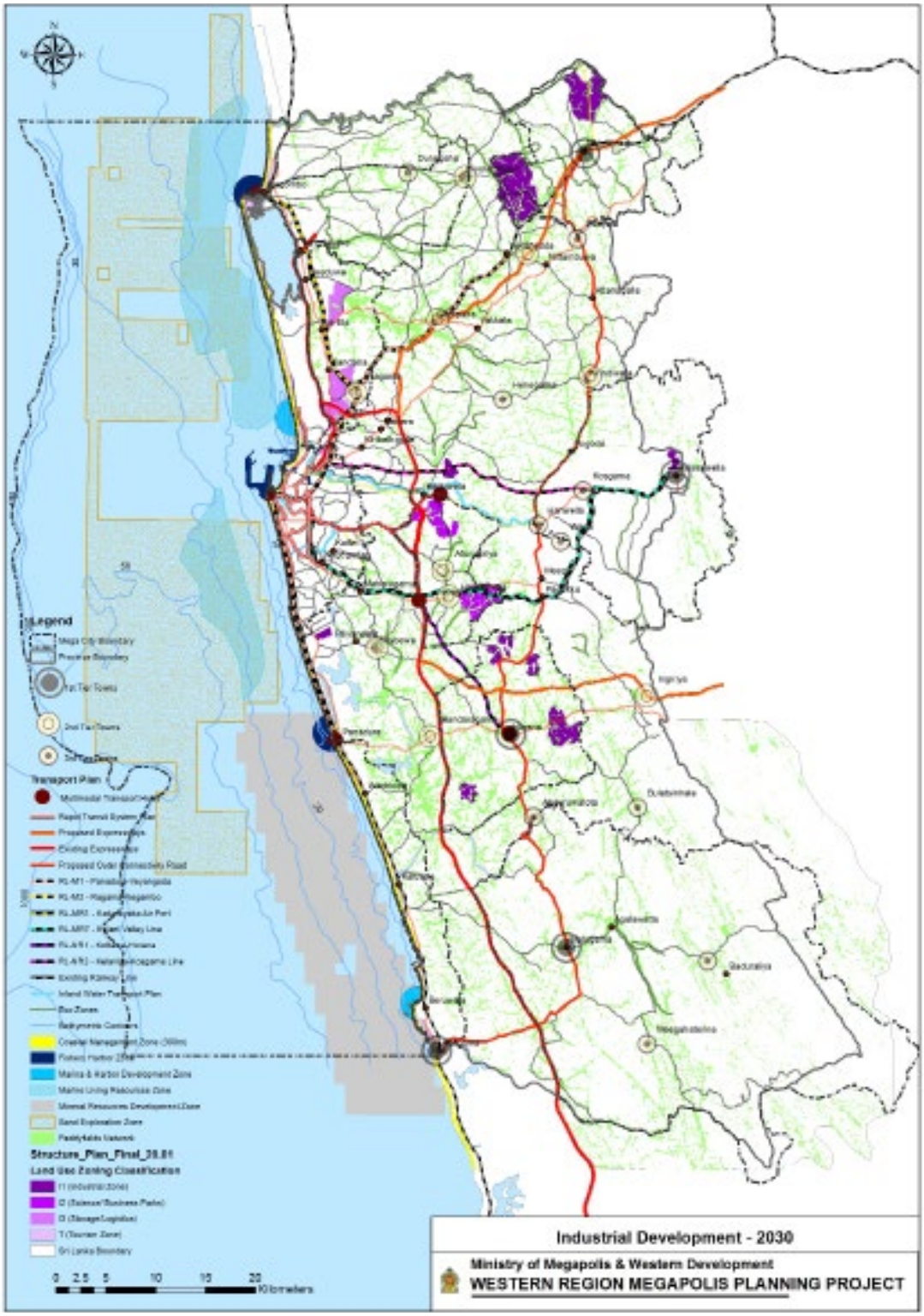


Fig.5.11 Proposed Industrial Plan

Green and Environmental Sensitive Areas

Wetlands, forests and environmental zones are the key components and natural assets of Western Region to be protected in the overall structure plan. To ensure their protection, buffer zones with minimum amount of development are assigned between the environmental sensitive areas and urban areas.

To enhance the natural assets, park connectors are proposed to link the wetlands, the riverside areas and the coastal belt. These park connectors will allow the wetlands ecosystem to thrive providing green links for the pedestrians and non motorized transport.

In order to conserve the natural capital of the Western Region by demarcation and protection of the environmental sensitive and ecologically important hotspots, it is proposed to declare three types of Eco Zones as follows;

Eco Zone 1: Sensitive areas where the highest priority should be given to conservation of the ecosystems and its functional services such as hydrological and ecological character. These areas such as sensitive forest patches such as Reserved Forests, Conservation Forests, Proposed Forest Reserves, National Parks, Sanctuaries, Major Wetlands, Water bodies such as rivers, streams, Lagoons, Irrigation Tanks, Lakes (both natural and manmade) and their feed areas will be declared under Eco Zone 1.

Eco Zones 2: The green belts, urban parks, small wetlands, reservations and buffer zones of Eco Zone 1 areas will be included in Type 2 Eco Zones.

Eco Zones 3: This area will consists with the coastal zone and set back areas, and low lying areas including paddy fields.

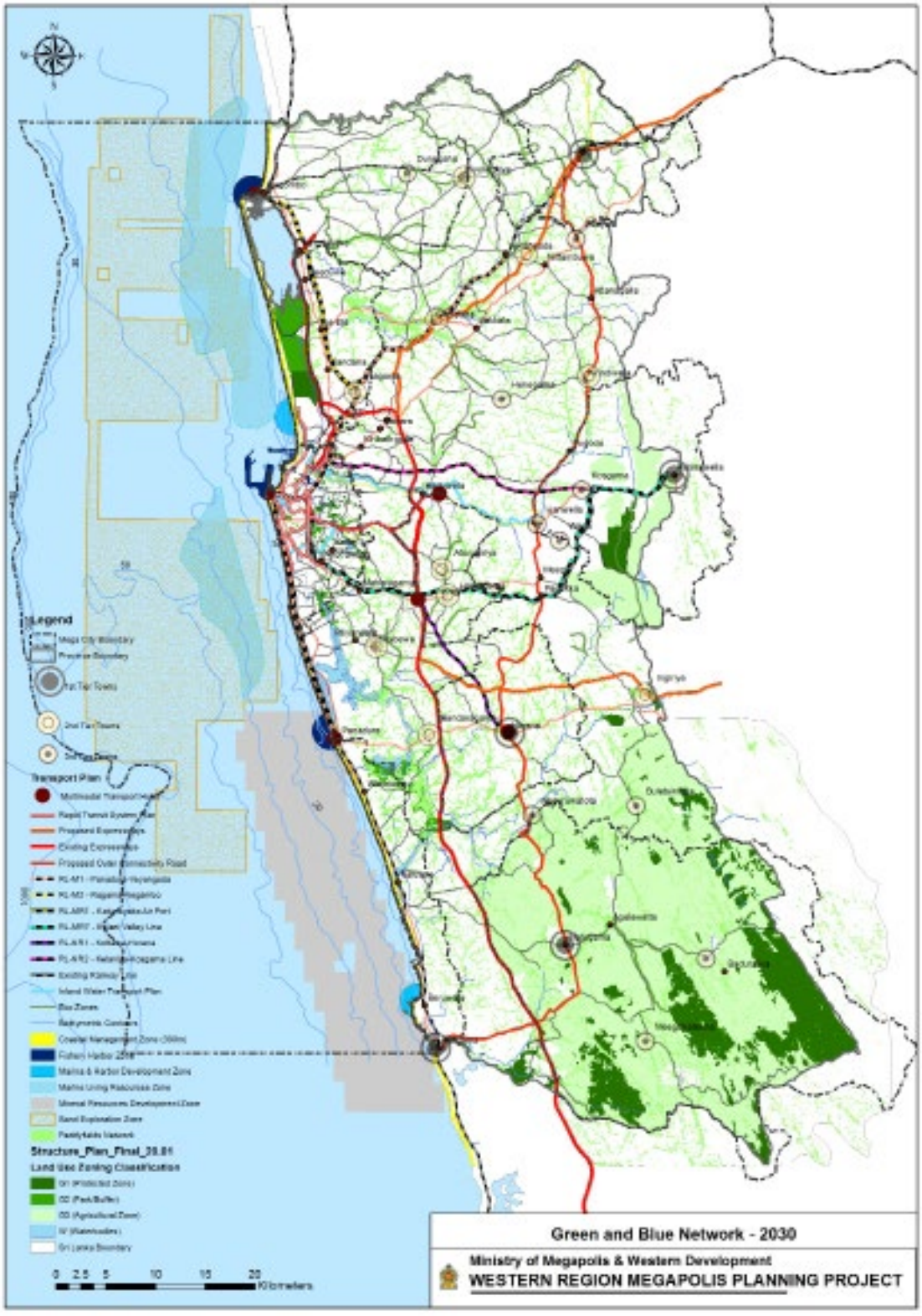


Fig.5.12 Proposed Green & Blue Plan

Transport and Traffic Management

Western Region Megapolis Plan proposed to guide the urban transport development in Western Region up to 2035. The development plan priorities have been prepared based on the urgency of the developments to resolve the critical urban transport problems based on a logical sequence of implementation, in order to maximize the outcomes to achieve the urban mobility objectives.

It is planned to intervene in the following subsector level to address the transport issues that are identified under previous studies & Megapolis Development.

- Transport Demand Management (TDM)
- Public Transport Improvement
- Road Infrastructure Development
- Environmental Sustainability

The above interventions are planned in a way to address the future development requirements specified by the Western Region Megapolis Planning Project (WRMPP). The key transport projects identified to be implemented in the transport proposal are;

- Railway Electrification and Modernization (Panadura to Polgahawela, Ragama to Negombo, Kelani Vally line)
- New Railway Line - Kottawa to Horana & Kelaniya to Kosgama)
- Rapid Transit System (Either LRT, Monorail or BRT)
- Multi Model Transport Hub (Fort)

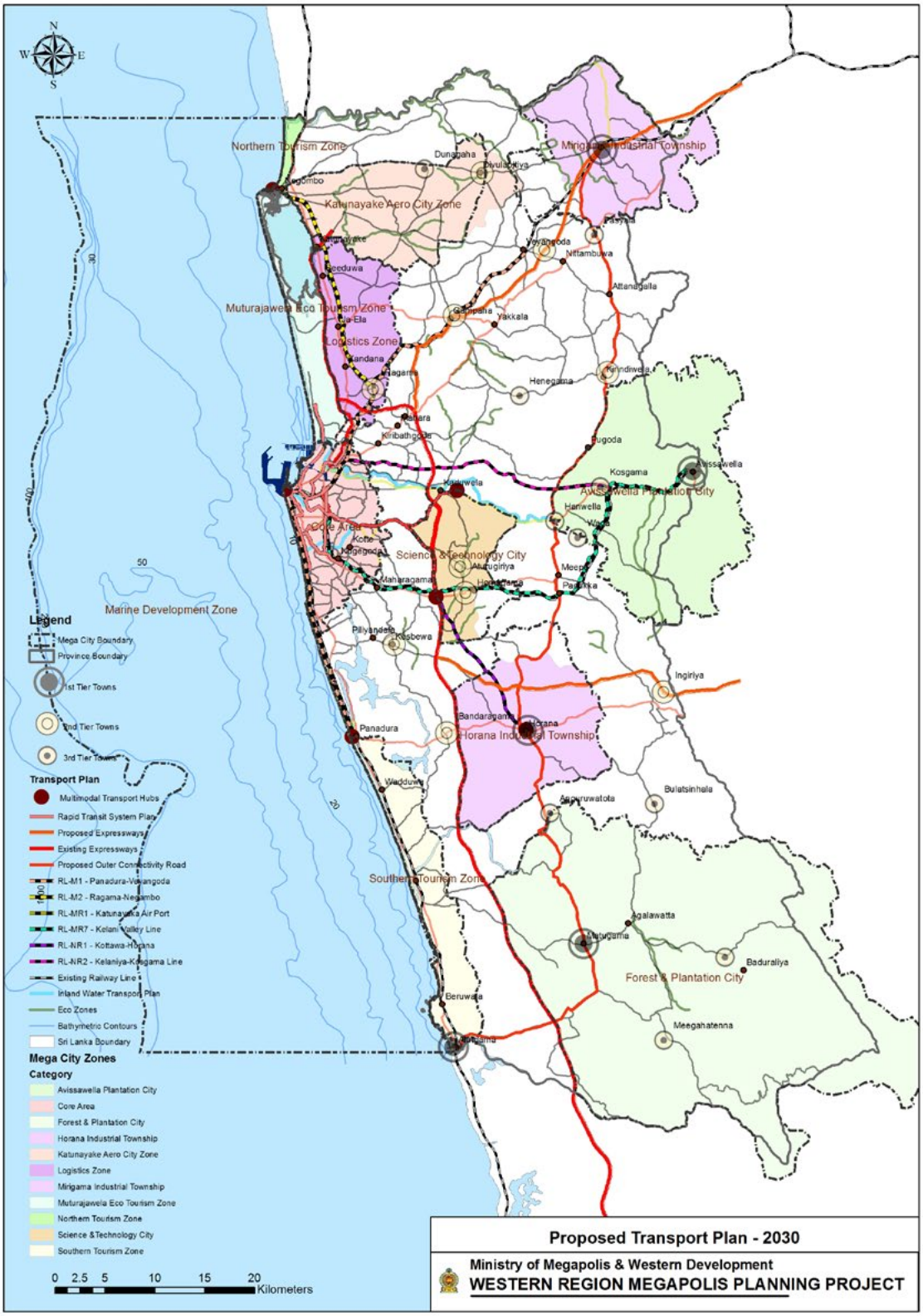


Fig.5.13 Proposed Regional Transport Plan

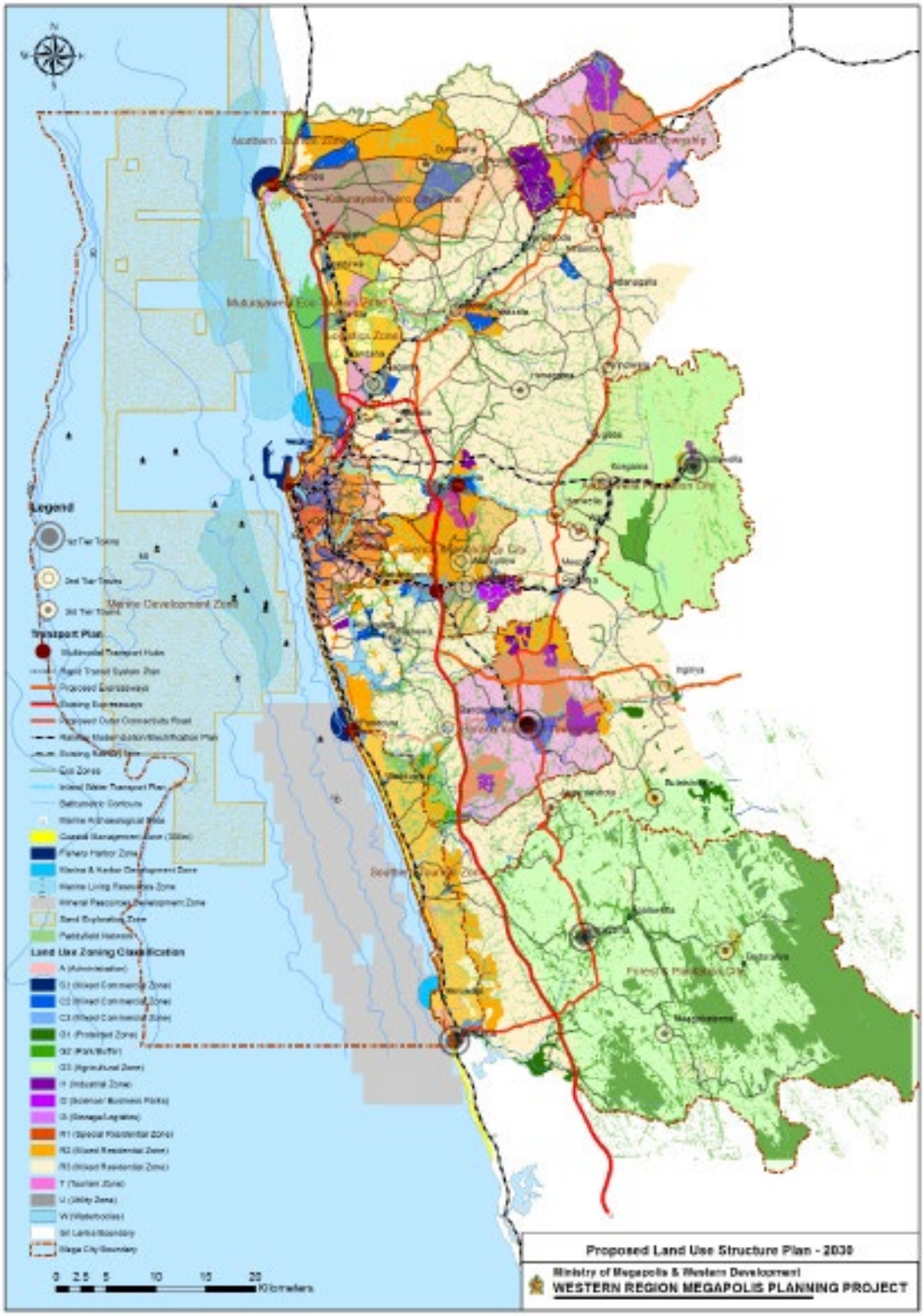


Fig.5.14 Proposed Regional Structure Plan

Key Components of Structure Plan

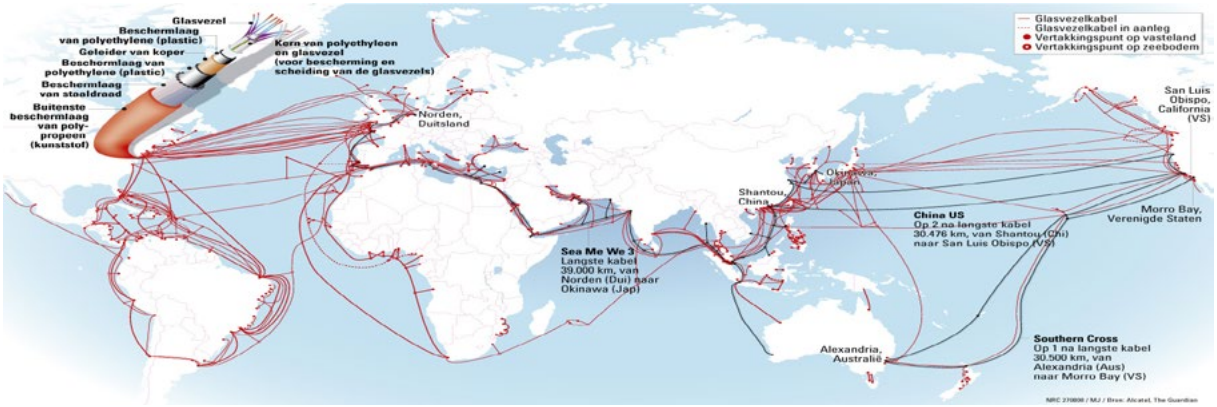
Structure Plan is derived from the selected concept plan and detailed by considering the following aspects.

- Harnessing the existing development potential.
- Conserving the environmentally sensitive areas of the region.
- Existing physical and natural resources of the region.
- Available infrastructure and future development projects for the individual zones.
- Existing urban form and land use activities.
- Required zoning and building regulations.

Micro level zoning has been undertaken to formulate the Regional Structure Plan. Key classification zones used in the Structure Plan preparation is as follows.

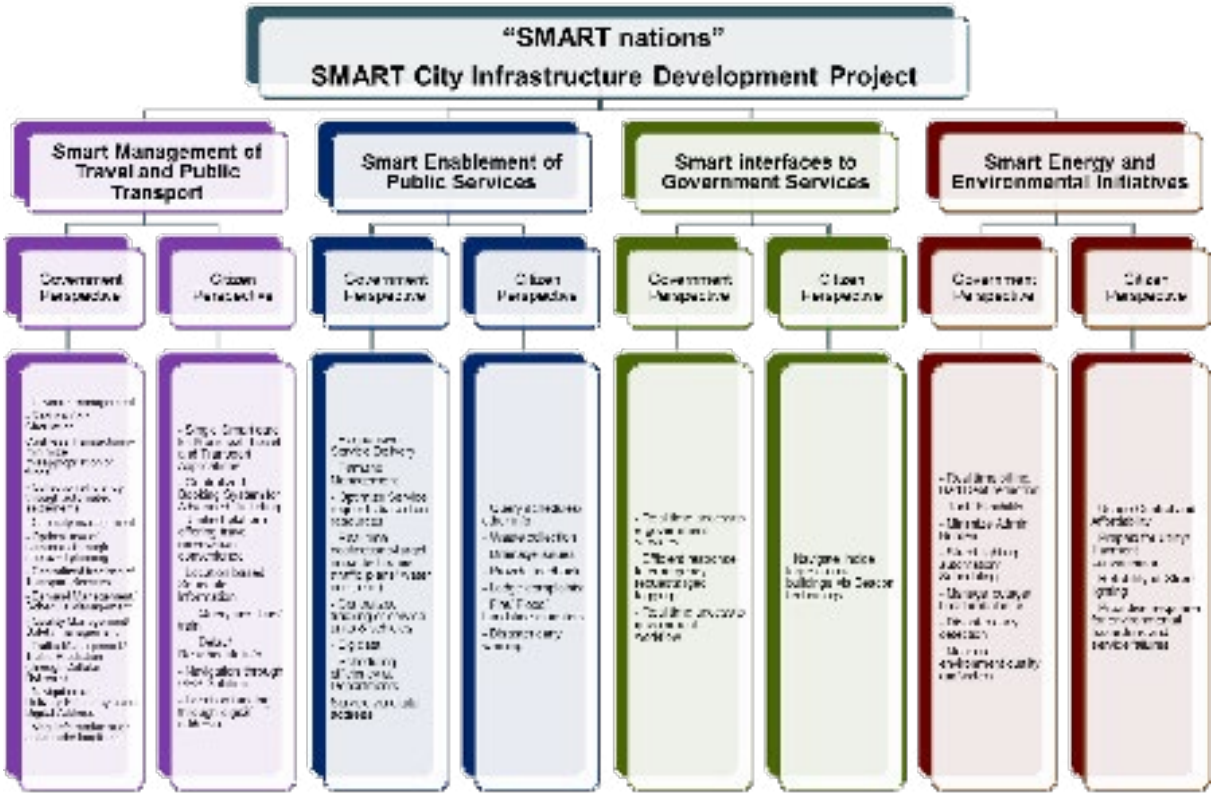
- Administration Zones (A)
- Mixed Commercial Development Zones (C1 - C2 - C3)
- Mixed Residential Zones (R1 - R2 - R3)
- Environmentally Protected Areas (G1)
- Parks and Buffer Zones (G2)
- Agricultural Zones (G3)
- Industrial Zones (I1)
- Science Parks & Business Parks Zones (I2)
- Storage and Logistics Zones (I3)
- Tourism Zones (T)
- Utility Zones (U)
- Waterbodies (W)
- Coastal Management Zone
- Fishery Harbor Zones
- Marina & Harbor Development Zone
- Marine Living Resources Zone
- Mineral Resources Development Zone
- Sand Exploration Zone

Regional Structure Plan depicts the sub zones that are proposed to develop with uniques use types. Newly concepts as such Smart Cities are adopted in detailing the Regional Structure Plan.



"SMART CITY" - "SMART NATION"

The extensive range of physical, social, institutional and economic infrastructure, and the enormous amount information that it necessitates to process and analyze round the clock in planning, implementing and operationalizing its numerous services and facilities does call for effective harnessing of digital infrastructure for optimal performance of the City. It is inevitable that the City should effectively engage intelligent, well interconnected, well instrumented systems to optimally manage the City. No modern city that pays due attention to its efficiency and sustainability in the long run could afford not to establish appropriate Smart City infrastructure. For the same reason development of Smart City Infrastructure has been identified as a separate functional area and hence a separate programme.



Chapter 06
Environmental Management

6.1 Critical Environmental Elements of Western Region

6.1.1 Natural Assets

The natural assets and environmentally sensitive areas in the Western Region including rivers, streams, tributaries, lakes, lagoons, reservoirs, manmade tanks, freshwater swamps, freshwater marshes, paddy fields, mangroves, sandstone reefs, National parks, sanctuaries, conservation and reserved forests, and proposed forest reserves and Environmental Protection Areas (EPA's).

Even though the natural habitat coverage of the Western Region is extremely low compared to the other eight Regions, it is one of the richest Regions in terms of species diversity, especially threatened, endemic and restricted range species. Nearly 50% or more of the total number of species of many taxonomic groups (especially butterflies, dragonflies, freshwater fish and birds) is recorded from the Western Region. However, it should be noted that more than 75% of the natural forest patches in the Western Region have not been inventorized properly and therefore the representation of species in the region is likely to be much higher than what is reported presently.

Environmental Sensitive Areas already under legal protection. Some of the areas in the Western Region are legally protected under the Forest Ordinance, Fauna and Flora Protection Ordinance and the National Environmental Act.

There are 21 already declared Forest Reserves and 41 proposed Forest Reserves within the Western Region. In addition, there are 4 Sanctuaries and one National Park, namely Bellanvila Attidiya,

Muthurajawela, Maimbulkanda- Nittambuwa, Sri Jayewardanepura Kotte Sanctuary and Horagolla National Park declared under the Fauna and Flora Protection Ordinance. In addition to the above, several environmentally sensitive areas have been declared as Environment Protection Areas under the National Environmental Act. These include Muthurajawela Buffer Zone, Thalangama Tank, Walauwatta Wathurana, Bolgoda North and South, Dedigama Kanda. It is imperative that these protected areas continue to be protect

Fig.6.1 Freshwater Marshes – Muthurajawela

Fig.6.2 Lagoons – Lunawa Lagoon

in the future with strict implementation of the respective laws in order to ensure that proposed development in the region, does not lead to incursions into these protected areas or impact adversely on them in any way.

6.1.2 Natural Capital of the Region

Natural capital refers to the elements of nature that produce value to people, such as the stock of forests, water, land, minerals and oceans. These benefit us in many ways, by providing us with food, clean air, wildlife, energy, wood, recreation and protection from hazards.

Despite its importance, the value of natural capital is routinely taken for granted. In the Western Province in particular, pressures on natural capital, such as from population growth and the consequent increasing demand for food, housing and transport are set to persist and intensify. Although the measures set out in the Government's National Infrastructure Policies and Plans will accommodate this expansion through the construction of new transport links and housing, it is critical that we act now to manage our natural capital better, compensating for losses where appropriate, to ensure that future pressures do not adversely impact on it.

If our natural capital is to continue to support development now and in the future, it is essential that it is properly taken into account in all decision-making and is invested in appropriately, such as through the Government's national infrastructure plans. During the planning of the Western Region Megapolis Plan it is imperative that the plan takes into account the remaining environmentally sensitive areas in the Western Region and that the planned infrastructure and other developments do not affect these sensitive environmental locations adversely. In conceptualizing the envisaged development of the Western Megapolis, the plan is expected to recognize the importance of achieving a number of objectives, a major objective being environmentally sustainable development, in harmony with nature.

Fig. 6.3 Freshwater Tanks – Talangama

Fig.6.4 Rivers- Kelani River

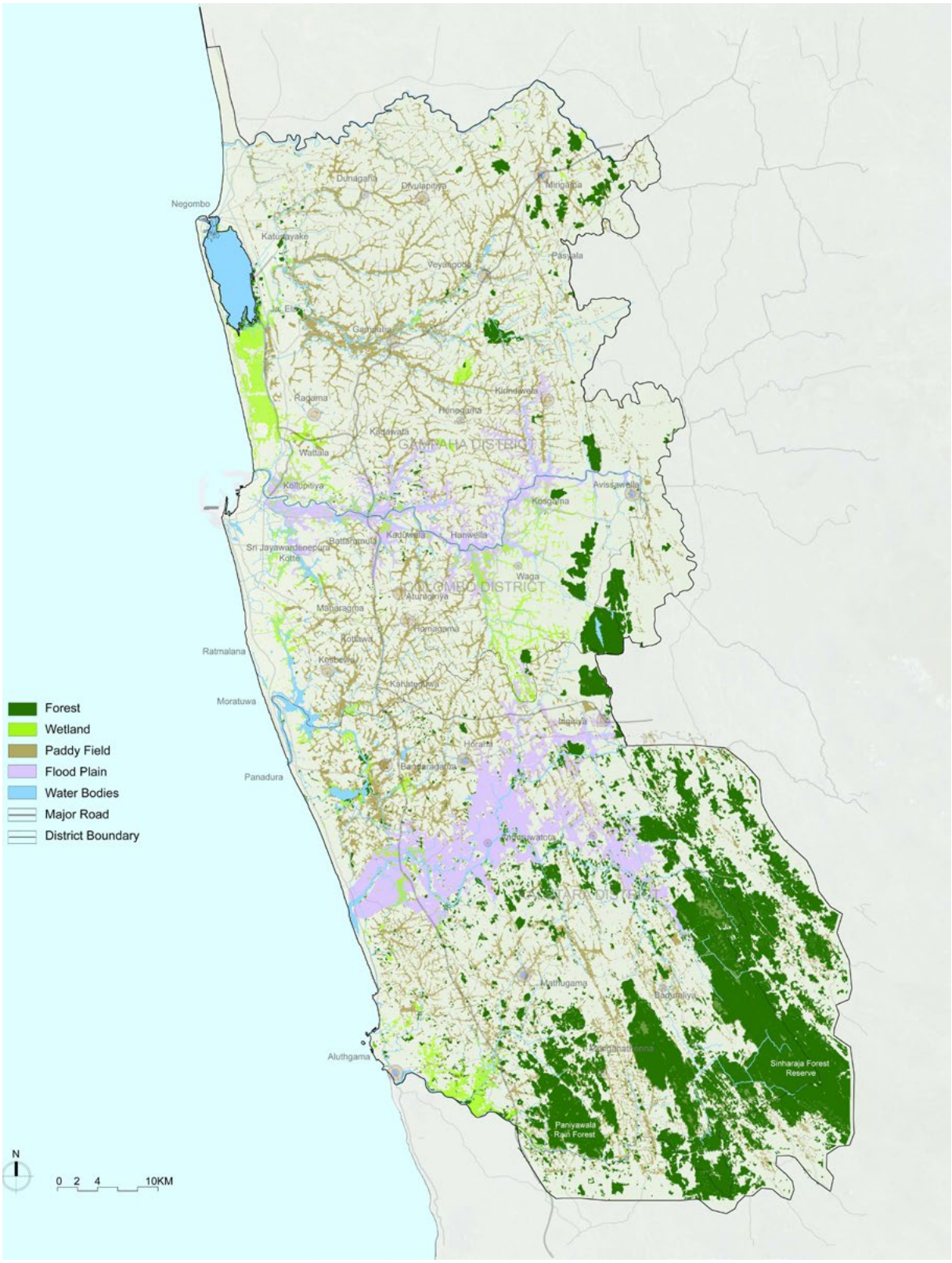


Fig 6.5: Existing Natural Assets of Western Region

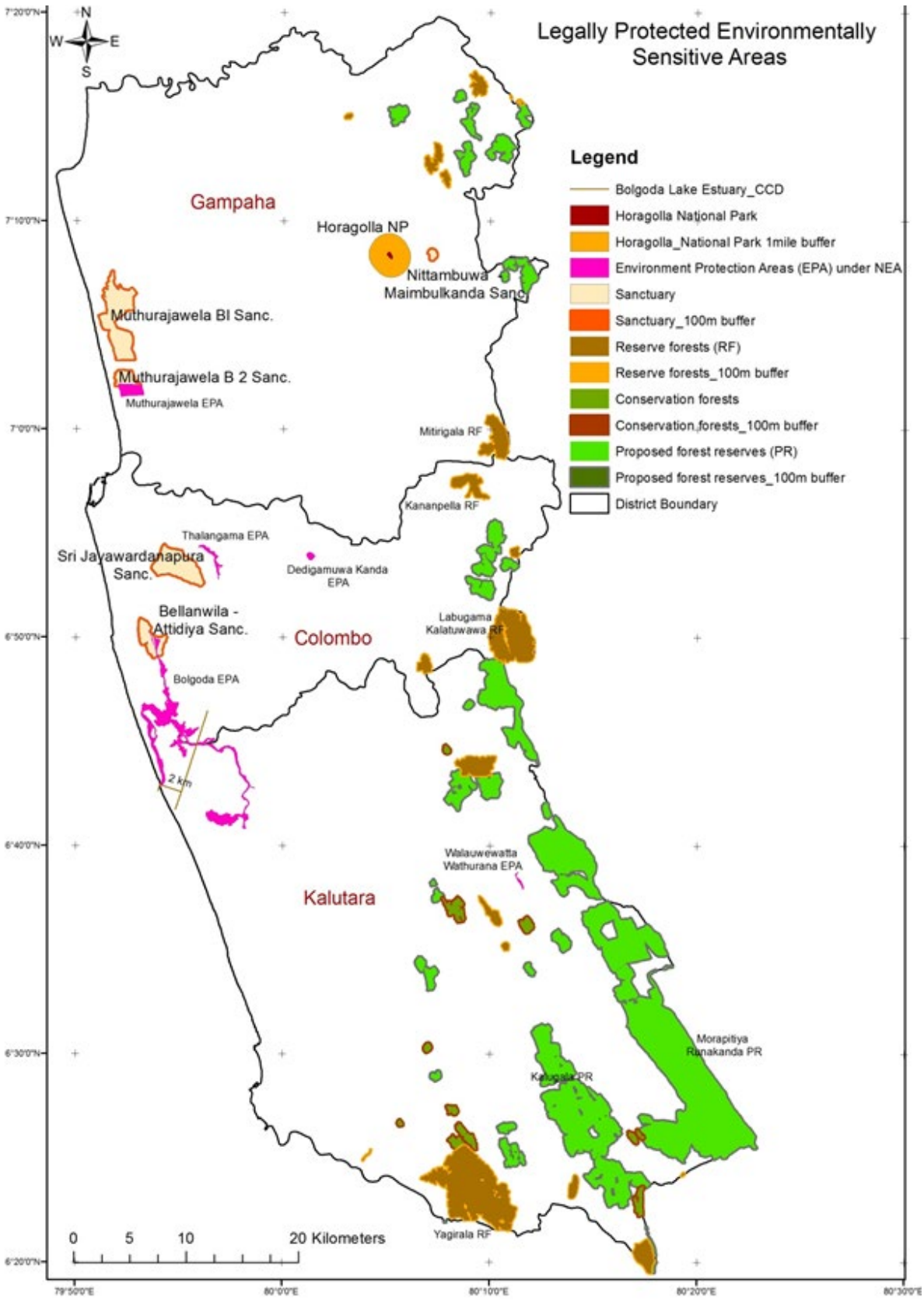


Fig 6.6 Legally Protected Environmental Sensitive Areas

6.2 Key Environmental Issues

There are several existing and potential environmental issues within the province which have been addressed in the Western Region Megapolis Plan. It is imperative that the proposed solutions to these issues are implemented on a priority basis as they are bound to be aggravated in the long term.

Some of these issues are as follows;

- Destruction of environmentally sensitive areas including wetlands
- Municipal solid Waste Management
- Hydrology and drainage issues
- Pollution of inland water bodies and coastal waters
- Wastewater management issues including sewage

Fig.6.7 Garbage dumping Site at Meethotamulla (Source: geosrilanka.wordpress.com)

Fig.6.8 Garbage on the streets of Colombo (Source: defence.lk)

- Haphazard siting of industries
- Air pollution arising mainly from vehicular emissions and industries and thermal power generation plants
- Hazardous Waste Management including industrial and hospital waste
- Issues relating to uncontrolled extraction of groundwater
- Impacts of Climate Change including sea level rise

Apart from waste, uncontrolled industrial development in the Western Region has added pollution to waterbodies and the surrounding residential areas. In addition, environmental issues pertaining to environmentally sensitive areas are also of great concern due to rapid urbanization in the Western Region and encroachments to these environmentally sensitive areas.

6.2.1 Destruction of Environmentally sensitive areas

Even though the natural habitat coverage of the Western Province is extremely low compared to the other eight provinces, it is one of the richest regions in terms of species diversity, especially threatened, endemic and restricted range species. Nearly 50% or more of the total number of species of many taxonomic groups especially butterflies, dragonflies, freshwater fish and birds) is recorded from the Western Region. However, the representation of species in the region is likely to be much higher than what is reported presently, as more than 75%of the natural forest patches in the Western Region have not been inventorized properly.

The presence of a high number of species, endemic species and threatened species in the Western Province despite the forest cover of the province being less than 10% of the total extent indicates the value of the remaining natural habitats albeit highly fragmented and converted at a rapid rate for human use. Therefore, there

is an urgent need for protecting the remaining natural habitats of the province.

6.2.2 Inland water bodies and Marine Waters

The inland water bodies whether natural or manmade as well as the coastal region of the Western Region add an important dimension to the natural environment and are important both aesthetically as well as for practical purposes such as for irrigation purposes, drinking water sources, recreation, bathing, fishing, tourism and for industrial use. These water bodies are also under immense threat due to illegal encroachments and pollution from multiple sources. It is imperative that these water bodies as depicted in figure 6.9 are designated as environmentally sensitive areas, and all efforts made to protect these waterbodies and the coastal zone from the multiple threats faced by them.

All these inland water bodies and coastal waters should be classified according to their use category such as drinking water sources, irrigation, recreation, fishing, bathing, industrial use etc. along with the gazetting of ambient water quality standards for each use category.

Furthermore, in order to minimize pollution of these inland water bodies in the long term, wastewater discharges such as industrial effluents and domestic wastewater including sewage should be prevented from entering these water bodies. In order to achieve this, all urban centers of the Megapolis will require to be served by sewerage collection and treatment schemes. Until such time this is realized, all discharges into inland water bodies and the coastal zone should be in strict compliance with the standards prescribed by the Central Environmental Authority and the Marine Environmental Protection Agency.

6.2.3 Municipal Solid Waste Management

The management of Municipal solid waste poses a major issue within the province. Even though there is a fairly regular and efficient waste collection system within the Colombo Municipal Council area and a few other Municipal Council and Urban Council areas, there is a major issue with respect to the final disposal of municipal waste. At present there is not even a single sanitary landfill site for the disposal of waste in the Western Province except for a relatively small scale sanitary landfill site in Dompe which caters strictly to the waste from the Dompe area only. Taking into consideration the quantity of waste collected on a daily basis within the province and especially within the CMC area, a speedy solution to this issue is required on an urgent basis.

Several solutions have been proposed under the WRMP including the implementation of two waste to energy projects in Karadiyana and Muthurajawela respectively. These projects should be implemented on an urgent basis in order to deal with this pressing environmental issue. In addition the identification of suitable sanitary landfill site/s for the final disposal of any residual waste from the waste to energy projects using municipal waste from the CMC and other Municipal and Urban Council areas is an urgent priority for the Western Province.

There is an ongoing project to locate such a site in Aruwakkalu in the Puttalam district, where the waste from Colombo is to be transported via the railway for final disposal at the Puttalam site, however the final approval for this project is still pending. It is noted that the proposed site is located within the buffer zone of the Willpattu National park which is not an ideal location for a project such as this.It is therefore vital to ensure that the proposed sanitary landfill is located at a site which has no adverse impacts on wildlife and has minimum impacts on the environment.

In addition the establishment of one or two sanitary landfill sites for the Western province, there is also a requirement to compel the public to separate waste into biodegradable and non-biodegradable factions. Maximum recycling will be made possible through waste separation as the biodegradable faction could be converted into compost while other material such as paper, cardboard, metal and plastic could also be

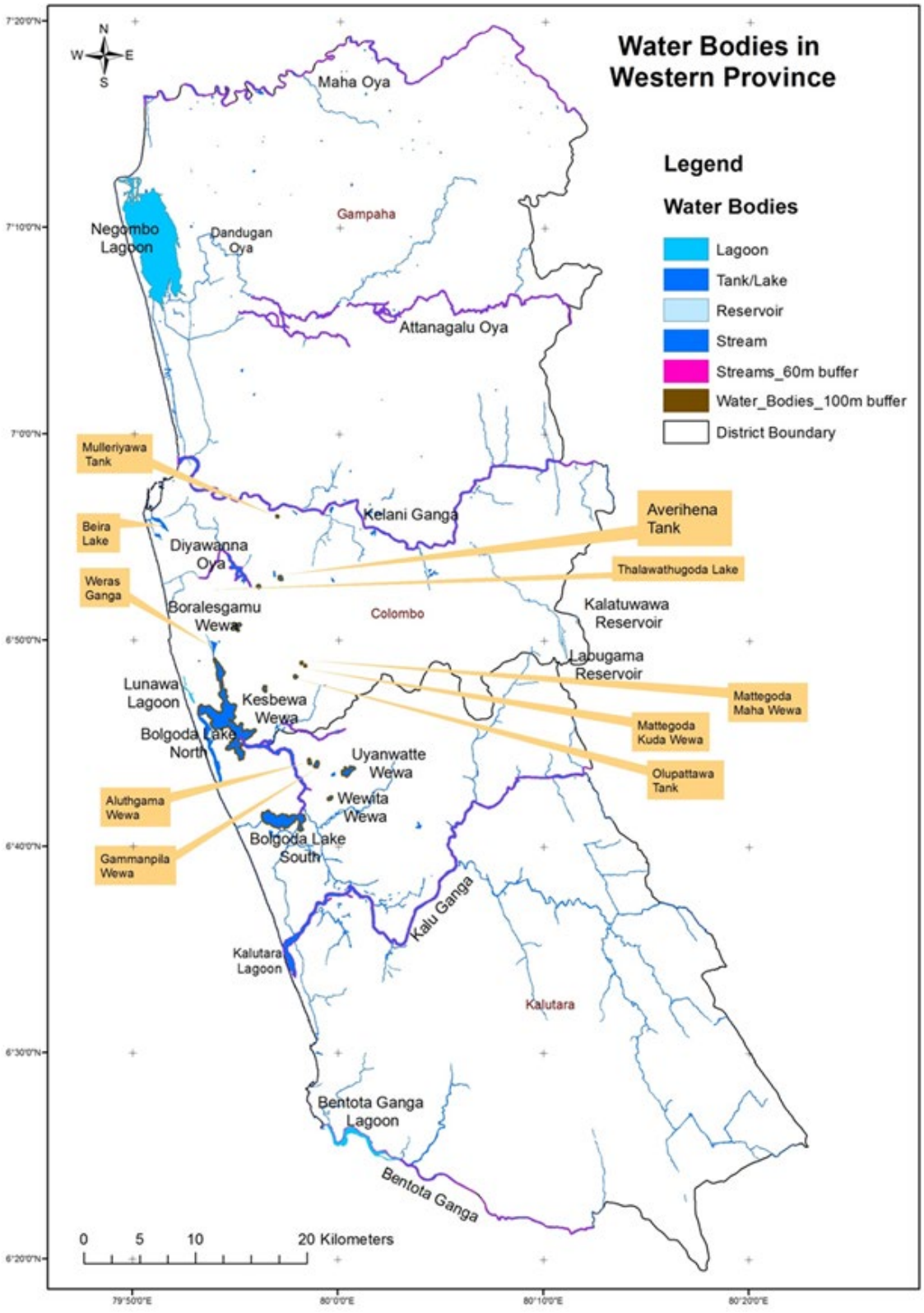


Fig.6.9 Water bodies in western region

recycled. This will ensure the reuse of valuable resources while at the same time reducing the waste load requiring final disposal, thereby increasing the lifetime of the landfills. As such separation of waste at household level has to be made mandatory throughout the province.

The strengthening of the Local Authorities who are primarily responsible for municipal waste management through the provision of adequate equipment such as waste collection trucks and other equipment as well as the training of the municipal work force on proper waste management techniques is also an urgent priority.

In addition, increasing awareness of the general public and educating them on the need to manage and dispose of household waste properly is urgently required.

Fig.6.10 Dompe sanitary landfill site

6.2.4 Hazardous Waste Management

The Western Province has the highest density of industries in the country, with over 80% of all industries situated within the Western Province. The largest concentration of High polluting industries are also situated in the Western Province. High polluting industries are classified as industries which generate large quantities of liquid, solid or gaseous waste or which use chemicals in their process. These include chemical industries, tanneries, textile industries, rubber based industries, asbestos industry etc. It is estimated that around 70,000 to 100,000 MT of hazardous waste is being generated annually within the country, out of which a major part is generated within the Western Province due to the high concentration of high polluting industries within the region. Only around 20% of the total amount of hazardous waste generated is being disposed in an acceptable manner through the use of the cement kiln in Puttalam, while the remaining 80% of the hazardous waste is being disposed along with municipal waste or dumped in various locations by the industries or through contractors.

It is imperative that a long term solution is provided for this serious issue through the establishment of an Integrated Hazardous Waste Management Facility. A proposal in this regard has already been formulated and put forward for implementation.

6.2.5 Hospital Waste Management

The management of hospital waste is also an issue which requires urgent intervention. This is an issue which the health authorities have ignored for a long period of time. The disposal of waste from a majority of hospitals in Sri Lanka including the Western Province leaves much to be desired in terms of environmental acceptability. A majority of hospitals do not even have primary treatment of their wastewater. In addition even hazardous hospital waste is not been managed properly. Disposal of hospital waste requires extreme care, as such waste could contain disease causing bacteria and viruses.

There are internationally accepted methods such as autoclaving and hydroclaving which

renders such waste harmless, which requires to be adopted by both private and government hospitals in Sri Lanka. Only a handful of hospitals adopt such measures at present. Even in the Western Province there is at present only one private sector entity collecting hospital waste and burning it in an Incinerator located in Angoda. It is imperative that more players are brought into this field and to assess the adequacy of the systems adopted by such private sector companies in order to ensure that they do not pose an undue health risk.

6.2.6 Industrial Pollution And Haphazard Siting Of Industries

Western Province presently has the largest number of industries in the country and according to estimates more than 80% of all industries in the country are situated within this province.

This situation has also led to severe problems as most of these industries are located in a haphazard manner and are spread out within the province. Figures 6.11 below indicates the location of standalone industries within the three districts of Colombo, Gampaha and Kalutara.

The spreadout nature of the industries causes many issues due to the highly populated nature of these three districts. It is recommended that in future all industries should be sited within industrial estates and no standalone industries should be allowed. The Western Region Megapolis Plan has identified areas to be developed as industrial zones.

These zones require to be developed with all required infrastructure including most importantly waste treatment facilities. At the same time, there are at present several categories of highly polluting industries such as Asbestos industries, leather tanneries and chemical industries which are presently operating in highly residential areas such as Moratuwa and Ratmalana.

In the long term, these industries should be relocated to more appropriate locations which are not highly populated in order to reduce the health risks associated with such industries. In addition to paying close attention to siting of industries, the operations of industries should be closely monitored. All industries should possess an Environmental Protection License (EPL) from the CEA and strictly adhere to the air emission, wastewater and noise standards stipulated in the respective licenses.

6.2.7 Wastewater Management

The provision of adequate sewer collection and treatment systems for highly populated urban centers is an urgent priority which has been addressed in the Western Region Megapolis Plan. This will also be a boon for industries as wastewater from industries could then be discharged into the sewer system after treatment up to specific pre treatment standards specified by the NWSDB or the CEA as the case maybe. The two waste treatment systems set up in Moratuwa wastewater easily thereby preventing further pollution of inland water bodies as well as the ocean.

Fig.6.11 Large, Medium and Small Industrial Distribution of Western Region (Source: CEA)

6.2.8 Air Pollution

The air quality in the Western province and even in Colombo where there is a very large number of vehicles which contribute to air pollution is still within acceptable levels as far as pollutants such as Sulphur Dioxide, Oxides of Nitrogen, Carbon Monoxide are concerned. However the level of particulate matter or dust is comparatively high and exceeds the acceptable standards as stipulated by the World Health Organization (WHO) many times over. There is an urgent necessity therefore to adopt measures in order to maintain the ambient air quality within acceptable standards.

At present the major contribution to air pollution is from vehicle emissions. This is an area requiring urgent attention as the number of vehicles plying the streets keeps increasing.

The present vehicle emission standards should be strictly enforced while also taking action to reduce the number of private vehicles on the road through the provision of an efficient public transportation system. This issue has been addressed comprehensively in the Masterplan, and it is expected that with the proposed improvement of the public transportation system, the air quality will show a substantial improvement.

Industrial emissions and thermal power generation using oil and coal also contribute to air pollution although in a limited manner at present.
Emissions from industries and thermal power plants should be strictly regulated through the imposition of the relevant emission standards. Using seafront clean air circular.

There should also be a medium to long term plan to convert to Natural Gas for power generation and for transportation. Natural Gas is far less polluting than oil or coal. Furthermore Natural Gas emits far less Carbon Dioxide than oil and gas and contributes less to global warming. The presence of Natural gas deposits in the Mannar Basin is therefore a boon to Sri Lanka, as use of Natural Gas for transportation and energy generation is an environmentally more friendly option than the use of either coal or oil.

The Western Province as well as the country as a whole could further reduce its Carbon Footprint by changing over to Natural Gas for power generation and transportation thereby making the dream of a Low Carbon Megapolis a reality in the future.

6.2.9 Hydrology and Drainage

Issues related to drainage and flooding is a major issue within the Western Province at the present time. Pocket flooding in Colombo City occurs mainly due to the under capacity of secondary and tertiary canals, as well as the absence of drainage connections between these drain systems with the main canal system. Flooding also takes place in Bolgoda, AttanagaluOya, and Colombo catchments due to the filling of sensitive retention areas. There are major issues related to the drainage system maintenance, such as the maintenance of streams, canals, tanks and lake reservations. The absence of a Drainage Masterplan for the region showing flood contours, sensitive retention areas, wetlands reservations etc. to be utilized by line agencies and Local Authorities, as well as the lack of proper land use planning, are major issues in this regard and has to be addressed urgently.The issue of drainage and proposed solutions have been dealt with elsewhere in this report.

6.2.10 Impacts of Climate Change

Addressing climate change related challenges, in particular within WRMP context, while connecting with the global knowledge in a proactive and stakeholder participation may improve the sustainability, credibility and relevance of the WRMPP. In the long-term the

process will help to maintain the resilience of the people and infrastructure developed through the WRMP approach.

Climate change impacts associated with global warming may affect the WRMP process by way of rainfall changes (droughts, floods including flash floods and changes to the ecosystems of wetlands and others), temperature rise (changes to diseases – pathogens, impact on fauna and flora, heat island effects in urban settings and high energy cost of air conditioning, health costs of unknown diseases) and sea level rise (sea water intrusion and changes to the currents leading to changes in coastal erosion, sea level rise induced high salinity in rivers such as Kelani River, changes to ecosystems due to salinity level changes in wetlands, lagoons etc.) to cite a few examples .

Prediction towards year 2,100, using global models and UNFCCC data, by a number of authors in Sri Lanka indicate a general trend that the wet region in the country where WRM is located will be wetter with time.

Similar predictions on ambient temperature indicate the trend that on the average the temperature will be increased around 1 C by 2,100 in the western region.

Sea level rise related predictions also have been attempted (Hazard Profiles of Sri Lanka, Disaster Management Centre, 2012).

However, exact implications of this predicted increased wetness, elevated ambient temperatures and sea level rise etc. are yet to be studied in detail, although the global information has a wealth of knowledge on possible effects.

As such during the WRMPP process we will

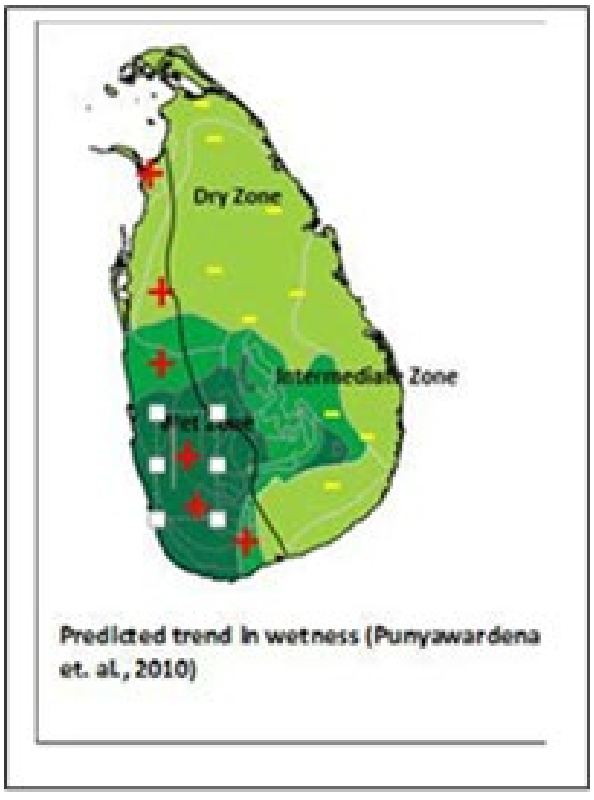


Fig.6.12 Predicted trend in wetness (Punyawardena et. al., 2010)

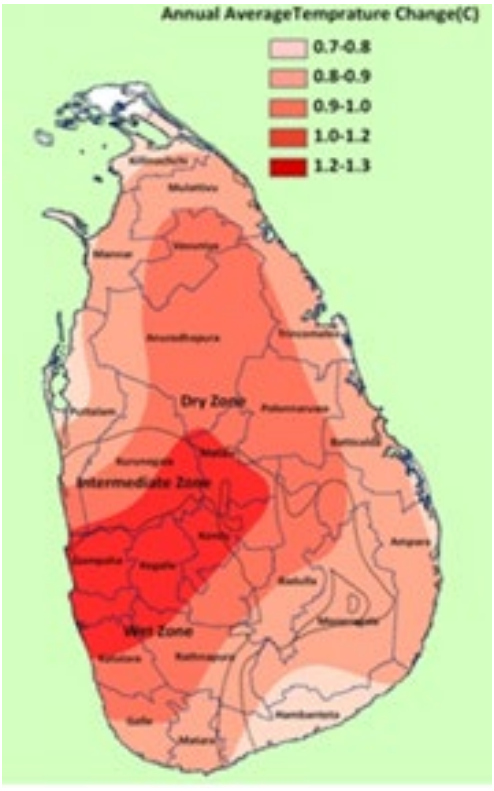


Fig.6.13 Predicted trend in ambient temperature change (Punyawardena et.al. 2010)

have a golden opportunity to "be proactive and innovative" and add value to the process by mainstreaming climate change. Also we can avoid "missing the bus" related to the global climate change agenda and green funds.

There are two modes of interventions when we consider climate change. First is the "mitigation" of greenhouse gases – the driver for global warming and the second intervention areas is the "adaptation" or improving our preparedness and response capacity to minimize the risks of potential impacts due to climate change.

In that context, it is proposed that WRMPP climate change agenda is expected to "Maximize our knowledge on potential implications of climate change, take proactive and innovative measures to mainstream mitigation and adaptation in planning and implementation, involve multi-sector agencies while enhancing their capacity, capitalize on the achievements to be a champion in the global agenda and harness multiple benefits towards the broader WRMPP vision."

Western Region also depend on the climatic conditions outside the Western Region, thus needing a thinking beyond the geographic boundaries. Colombo and other cities in the Western Region have experienced flash flooding in the recent past (including the Parliament going under water). Also both floods and drought do not have provincial boundaries, therefore, it is important to consider the changes to the ecosystems of the watersheds connected to WPMP too.

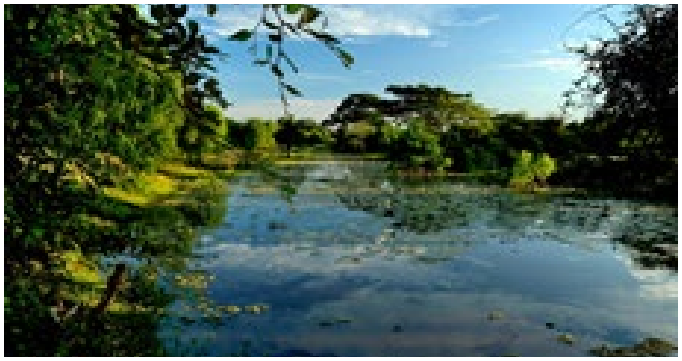
6.2.11 Protection of Archealogical Sites and Monuments

There are about 350 archaeological sites within the Western Region which have been identified by the Department of Archaeology.

There are many serious threats to these sites such as looting and vandalism, treasure hunting, neglect, improper maintenance, encroachment and pressures due to urbanization. There are also potential threats to these sites through natural disasters such as floods, earthquakes, cyclones etc.plans are prepared and implemented for the significant sites and that periodic monitoring of the sites are carried out by the Department of Archaeology.

Adequate funds should be provided to the Department of Archaeology. It is strongly recommended that the inventorisation and documentation of the archaeological sites within the Western Province is completed along with photography and GIS maps, as early as possible. It is also proposed that site management of Archeological sites.

6.3 Wetland Ecosystems in the



Region and the Need for their Conservation

The wetland ecosystems in the Western Province perform many functions such as flood protection, providing wetland habitats for a number of fish species and birds, as well as being important in terms of biodiversity and providing aesthetically pleasing biodiversity rich areas within an urban landscape. It is vital that these wetlands are protected under any circumstances.

There are many developed countries which have totally destroyed the natural environment in their quest for rapid development and these countries are now spending vast amounts of money in order to recreate areas such as artificial wetlands. Sri Lanka is fortunate that even in highly urbanized provinces such as the western province there are many ecologically rich areas remaining. With the strong emphasis on an environmental baseline which will not be compromised during the implementation of the Western Region Megapolis Plan. It is imperative that action is taken to protect these remaining environmentally sensitive areas on an urgent basis.

6.4 Declaration of Eco Zones

In order to conserve the natural capital of the Western Region by demarcation and protection of the environmental sensitive and ecologically important hotspots, it is proposed to declare three types of Eco Zones as follows;

Eco Zone 1:

Sensitive areas where the highest priority should be given to conservation of the ecosystems and its functional services such as hydrological and ecological character. These areas such as sensitive forest patches such as Reserved Forests, Conservation Forests, Proposed Forest Reserves, National Parks, Sanctuaries, Major Wetlands, Water bodies such as rivers, streams, Lagoons, Irrigation Tanks, Lakes (both natural and manmade) and their feed areas will be declared under Eco Zone 1. Protection of these areas will be guided by the provisions in the respective laws under which these areas have been declared such as the Forest ordinance, Fauna and Flora Protection Act and the National Environmental Act. No permanent constructions or conflicting activities that may negatively impact the environmental services of the eco systems will be allowed in Eco Zone 1 areas.

Eco Zones 2:

The green belts, urban parks, small wetlands, reservations and buffer zones of Eco Zone 1 areas will be included in Type 2 Eco Zones. No permanent constructions will be allowed within these areas and activities within these areas will be subject to strict planning guidelines and screening as well as regulatory requirements such as EIA.

Eco Zones 3:

This area will consist of the coastal zone and set back areas, and low lying areas including paddy fields. Activities in these areas will be guided through planning guidelines.

A project proposal in this regard has already been prepared for funding.

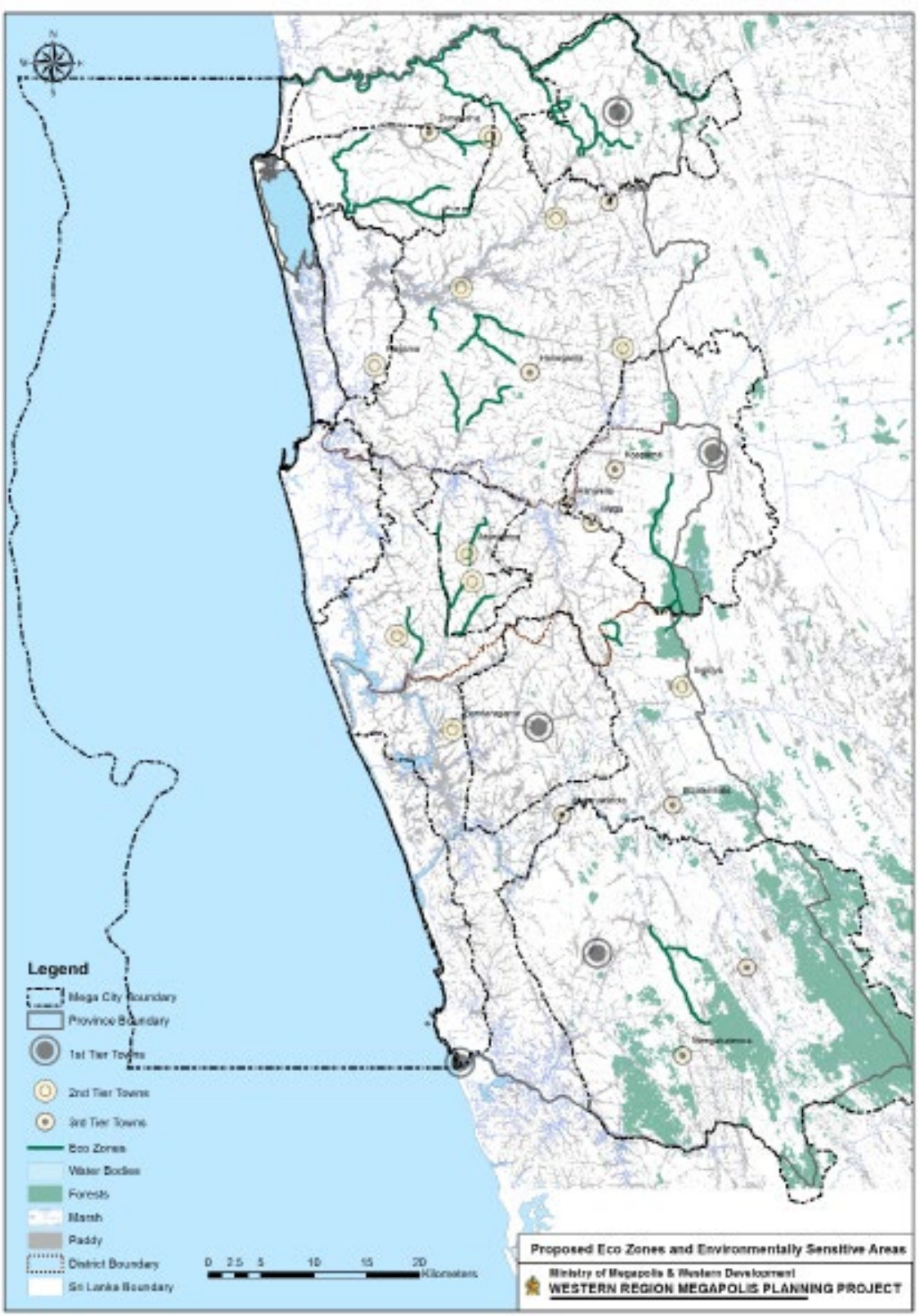


Fig.6.14 Proposed Distribution of Eco Zones in the Western Region

6.5 Megapolis Environmental Plan & Guidelines

6.5.1 Environmentally Sensitive/ Project Areas

The infrastructure development and other major developments proposed under the Western Region Megapolis Plan should not adversely affect or intrude into the environmentally sensitive areas such as Forest Reserves, proposed Forest Reserves, Sanctuaries, Environmental Protection Areas declared under the National Environmental Act, Inland water bodies such as rivers, streams, lakes, lagoons or the ocean. These areas are recommended to be declared as Eco Zones.

In order to conserve the environmentally sensitive areas within the western Province it is proposed that three categories of Eco Zones are declared as follows;

Eco Zone 1:

Reserved Forests, Conservation Forests, Proposed Forest Reserves, National Parks, Sanctuaries, Major Wetlands, Water bodies such as rivers, streams, Lagoons,), Irrigation Tanks, Lakes(both natural and man made) and their feed areas.

Eco Zones 2:

the green belts, urban parks, small wetlands, reservations and buffer zones of Eco Zone 1 areas.

Eco Zones 3:

coastal zone and set back areas, and low lying areas including paddy fields.

In approving the proposed development plans the coastal setbacks stipulated by the Coast Conservation Department as well as no build zones/reservations stipulated by regulatory agencies such as the Urban Development Authority, Central Environmental Authority, Irrigation Department should be strictly adhered to.

6.5.2 Green Cover

A minimum average green cover of at least 35% should be maintained in urban built up areas while other areas should have a higher level of up to 50% green cover. All efforts to be made to preserve the natural green cover in all areas rather than the artificial creation of green areas.

6.5.3 Waterbodies

All water bodies within the Western Province including lakes, lagoons and rivers and streams should be specified as environmentally sensitive areas.

These Water bodies include the Kelani River, Kalu Ganga, AttanagaluOya, MahaOya, Panadura Ganga, Bentara Ganga, Negombo lagoon, Lunawa lagoon, Bolgoda Lake, Beira lake, Thalangama Tank, Borelesgamuwa lake, DiyawannaOya, GammanpilaLake,KesbewaWewa,Olupattawewa, MattegodaKudawewa, MattegodaMahawewa Tank, Labugama, Kalatuwawa Reservoirs, WewitaWewa, Aluthgama Tank, Borelesgamuwa Tank, Uyanwatte Tank, Nalandawa Tank, Kalutara Lagoon, Parliament Lake, Rampalawatta Tank, BentotaGanga Lagoon, Mulleriyawa Lake, Beira Lake, Thalawathugoda Lake, Avarihena Tank. It is recommended to declare these water bodies as Eco Zones.

6.5.4 Discharges Into Inland Water Bodies

There should not be any discharges of industrial effluents, sewage or other wastewater into static waterbodies such as lakes where there is no flowing water. Such waterbodies include the Negombo lagoon, Lunawa lagoon, Bolgoda Lake, Beira lake, Thalangama Tank, Borelesgamuwa lake, DiyawannaOya, Gammanpila Lake, KesbewaWewa, Olupattawewa, MattegodaKudawewa, MattegodaMahawewa Tank, Labugama, Kalatuwawa Reservoirs, WewitaWewa, Aluthgama Tank, Borelesgamuwa Tank, Uyanwatte Tank, Nalandawa Tank, Kalutara Lagoon, Parliament Lake, Rampalawatta Tank, BentotaGanga Lagoon, Mulleriyawa Lake, Beira

Lake, Thalawathugoda Lake, Avarihena Tank. Discharge of wastewater treated upto the standards specified by the CEA into flowing waterbodies with the required dilution factor(1:8) may continue until such time the required infrastructure facilities are in place. The discharge of polluting inputs such as industrial effluents and sewage should be stopped into these water bodies in the long term (by 2025). These Water bodies include the Kelani River, Kalu Ganga, AttanagaluOya, DanduganOya, MahaOya, Panadura Ganga, Bentara Ganga. It is recommended to declare all water bodies mentioned above as Eco Zones.

In the long term, industrial effluents or treated or untreated sewage should not be discharged into inland water bodies such such as rivers lakes, tanks, reservoirs and streams. In order to facilitate this, all urban areas should be provided with sewer connections and treatment facilities. The treated sewerage should be discharged through outfalls into the ocean and should comply with the standards specified by the CEA.

6.5.5 Siting of High Polluting Industries

Since the Western Region in general and Gampaha district in particular has reached its maximum carrying capacity with more than eighty percent of all industries situated within the province, no further High Polluting sector of industries should be allowed to be sited within the Western Province. The present pattern of haphazard location of industries should be discontinued with immediate effect.

All existing high polluting industries operating in unsuitable locations and/or residential areas within the province, should be relocated within industrial estates with the required infrastructure such as waste treatment plants. The wastewater from the industrial estates should be treated upto the standards specified by the Central Environmental Authority and discharged into the ocean through outfalls of appropriate length.

6.5.6 Buffer Zones around Industrial Estates:

A minimum of 500m should be maintained around all industrial estates with high polluting industries. No residential areas should be allowed within the buffer zone.

6.5.7 Siting of Low Polluting Cottage Industries

In order to facilitate the low polluting cottage type of industries which are presently functioning in residential areas and in houses, provision should be made to locate at least one industrial estate for each Divisional Secretariat area where such cottage industries could be relocated.

The space within these estates should be provided free of charge or at very nominal rates so as not to affect the livelihood of the small scale industrialists.

6.5.8 Classification of Waterbodies including Rivers

All water bodies and rivers within the Western Province should be classified according to the user category such as nature conservation, conservation, recreation, fishing, bathing, industrial, drinking water etc. All rivers in the province should be zoned according to usage. The upstream areas from which water is being extracted (Eg. Kelani River, Kalu Ganga) should be declared as Environmental Protection Zones under the National Environmental Act.

No discharges or developments should be allowed around such declared areas in order to preserve the water quality within drinking water standards. The other areas in the river should be classified according to usage such as nature conservation, fishing, recreation, bathing, and industrial use. The suggested ambient water quality standards are given in annexure 4 of this report.

6.5.9 Improved Public Transportation:

The Western Region Megapolis Plan has already prepared a comprehensive Transportation Plan for the region described elsewhere in this report. This plan should be implemented on a priority basis in order to reduce road congestion by reducing the number of private vehicles within

the province. Addition of properly designed bicycle lanes and walking lanes will also facilitate people to cycle and walk thereby reducing traffic congestion. This will lead to improved air quality and lead the Western region towards its final goal of a Low Carbon, Pollution Free Megapolis.

6.5.10 Waste to Energy Projects and Sanitary Landfills for Municipal Waste

The proposed Waste to Energy projects should b e implemented on a priority basis in order to resolve the municipal solid waste problem in the region. In addition to this, at least two sanitary landfills for the three districts of Colombo, Kalutara and Gampaha should be established on an urgent basis in order to resolve the major environmental issue in relation to Municipal solid waste disposal.

6.5.11 Waste Separation at Household Level

In addition to the above separation of biodegradable and non biodegradable waste at household level will facilitate increased recycling and reuse of waste thereby reducing the pressure on landfills and increasing the lifetime of the landfills. Separation of waste should be done through appropriate regulations and through education and awareness programmes.

6.5.12 Hospital Waste Management

A program should be developed for the treatment and disposal of hospital waste within the Western province. The existing hospital waste management system should be assessed and the required funds and infrastructure facilities should be provided on an urgent basis.

6.5.13 Hazardous Waste Management

An Integrated Hazardous Waste Management Facility should be established for the treatment and disposal of hazardous waste within the Western province and other regions of the country. A proposal in this regard has already been put forward for funding.

6.5.14 Demarcation of Waterbodies as Sensitive Areas

All major water bodies within the province such as the Negombo lagoon, Bolgoda Lake, Lunawa Lagoon, Thalangama Tank, Borelesgamuwa Tank, Gammanpila Tank, Dedduwa Lake should be protected an used as recreation and tourism development areas. The necessary infrastructure for this purpose should be provided and these areas declared as environmental sensitive areas and development around them should be managed in order to preserve these areas.

The physical boundaries of these lakes should be demarcated on ground urgently as a means of preventing illegal encroachments in future. A buffer zone of at least 100 meters should be maintained around non flowing water bodies such as lakes and lagoons. No waste discharges including sewage or industrial effluents should be allowed to be discharged in to such water bodies. It is recommended that water bodies are declared as Eco Zones 1 and buffer zones around these water bodies and other sensitive areas are declared as Eco Zones 2.

A Reservation of at least 60 meters should be maintained along major rivers. These buffer zones should be declared as Eco Zones 2.Any discharges in to flowing water bodies such as rivers and streams should be allowed only if the required 1:8 dilution is available and the waste water complies with the standards for the discharge of effluents in to inland water the discharge of effluents in to inland water bodies. The Megapolis plan should have a long term plan to completely stop waste discharges in to inland water bodies through the provision of the required infrastructure facilities.

6.5.15 Protection of Archaeological Sites

All archeological sites within the western Province should be inventorized and proper management plans drawn up for such sites. These sites could be used as tourism sites and funds earned through tourism could be used for the upkeep and preservation of such sites.

6.5.16 Potection of Wetlands

The remaining wetlands within the Western Province including paddy fields should be preserved for flood control purposes, biodiversity and aesthetic value. The major wetlands in the Western Region should be gazetted as Tier 1 Eco Zones. The less important wetlands should be declared as Eco Zone 2 and Eco Zone 3.These areas could be utilized for recreation purposes and foreducational and research purposes only. The wetland zoning plan developed by the UDA in consultation with the Central Environmental Authority, Sri Lanka Land Reclamation and Development Corporation and other agencies should be gazetted and implemented.

6.5.17 Disposal of Wastewater into Inland Waterbodies

The practice of disposing of treated and untreated wastewater, industrial effluents and sewage into inland water bodies such as rivers and streams should be stopped forthwith. In order to facilitate this, wastewater collection and treatment schemes should be provided to all urban centers. Households and industries should be allowed to discharge wastewater into these systems on a payment scheme based on the pollution load.

6.5.18 Reservations/ Buffer Zones around Waterbodies

A reservation of at least 60m from the high flood level of all major rivers, and 100m buffer zone for other inland water bodies should be maintained as a means of preventing pollution of water bodies and for aesthetic purposes. Only selected limited activities should be allowed within these reservations. These buffer zones should be declared as Tier 2 Eco Zones.

6.5.19 Green Building Concepts

Energy and water conservation should be made mandatory in commercial buildings through appropriate building regulations. The existing Rainwater harvesting regulation should be strictly enforced in future as a means of water conservation and drainage water management and flood control. The reuse and recycling of greywatershould be encouraged through appropriate means.The Green Building concept should be popularized through awareness programmes and through appropriate policy changes and regulations.

6.5.20 Use of Asbestos

The use of Asbestos as roofing material and for other uses should be discontinued within the Western Province and in the country due to the proven carcinogenic (cancer causing) properties of Asbestos.

6.5.21 Use of Groundwater

At the present time there are no regulatory controls on the extraction of groundwater within the Western Province and countrywide. This could lead to serious issues in relation to ground water in the future. The extraction of groundwater within the Western Province and countrywide, for industrial and commercial use should be strictly regulated. Industrial and commercial use of groundwater should be strictly controlled and commercial scale extractions should be charged a fee according to the volume of extraction.

6.6 Policy Recommendations To Be Implemented On A Priority Basis.

- Incorporate sustainability concepts into all development sectors such as transport, energy, industrial sectors
- Promote the use of cleaner fuels such as Natural Gas and electricity in the transportation sector and Natural Gas and Renewable energy sources in the power sector and for domestic use.
- No further High Polluting industries should be established within the Western Province since more than 80% of all industries in the country are situated within the province and the region has already exceeded its carrying capacity,
- Prepare and implement a Drainage Management Masterplan for the region on

a priority basis in order to improve drainage facilities and to prevent flooding.

- Improve public transportation on a priority basis, in order to reduce traffic congestion and air pollution levels.
- Promote incentives such as tax exemptions for environmentally friendly products such as solar panels, hybrid/electric vehicles. Pollution control equipment, water and energy saving products.
- Adopt the National Solid Waste Management Strategy to suit the Western Region and compel separation of waste at household level through appropriate legislation/regulations.
- Encourage Waste to Energy projects through appropriate policy and economic instrumentsEncourage Green Building concepts through building regulations and adoption of appropriate policies and economic instruments.
- Energy and Water Conservation should be made mandatory through appropriate legislation/regulations. Recycling and reuse of treated wastewater should be encouraged through the adoption of wastewater discharge fee schemes.
- Bring in regulatory controls on industrial and commercial scale groundwater extraction and impose appropriate groundwater extraction charges for industrial and commercial scale extractions.

- Enforce the "Polluter Pays Principle" by imposing a wastewater discharge fee for industries, based on the pollution load discharged into the environment, as proposed by the Central Environmental Authority.

6.7 A Low Carbon Megapolis

The latest report of the IPCC shows the extent to which global warming is expected to affect the earth, and the need for the global community to bring down emissions of Carbon Dioxide, Methane and other greenhouse gases, in order to slow down the warming of the earth and its attendant consequences such as sea level rise.

Sri Lanka is a country with a very low level of green house gas emissions. However, Sri Lanka as a country can contribute to the global movement, by adopting a low carbon economy. This will ensure that the country will elevate its position as a responsible global citizen, while at the same time gaining many benefits for the country through the adoption of a Low Carbon Economy, chief among which is a pollution free environment and savings in energy and water. The Western Region Megapolis Plan is therefore a golden opportunity whereby a Low Carbon Megapolis could be created through the adoption of specific strategies. These strategies will go a long way in creating a Green Megapolis which is eminently livable while at the same time creating a pollution free and healthy environment.

Some of major strategies in this regard are changes to be made to the existing policies on Energy Generation, Transport and Building Technology etc. The Government has already made a commitment to generate 25% of energy using renewable sources by 2025. Sri Lanka is also fortunate to have discovered Natural Gas reserves in the Mannar Basin. Converting to Natural Gas for Transportation and Power Generation instead of using oil and coal as at present, will contribute in a substantial reduction of pollutants such as Oxides of Nitrogen as well as Sulphur Dioxide emissions. Natural Gas also emits very much lower levels o f Carbon Dioxide when compared to coal and oil thereby reducing global warming.

The Western Region Megapolis Plan should therefore base the plan on the basis of power

generation and transportation using Natural Gas thereby reaching its goal of a Low Carbon Megapolis.

Other major area to be considered is transportation. Colombo city is facing increasing traffic congestion levels due to the use of a large number of private vehicles powered by petrol and diesel. This leads to high levels of air pollution as well as emission of green house gases.

The Megapolis Plan has developed a transportation plan with a major focus on improvement of public transportation through the provision of an efficient mass transportation system within the Megapolis. This will reduce the number of private vehicles plying the roads leading to reduced traffic congestion and the resultant emission of air pollutants and green house gases. Other policies such as the reduction of taxes of low emission vehicles such as electric and hybrid vehicles and environmentally friendly technology such as solar panels and energy and water saving equipment, will also go a long way in reducing emissions while at the same time contributing to the long term goal of a Low Carbon Megapolis.

The other important area to be considered is the adoption of green building concepts which are gaining popularity due to the many benefits it provides such as the savings on water and energy and the attendant savings to the building owners. People could be encouraged to adopt green building concepts through building regulations as well as through the creation of awareness on the benefits accrued through the adoption of green building plans.

6.8 New Legislation/Regulations For Environment and Protection within The Western Region Megapolis

At the present time there is a fairly adequate legal framework in the country for the Management and Protection of the environment. Many of the regulations promulgated under the National Environmental Act, such as the EIA regulation, EPL regulation, Noise regulation, regulations for Management of Hazardous Waste, and regulations for the declaration of Environmental Protection Areas are invaluable for the purpose of achieving sustainable development and environmental conservation.

The implementation of the above mentioned regulations require further strengthening in order to achieve their full potential
The following new legislation is proposed under the Megapolis Authority in order to achieve the stated goals in the vision and mission statements of the Western Region Megapolis Plan.

- Regulations for the declaration of Eco Zones 1, Eco Zone11 and Eco Zone111.
- Regulations for declaration of 60m for rivers and 100m buffer zones for other inland water bodies such as lakes, lagoons, reservoirs and lakes.
- Regulations for declaration of a 500m buffer zone around all industrial estates and for limiting residential development within the buffer zone. .
- Regulations for declaration of inland water bodies according to use category such as for Nature Conservation, Drinking Water Source, Industry, Fisheries, Recreation etc.
- Gazetting of Ambient Water Quality Standards.
- Regulations prohibiting wastewater discharges into inland water bodies after 2025.
- Regulations for declaration of Environmental Protection Zones around water extraction points.
- Regulations mandating Green Building concepts (energy/water conservation, waste management, wastewater recycling)
- Regulations for wastewater discharge fees for

industries (Polluter Pays Principle).

- Regulations making Municipal waste separation mandatory at household level.
- Regulations limiting the establishment of any further High Polluting industries within the Western Province and mandating the future establishment of High Polluting category of industries within industrial estates with required infrastructure, including common waste treatment facilities.

6.9 Key Projects

6.9.1 Declaration Of Eco Zones Within Thewestern Province

The environmentally sensitive areas within the Western Province have been identified and mapped as given in figure 2.9 of this report. there is an urgent need to carry out the required surveys and demarcate these areas as Eco Zones. It has been proposed to declare three types of Eco Zones.

These zones will be brought under protection status with Eco Zones 1 having the highest protection status and Eco zone 2 and 3 having a lower level of protection. This project is expected to be implemented by the Western region Megapolis Authority in close collaboration with the Central Environmental Authority, Forest Department, Department of Wildlife Conservation and Universities.

6.9.2 Solid Waste Management-Colombo And Suburban Area (Waste To Energy)

At present waste generation in Colombo Municipal Council area is around 750Mt per day. The total quantity of waste in the Colombo and suburban areas (CMC, Dehiwala, Kotte, Moratuwa, Ratmalana, Maharagama) exceeds 2000Mt per day. The present method of disposal is not environmentally sustainable. The proposed project is to use municipal solid waste as a resource and convert it to energy. Two sites have been proposed in Karadiyana and inMuthrajawela within the area that has been designated for this purpose. These projects are expected to be implemented by the private sector.

6.9.3 Integrated Solid Waste Management For Local Authorities

Inadequate Solid Waste Management is one of the major environmental issues in all Local Authority areas of Western Province. There the goal of clean and green low Carbon Western Region Megapolis as envisaged in its vision and mission statements.This project is expected to strengthen Local Authorities through the provision of equipment and the required training in Municipal solid waste management.

There are many factors contributing to this situation including the lack of required infrastructure as well as inadequate equipment, machinery and dedicated human resources necessary for the task within most local authorities.

through the provision of equipment and the required training in Municipal solid waste management.

6.9.4 Implementation Of An Integratedhazardous Waste Management Facility

Due to the absence of proper hazardous waste disposal facilities in the country some industrialists tend to practice haphazard disposal methods causing health and environmental implications as well. As such it is an urgent requirement to facilitate the industries to carry out their industrial processes without any interruption while minimizing the possible health and environmental impacts.

6.9.5 Public Private Partnership Towards Effective Environmental Management In The Kelani And Kalu River Basins

Kelani&Kalu river water and basin resources are being widely shared by private sector as inputs for industries, urban services and recreation among others. Many industries discharge treated and untreated effluents due to deficiencies

in regulatory and disposal mechanism. Municipalities and local councils too use both rivers and its vicinities for garbage/solid waste dumping . Small and medium industries also contribute to the pollution significantly.

Number of drinking water schemes obtain water from Kelani and Kalu rivers. The multi sector and multi -agency participatory planning and implementation approach is appropriate for the effective environmental management. This multi stakeholder partnership involves government agencies, private sector, non- governmental entities, universities, research, international agencies etc. the overall understanding of pollution issues, barriers and potential solutions could be gathered through consultation with stakeholder agencies, state and private sector and international agencies.

6.9.6 Protection Of Inland Water Bodies In The Western Province Through Classification Of Water Bodies And Reducing Polluting Inputs

Inland water bodies in the Western Province are severely threatened due to pollution as well as un authorized reclamation. A very large quantity of waste water, treated and untreated is being discharged into such water bodies resulting in severe pollution. Since rivers in the western province are used for the provision of drinking water it is important that pollution of these water bodies is prevented through the adoption of appropriate policy and legal measures and through the classification of water bodies according to use category.

6.9.7 Enhanced Capacity To Track Climate Change Impacts On The Wrmp Eco System Including Sea Level Rise, Rainfall Changes And Temperature Increase Related Impacts

Understanding the preparedness to address climate induced impacts on the coastal and inland areas of the WRM is important. The potential global sea level rise is predicted by IPCC to be around 0.8m per 100 years. Also climate data indicates changes in rainfall pattern and increase in air temperature. In addition, these impacts need to be understood and tracked to ensure that WRMP related infrastructure , settlements, livelihoods etc. are sustainable and resilient .

6.9.8 Air And Water Quality Baseline Establishment And Continuous Monitoring

According to the emission inventory data air emission from the transport sector contributes more than 50% of total air pollution in Sri Lanka. It is more than 70% in the Western Province. In addition, more than 80% of the total industries in Sri Lanka are situated within the Western province, contributing further to air pollution. Poor infrastructure and poor environmental management systems adopted by industries aggravate the air pollution problem. . Several air pollution management tools are being implemented by the CEA to reduce air pollution in the country, but there is no proper mechanism to understand the effectiveness of these management tools.

Public concern about air quality is increasing with demands for more information about air pollution levels throughout the country as well as answers about sources , causes and solutions by individuals and organizations on global warming and climate change issues.

Inland water bodies within the Western Province are subject to pollution due to rapid urbanization and industrialization. Major rivers such as Kelani, Kalu, Attanagaluoya are heavily used to provide drinking water to the population in the Western Province. As such monitoring of the water quality in these water bodies is essential in order to ensure that these water sources are within acceptable quality for drinking purposes.

6.9.9 Implementation Of Clinical Wastemanagement Facility

Due to the absence of adequate options for the disposal of clinical waste in the country, haphazard disposal methods are in practice

by the health care facilities posing health and environmental implications. As such it an urgent requirement to provide adequate disposal and treatment facilities to cater the total health care waste generated within the county.

6.9.10 Establishment Of Electronic Waste Recycling Facility

The rapid increase and changing need of consumers for electrical devices and information technology on a global scale has resulted in a significant rise in electronic and electric products. At present some private sector companies had moved on with successful collecting system for electronic waste while considerable amount of e-waste continues to be recycled in the informal sector. However, establishing a national level electronic and electrical waste management system that makes re-use and recycle of products readily available to the country has become a priority.

6.9.11 Sanitary Land Fill For The Region Or District Wise

At present waste generation in Colombo Municipal Council area is 750 Mt per day. 1000 Mt. However the Management of Municipal solid waste had become one of the critical issues, especially in Western Region. Therefore it is required to establish proper system of solid waste collection, treatment and disposal.

Chapter 07
Social Infrastructure Development (Housing, Health & Education)

7.1 Housing Development

Housing is one of the most important areas of social infrastructure that has a bearing on both economic and social development in the region. Inadequate public investment in housing over the last few decades have paid the way for greater involvement of private developers in housing construction as well as unregulated and unauthorized construction of housing units including squatting in many parts of the region. It particular in and around Colombo.

Poor and unregulated housing development poses a major public health challenges. While a more decentralized development pattern will reduce rural urban migration, development of housing in a more planned manner in peripheral urban centers could help avoid unplanned housing development in the region in the near future.

The nature and demand of housing varies across social strata. While on the one hand, higher income group's demand up market housing such as luxury apartments, condominium complexes, etc., the poor and marginalized cannot have access to land and housing in the open market. The development of social housing to meet the demand for accommodation from the lowest stratum of society is critically important to avoid quitting, unauthorized construction and homelessness everywhere, in particular urban centers.

On the other hand, given the scarcity of land in the Western Region, emphasis has to be on building integrated housing settlements in both rural and urban areas where multi-storey, walk ups can provide descent accommodation to low income and marginalized groups. While the removal of unauthorized construction on public land and reservations cannot be avoided, the displaced need to be accommodated in well planned integrated settlements in different parts of the region.

Creating income and other opportunities in peripheral areas as part of the megapolis development plan can be expected to facilitate a more healthy distribution of population between urban and rural areas in the future, leading to a reduction of population pressure on already congested parts of the region.

7.1.1 Housing Stock & Deficit

The proportion of housing in the Western Region in 2012 was 28.1 % out of the total in the country. The percentage increase in the housing stock between 1981 and 2001in the Western Region was 71 %. This included the increase of 200,000 and 210,000 in both Colombo and Gampaha Districts respectively.

During the intra-censal decade of 2001 – 2012 the total increase in the Western Region was 25 % with Gampaha and Kalutara districts recording an increase of 25.8 % or 122,827 units and 23 % or 56,587 respectively. The increase in Colombo district was only 19 %.
The number of occupied housing units in 2012 was 1,463,595 which was an increse of the housing stock from 2001 t0 2012 by 22.5%. however, there was a deficit of 150000 houses in the Western Region Megapolis area in 2012 for people living in underserve settelments. (USS)

Table 7.1: Occupied Housing Units of Western Region

Region/ District	Number of Occupied housing units	Percentage of the Country
Colombo District	562,550	10.8
Gampaha District	598,674	11.5
Kalutara District	302,371	5.81
Western Province	1,463,595	28.11
Sri Lanka	5,207,740	100

Source: - Department of Census & Statistics

Table7.2 : Occupied Housing Units and Inter - censal Increase 2001 – 2012

Region/ District	Occupied Housing Units		Increasing of Housing	
	2001	2012	Number	Percent
Colombo	473,045	562,550	89,505	19
Gampaha	475,847	598,674	122,827	26
Kalutara	245,784	302,371	56,587	23
Western Province	1,194,676	1,463,595	268,919	23

Source: - Department of Census & Statistics

Table7.3 : Occupied Housing stock within the Western Region

Year	Housing Stock
1981	698,866
2001	1,194,676
2012	1,463,595
2020	2,136,542
2025	2,530,832
2030	2,905,862

Source: (1981-2012)Department of Census & Statistics; (2020- 2030) Projected by WRMPP

According to survey carried by UDA this includes 66,000 – 75,000 slum and squatter households from the Colombo Municipal Council (CMC) which is approximately 50% of the population of the City of Colombo. It should be noted that 1,500 such pockets of slum and squatter concentrations occur in nearly 1,000 acres of land within the CMC limits. Approximately, 12,137 families live in USSs in Dehiwala Mount Lavinia, Kotte, Kolonnawa, Wattala, Sri Jayawardenepura Kotte, Maharagama, Homagama, Kalutara and Moratuwa Local Authority areas.

Owing to migration, the demand for housing in the Megapolis is expected to increase and unless prompt action is taken, the deficit would amount to 1 Million (with a 1% rate of obsolescence) by 2030.

Development activities in the region involve a certain amount of displacement. People who are displaced will be resettled according to the National Involuntary Resettlement Policy of 2001 approved by the Cabinet.

7.1.2 Housing Type & Needs

Social Housing and Low Income Housing

Over fifty percent of the Colombo city population lives in shanties, slums or dilapidated old housing schemes, which occupied nine percent of the total land extent of the city. A survey which is being conducted at present by the Urban Development Authority has identified a total number of 68,812 families living in 1,499 community clusters (underserved settlements) which do not have a healthy environment for human habitation and access to basic infrastructure facilities such as clean water, electricity, sanitation etc. Relocation of these families in new housing schemes with acceptable standards will be one major step in the direction of transforming Colombo into a world recognized city with a clean and pleasing environment to cop up the city development plan objectives.

The Social & Low income community regeneration programs are urgent; specially to release the economic corridors occupied by them. These housing complexes need to include following functionalities.

- Housing units, well separated privacy preserved buildings {tall structures may be needed to reduce the building footprints.}
- Ground level for parking & gathering
- Community hall for functions & events at cost
- One ward, OPD & clinics affiliated to nearest hospital
- Nearby school, montessori school & day care centers which need to be used for adopting the new generation for an equitable society
- Shopping area for commodities
- Building area opened for investors to put up light industries and to continue their self-employment
- Areas for leisure/ recreation/ play/ green garden
- Transport node and access ways with defined transport mode
- Waste handling/ sorting unit
- Sewer handling system; as number of houses built in small area, where there is no pipe borne sewerage system, the sewer need to be treated or separate discharging water
- Communication points, Wi-Fi facilities

Table 7.4 Types of Underserved Housing Units in the City of Colombo

	Types of Settlement	Numbers	Precentsges
1	Slums	26,718	39
2	Shanties	14,532	21
3	Low Cost Flats	15,224	22
4	Relocated Houses	8,896	13
5	Old Dilapidated Houses	2,753	4
6	Unplanned Permanent dwelling	692	1
	Total	68,815	100

Under the low cost housing program, already a total of 17,408 housing units are under construction or completed. Of the above total 4,937 units have been completed and another 4,937 units are under construction in phase I & another 7,719 units are under construction in phase II. The total estimated cost of construction of 68,815 units are given in table 7.4, has been estimated as Rs. 500bn.

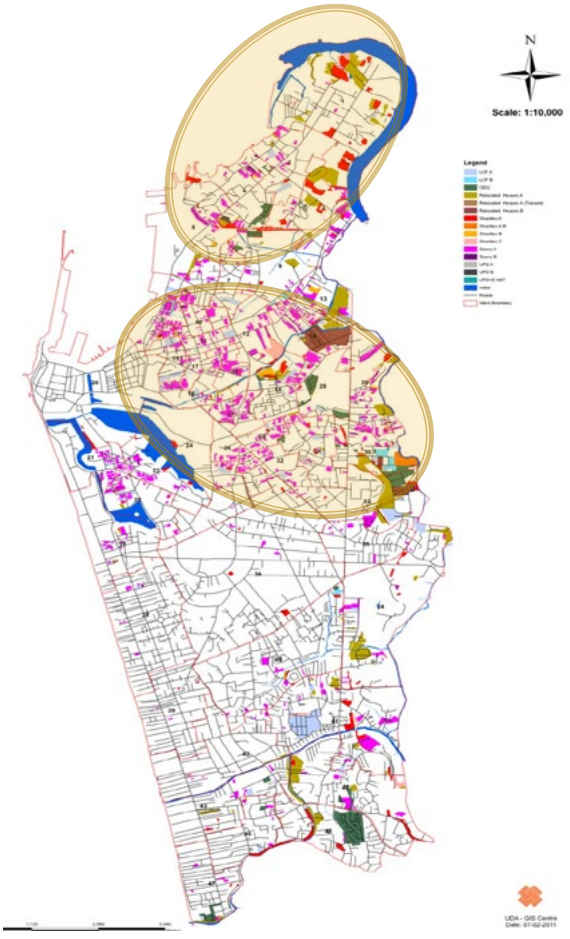


Fig 7.1. Colombo Under served Settlement Area

Middle Income Housing

The household income levels have increased almost 5 fold during the past decade ending 2014. Today about 60% of the country's households can considered as the 'middle class'. It amounts to 3.2 mn in the whole country, and about 940,000 households in the Western Region, according to the Household Income and Expenditure Survey of 2013. The richest and the middle class households at both at the national and regional (Megapolis) levels account for over 90% of the national household income.

The middle class is expanding the society and mainly consist of public & private sector employees. With proper housing schemes & facilities the majority is expected to be these housing defining an equality within the society. Middle class housing complexes are advocated to have following features.

- Housing units, well separated privacy preserved buildings {tall structures may be needed to reduce the building footprints.}
- Ground level for parking & gathering
- Community hall for functions & events at cost
- One ward, OPD & clinics affiliated to nearest hospital
- Paying ward, OPD & consultations affiliated to a private hospital
- Nearby School, Montessori school & day care center
- Day care center for old & feeble
- Shopping area for commodities
- Building area opened for investors to put up light industries
- Areas for Leisure/ Recreation/ Play/ Green garden
- Transport Node and access ways with defined transport mode
- Waste Handling/ sorting unit
- Sewer handling system; as number of houses built in small area, where there is no pipe borne sewerage system, the sewer need to be treated or separate discharging water
- Communication points, Wi-Fi facilities

Luxury Housing

Luxurious housing complexes caters for a different market segment and their needs should be addressed through following functionalities. These houses should be profitable ventures.

- Luxurious housing units, well separated privacy preserved buildings {tall structures will be needed} with panoramic views
- Drive in parking
- Halls for business meetings & other events
- Catering & dining places
- Paying ward, OPD & consultations affiliated to a private hospital
- Montessori school & day care center
- Day care center for old & feeble
- Shopping area for services & goods
- Areas for leisure/ recreation/ play/ green garden
- Extended recreational activities such as boats, kayaks, activities on water
- Transport node and access ways with defined transport mode
- Waste handling/ sorting unit
- Sewer handling system; as number of houses built in small area, where there is no pipe borne sewerage system, the sewer need to be treated or separate discharging water
- Wi Fi, satellite TV etc

7.1.3 Action to be taken

Law Enforcement

- Enforce regulatory environment to foster optimum land-use by providing standards, criteria, and infrastructure for multistoried residential development and urban renewal.
- Implement an adequate legal, regulatory and institutional framework to achieve well regulated controlled development.
- Develop greater monitoring and enforcement of regulations,
- Establish and enforcing required measures for the supervision and maintenance of environmental quality.
- Strengthen regulatory and institutional mechanisms of local authorities and government agencies to arrest the problem of encroachment of land and squatting in the urban centers.
- Engage and encourage private sector developers and financial institutions in investment on housing, urban renewal and infrastructure development and develop appropriate market based mechanisms for them to ensure returns for their investments.
- Remove all legal impediments that discourage the private developers and property owners. (Sections of the Condominium Act, should change condominium corporation's and property owner's power and authority to have, register and enforce a lien against a unit owner's property on account of nonpayment of rentals, violation of agreements, nonpayment of common expense contributions without any form of judicial process. In short, this is an extraordinary power).
- Condominium management corporations of mix development complexes (Retail, shopping, Offices, residential etc.) should allow to take decisions in relation to improvements, renovations, refurbishments etc. with the consent of majority members instead of 100% agreement.

Individual House Builders

- Supply of building materials at affordable cost.
- Deregulate the laws and regulations; reduce the conveyance fee pertaining to transfer of lands.
- Promote the secondary housing market.
- Increase accessibility for housing finance at lower lending rates.
- Create awareness among the public on house building technology, methods, law and regulations, markets, financing etc.
- Rent revenue arising from any house constructed by a person, who is used solely for residential purposes; be exempt from income tax for 10 years.
- In the case of converting a house into two or more residential units, the rent arising from those units are exempted from income tax.

Housing Finance

- Providing incentives for households to mobilize and invest their own savings.
- Enabling access to EPF and ETF funds for housing.

- Enable HDFC to participate along with SMIB to mobilize ETF and EPF funds to commit for housing finance.
- Increase access to credit at lower interest rates for individual house builders.
- Housing financing assistance at a affordable cost.
- Increasing the availability of funding in housing finance market by inviting banks, insurance companies, EPF, ETF, and foreign donor agencies to invest in the shelter sector.
- Develop markets in mortgages and other housing and land related financial securities.
- Encourage securitization of lands as a means of financing condominium housing and real estate development financing.

Market Based Housing Development Strategies

- Undertake urban renewal projects to reduce or control slum and shanty settlements within the City of Colombo & outskirts and other urban places.
- Release State lands for commercial and urban renewal according to urban development strategies enabling the market forces to advocate the process.
- Encourage re-housing of slum and shanty dwellers using market based solutions to finance both re-housing and development of recovered lands.
- Encourage market based financing instruments created as a measure of financing such projects.

Small and Micro-enterprises

- Collaboration with specialized institutions like Micro-enterprise Development Authority, Vocational Training Institution, NGOs and other agencies to assist the beneficiaries of the low income settlements on capacity building and venturing into small and micro enterprise development activities as a part and parcel of the overall social mobilization process in all enabling and market based housing and urban poverty reduction strategies.
- Giving priority in funding allocation for such projects including environmental management components by the communities.

Private Sector Participation

- Encourage private property developers to invest in construction of houses for middle and upper middle-income people by providing them with buildable lands, offsite infrastructure, financing on special terms and conditions.
- Provide large extents of lands between 10 – 100 Acres by the state (through acquisition or vesting of State lands) to both the NHDA and the Private Sector to develop housing estates.
- Encouraged the private property developers, employers and other stake holders to invest in construction of houses for employees of middle and lower-middle income groups by providing them following incentives and concessions:.- Low cost housing funded through ETF with a minimum investment of Rs. 50 million and 50% of housing units to be made available to employees.

Duty free imports,

- Stamp duty on buying and selling of houses and housing mortgages reduced to Rs. 1 for every Rs 1,000/=.
- For the construction of at least 100 housing units in not more than 3 locations with an investment of over Rs. 50 million be given 7 year income tax holiday while for the investment over Rs. 100 million or more same concession for 10years including the exemption from the custom duty for importation of project related items.

- Buy back guarantees to the projects in the case of liberation of land through rehousing of people encumbered in underserved settlements in Colombo as a measure of recovery of construction cost through sale of such lands.
- Provision of state owned lands to BOI approved property development projects on concessionary terms where the developer pay for 51% of the land value while GOSL holds 49% as its equity share of the project in the case of joint ventures.
- Provide financial incentives and BOI status for private sector developers to design and develop the areas identified for urban renewal projects.
- Concessions and incentives to domestic construction contractors to encourage for more housing and to reduce cost.
- Reduction of income tax from 35 to 15% for domestic construction firms.
- Set up a guarantee fund by GOSL for the benefit of domestic contractors.
- GST exceptions the supply, sale, and rent of residential houses.
- Full infrastructure up to the site by the BOI for the private sector developers who opt to construct over 300 units of houses in a single project, at affordable prices, for middle and lower middle classes.
- Harmonization of all indirect taxes within the GST system under the revenue reforms.
- Tax breaks to be replaced with tax deductible allowances geared to the amount of equity capital invested in new projects of high economic priority.
- Provide direct access to donor funds by the private sector in specified priority areas.
- Encourage application of modern low cost building technologies that reduce per unit housing cost.
- Encourage public-private partnerships in urban renewal projects.
- Giving incentives to private sector to venturing into environmental management and infrastructure development, management of the human settlements.
- Create conducive environment for effective private-public sector participation through removal of legal impediments and unnecessary administrative procedures.
- Privatization of management of the urban services including water, sewerage, road development, building material supply etc.

Other Suggessions

- Provisions of state lands owned by NHDA at 50% of the market price to government employees/artists/scientists and other professional groups etc. to construct their own houses.
- Increase the supply of housing at affordable prices in the market by enabling private sector venturing into housing.
- Supply of state lands owned by Land Commissioner to low income needy families upon recovery of nominal rental under 30 years lease, for them to construct their own house.
- Direct supply of building materials such as roofing sheets and tiles to low- income needy families on free grant basis to enable the beneficiaries to construct their own houses.
- Introduce necessary amendments to Municipal Council Ordinance/Urban Council Ordinance and other relevant Acts to give away cumbersome and tedious procedure in granting ownership to occupants in their housing schemes.
- Provide adequate coverage in the legislation relaxing Rent Act, to safeguard the tenure rights and interests of the private sector in order to facilitate rental housing market.
- Land tenure regularization process in Colombo and other urban places to make compatible with the UDA law.
- Commercial banks to recognize the housing sector as lending priority area.
- A method should be introduced to obtain



the loan on a reasonable interest rate, affordable to low income groups.

- Long processing procedures, procedures followed by state owned housing financing agencies has to be relaxed.
- Alternative methods should be adopted to overcome shortcomings in the title deeds.
- Strict loan recovery discipline to be maintained by NHDA without allowing unwarranted political interference .

7.1.4 'MAHAMAGA MITHURO' –FROM 'STREET TO HOME' – a PROJECT FOR REHABILITATION OF BEGGAR FOLK

The objective of this project is to rehabilitate beggar folk and effectively integrate them into the society. This program is designed to rehabilitate them by way of developing their skills in different sectors through education and vocational training and, effectively harness their inputs to the mainstream economy rather than allowing them to be dependent on others.

In the meantime this initiative is also expected to facilitate the efforts for beautification of the city.
According to a survey conducted in the Municipal Council, Urban Council and Pradeshiya Sabha areas in Colombo district, approximately 405 begging people have identified. The ministry, with the help of other relevant ministries, departments and non-governmental organizations; has attempted some solutions by forming committees for children and mothers and committees for people with mental disabilities.

According to the recommendations of above committees, it has been decided to direct the begging people to the existing rehabilitation center in Ridiyagama, Hambantota after repairing the available components and reconstructing the lacking facilities. And there is a proposal to construct new rehabilitation homes according to the demand for space with the amount of begging people. Two schools (nonfunctional) in Homagama area have already being identified to convert into hostels to accommodate street children and mothers after vesting the ownership of those lands with the ministry.

7.1.5 Caring For Stray Animals

The stray animals mostly stray dogs and cattle are also identified as a significant issue that adversely affects the visual attraction of the city.

According to a survey conducted in Municipal Councils, Urban Councils and Pradeshiya Sabha areas in Colombo district, approximately there are about 16509 dogs and 830 cattle which are straying in and around Colombo city.
Under the above project, a solution has an identified to give proper caring to those stray animals which also will also benefits Colombo City beautification project. The proposed caring methods are follows;

- Handing over the stray cattle to the persons who are willing to take care of them (eg. Temples – Buddhist and Hindu, farmers from other parts of the country etc)

- 'Adopt a dog concept' or center for dog caring with the help of NGO or any other suitable financing method.

7.2 HEALTH SECTOR

7.2.1 Introduction

Sri Lanka holds a widespread network of healthcare institutions by both state and private sector ensuring easy access to a reasonable level of healthcare throughout the country. A healthcare facility can be found on an average not further than 1.4Km from any home and free Western type government health care services are available within 4.8km of a patient's home.
Ayurvedic health care is provided both by public and private sector. Total preventive care is provided by public sector whereas 95% of the inpatient care and 50% of the outpatient care is provided by the state health care system. The remaining 5% of the inpatient care and 50% of the outpatient care is provided by the private health sector.

7.2.2 National Health Policies

The current national Health policy is based on an evidence based process that was carried out to develop the health master plan (HMP) of 2007 – 2016 ensuring the preservation of a free health system.

Health Master Plan is designed to support Sri Lanka's overall economic and social goals. It aims to facilitate equity through ease of access to health services, improve productivity and ensure that resources allocated to health result in a healthier population that is able to contribute to the economic and social wellbeing of the country. The predominant aim of improving health status and reducing inequalities will be achieved by the five strategies, namely:

- To ensure the delivery of comprehensive health services, which reduce the disease, burden and promote health;
- To empower communities (including households) towards more active participation in maintaining their health;
- To improve the management of human resources for health;
- To improve health financing, resource allocation and utilization; and
- To strengthen stewardship and management functions of the health system.

7.2.3 Health Care Facilities in Western Province

There are 635 medical institutions with inpatient facilities. There were 461 Primary Health Care Unit and 338 MOH areas in Sri Lanka in 2013.

When considering Western Province, In Colombo, Gampaha and Kalutara districts there are 33, 24 and 21 hospitals respectively. Of the 18 Teaching hospitals in the country 8 are located within Western Province. Summary description of all types of health care facilities are stated as follows.

Table 7.5 Distribution of Government Medical Institution by District in WP, December 2013

District Name	Teaching Hospital		Provincial General Hospital		District General Hospital		Base Hospital Type A		Base Hospital Type B		Divisional Hospital Type A		Divisional Hospital Type B		Divisional Hospital Type C	
	Ins	Beds	Ins	Beds	Ins	Beds	Ins	Beds	Ins	Beds	Ins	Beds	Ins	Beds	Ins	Beds
Colombo	7	7855					2	1043	1	308	1	104	6	396	2	64
Gampaha	1	1523			2	1558	1	602	2	277	4	597	1	76	7	213
Kalutara					1	834	3	946	1	169	2	196	8	596	6	150
Sri Lanka	18	21995	2	2578	17	10295	22	7976	46	7808	46	4989	134	9506	307	7932

Table 7.6 Distribution of Government Medical Institution and Beds by District in WP, December 2013

District Name	Primary Medical Care Units and Maternity Homes		Other 1		Total Hospitals		Beds Per 1000 Population	Primary Medical Care Unit	MOH area
	Ins	Beds	Ins	Beds	Ins	Beds			
Colombo	5	NR	9	3555	33	13325	5.7	28	13
Gampaha			6	1175	24	6021	2.6	45	16
Kalutara					21	2891	2.4	9	12
Sri Lanka	14	163	29	4926	635	78168	3.8	461	338

Source: - Medical Static Unit

Health manpower

The total number of Medical Officers in the country increased to 15,910 in 2012. Accordingly, medical officers per 100,000 populations also increased. In 2012 this figure was 78 as compared to 71 in 2010 and the highest figure recorded ever.

In the western Province 540 Consultants in curative sector, 8354 medical officers and 386 dental surgeons serve in government health institutions.

The total number of nurses serving in health institutions was 36,486 in the country. This was 180 nurses per 100,000 populations. Most specialized units are situated in Colombo district, it is having more than 300 nurses per 100,000 populations Although Gampaha and Kalutara have only 100-199 nurses per 100,000 populations.

A shortage of qualified paramedical staff,

such as Pharmacists, Medical Laboratory Technicians, Radiographers, Physiotherapists and ECG technicians still exists in all three districts.

Disease surveillance is one of the main strategies in disease prevention and control in communicable diseases. During the year 2012, 44,461 cases of DF/DHF and 181 deaths were reported (0.40% CFR). The highest ever recorded number of cases in a given year. Also Leptospirosis, Typhus Fever and Enchephalitisis are more common in Gampaha whereas Kalutara district displays a higher incidence of dysentery cases and District of Colombo shows higher incidence in other diseases.

7.2.5 Major Issues and proposed Interventions for Health Sector in Western Region

Non Communicable Diseases (NCD) – Acute

Issues

- Traumatic Injuries
- Road traffic accidents the prime reason for hospital admissions in the WP
- Ignorance of safety factors in day to day activities.

Responses / Interventions

- Establish accident and emergency units in each category of hospital in high risk areas
- Capacity development of health staff to handle emergency situations
- Improve facilities in health institution for rehabilitation of patients after acute management of traumatic injuries.
- Establish Rapid Respond command Centers and teams to help public in handling emergency situations.
- Strict implementation of road safety regulations and proper maintenance of road network.
- Programs for drivers to inculcate a disciplined driving culture.
- vTrain community on "basic life support" skills (drivers, child care givers, office staff, and industrial workers).

Non Communicable Diseases – Chronic (NCD)

Issues

- Diabetes
- Hypertension Cardiovascular disease
- Cerebrovascular injuries are prime causes for hospital deaths in WP
- Cancers
- Chronic Respiratory Diseases
- Smoking
- Beetle and tobacco
- Use of alcohol, Unhealthy diet
- Lack of physical activity.

Responses / Interventions

- Health promotion for adopting healthy lifestyle among public.
- Inculcate physical activity enhancing culture and establish more public gymnasiums, walking paths and other infrastructure.
- Strengthen the local hospitals for early detection of common NCD
- Capacity building of health staff especially physiotherapy, occupational therapy and other rehabilitation services.
- Establish stroke rehabilitation centers in peripheral hospitals ensuring easy public access.
- Promotion of local production of pharmaceutical drugs.
- Uninterrupted supply of essential drugs

at all hospitals.

- Implement healthy canteen policy at schools and work places.
- Screening programs for high risk population and early diagnosis
- Strengthening facilities at current Cancer institutes.
- Establishment of more specialized cancer treatment units in peripheral hospitals for diagnosis and treatment of cancers
- Programs to educate public to avoid beetle, tobacco, alcohol and other carcinogens
- Enforce no smoking areas in public places

Emergence of mental health

Issues

- Depression
- Suicide among public due to inability of coping day today stresses
- Loneliness

Responses / Interventions

- Public awareness programs for detection of common mental illnesses.
- Improve facilities at institutions for case management
- Improve accessibility for counseling services.
- Improve social support services for affected persons
- Establish more rehabilitation centers, half way homes for socialization after treatment.
- Help lines for counseling services for school children and public
- Establish professional counseling service for school children within school premises.

Respiratory Diseases

Issues

- Asthma
- Viral influenza
- Vesting

Responses / Interventions

- Awareness programs for general public regarding prevention of respiratory diseases.
- Improve curative and diagnostic care facilities for treatment of respiratory diseases in paediatric and medical wards.
- Uninterrupted provision of drugs and devises(inhalers) to hospitals
- Implementation of air quality regulations.
- Implementation of air quality regulations and use of Personal Protective Equipment at industrial settings
- Improve housing facilities in urban areas.

HIV & Sexually Transmitted Diseases

Issues

- Migration
- Tourist industry
- Change of social behavior

Responses / Interventions

- Conducting awareness programs among high risk categories for prevention and early case detection by periodical volunteer screening.
- Improve Surveillance and Detection
- Expand preventive interventions
- Expand treatment services
- Special screening for foreigners who obtain employment visa

High incidence of Dengue and Tuberculosis

Issues

- High density of populated residential areas.
- Poor waste management
- Lack of drainage facilities
- Lack of sanitary facilities.
- Poor housing conditions

Responses / Interventions

- Strengthening of hospital facilities and training of staff for proper case management in high risk areas.
- Proper town planning with garbage disposal and sanitation facilities.
- Enforcement of law to prevent dengue breeding
- Introduction of advance diagnostic laboratories in each district
- Improve housing facilities in urban areas preventing overcrowding and ensuring adequate ventilation.

Family Health Programme

Issues

- Maternal Health
- Child Health
    - Low birth weight
    - Under 5 malnutrition rates.
    - Malnutrition among school children are high in WP
    - Childhood Obesity

Responses / Interventions

- Improve antenatal and perinatal services
- Improve Emergency Obstetric care facilities in hospitals
- Strengthen programs to improve maternal Nutrition
- Facilities for genetic counseling to reduce adverse effects on maternal and new born
- Iron and micro nutrient supplementation for school children
- Conduct Nutritional education programs in schools
- Food supplementation programs for selected groups of children with malnutrition and at risk of malnutrition
- Physical activity regulation for school children.
- Promoting team and individual sports activity.
- Conduct nutritional awareness programs in schools
- Implement healthy canteen policy in schools
- Introduce low sugar milk and other beverages to the market
- Regulations to control salt and sugar levels in processed food

Social and unhealthy behavioural pattern of the people

Issues

- Drug and Alcohol abuse
- Dental diseases
- Occupational Health and Internal Migrants
- Rabies
- Lack of support to families of migrant workers
- Increasing Elderly population
- Eye care
- Blindness and visual defects are common in elderly population
- Lack of proper regulations for cosmetics

Responses / Interventions

- Improve hospital based curative services.
- Rehabilitation of alcohol & Drug abuse victims.
- Counselling services.
- Special programmes in schools and school leavers in avoidance of drug and alcohol.
- Improve primary dental care services
- Programmes to improve maternal and adult dental services.
- Programmes for school children to protect

their teeth.

- Increase factory and work place visits by regulatory authorities
- Workplace based physical activity programmes.
- Disaster management preparedness guidelines to be implemented at workplaces.
- Programmes to ensure mental wellbeing of workforce
- Control of stray and community dog population
- Education programmes for public regarding prevention of rabies
- Promote responsible pet ownership.
- Ensure Public Health Midwives keep close monitoring of health status of such families and refer when necessary to relevant authority.
- Launch an integrated programme with Foreign Employment Bureau, Ministry of Labour, Department of Social Services and Ministry of Health to ensure safety and welfare of the family members
- Implement elder and disability friendly buildings, Transport facilities (trains, buses, train and bus stations) and other infrastructure facilities.
- Provide nutritional supplementation and social assistance to low income holders
- Train caregivers for home-based elderly care service.
- Establish more elderly day care services.
- Programmes encourage elders to engage in social activities
- Establish more eye units with consultants in peripheral hospitals
- Improve facilities and reduce waiting time for eye surgeries
- Develop Cosmetic regulatory policy and implementing authority

Hospital Administration and Health work force

Issues

- Shortage of health staff in peripheral areas.
- Shortage of nurses and paramedical staff
- Overcrowding of major health institutions and underutilization of peripheral health institutions
- Proper disposal of clinical waste and radioactive waste from hospitals
- Inadequate regulations to monitor private medical service

Responses / Interventions

- Improve accommodation and other facilities for health staff in peripheral areas.
- Establish a national institute for health work force training
- Pathway for professional development for all staff categories
- Redistribution of services in hospitals according to the current health needs
- Upgrading of services in currently available hospitals
- Uniform standardization of services provided by the Out Patient Departments(laboratory, medication)
- Uniform method to be followed by all hospital regarding management of clinical waste by segregation from normal waste.
- Incinerator facilities in identified institutions to be established
- Automated laundry facilities to be provided to all hospitals ensuring non pollution of public water sources
- Ensure only qualified medical officers and other staff categories are employed.
- Price ceiling for common Investigations, procedures and surgeries.
- Quality of service to be monitored.

7.2.6 SUGGESTIONS

- ### Promotion of local production of pharmaceuticals

Local and foreign technical expertise could be sort to produce commonly utilized drugs and other supplies to health sector.

- ### Establishment of Rapid Response Command Centre

This center would help the community to inform health and non-health (road traffic accidents, injuries, poisoning, violence, natural disasters) emergencies and seek assistance of ambulance services, police and Fire brigade. Mobile paramedical staff has to be trained and located in health institutions to cover the entire WP.

- ### Integration of Western and Ayurvedic medical services when possible

For rehabilitation of patients after injury and Cerebro Vascular Accidents (stroke), medical tourism and in other instances integration of both systems would enhance patient satisfaction and quality of care.

- ### Private public partnership for care giving services

Rehabilitation after acute state of many disease and natural ailments in elderly population would need home base care giving services. Currently this is carried out either by a family member or by a untrained caregiver resulting loss of working days for the family member and substandard care for the patient. Training family member or paid caregivers would improve patient care and this could be used as a service coordinated by public private partnership.

- ### Integrate CMC health services with national health services

Currently Colombo Municipal Council primary health care services are provided by CMC medical unit. Integration of health services in CMC with Colombo Regional Director of Health Services would provide uniform health service throughout WP

- ### Proper town planning with water, sanitary facilities and garbage disposal

When creating Megapolis in WP it is essential to plan to supply water for drinking and other purposes, adequate sanitary facilities for housing and building complexes, creating adequate public toilets, and proper methods of garbage collection and disposal. These facilities should be adequately planed for resident and commuting population In WP. People living in urban unhealthy dwellings should be relocated to proper housing complexes confirming to proper living standards. Implement transportation plan integrating train and bus services ensuring easy access to any part of the province. Transportation modalities should be in par with needs of elders and disabled safeguarding independent movement.

- ### Strategies for Health Sector proposed development in Western Region by 2030

Upgrade the facilities in existing hospitals and expansion of existing hospitals

- Establish accident and emergency units in each category of hospital in high risk areas
- Improve facilities in health institution for rehabilitation of patients after acute management of traumatic injuries
- Establish rapid respond command Centers and teams to help public in handling emergency situations.
- Establish stroke rehabilitation centers in peripheral hospitals ensuring easy public access
- Establishment of more specialized cancer treatment units in peripheral hospitals for diagnosis and treatment of cancers
- Establish more rehabilitation centers, half way homes for socialization after treatment
- Improve antenatal and perinatal services
- Improve Emergency Obstetric care facilities in hospitals
- Establish more eye units with consultants in peripheral hospitals
- Improve accommodation and other facilities for health staff in peripheral areas.
- Incinerator facilities in identified institutions to be established
- Automated laundry facilities to be provided to all hospitals ensuring non pollution of public water sources
- Increase bed capacity in all hospitals.
- Improve facilities in health institutions for patient management
- Introduction of advance diagnostic laboratories in each district
- New-born ICU Bed Availability System
- Improve facilities in neonatal units
- New-born screening for congenital Heart Disease/ Thyroid diseases

Capacity building of health staff

- Increase no of paramedical staff to the all category of hospitals in the region. Such as Pharmacists, Medical Laboratory Technicians, Radiographers, Physiotherapists and ECG technicians etc.
- Establish a National Institute for health work force training

- Upgrading of services in currently available hospitals
- Uniform method to be followed by all hospital regarding management of clinical waste by segregation from normal waste.
- Incinerator facilities in identified institutions to be established
- Automated laundry facilities to be provided to all hospitals ensuring non pollution of public water sources.
- Promotion of local production of pharmaceuticals
- Integration of Western and Ayurvedic medical services when possible
- Private public partnership for caregiving services
- Integration of health services in CMC with Colombo Regional Director of Health Services would provide uniform health service throughout WP

7.2.7 HEALTH SERVICES - POLICIEY INTERVENTIONS

Health System Development

- Integrate CMC health services and national health services
- It is essential to integrate the service provided by the local government authorities, educational services, Ministry of energy and Power, Ministry of transportation and many other parties to accomplish this task. The approach of "Health in All Policies"(HIAP) should be adopted by all stakeholders.
- A separate coordination unit should be established for continuous monitoring and surveillance of health, environmental, socio-demographic, economic and industrial data.
- Quality of service at the private hospitals to be monitored.
- Integration of Western and Ayurvedic medical services when possible
- Private public partnership for care giving services

Curative services

- Upgrade services in hospitals in the relevant areas:

- Establish accident and emergency units in each category of hospital in high risk areas

- Establish Rapid Response command Centers and teams to help public in handling emergency situations.

- Improve facilities for screening and treatment of Non Communicable Diseases (hypertension, diabetes, respiratory illnesses, heart diseases and cancer)

- Establish stroke rehabilitation centers in peripheral hospitals ensuring easy public access. Establishment of more specialized cancer treatment units in peripheral hospitals for diagnosis and treatment of cancers

- Establish more rehabilitation centers, half way homes for socialization after treatment.

- Rehabilitation of alcohol & drug abused victims.

- Introduction of advance diagnostic laboratories in each district

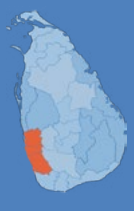
- Promote development of a primary care network using Ministry of Health and independent medical practitioners (private practitioners).
- Promote public-private partnerships to improve health services
- Establish more elderly day care services
- Establish more eye units and dental units with consultants in peripheral hospitals
- Uniform standardization of services provided by the Out Patient Departments (laboratory, medication)
- Uniform method to be followed by all hospital regarding management of clinical waste by segregation from normal waste.
- Incinerator facilities in identified institutions to be established
- Automated laundry facilities to be provided to all hospitals ensuring non pollution of public water sources.
- Price ceiling for common Investigations, procedures and surgeries in the private hospitals
- Screening facilities for HIV and STDs
- Screening facilities to cope with large influx of migrations

Preventive services

- Uninterrupted provision of essential drugs and devises(inhalers) to hospitals
- Special programs in schools and school leavers in avoidance of drug and alcohol
- Programs encourage elders to engage in social activities

Training and capacity development

- Establish a National Institute for health work force training



INVESTMENTS

- Promotion of local production of pharmaceutical drugs, biotechnology and devices

PUBLIC HEALTH MEASURES

- Enforce no smoking areas in public places
- Implementation the use of Personal Protective Equipment at industrial settings
- Enforcement of law to prevent dengue breeding
- Improve housing facilities in urban areas preventing overcrowding and ensuring healthy levels of natural ventilation.
- Food supplementation programs for selected groups of children with malnutrition and at risk of malnutrition
- Promoting team and individual sports activity.
- Disaster management preparedness guidelines to be implemented at workplaces.
- Programs to ensure mental wellbeing of workforce
- Launch an integrated programme with Foreign Employment Bureau, Ministry of Labor, Department of Social Services and Ministry of Health to ensure safety and welfare of the family members
- Legislate for all new buildings and transport facilities to be elder and disability friendly.
- Legislate to provide social support for informal workers sector, unemployed workforce, disabled and elderly, and to those suffering from illness.
- Legislations to ensure health insurance for illness suffered during work, and social facilities in the workplace.

- Provide nutritional supplementation and social assistance to low income holders

• HEALTH SERVICES

Health System Development

- Legislate for Health Impact Assessments in development of policies and planning

Curative services

- Improve healthy indoor environments in hospitals using legislations/regulations

Preventive services

- Legislate for special screening for foreigners who obtain employment visa.
- Develop Cosmetic regulatory policy and implementing authority

PUBLIC HEALTH MEASURES

- Legislate to ensure integration of Public Outdoor Recreation Space planning for city planning initiatives.
- Legislation to include designated biking tracts, pavements and walking tracts in planning.
- Legislate to promote healthy permissible levels of indoor and outdoor air quality.
- Legislate to optimize energy efficiency in housing and workplace facilities in urban areas.

- Proper town planning with garbage disposal, sanitation facilities and recycling processes.
- Regulations to control salt and sugar levels in processed food
- Regulations to ensure faculties and time for physical activity in school children and office / factory staff.
- Include signposting of urban areas to enable efficient utilization of facilities
- Maximize thermally comfortable

pedestrianized zones (i.e. vehicle free areas) within urban areas with a tree cover

- Regulations for vehicle free days in cities (e.g. Sundays)
- Laws on eateries to ensure availability of healthy foods (e.g. fruits, vegetables)
- Regulations to restrict food outlets selling calorie dense foods and drinks
- Regulations to indicate calorie amount of food items
- Regulations to restrict alcohol and tobacco sales
- Regulations to ensure network of well-lit roadways to reduce crime
- Regulations to develop sport centers, religious places, recreation facilities, community centers etc. to promote social cohesion and interactions
- Legislate to reduce noise pollution (e.g. monitoring of noise from vehicles)
- Legislate to control visual pollution (e.g.: control of reflections, glare)
- Traffic calming measures to be included in planning of urban areas
- Regulations on mass sterilization of animals, pet ownership, rabies vaccination for dogs and control of garbage to reduce dog population
- Regulations for public placement of health screens to promote health promotion messages
- Legislative measures to reduce gender discrimination and gender-based violence.

7.3 EDUCATION SECTOR

Though educational services are well developed across the country, Colombo emerged as the most important focal point for education, in particular, well developed private education in the country. Some of the government schools in Colombo are popular across the country and attract many children from all parts of the country. This has resulted in a massive expansion of the student population in Colombo, exerting considerable pressure on educational institutions as well as transport services. In fact, traffic congestion in Colombo increases considerably during the school period. This is not a very healthy situation. We have proposed to develop educational services in the peripheral areas of the region, in particular in the proposed compact cities. Establishment of model schools with all facilities or improvement of existing educational institutions can reduce the demand for Colombo schools.

Strategies proposed for development of school education

- Upgrade the facilities in each school in the western region.
- Re-design at least 3 1AB schools in every divisional secretariat division.
- Initiate at least 5 Technological labs in a school in every divisional secretariat division and allow students to follow the technological subject stream for A/L.
- Construct attractive child friendly primary schools around each secondary schools
- Construct of Fully equipped computer unit for each upper schools
- Construct of Language laboratory for each secondary schools
- Construct of Mathematics laboratory for each upper schools

Table7.7 Existing Education Instituttioons in Colombo, Kaluthara and Gampaha Disttrrict

	Colombo District	Kalutara Distrcit	Gampaha District	Total
National School (2014)	37	16	18	71
Provincial School (2014)	368	398	522	1288
1AB National Schools(2014)	35	18	17	70
1AB Provincial Schools (2014)	37	27	37	101
1AB schools (2014)	72	45	54	171
1AB Schools (2030)	72	70	65	207
1C Schools (2014)	81	70	113	264
1C Schools (2030)	81	45	102	228
Type "2" Schools (2014)	162	170	210	542
Type "3" Schools (2014)	88	122	154	363

- Construct of Science laboratory for Chemistry/ Physics /Biology for all secondary schools
- Incorporate vocational training facilities to the school leavers after A/L education.
- Establish approved sanitary standards in each school.
- Introduce and commence job oriented vocational training programs for school leavers.

a. Upgrade selected schools in urban centers that are accessible by road and/or rail such as Gampaha, Panadura alutara, Homagama and Negombo. These schools should be well equipped with Laboratories, a Computer center with Internet facilities, a playground, school farm, handicraft center, a swimming pool and library, with experienced and qualified teachers.

b.Develop Model Schools or upgrade existing ones in the 4 Townships- Mirigama, Avissawella, Horana, Matugama. Such well-equipped secondary school will have all facilities i.e. Science and Language Laboratories, playground, school farm, handicraft center and a Computer center with Internet, swimming pool, library, etc.

c.Promote Technological Education

d.Tertiary Education

Establish Outreach Campuses of the more compact Colombo, SJP, Kelaniya and Moratuwa Universities in Horana (Colombo), Yakkala (Kelaniya), Homagama (Moratuwa), Kesbewa (Visual and Performing Arts),Homagama (SJP). The Campuses would be designed with green buildings and open spaces.
In accordance with the vision and objectives of the WRMP, the purpose of establishing outreach campuses is to promote equity in tertiary education and enable youth to undertake furthercompact Colombo, SJP, Kelaniya and Moratuwa Universities in Horana (Colombo), Yakkala (Kelaniya), Homagama (Moratuwa), Kesbewa (Visual and Performing Arts),Homagama (SJP). The Campuses would be designed with green buildings and open spaces.

In accordance with the vision and objectives of the WRMP, the purpose of establishing outreach campuses is to promote equity in tertiary education and enable youth to undertake further
studies in high-demand areas, and be equipped with the right skills to ensure they are employable upon graduation.

Traditionally, Sri Lankan academic institutions follow the European approach where faculty are devoted to teaching, research, and service - the involvement of faculty in university governance, their individual disciplines and professional associations.
At present there is a need to reduce the skills gap between the demand (technical and soft

skills, language and communication skills) and supply (graduate and non-graduate youth who do not possess the right skills to enable them to gain access to employment in IT and BPO, hospitality and skilled infrastructure professionals such as engineers, architects, designers and managers). Secondly, there is a need for 'up skilling the current workforce through on-the-job training or through mentoring'.

In order to cater to these demands, the universities to integrate their traditional classroom subjects with the needs of outside organizations through the creation of outreach programs. The curriculum needs to be prepared in consultation with the business and industry leaders and the academics.

Identified priority areas for skill development vocational training.

- Impart skills- human resource development for tourism industry (Hospitality management, event management, reception, chef. tour guiding , travel arranging, leisure arranging, etc)
- Automobile electrical.
- Automobile engineering
- Computer aid designing
- Communication and media
- Nursing
- Pharmacists
- a.Medical Laboratory Technicians, Radiographers, Physiotherapists and ECG technicians etc.
- Fashion designing
- Mechanics
- Heavy vehicles and heavy machines operating
- Packaging designing
- Landscaping and gardening
- Housekeeping, kitchen stewarding, maintenance engineering
- Masonry and carpentry
- Electricals and electronics

7.4 SPIRITUAL DEVELOPMENT

'Individual Happiness' forms one of the four pillars of the philosophy that guides overall human development envisaged by all development initiatives, large and small, including the Western Megapolis, the other three pillars being Economic Growth & Prosperity, Social Equity, and Environmental Sustainability. While the material comforts in the living environment brought about by the other three pillars will certainly contribute to happiness, it will be far from the 'Happiness' derived through spiritual development.

Closely intertwined with the organized efforts to facilitate "individual happiness" will be the need to facilitate the development of the common citizen of the megapolis as a "cultural human being".

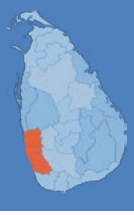
Individual Happiness achieved through spiritual development has been a cornerstone of the Sri Lankan Society for over two and a half millennia, and is deep-rooted in the Sri Lankan culture, as well as in its consciousness and identity as a nation.

Indeed, individual happiness and spiritual development had been an all pervasive guiding philosophy that had been inextricably built into spatial planning of the historical kingdoms of Sri Lanka, with Anuradhapura, which is the only city in the whole world that had remained the capitol city for over fourteen centuries while sustaining its physical, economic and social infrastructure, providing classic living testimony to the same.

This provides the rationale for not only the inclusion of a programme for 'Individual Happiness' and 'Spiritual Development Facilitation' as an integral part of the master plan of Megapolis, but also the degree of prominence accorded to it by ranking it among the Ten Mega Projects, despite its relative size in terms of the physical resources expended.

The Specific Projects identified for building of new physical facilities or improvement of the existing facilities under the 'Facilitation of Spiritual Development' Project, named 'Tranquility' include,

- Rehabilitation and Improvement of Buddhist Temples, Hindu Temple, Mosque and Church belonging to all other main religions within the Megapolis
- Establishment Centers of Meditation belonging to each religion
- Establishment of 10 full-pledged Centers for the practice of the techniques for holistic simultaneous development of physical and mental health, such as 'Yoga', and their training and education
- The programme, in addition, includes development of centers for performing arts with such a comprehensive Performing Art Centre with Multiple Galleries for different disciplines planned to be set up within



7.5 SAFETY AND SECURITY

The Megapolis has a high residential mobility since it is primarily a migrant reception area. In addition to permanent migrants there is also an influx of temporary migrants such as workers employed in the FTZs, industrial estates and in other large and small scale industrial units and in the commercial and service sectors; people working in the informal sector or those seeking employment. Thus the region has become a socially heterogeneous area with an admixture of higher, middle and lower income groups.

The proportion of grave crimes in the Megapolis had increased from 38.3% in 2005 to nearly 44.2% by 2014. Four Police divisions increase of over 10% in crime rates between 2005 – 2014 viz; Gampaha 12.36%, Mt. Lavinia 14.06%, Nugegoda 21.25% and Kelaniya 15.45%.

The most common type of crime in the region is theft and burglary that are facilitated in anonymous urban settings. The urban, suburban and rural areas in the Region are characterized by socio-economic heterogeneity, anonymity, collapse of social structures and the absence of cohesiveness among residents. Houses are left unguarded, and in minor roads and lanes houses are deserted for several hours. Strangers can enter houses easily due to ease of access without observation from inquisitive neighbours. Similarly, the presence of numerous factories, offices, shops and other work places provide ample opportunities for loitering.

With increasing population in a region, types of interpersonal violence such as child abuse and neglect, violence against women, elder abuse, sexual violence, workplace violence, youth violence and other violent crime could increase. Other types of violence that are likely to increase include contact crimes or personal crimes such as robbery or stealing property through the use of violence. It is often classified as both a violent crime and a property crime. Crimes against public order include corruption or the abuse of public power for personal gain; sexual offences and infractions, such as corruption, trafficking of human beings, firearms and illicit drug trafficking, fraud, cyber-crime and 'white collar' crimes and environmental offences.

In the Megapolis, out of 1604 drug crimes in the country, Colombo accounts for 29% (n=465) while Gampaha and Kalutara districts account for 7.4% (n=119) and 5.4% (n=87) of the total number drug crimes respectively. Accordingly, these three districts deserve special attention for the prevention and control drug offences as all the rates remain at higher level compared to the island rate. Major issues include increase in the population of drug addicts; dominance of heroin market in the illegal drug market; abuse of legal drugs; expansion of drug abuse among school children; development of criminal networks on the smuggling distribution and sale of illegal drugs and the fact that Colombo is considered as a transit point of international drug smuggling. Social Impacts and Issues related to drugs include organized crimes and criminal gang operations in the market of illegal drugs; drug market related violence and other crimes; drug dependence related violence and property crimes; negative impacts on the employability of drug addicts; family disputes, separation and domestic violence, abuse of family members; socialization issues of the children of addicted families; health issues of drug addicts and economic dependency of drug addicts on parents and others.

7.5.1 Issues and interventions related to crimes in the Western Region

Area	Issues	Proposals	Suggestions
Public Order	Development of slums and sanities	Good housing schemes	Reducing criminogenic environmental factors of human settlements
	Community disorganization in urban areas.	Socio-cultural program for the social integration of communities	Community Programs
	Higher dependence on police service for solving problems of crime and disputes	Introduction an organization of community based policing and alternative means of disputes management	Community programs for solving crime and other disputes
	Poverty and unemployment	Provision of sustainable job opportunities and increase of employment Opportunities	Employment generating programs
	Educational issues of the community. Higher dropout rates and incompletion of formal education and less commitment to the formal education	Program for restoration of primary, secondary and tracery educational involvement of the community.	Developmental programs to assure 100% schooling and pursuing higher education and vocational training
	Cultural issues. Value conflict and impact of urbanization	Proper adaptation to the urban social environment through peaceful means and negotiations on cultural issues value conflicts.	Programs designed for the education of values and other norms important for the modern urban life and restoration of cultural values of various religious, ethnic, and other heterogeneous characteristics of urban society.

- Enhancing urban safety and security through effective urban planning, design and governance. Poor planning, design and management have been identified as among the constellation of factors associated with crime and violence. This group of activities is therefore mainly about manipulating and maintaining the physical environment, which is the setting within which most crimes take place.

- Community-based approaches to enhancing urban safety and security. Activities of this nature are essentially about getting communities to take ownership of initiatives. Very often this will mean that community groups or individuals will either be the source of project ideas or will play leading roles in implementing them.

- Strengthening formal criminal justice systems and policing. This could be seen as the 'classical' approach to problems of crime and violence, regarding them as being the primary territory of the police and the criminal justice system. Initiatives in this area are also often undertaken at the city or even broader scale.

- Reduction of risk factors. These approaches tend to focus on groups that are likely to be perpetrators of crime or on groups that are at risk of being victims of crime. The aim here is either to reduce the likelihood of such groups getting involved in criminal activities or to reduce the problems faced by victims.

- Non-violent resolution of conflicts. This essentially is about seeking to manage situations in which conflicts often arise in order to reduce the likelihood of this happening or to find solutions to the problems that do not result in violence.

- Strengthening of social capital. This includes improving the ability of people, groups and communities as a whole to challenge the problems of crime and violence and the provision of community facilities that facilitate or provide more opportunities for processes of this nature (UN-Habitat, 2007).

Chapter 08
Transportation and Traffic Management

8.1 INTRODUCTION

Sri Lanka, which has earned middle-income states, has initiated several development plans in its path to earn high-income earning states, on achievement of upper-middle income states. In the process, Western Region Megapolis Planning Project (WRMPP) is in highest priority and expected intergraded development in the region, to make Western Region (WR) the economic hub of the country, facilitating geographic concentration and economic integration, while ensuring more uniform basic living standards across the country.

Recent few decades have witnessed a rapid change in the urban transport in the Country and in the Western Region (WR) particularly. The intense traffic crises in Colombo have risen up the extent of threatening the environmental qualities and economic performance.

The population of Western Region was 5.8 million in 2012. It is estimated that the total population of the Region will increase to 8 million by 2025. With the development anticipated under the New Megapolis Plan, it is projected 9.2 million in year 2035, with the planned economic growth targets. This development would further increase the transport demand.

As the nation's busiest international seaport and airport are located within the area, and expansion of such facilities are also in the pipeline, introduction of structural changes to the transport system is paramount important to make the metropolitan area a modern, liveable, environment and investor friendly area.

8.2 VISION AND OBJECTIVES OF THE COMPREHENSIVE TRANSPORT MANAGEMENT STRATEGY

The Government believes that the current policy direction is insufficient to manage and regulate the mobility needs in Western Region, and therefore a vision that will progressively take the urban transport development into a new direction is required.

The existing public transport system, which serves as an important mode of travel currently deteriorates and is unable to meet the mobility needs of the population. Strict application of transport demand management (TDM) measures such as parking restrictions, road pricing and vehicle taxation policies, to reduce traffic levels are deemed inappropriate without viable alternative ways to travel. Any attempt at a strict application of TDM initiatives may cause unwelcome social issues and adversely burden the economic activities in the area.

The Government has therefore decided to adopt urban mobility solutions as the most appropriate way forward. This approach will focus on facilitating the mobility needs for people, not vehicles, by encouraging and maximizing the use of sustainable transport modes, such as public transport and non-motorized transport (NMT).

A tag line Promoting/inclusive and Sustainable urban Mobility which agreed by the NPD as a policy, has therefore been chosen by WRMP as the key policy statement that will drive the urban mobility development in Colombo.

This initiative will promote greater accessibility and connectivity within Western Region for all modes of transport and in the same time will transform the capital city into a vibrant and liveable urban environment that supports inclusive economic growth and environmental sustainability.

The modern concept, as well as the commonly adopted model of Magapolis, is based on the premise that, if the cities in adjacent region work together can create a new urban form that will increase economic opportunity and global competitiveness for each individual city and for the nation as a whole.

The proposed Megapolis plan is aimed at transforming the whole Western Region as the most vibrant and liveable cosmopolitan Smart City Region in South Asia- creating opportunities for all its inhabitants and investors, achieving the highest environmental standard and quality of life, ensuring socio-cultural harmony, and expanding its position as the preferred location for business and industry, to accommodate about 9.2 million people by 2035 with the Colombo as the core.

To achieve this vision, the Megapolis plan promotes the polycentric & multi centric spatial structure by directing the developments towards Eastern, Southern and Northern segments of the Western region and thus spreading the development away from the Colombo core area.

The Megapolis plan proposes new major growth areas such as Aerotropolis in Katunayake, Industrial townships in Mirigama and Horana, Free Port and Logistics corridor between Katunayake and Colombo, Science & Technology city corridor between Kaduwela to Homogama, Plantation City in Awissawella, Plantation & Forest City in Matugama & Baduraliya area, Tourism resort area in Dedduwa lake, eco-tourism in Negombo & Muthurajwela and Airport city in Rathmalana as shown in Figure 5.6. These growth areas are located in the Northern, Eastern and Southern parts of the Western region and will be developed with necessary infrastructure and more land supply to create new living environment for its people.

In order to support proposed growth pattern, a poly-centric and multi centric spatial structure will be established connecting the important urban centres such as Kaduwela, Kottawa, Moratuwa, Panadura, Horana, Matugama, Aluthgama, Avissawella, Gampaha, Ja-Ela, Mirigama, Pugoda, Diulapitiya, Katunayake and Negombo, to facilitate better living environment for the residents and the commuting population in the new growth areas.

The Population and Employment forecasts for 2035 by Transport Analysis Zones (TAZ), based on the Mega City Structure Plan are shown in Figure 8.1 and Figure 8.2.

The Plan will provide efficient connectivity system for its people to have easy access to facilities and at the same time avoid overcrowding at the Colombo core.

Employment opportunities in manufacturing and service sectors will be distributed to proposed growth areas or townships to ensure that there will be jobs available near home. It is anticipated that well-planned essential facilities such as health, education and basic recreational facilities like public spaces; parks, public pool and sport facilities will be provided in easily accessible distances.

In this context, transportation sector plays a key role to support the envisaged rapid development in the Western Region. The need to take an integrated approach to plan the road development, public transport services and rail transport system as a part of the Megapolis planning process have been well recognized as essential to ensure the efficient connectivity and mobility systems for the movement of people and goods within the region and the rest of the country.

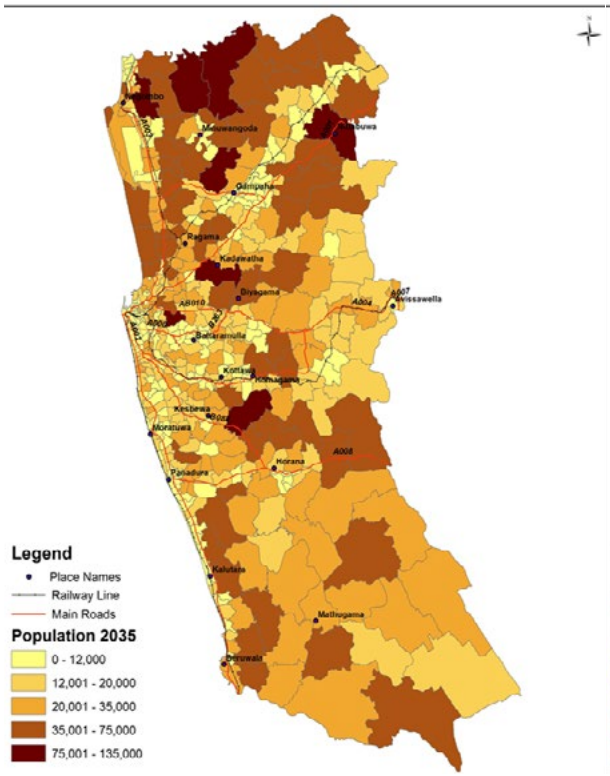


Fig 8.1: Population Forecast for 2035 by TAZ

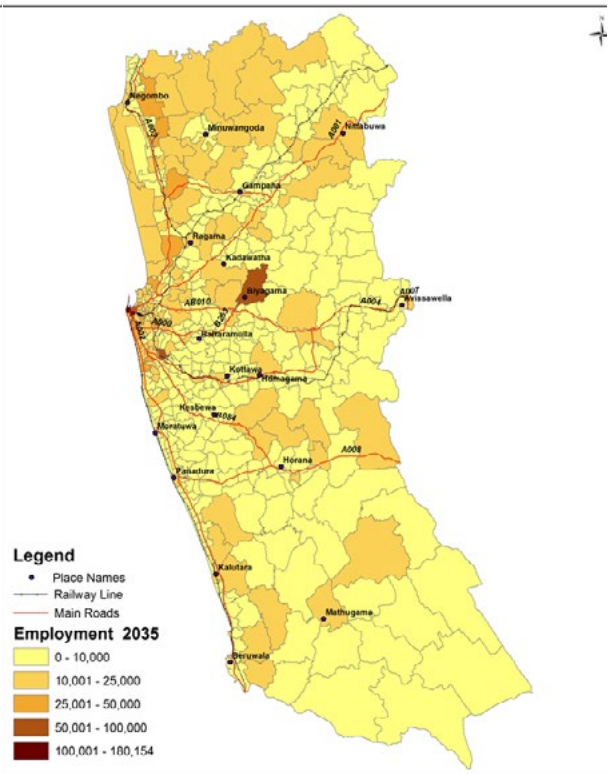


Fig 8.2: Employment Forecast for 2035 by TAZ



8.3 Transport Issues in Colombo Metropolitan Area

Number of attempts has been made for better understanding of urban transport patterns in Colombo Metropolitan area, with the view to find solutions. Any transportation master plan needs urban structure plan to forecast the transportation trends for the future. Following two recent master plan studies are considered as significant in proposing a comprehensive transport plan for the Colombo Metropolitan Region (CMR).

1. JICA ComTrans Master Plan Study undertaken by JICA in 2013/2014 formulated a comprehensive urban transport master plan for the Colombo Metropolitan Region and selected six transport corridors to implement projects in short-term, medium-term and long-term.

2. The Strategic Plan for Traffic Management in Colombo Metropolitan Region (Master Plan Review) by Ministry of Transport in 2015 prepared a transport master plan covering next 20 years up to 2035, which includes reviewing the master plan proposed by the ComTrans study. 2.

Department of National Planning has made an initiative by drafting a policy paper on urban transport strategy in Colombo by 2020/2035 in order to promote inclusive and sustainable urban mobility in Colombo. The draft policy paper has recognized that the JICA study has identified a number of public transport related issues in CMA and forms the basis of the said report and a basis for the prioritizing the investments. However both of the above transport plans have used the 1998 CMRSP structure plan with updates to accommodate potential growth centres which is contrastingly different from the proposed Megapolis Structure Plan. The JICA ComTrans was planned with a population forecast of 7.8 Million people in 2035 while The Megapolis Structure Plan has a population forecast of 9.2 million by 2035.

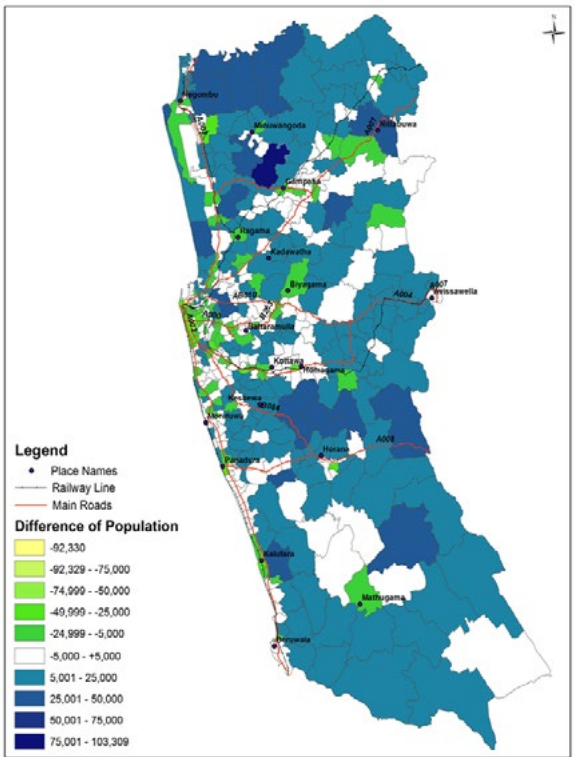


Fig 8.3 : Difference of 2035 population between the Megapolis Plan and ComTrans Plan by TAZ

Therefore it is required to reconsider the transportation solutions by the two previous studies with updated population and employment, taking the scenario under Megapolis development in to account. The both studies have used the JAICA STRADA model to forecast for the future demand of transport needs throughout the region JAICA STRADA model was re-run with the new forecasted data for 2035.

The Figure 8.3 shows the difference of 2035 population between the Megapolis Plan and ComTrans Plan at Transport Analysis Zones (TAZ). The blue coloured areas have a higher population and green coloured areas have a lower population in Megapolis Structure Plan in contrast to ComTrans Plan. These show a forecasted population difference up to 100% in the Megapolis Structure Plan in areas such as Divulapitiya and Mirigama. A similar variation is forecasted for employment for the Megapolis Plan. higher population centres are expected to generate more trips than the previous studies forecasted, while the higher employment centres are expected to attract the trips generated from the population centres. These changes in population and employment in Megapolis Plan is expected to change the trip patterns within the region.

There are seven transport corridors as shown in figure 8.4 that are radial connections to the CBD from major urban centres of CMA. The practice had been providing solution for each corridor; however people not necessarily travel just on corridors but between corridors as well. The Origin Destination (OD) desire lines as shown in figure 8.5 shows the pattern of trips within region forecasted for 2035.

This explains where people would like to travel from their trip origin. The Desire lines explain that people do not necessarily travel on corridors and actually travel between corridors as well. Therefore the technology that is selected to provide a solution to only one corridor will not be sufficient as people consider the total trip when they make a choice of selecting public transport versus private. The connections between corridors are vital to achieve the planned mode shift.

Fig 8.4: Transport Corridors in Western Region(Source: COM Trans Study

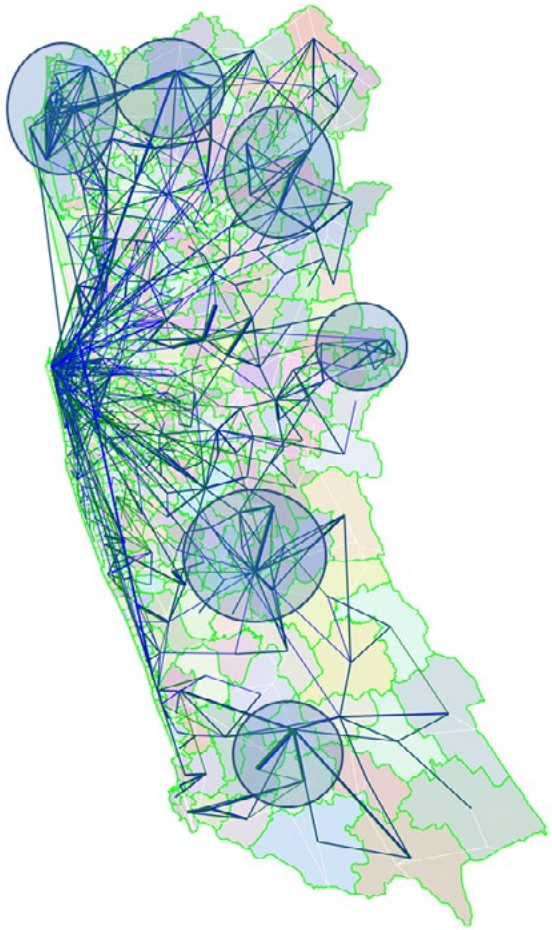


Fig: 8.5 Desire Lines for 2035 Trips between TAZ

The desire lines shows that a concentration of trips towards Colombo CBD with a cluster of lines merging to CBD. However, it also shows patterns of short trips around Mega cities shown in circles in line with the envisaged structure plan of providing employment and necessary services around the city itself.

Table 8.1 Daily Passenger Flows at the CMC Boundary – Both Directions

	Number of Passengers Entering CMC	
	2013 (ComTrans Study)	2035 (Megapolis Study)
Corridors		
Negambo Rd	245,880	761,493
Kandy Rd	437,120	966,101
Low Level Rd	150,000	201,779
Malabe Rd	348,000	656,040
High Level Rd	174,000	397,561
Horana Rd	130,000	448,505
Galle Rd	298,000	447,518
Non Corridors		
Kolonnawa Rd (B096)	89,335	136,057
Kirimandala Mw	27,051	30,933
Narahenpita Rd	47,623	135,596
Polhengoda Rd	14,857	40,700

Table 8.1 shows the number of daily passengers entering the CMC boundary. The 2013 numbers are based on ComTrans study while the 2035 projected values are based on Megapolis Transport Plan forecasted values. It shows that the passenger trips will double by 2035.

It was highlighted in both JAICA study and the subsequent master plan review that public transport improvements are required and should be the priority. The Megapolis Transport Plan also share the same view of improvement to public transport. There are different urban transport technologies available to provide solution for the current transport problems.

As depicted in figure 8.6 the identified technologies can be categorized based on cost of the technology in million US$ per kilometre and the capacity of the technology based on passengers per hour per direction (PPHPD) for a single lane/track. While the cost plays a role in economics of the intervention, the capacity plays a role in the sustainability of the intervention. An intervention with under capacity to cater for the project planning horizon is detrimental similar to intervention with a high costs.

It is vital that technologies that can cater for the total project duration is selected. The figure shows the 2015 passenger per hour per direction for selected corridors which shows that some of the technologies are almost at capacity even at current stage and some are beyond providing a solution for these corridors. Trams shown in light green in the figure which has about 5000 PPHPD is beyond providing any solution for the current problem even at 2015.

Technologies such as BRT are almost at capacity Galle Road and Negombo corridor at 2015 if only one lane of BRT is provided per direction while beyond for Kandy and Malabe corridors, while elevated or underground Metro have a huge costs associated with the technology although they can provide a high capacity. A solution might be providing two technologies to supply for the demand of each corridor as indicated on Figure 8.6 which are over the capacity for individual technology. However the potential of providing a solution with one technology has to be considered as a prior. Therefore the Megapolis transport plan focus on providing a solution with improved and modernized railway along with Rapid Transit Systems (RTS) such as Light Rapid Transit (LRT) and Monorail along with new transport modes such as inland water transport.

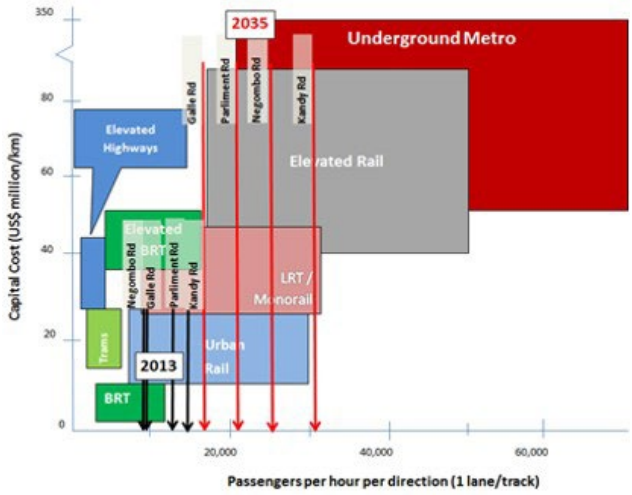


Fig 8.6 Modern Technologies and its Capacities

8.4 Sub Sector Approach For Interventions

It is planned to intervene at the following subsector level with the view to address the transport issues that are identified under JICA study and the Megapolis Development within the region. Proposals are identified under the following transport sub sectors.

1. Transport Demand Management (TDM)
2. Public Transport Improvement
3. Road Infrastructure Development
4. Environmental Sustainability

8.5 PROPOSED INTERVENTIONS

8.5.1Transport Demand Management (TDM)

Transport Demand Management plays a major role in design and operations of sustainable transport systems. Identifying the travel demand, trip purposes, travel times and travel modes it is required to define TDM strategies for the system.

The areas of interventions are such as service designs, enforcement, control and land use planning. Ultimate goals of TDM should make the travel options more affordable, reliable and convenient to the travellers. Several measures that can be introduced under the Western Region Development plan are listed in the below.

Flexible work hours:

Flexible working hours can be introduced in public and private institutions to spread peak load of the traffic flow. Employees can adjust their working time without any negative effect to the working process of the institutes.

- Develop a Pricing mechanism for Parking
- Implement 'parking metering system' to Colombo district as a preliminary stage
- Time limited parking enforced at identified roadside parking lots (e.g. 30 min Maximum)
- Provide overflow parking facility for long distance private buses
- Outsource the Towing of unauthorized parking

Benefits:

- Reduce traffic volume & congestion during peak times by shifting driver commuters to less congested hours and spreading the peak period.
- Flexible work hours allow workers to determine their own schedule times and planned their work hours.
- Office working times can be rearranged letting the employee to decide their working time.
- Increase the time period the public services are available.
- Improve passenger and rider satisfaction.
- Improve air quality in urban and suburban areas.
- Flexible schedule hours increase productivity of the employee and reduce cost of overtime and sick leave for institutes.
- Reduced road and parking lot congestion minimized wasted time on roads and frustration.
- Will reduce the heavy peak hours and traffic congestion during the peak period.

Vehicular Parking Management:

The aim of parking management is to reduce vehicle trips by controlling on street parking, and make it more expensive, on the assumption that people will change modes or carpool etc.

Actions to be taken:

- Develop a Pricing mechanism for Parking
- Implement 'parking metering system' to Colombo district as a preliminary stage
- Time limited parking enforced at identified roadside parking lots (e.g. 30 min Maximum)
- Provide overflow parking facility for long distance private buses
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- Reduced road and parking lot congestion minimized wasted time on roads and frustration.
- Will reduce the heavy peak hours and traffic congestion during the peak period.

Intersection Control:

Intersection control will improve the turning movement capacity and the efficiency. This will help to initiate signal synchronization of the area as well.

Actions to be taken:

- Minor improvements to signalized intersections (capacity improvements) and signal timing updates
- Upgrading signal lights system along with traffic flow detection. Develop Specifications for all signal lights.
- New traffic signals to major intersections
- Installation of Traffic control centre with traffic flow detection (CCTV, Magnetic loop, Infar red) and real time traffic management
- Synchronize signal lights along main corridors

Benefits:

- Reduce the delay to through traffic, and right turning movements and increase capacity of intersection
- Reduce the number of conflict points and coordination of intersection flows.
- Infrastructure equipment for public transit priority
- Increase safety and efficiency of vehicle, bicycle and pedestrian
- Reduce the frequency of sever crashes.
- Reduction in delay in turning movements
- Improve the capacity of the intersections.
- Reducing vehicle emissions
- Provide priority for public transport

Traffic Flow Management:

Traffic flow management will enhance the mobility on corridors, reduction of congestion, improvement in road safety and reduction of delay on roads. Demarcation of separate bus lane and other separate lanes for different user groups such as bicycle traffic flow can be improved drastically.

Actions to be taken:

- Converting two-way streets to one-way operation where technically feasible
- Roadway and intersection widening and reconstructions
- Priority for HOV (high occupancy vehicles)
- Relocation of bus stops/pedestrian crossings to minimize unnecessary conflicts and delays
- Reductions of Traffic Density closer to Schools

Benefits:

- Reduce the delay to through traffic, and right turning movements and increase capacity of intersection
- Reduce the number of conflict points and coordination of intersection flows.
- Infrastructure equipment for public transit priority
- Increase safety and efficiency of vehicle, bicycle and pedestrian
- Reduce the frequency of sever crashes.
- Reduction in delay in turning movements
- Improve the capacity of the intersections.
- Reducing vehicle emissions
- Provide priority for public transport

- Traffic Enforcement through CCTV Monitoring

Automate the law enforcement with automated number plate recognition and sending the fine to the registered owner of the vehicle.

- Road Pricing of Entry Roads to CBD

Road pricing discourage traffic into CBD and particular roadways during periods of peak congestion. Tolls are generally fixed amount charge on a single roadway while congestion pricing involves variable charges based on levels of congestion or time of day & can be charged over a wide area rather than only a single roadway.

8.5.2 Public Transport Improvements

Public transport system development is the core intervention that is required to reduce road congestion and environmental pollution. Reliable public transport system enhances the safety and the comfort of the rider while an efficient transport system will reduce the stresses of commuters and the road rage. Thereby, productivity of employees can be increase drastically.

- **Restructure of Public Bus Service:**

Some of the existing bus routes do not cover important areas and some areas do not have adequate bus services. Bus route network has not been revised for about forty years.

- **Modernize and improving the quality of buses and services:**

This will improve public transport by attracting some motorists back to public transport system as a result of priority to the buses and public transport system.

- **Improvement of office and school services:**

Majority of school children are coming by private vehicles and that needs to reduce by introducing school to home based bus service. Further improved office transport services can attract part of motorist to office transport services introducing higher quality, comfortable office service.

- **Regulate and Improve Taxi Services:**

Taxies are a part of a functioning community and it provides door to door service to the general public. Numbers of taxies operating on roads are increasing any control and it had led to many social and traffic issues in the country.

- **Develop Multimodal Transport Hub:**

Multi-modal transport hubs will be a key component to connect all major public transport modes in a central place of a City. Therefore, the “Multi-Modal Centre” is proposed to divert a part of the transport hub function to the suburbs of the Colombo Metropolitan Area. The Multi-Modal centres (MMC) function as the transit facilities for passengers from feeder buses and inter-provincial buses at the edge of the urban area to the city centre by other modes. Five multi-modal centres on major corridors are proposed to serve passengers by corridor.

- **Railway Electrification & Modernization:**

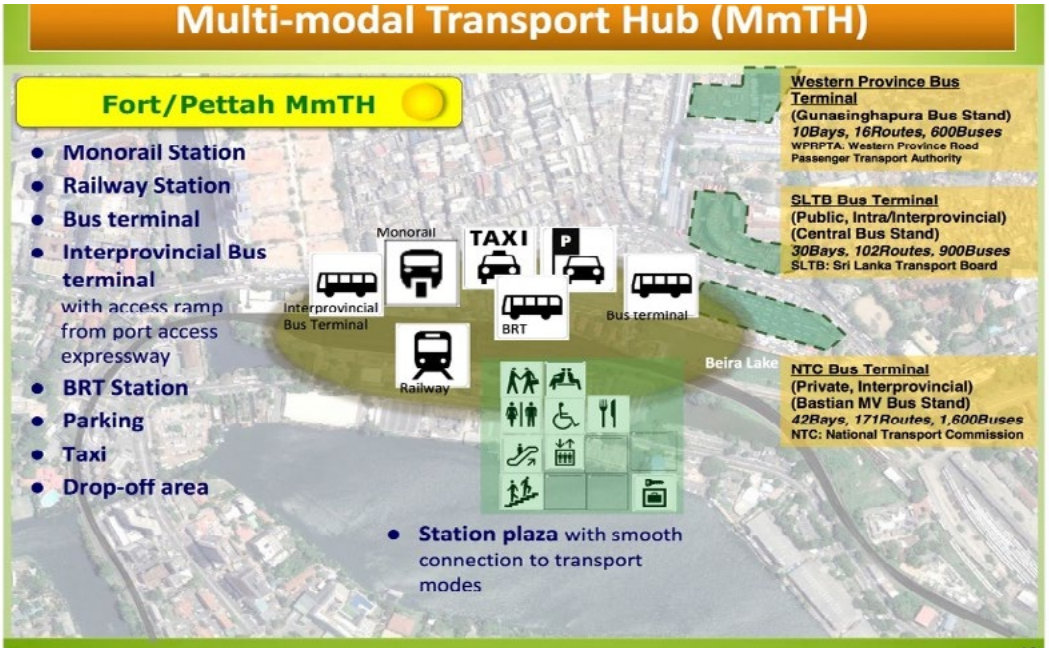
Modernize the railway with electrification new rolling stock that has faster acceleration and deceleration. The modern system with track improvements, station upgrades and signal system upgrades to attract more ridership for railway.

- **New Rapid Transits System:**

New lines for highly demanded areas. Current railway network is in a radial pattern which is not an ideal network for passenger transport. New line to be included to improve the connectivity of railway system.

- **Introducing New Water Transit System:**

Use of inland waterways so that the total travel time can be reduced drastically. This transit system can be used for Eco tourism at night and off peak periods.



8.5.3 Roads Infrastructure Developments

- **Capacity improvement by Development of road links:**

Improve the existing roads by widening with required intersection improvements at Grade and Elevated.

- **Improve the Capacity of Existing Expressway Network:**

Vehicle operations on expressways are to be improved by changing the demand on expressways and improving the public transit operations.

- **Improve Walkability:**

Walking is an essential mode of transport. New and improved pedestrian facilities enable greater access and mobility within our communities. A pedestrian-friendly environment plays an important role in encouraging walking as a mode of travel, and this has proven health and environmental benefits.

- **Intersection Control Reduce vehicle emission:**

With the increase of air pollution in urban areas the requirement of controlling of vehicle

emission has become an important requirement of the country.

Construction of new Expressways:

The proposed new expressways and major road upgrading projects of the Road Development Authority (RDA) are recognized and incorporated in the overall road network of the Western Region Plan in whole or with minor modification and re-alignment. The proposed new expressways/ highways enables more inland connectivity and the expansion of existing expressway network.

Actions to be taken

- Construction of Ruwanpura Expressway
- Construction of Central Expressway
- Construction of New Kelaniya Bridge and Elevated Road to Colombo Port & Fort Area (CKE extension)
- Construction of Elevated Urban Expressway from New Kelani Bridge to Battaramulla

8.5.4 Environmental Sustainability

Environmental sustainability is a very important factor to be considered in regional planning. Reduction of vehicle emissions, air pollution, and noise pollution will improve the health conditions of the public in a country

- **Encourage Bicycle Use:**

Usage of bicycles as a transport mode is very sustainable, reducing emission; reduce fuel cost and healthy mode of transport.

Actions to be taken

- Provide appropriate vegetation cover or paved area at either side of the roads
- Provide separate lane for bicycle/motor cycle use.
- In suburban to rural areas it can be checked that the center median can be converted into a bicycle path
- Canal banks can be converted bicycle/motor cycle lanes.

Benefits

- Promoting cycling and walking for transportation can benefit lower-income people by increasing public acceptance and support of non-motorized travel.
- Shifts from driving to cycling or walking can reduce traffic congestion, road and parking facility costs and environmental impacts, and increase community livability and improved public health.
- Reduce carbon Foot print.
- Can promote park and ride facilities at railway stations
- Saving of fuel
- **Electric vehicle rapid charging centers:** 50 numbers of rapid charging stations

The Western Region Megapolis Planning Project will ensure a sustainable transport system with higher mobility, connectivity and new transport mode choices for the commuters enhancing a friendly and peaceful environment. The projects will be implemented in key different areas namely:

- Transport Demand Management (TDM)
- Public Transport Improvements (PTI)
- Road Infrastructure Development (RID)
- Environment Sustainability (ES).

Improvement of transport policy is also an important requirement which needs to be considered parallel to the implementation of identified projects.

Projects commencement period is identified under 4 stages namely immediately (within 6 Months), short term (6 months to 3 years), medium term (3 years to 5 years) and long term (Beyond 5 years). The prerequisites for certain projects are also being identified in proposals so that fulfilment of prerequisites will ensure the smooth implementation of new project and acceptance of new projects by transport operators and users.

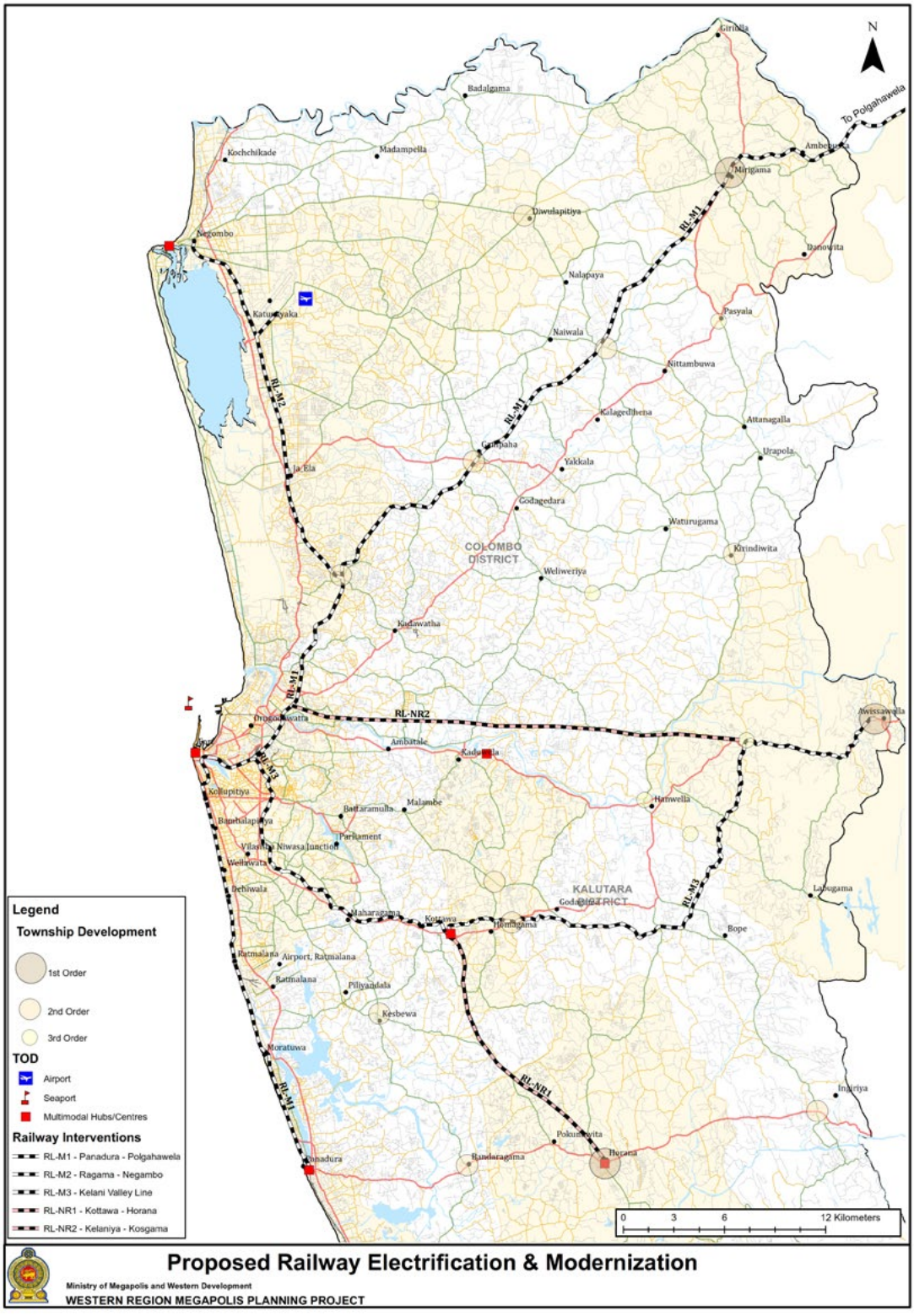


Fig 8.7 Proposed Railway Electrification and Modernization

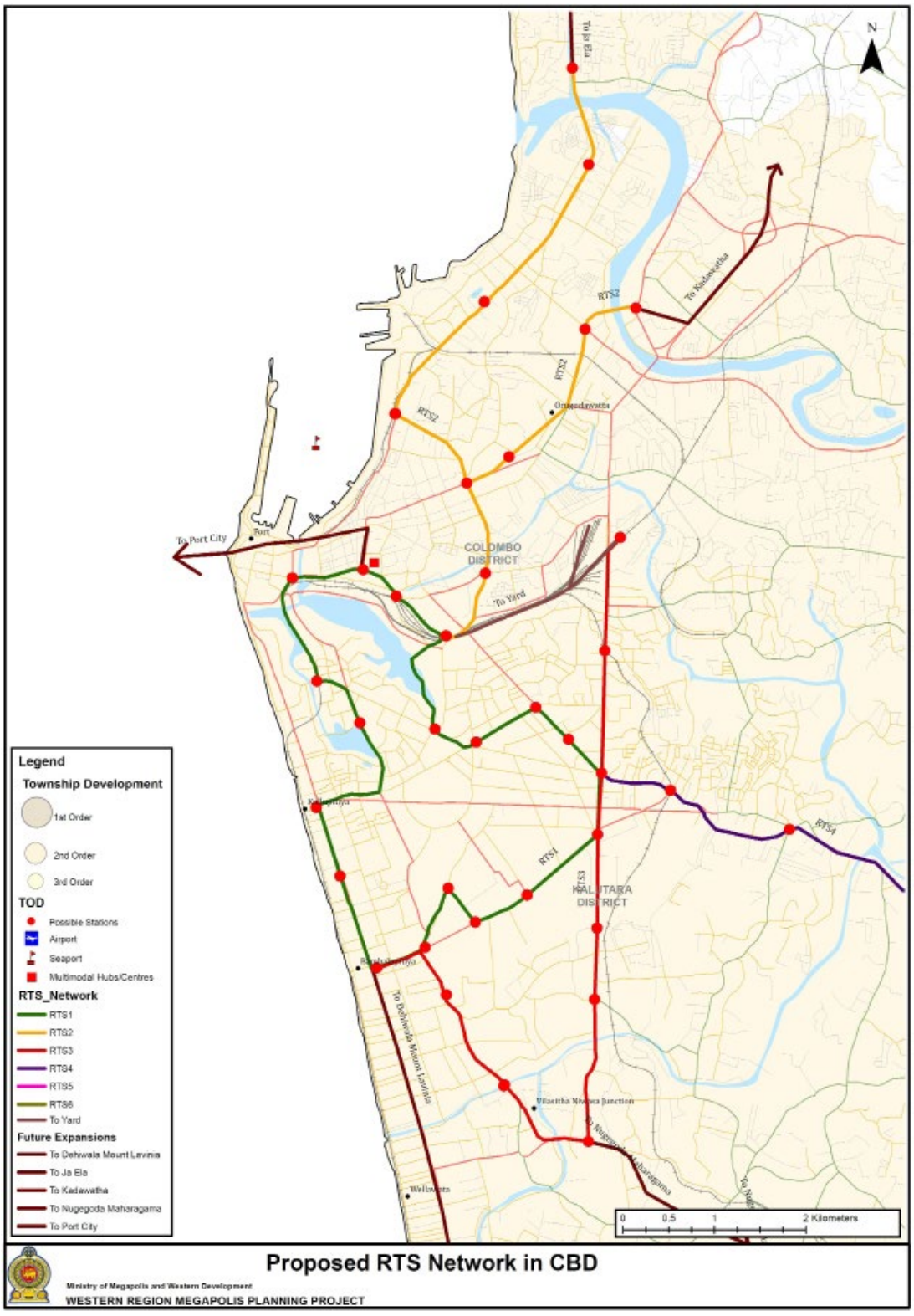


Fig 8.8 Proposed RTS Network in CBD

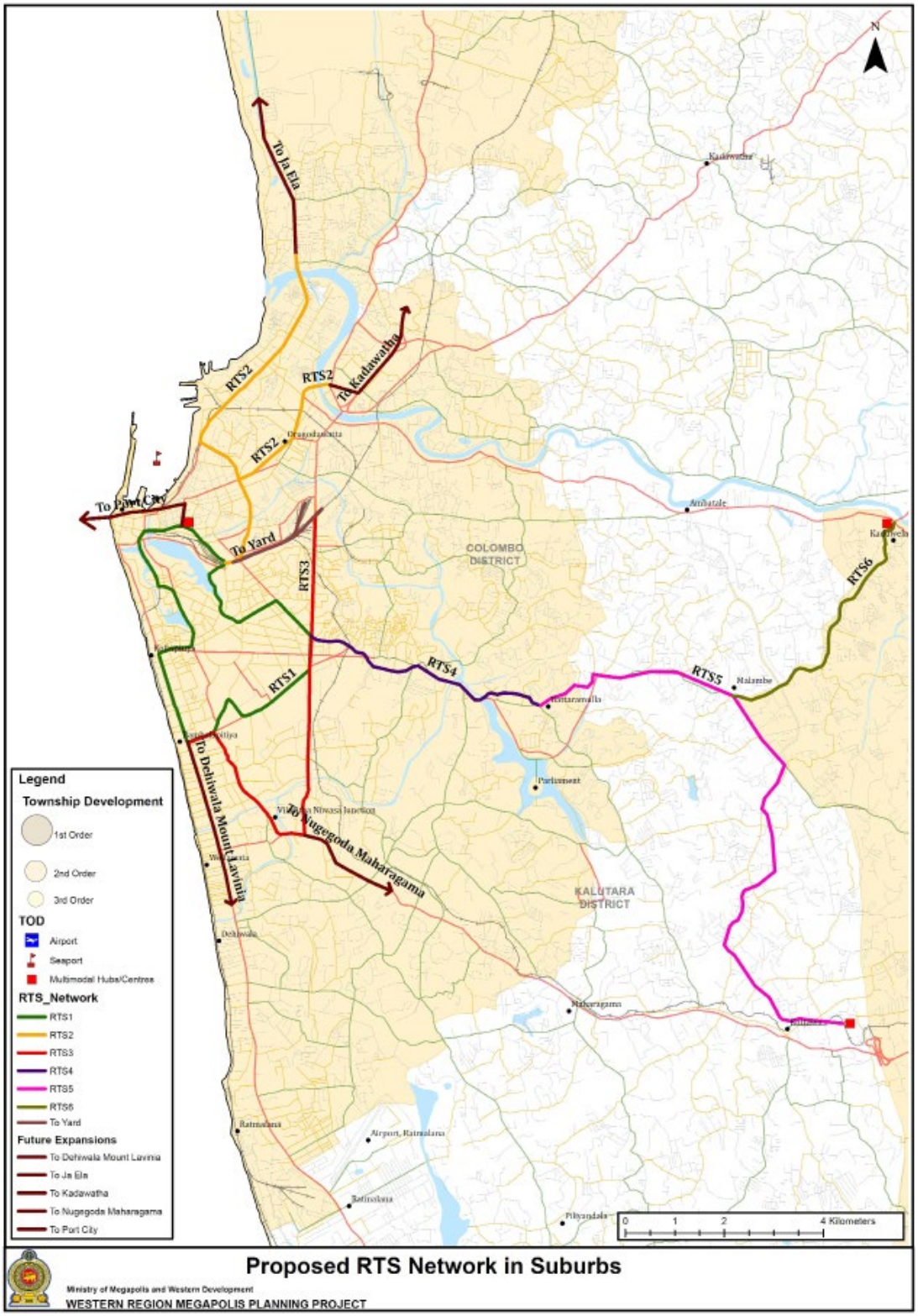


Fig 8.9 Proposed RTS Network in Suburbs

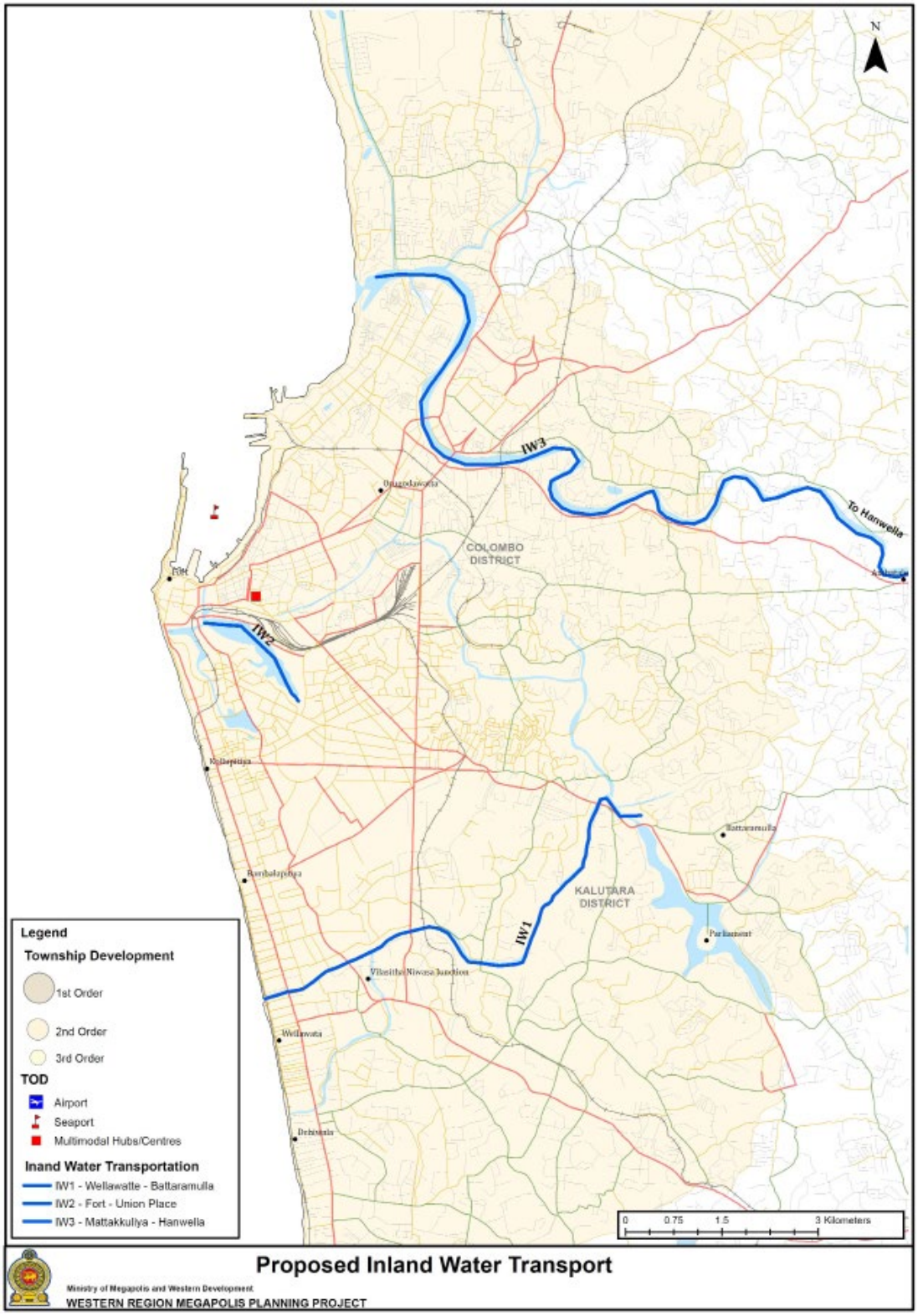


Fig 8.10 Proposed Inland water Transport

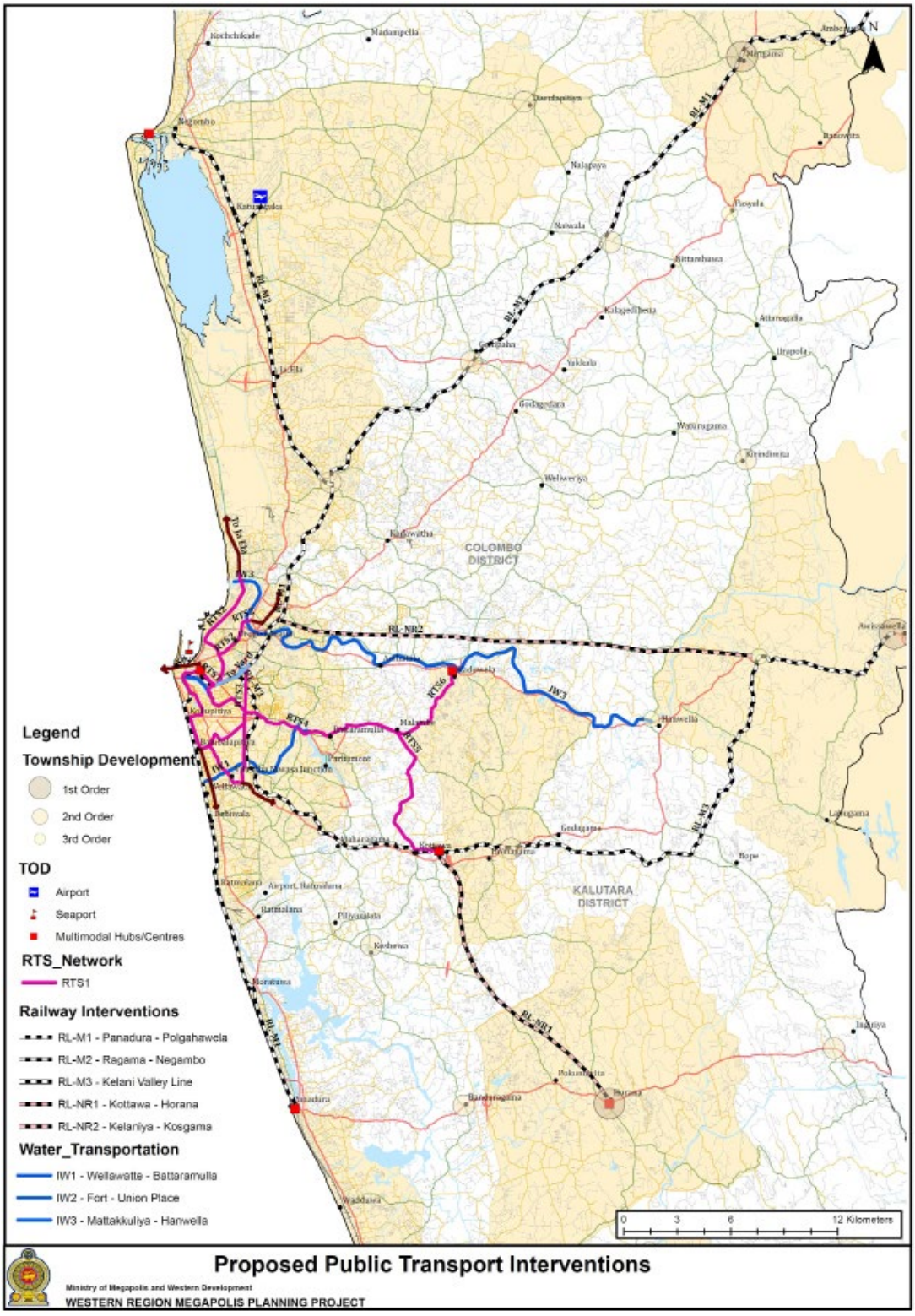


Fig 8.11 Proposed Public Transport Interventions

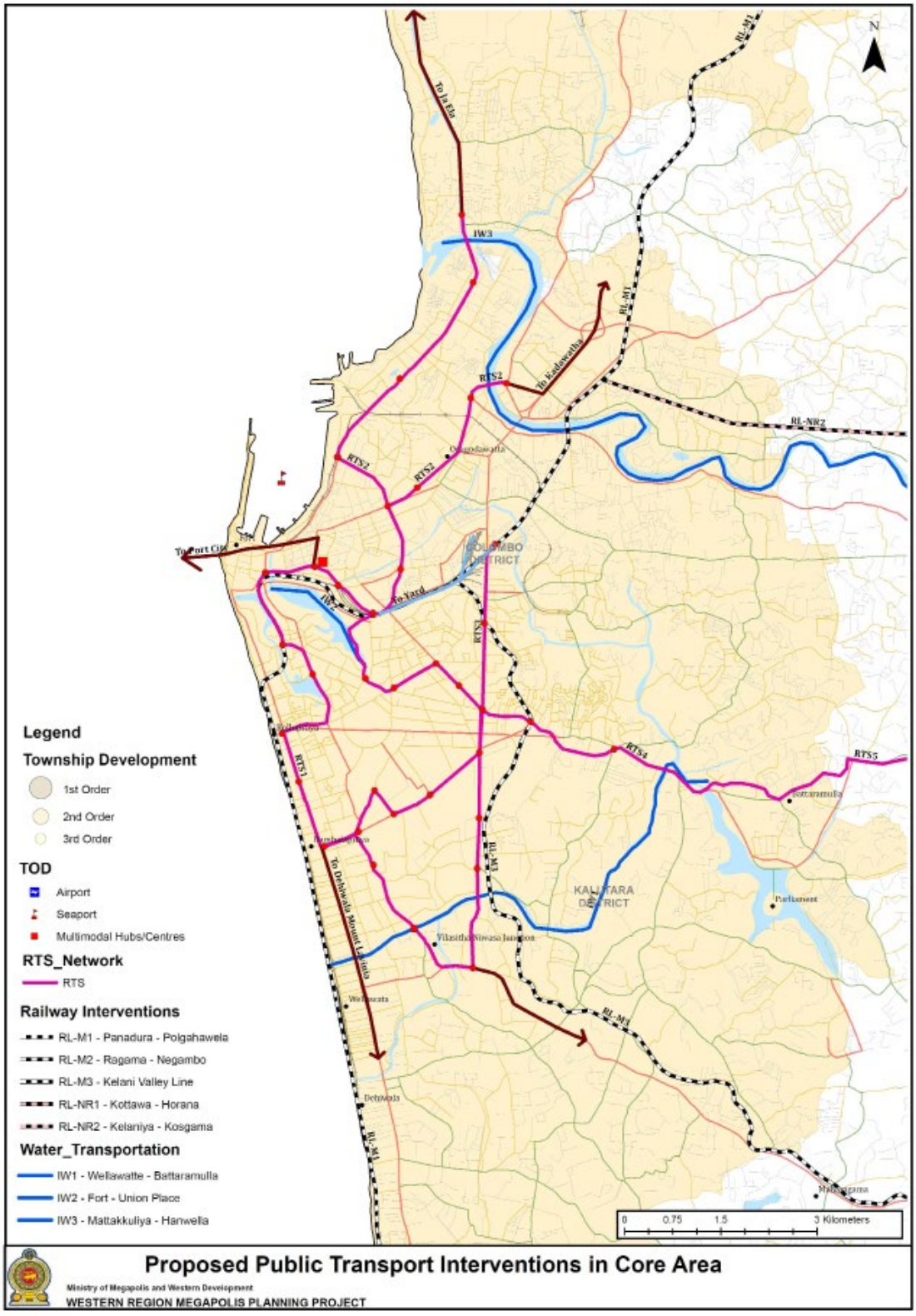


Fig 8.12 Proposed Public Transport Interventions in Core area

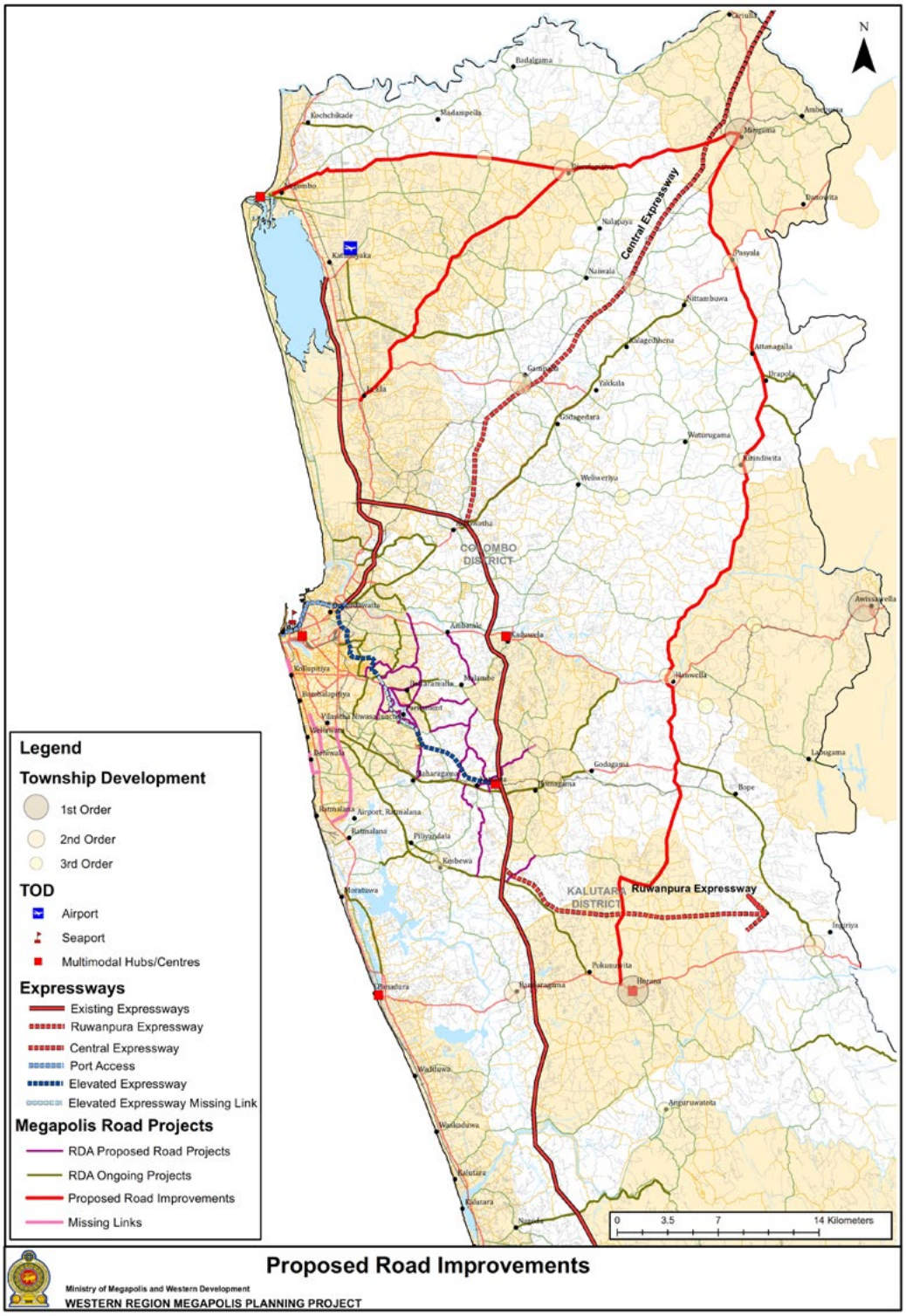


Fig 8.13 Proposed Road Improvements

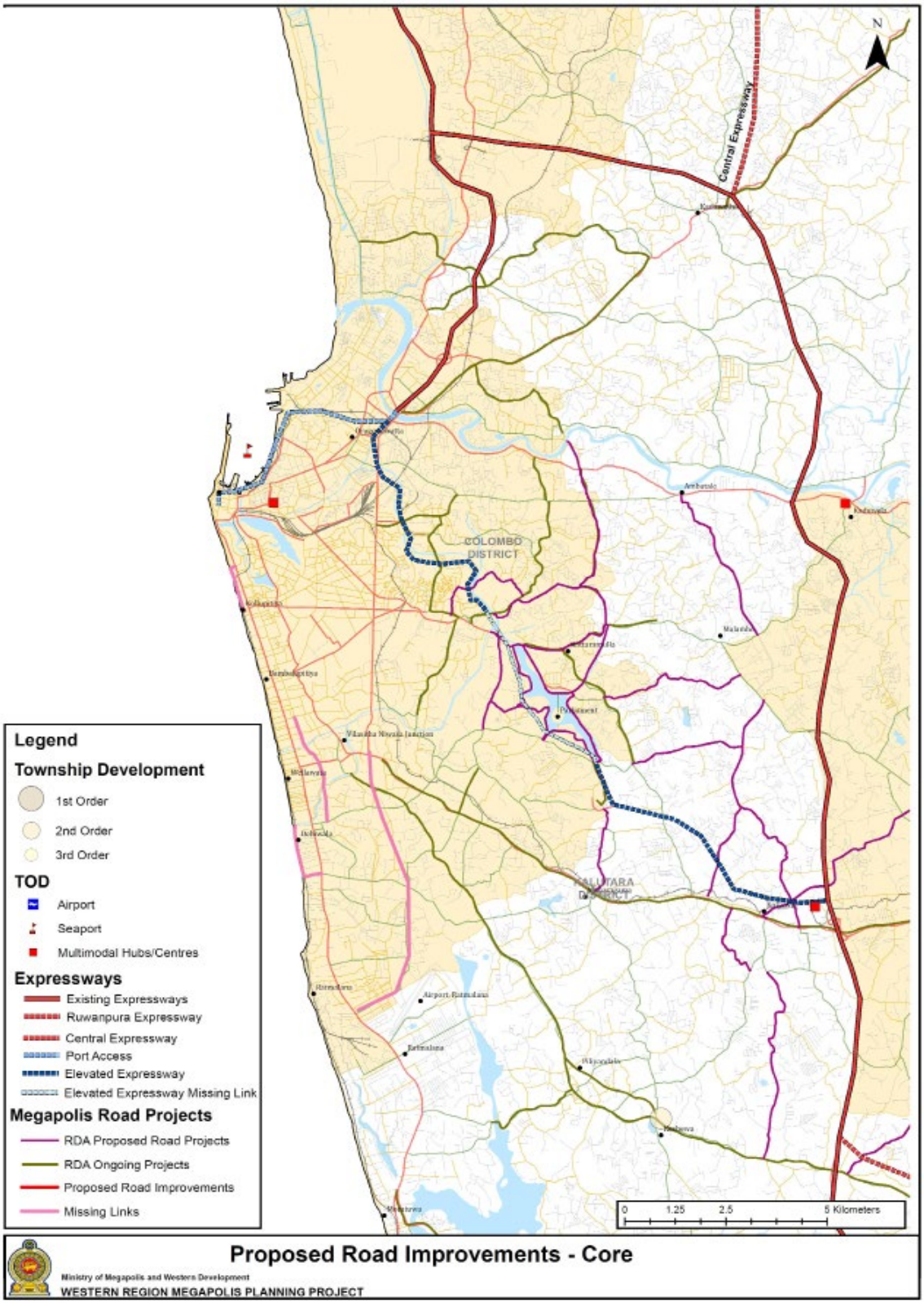


Fig 8.14 Proposed Road Improvements - Core

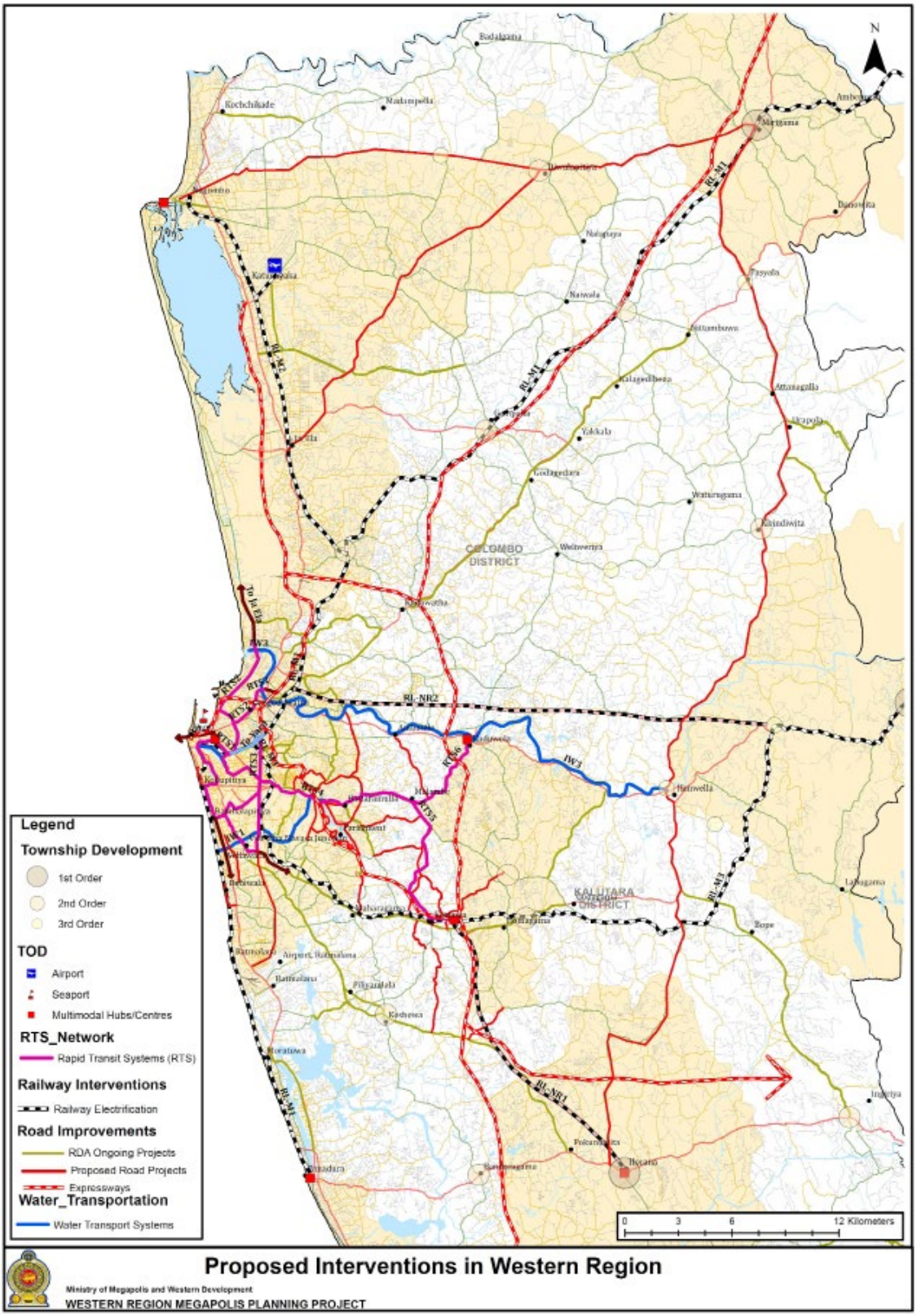


Fig 8.15 Proposed Interventions in Western Region

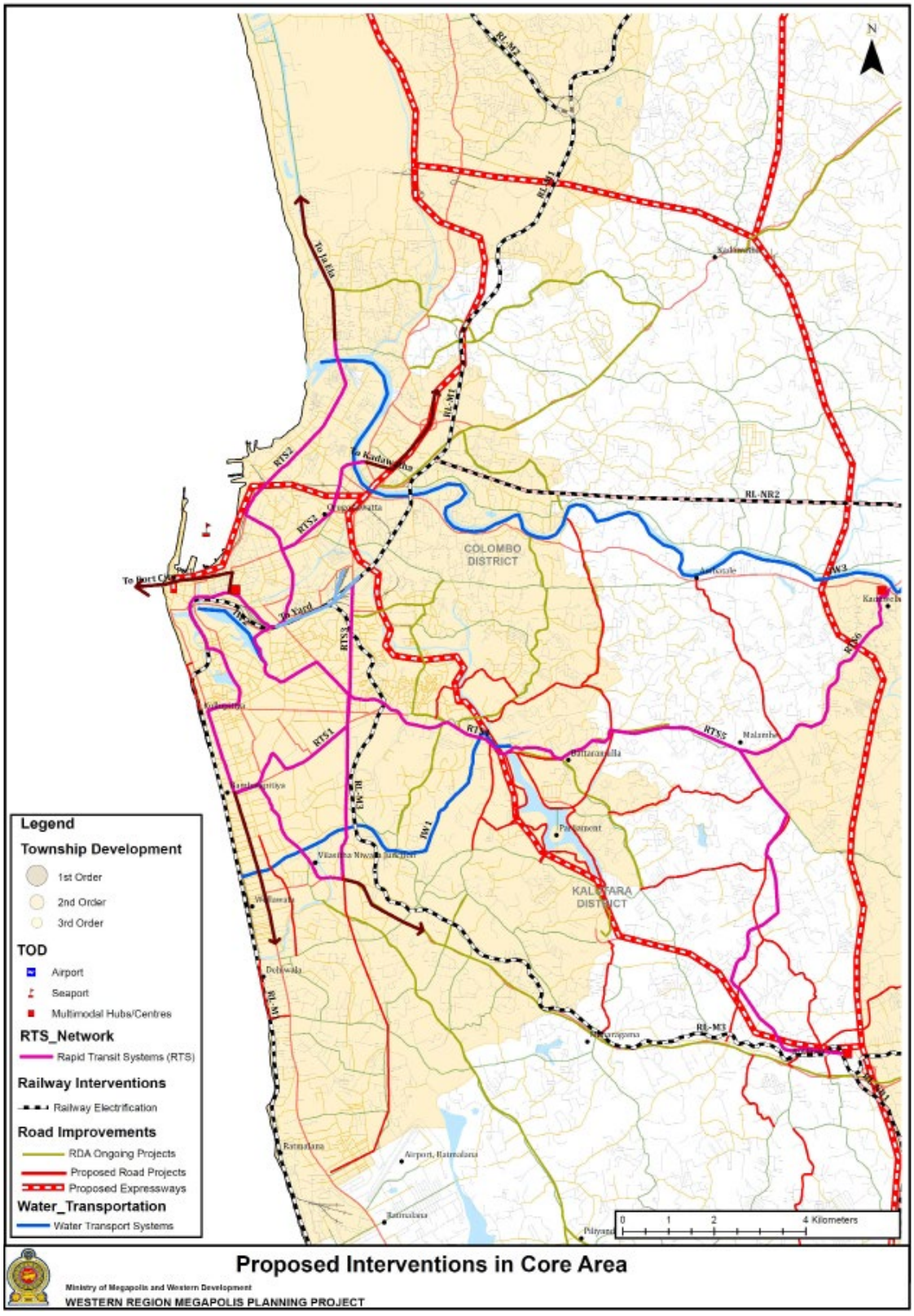
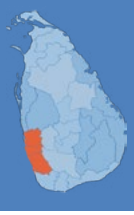


Fig 8.16 Proposed Interventions in Core Area

Fig 8.17 Proposed Cycle and Motorcycle Paths



Chapter 9
Airports and Port Infrastructure

The Airports and Port in the Western Region play a very important role in Sri Lanka's economy over the long run, considering its positioning as international transport and logistics hub in the region. The forward planning and allocation of land for future expansion of these infrastructure is therefore critical for the economic development of Sri Lanka and Western Region.

9.1 Colombo Port

Colombo Port has very good potential to grow considering its strategic location along the international shipping route. At present, Colombo port has a capacity to handle around 7.1 million TEU annually while it handled around 5.2 million TEU in 2015. Due to physical constrains of existing terminals, the virtual capacity of Port of Colombo is less than the total available capacity of terminals. With timely implementation of East and West Container Terminals of the Colombo Port Expansion Project, SLPA will be able to accommodate the container demand of Port of Colombo up to 2030 without any hindrance.

In the future, the port is expected to improve its capacity to process around 20 million TEU and as such, additional berthing facilities need to be added to the existing facilities. This could be achieved by extending the existing south port and adding the new north port. At the same time, additional land for logistic and processing facilities will also be reserved to complement and create higher value-add in port services. The proposed port extension (by Ports Authority) for 2020, 2030 and 2045 is as shown in the figures 9.2, 9.3 and 9.4.

With higher capacity, the connectivity to the Port also need to be improved to allow port traffic to have direct access to the highway network.

At present, SLPA has a dedicated cruise berth and passenger terminal facility at the Port of Colombo. Due to physical constrains in existing berth, it is not possible to accommodate world class cruisers into Port of Colombo. Cruise activities are expected to increase with the economic growth in South Asia and Colombo could position itself as the largest Cruise Centre in the region considering the surrounding international tourism destination within Sri Lanka as well as in the Indian Ocean. Cruise Centre is proposed by converting and extending the current bulk cargo terminal near the Fort Area. This Cruise Centre should be connected directly to the City to add vibrancy to the Fort, the Pettah areas and the new development along Beira Lake.

Fig 9.1 East Container Terminal Development Project - Phase 1

Fig.9.2 Colombo Port Development PlanPHASE 01 (Source: SLPA)

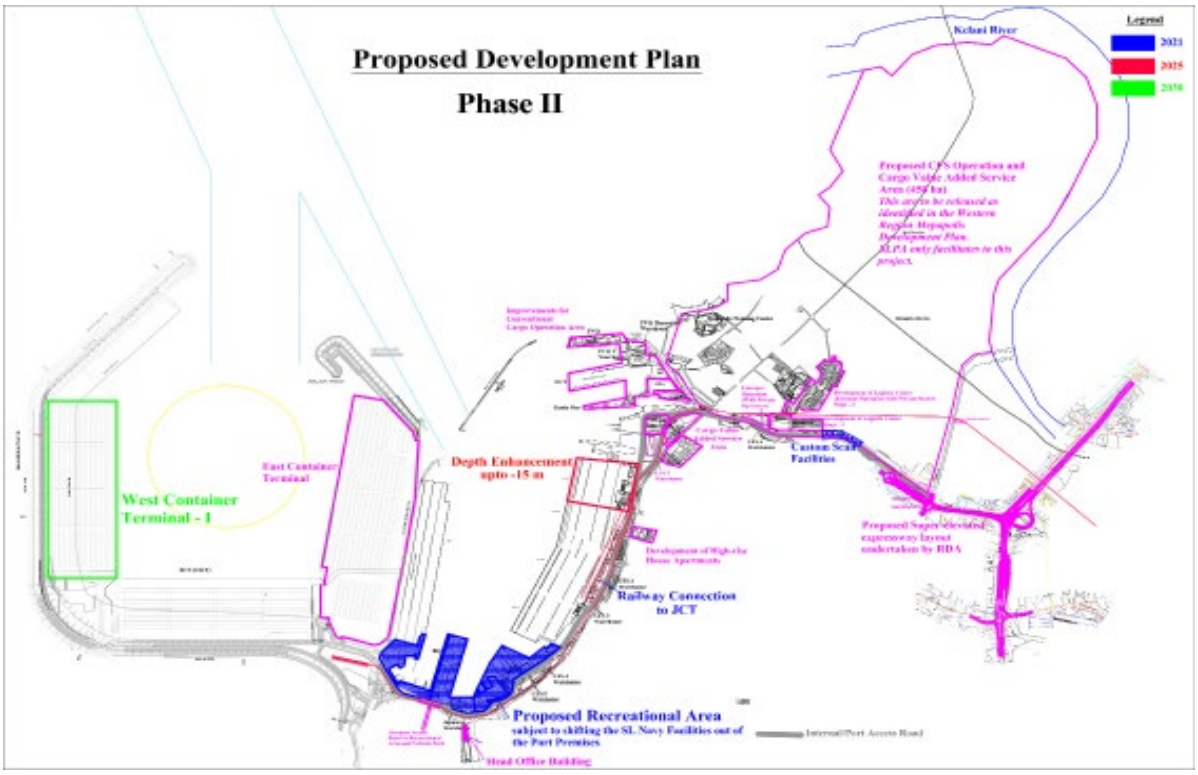


Fig.9.3 Colombo Port Development PlaN PHASE II (Source: SLPA)

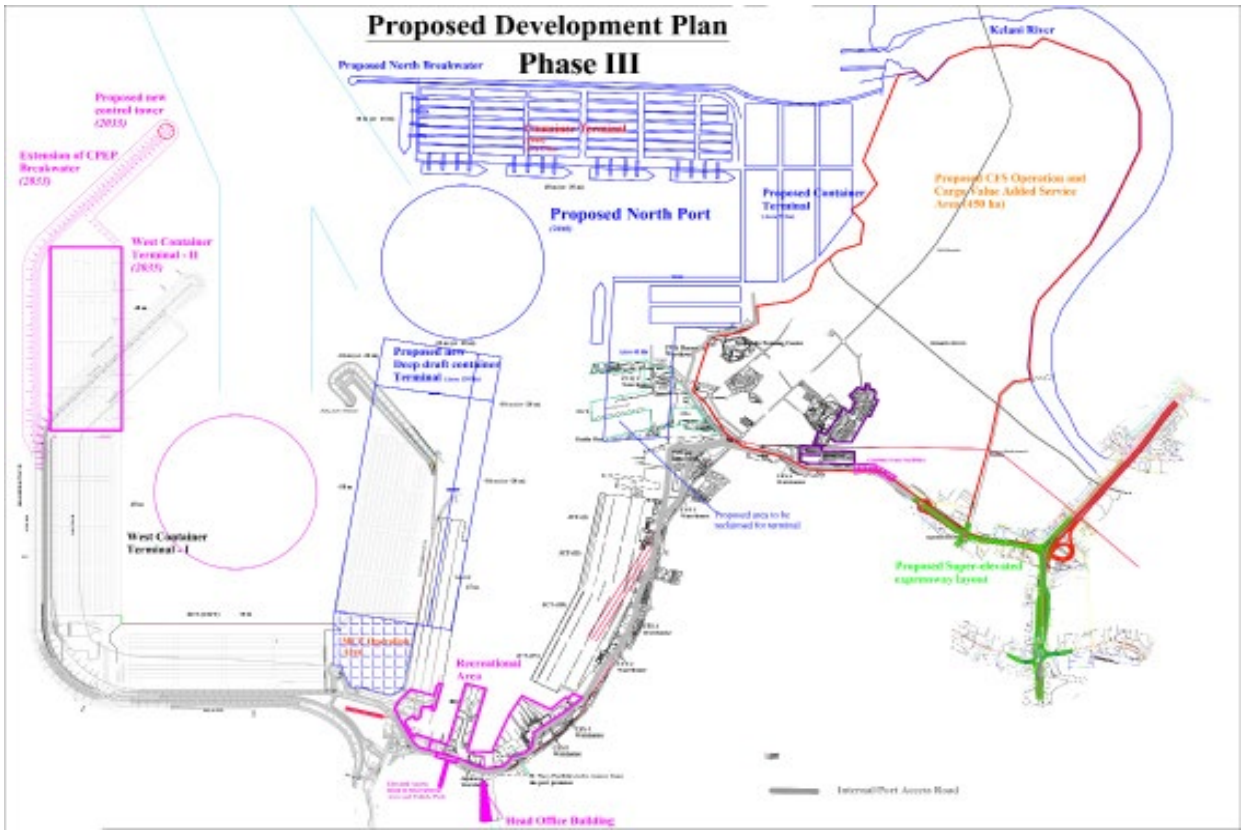


Fig.9.4 Colombo Port Development Plan III (Source: SLPA)

9.1.2 Key Projects & Interventions

- EAST CONTAINER TERMINAL

In line with the growth of the container volume to the Port of Colombo, identified the requirement of a new deep draft container terminal on immediate basis. Therefore, SLPA has constructed 440 m length of -18 m deep quay wall and 10 ha of container stacking yard space of East Container Terminal (ECT) facilitating to handle 0.8 million TEUs per annum (Phase-1). Procurement of container handling equipment for the project is in progress. The total quay length of the ECT is 1.2 km and its full capacity is planned as 2.4 million TEUs per annum. ECT is expected to be in operation by 2018.

- IMPROVEMENT OF UCT, PVQ AND GUIDE PIER TO OPERATE CONVENTIONAL CARGO

At present, Port of Colombo handles conventional cargo at the Bandaranayaka Quay (BQ), North Pier, PVQ and Guide Pier. Depths of these facilities are limited. SLPA has revealed the need of attracting larger conventional cargo vessels and improve the facilities to operate conventional cargo. Considering the above requirements, SLPA has identified to improve Unity Container Terminal (UCT), Prince Vijay Quay (PVQ) and Guide Pier (GP) to operate conventional cargo.

- DEVELOPMENT OF RECREATIONAL FACILITIES

Cruising has become a major part of the tourism industry. In line with the rapid growth of cruising industry, it is worthwhile to develop recreational facilities in the Port of Colombo to deliver a better contribution for enhancement of tourism. Port of Colombo will require modernized passenger terminal in line with the other development in the tourism sector in the country. SLPA has

identified to develop BQ as a passenger terminal to accommodate large cruise ships and to enhance adjacent areas as recreational facilities including a yacht marina.

- DEVELOPMENT OF WEST CONTAINER TERMINAL (WCT) 1

Container throughput forecast will reach 12 million TEUs by 2030 as per the present studies of SLPA. With the saturation of the container handling capacity of Port of Colombo, SLPA will require to develop an additional deep draft container terminal by that time. The project will create a terminal with the capacity of 2.4 million TEUs per annum having 1.2 km deep draft berths and 50 ha of container stacking yard. WCT 1 is planned to be operational by 2025.

- EXTENSION OF COLOMBO PORT EXPANSION PROJECT BREAKWATER AND DEVELOPMENT OF WEST CONTAINER TERMINAL 2

Accordance with the container forecast, Port of Colombo will reach its container handling to 19 million TEUs in year 2040. This will lead to need of implementation of Colombo Port Expansion Project Phase 2. It is planned to operate WCT-2 by 2035.

- NORTH PORT DEVELOPMENT PROJECT

Beyond the demand that can be accommodated with in the Colombo South Port and the perennial port, SLPA will require to extend its developments towards North side of the Port. North Port development has been identified as the ultimate port development plan at the Port of Colombo, which will create more deep draft container terminals, conventional cargo handling facilities and other essential port facilities. As per the present development plans of SLPA, North Port development project will be implemented during the period from 2040 to 2050.

- EXTENSION OF ECT AND SAGT AS COMBINED BACK TO BACK TERMINAL

With the introduction of North Port, opportunity will be created to extend the ECT and SAGT and operate as a combined back to back main-feeder container terminal. This project will enhance the capacity and productivity of two terminals. Further, an area of 15 ha adjacent to the terminals will be developed for Multi-Country Consolidation (MCC) operations.

- EXPANSION OF LOGISTIC AND CARGO HUB

SLPA intends to create opportunity for logistics and cargo value added services to increase its domestic cargo handling and thereby to minimize the risk of loss of transshipment market.

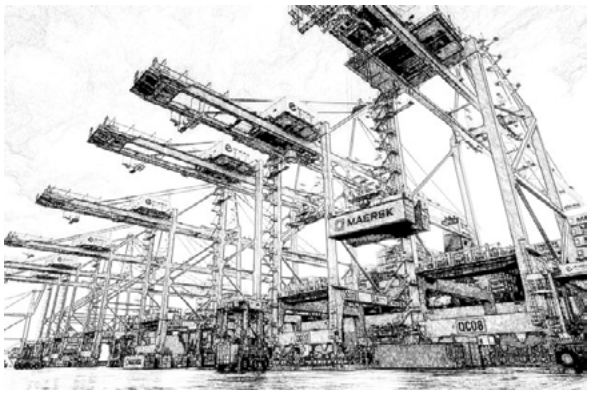
Expansion of cargo operation and logistics in Port of Colombo have been restricted due to limited land availability for port business. In global context, a sufficient land have been utilized next to the main commercial ports for logistic business to harvest its maximum benefit to the country. SLPA has identified that allocation of approximately 200 ha of land close to the Port of Colombo for logistic function is essential. Considering the potential requirement, SLPA will establish logistics and cargo value added service center in SLPA owned land adjacent to Port Access Road in Bloemendhal SLPA quarters area until intervention of Government to allocate sufficient land for the business.

- ESTABLISHMENT OF CARGO VILLAGE

The Port of Colombo, owing to its close geographic proximity to major arterial global East–West shipping lane and, its centric position to the greater Indian Sub-Continent and adjacent markets, enjoys a unique strategic advantage. Massive population and existing medium level labour cost create good opportunity for Sri Lanka to take a major part of logistic business in the region with the location advantage of the Port of Colombo. Even though the country left behind the technology level of the world, this could be improved during the performance of the business. Therefore, in addition to the proposed logistic corridor of 200 ha it is worthwhile to establish a cargo village of about 2000 ha in suitable location close to the Port of Colombo with necessary transportation access and infrastructure facilities.

This project to be implemented in stages with the growing demand for the business. Required land to be allocated by the Government of Sri Lanka and necessary road connections and infrastructure will need to be provided by the Government in line with the demand. The proposed land(s) to be connected with Port of Colombo through a dedicated access or expressway link. The cargo village to be operated as a free-trade zone. Land to be offered to investors by calling proposals and appropriate concessions may have to be given to attract more investors. This project will create a good platform to centralized the logistic business thereby reduce production cost and traffic congestion.

- CONSTRUCTION OF SHIPPING AND MARITIME CENTER BUILDING
- ESTABLISHMENT OF CARGO VILLAGE
- ESTABLISHING A MARINA BY CONVERTING SOUTHERN PART OF DICKKOWITA FISHRIES HARBOUR
- REHABILITATION OF PANADURA FISHERIES HARBOR
- ESTABLISHMENT OF THE LOGISTC HUB (Please refer Chapter of key Mega Projects)



9.2 Bandaranaike International Airport (BIA)

Bandaranaike International Airport (BIA) is the main airport in Sri Lanka serving both domestic and international travels. Currently, the airport has a single runway and handled 7.7 million passengers per annum in 2014. The total tonnage of cargo BIA handled in 2014 is 209,417 metric tonnes.

In line with the growth in air transport, BIA is expected to accommodate up to 50 – 60 million passengers in the long run. Accordingly, this airport will need a 2nd runway as well as the extension of airport building and related cargo terminal and other airport facilities.

Currently, 2 runway options are being studied, the northern runway option and southern runway option. Once the option is decided, sufficient land has to be allocated for the 2nd runway as well for the airport extension and related facilities. Figure 9.5 shows the runway options.

The facilities at present in the BIA can't cater the expected future arrivals. The predicted passenger / tourist number to the BIA will be 30 mn by 2030. As per the predictions and Megapolis goals and economic targets, the need of second Runner-way becomes very vital. The construction of the second runner way has been identified to meet this demand of Megapolis plan. According to the analytical studies project team has identifies two options as demonstrate in the following figure. Out of both, option one recommend for detail designs and feasibilities.

Preparation of master plan, land acquisition, resettlement activities, capacity building and construction of the proposed runnaway are some listed project activities under the construction of proposed 2nd runnaway.

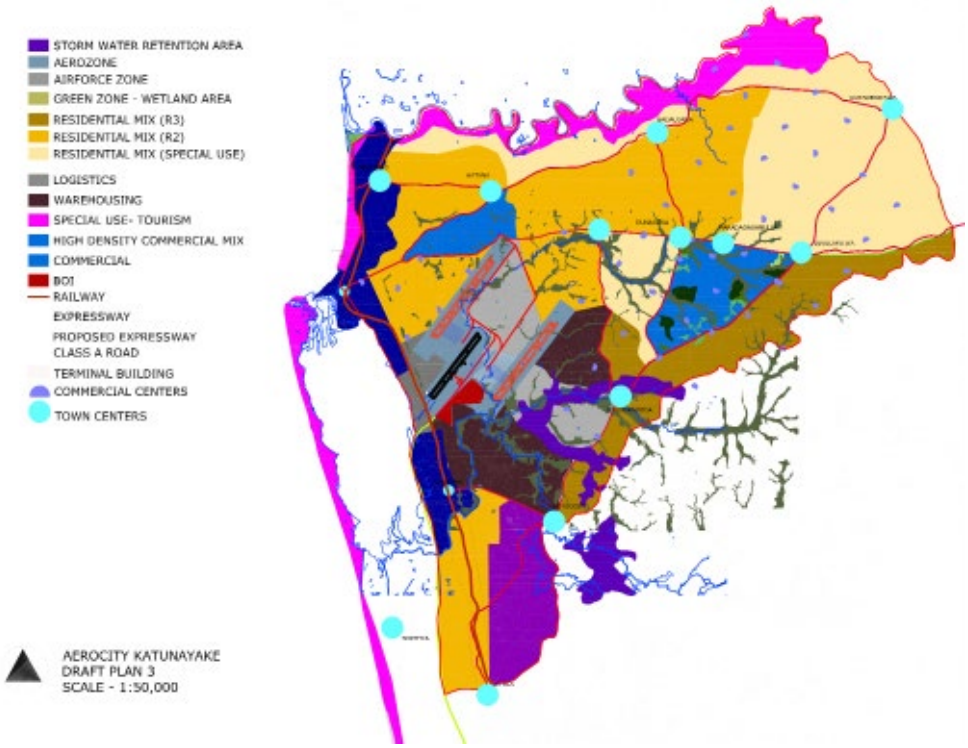


Fig.9.5 Zoning Plan of Aero City Zone

8.3 Ratmalana Airport

Ratmalana airport is the older airport of Colombo. It has a single and short runway of about 2.5 km and is currently used for chartered plane and other domestic air travel. The government has been contemplating to redevelop the airport into residential and commercial development as the airport is not optimally used and may not be viable in the long term.

While the decision has not been made on its future, it is worth considering to keep the Ratmalana airport as a city airport serving the shorter destinations as well as serving the projected increase in chartered and private planes and the possibility to develop it into a hub for budget airlines. A feasibility study has to be undertaken by Civil Aviation Authority to harness the full potential of Ratmalana Airport. No additional land can be allocated for this airport as it is located in the urbanized area.CIvil Aviation regulations must be followed during Helicopter landing.

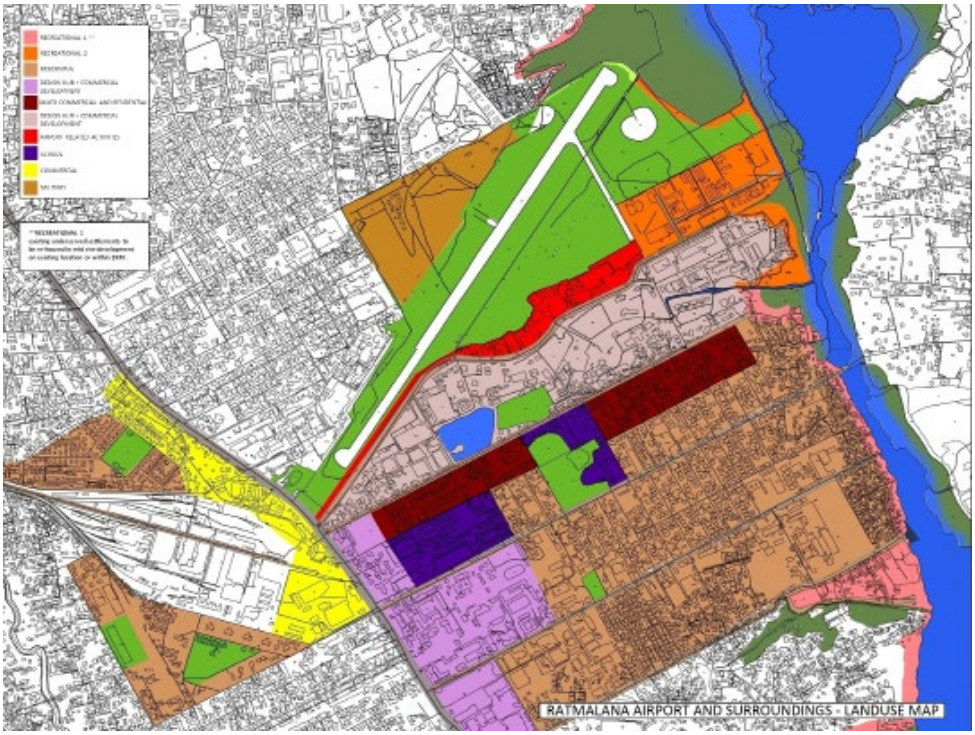


Fig.9.6 Land Use Plan of Ratmalana Airport & Surrounding

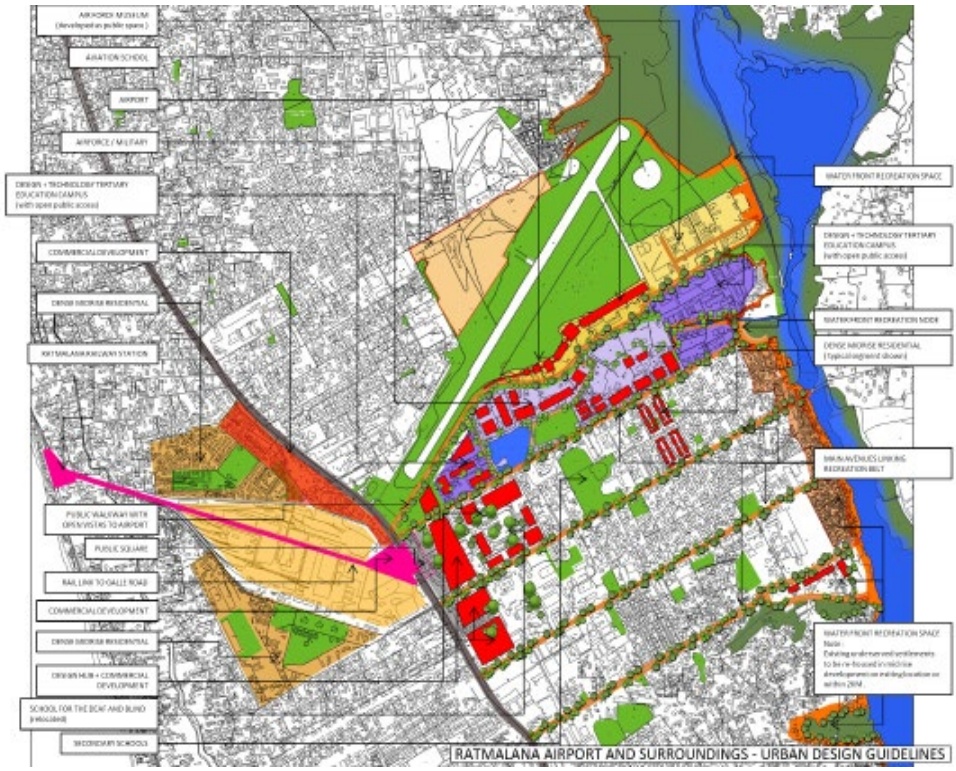


Fig.9.7 Urban Design Guidelines of Ratmalana Airport & Surrounding

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Chapter 10
Water and Energy Management

10.1 Water Supply Plan

10.1.1 Issues

Provision of potable and non-potable water is crucial to support Western Region's projected economic and population growth in 2032. Currently, 97.3% of the population in Western Region has access to safe water supply, with piped water supply service coverage of 57.5%.

Surface water is the main water supply source in the region. The major surface water resources are Kelani River, Kalu River, Labugama Reservoir and Kalatuwawa Reservoir. Groundwater is only used for small scale water supply scheme.

There are nineteen water treatment plants (WTP) in Western Region. Total production capacity is estimated to be 1,078,520 m^3/day currently.

Based on the projected population of 8.7 million, water demand is expected to grow to 2,200,000 m^3/day. Hence, existing water supply system has to be augmented progressively to meet future demand.

Domestic Demand (m3 /d)	1,251,311
Commercial Demand (m3 /d)	437,390
Special Demand (m3 /d)	220,428
Total Demand (with NRW) (m3 /d)	2,177,833

Source: Water Demand of WRMP 2030
Calculted by NWSDB

In addition to water supply augmentation, the remaining key issues have been identified:

- Deteriorating raw water quality due to municipal and industrial waste water discharge, algae bloom and salinity intrusion;
- Low raw water supply during dry season;
- Several WTPs operating below their design capacity due to aging facility, insufficient land and fluctuating reservoir yield;
- High unaccounted-for-water loss in the water supply network; and
- Inadequate water storage.

10.1.2 Water Supply Plan

It is important to establish service coverage of the existing WTP and estimate future water demand in order to plan for future water supply projects.

The location and service coverage of the existing WTP are to be mapped on the latest policy plan to determine the adequacy of the existing water supply service within each planning area.

The water demand projection has to incorporate both domestic and non-domestic water use with reasonable unaccounted-for-water loss. Domestic water consumption rate shall be adopted from Western Province Water Supply Master Plan. It ranges from 100 - 120 litre per person per day (lpcd) for rural areas to 180 - 200 lpcd for urban areas. Non-domestic water demand shall be estimated based on existing ratio of non-domestic water consumption to total water demand.

Labugama Impounded Reservoir

Kandana WTP to be Upgraded

Kelani Right Bank WTP to be Upgraded

Water supply planning for Western Region has to be focus on the following aspects:

- Safe and reliable water source;
- Construction of new WTPs and reservoirs;
- Rehabilitation and upgrading of the existing water supply network; and
- Reduction of unaccounted-for-water loss.

Water supply sources for Western Region will still be relying on major rivers and existing impounded reservoirs such as Kelani River, Kalu River, Seethawaka River, Kuda River, Dandugam Oya, Labugama Reservoir, Kalatuwawa Reservoir and Ingiriya Reservoir. Impounded reservoirs are to be constructed upstream of these major rivers, if required.

They are meant for storing excess water in the rivers during wet season in order to have reliable and continous supply throughout the year. There is an ongoing Flood Mitigation Study by Ministry of Irrigation & Water Management to explore potential upstream reservoir locations to mitigate flooding. With proper planning and management, identified reservoirs could be utilised for both water storage and flood control.

Sewerage projects have to be implemented concurrently to improve the existing surface water quality which would be fed to the WTPs.

In addition, strict water quality monitoring has to be carried out for industrial areas that are discharging treated wastewater effluent into the existing water sources such as Kelani River, Kalu Ganga and Maha Oya. Wherever possible, the discharge outlet has to be located at the downstream of the WTP's intake.

Upgrading of the existing WTPs and construction of new WTPs have been planned up to 2040. It is estimated to provide additional 2 million m^3 of potable water daily, upon successful implementation by 2040.

Reduction of unaccounted-for-water loss shall be focused on replacement of the existing small diameter pipes, service connections and water meters that are more than 25 years old.

10.1.3 Key Projects

There are various projects being identified based on the urgency, critical projects for immediate implementation are listed below: according to the catergories of water export, water protection, pollution free water, new water supply projects, areas for new sewerage projects. *(For more project details please refer Project Identification Report)*

- Welivitta water supply project Satage
- Kelani Right Bank Water Supply Project Stage - 11
- Kaluganga Water Supply Phase – 11
- Kotte area (jubilee reservoir) water service improvement project
- Construction of Kelani ganga upstream reservoirs
- Divulappitiya water supply project
- Mirigama, Kandalama, Kaleliya and Ganegoda group of towns water supply project
- Mirigama industrial city water supply project


Michigan MBR Plant


Shenzhen IFFAS Plant


Columbia Constructed Wetland Unit

10.2 Sewage Plan

10.2.1 Issues

Sewerage system with limited coverage is available within the city of Colombo, Ratmalana and Ja-Ela. The sewage is treated in the existing Waste Water Treatment Plants (WWTP) and discharged into the sea via the outfalls in Mutwal and Wellawata. The existing sewerage system was built 100 years ago by the British and faces recurrent collapse and blockages.

The remaining areas within Western Region have no public sewerage system. On-site sanitation such as septic tanks is commonly used in residential areas and institutions. In less developed areas, the sewage is discharged directly into the existing water bodies which lead to numerous problems due to contamination of ground water and surface water.

To achieve higher environmental standard and quality of life in Western Region in the future, there should not be any discharge of untreated sewage into the water bodies.

10.2.2 Sewerage Plan

Sewerage system has been proposed in the following areas: Negombo, Gampaha, Kelaniya, Sri Jayawardhanapura, Maharagama and Dehiwala. However they only cover less than 10% of Western Region area. Going forward, sewerage system must be planned for each of the planning areas to ensure full coverage within the Western Region in the future.

Decentralised gravity sewerage system is envisaged for Western Region due to the region's undulating topography, high future sewage flow and large service coverage area. Ideally, each planning area is served by at least one WWTP.

Planning areas with high density urban developments such as CBD & Inner Core and Intermediate Zone could consider advanced treatment technology such as membrane bioreactor (MBR) or integrated fixed film activated sludge.

10.2.3 Key Projects

The planning approach for sewerage is to upgrade the existing sewerage network and expand the sewerage network in tandem with the proposed growth areas. *(For More project details please refer Project Identification Report)*

- Waste water Collection and Disposal System for Negombo Township , Kelaniya-Peliyagoda,Sri Jayawardenapura Kotte, Maharagama Boralesgamuwa , Gampaha Municipal Council Area ,Ja-Ela/Ekala and Ratmalana/Moratuwa stage-i phase-ii project.
- Expansion of Pipe Borne Sewerage Coverage for Dehiwala-Mt.Lavinia Municipal Council Area.
- Wastewater collection, treatment and disposal system for Horana & Mirigama IZ.

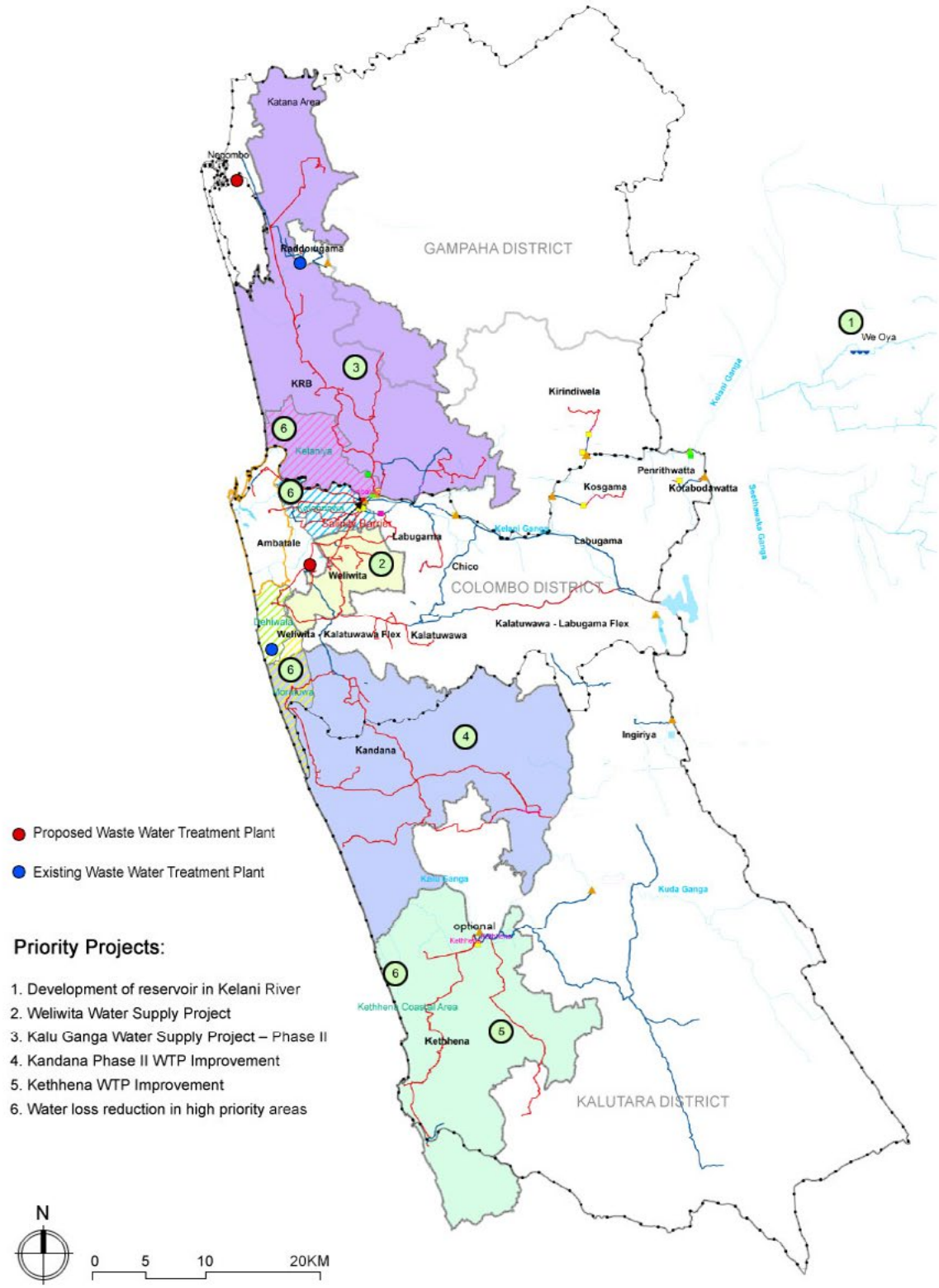


Fig 10.1 Proposed Water Supply and Sewage Plan


Maha Oya River


Existing Aluth Mawatha Canal


Mutwal Outfall

10.3 Storm Water Plan

10.3.1 Issues

Western Region is bounded by Maha Oya in the north and Bentara Ganga in the South. There are three existing river basins that traverse westward, namely Attanagalu Oya, Kelani Ganga and Kalu Ganga.

The existing storm water drainage network is 100 years old and often overloaded, resulting in localised flooding in low-lying areas. The other issues are identified as follows:

- Reduction of natural retention areas due to rapid urbanisation;
- Illegal dumping of garbage and lack of maintenance, thus reducing the drain's capacity;
- Illegal discharge of untreated sewage; and
- Damage to the river banks due to sand mining.

With the densification of the Western Region, the amount of surface runoff is expected to increase due to loss of natural retention areas. Therefore an integrated storm water management plan would be required to manage the surface runoff post development.

10.3.2 Storm Water Drainage Plan

In the near term, the existing drainage networks within Western Region, especially within the Colombo Core must be re-habilitated to prevent flash flooding during the monsoon season. In the longer term, a comprehensive drainage scheme must be developed and implemented in each of the planning areas with storm water detention ponds as part of the drainage requirements.

Protection of the natural flood retention areas within the planning areas must be strictly enforced during the implementation of the master plan to prevent encroachment of future developments into these areas.

Reassessment of the drainage catchments and retention areas in accordance with the revised policy plan may be necessary to find balance between keeping the natural retention areas and future development.

It is also recommended to assign flood control reserves along the existing water bodies. The width of the reserves would depend on the catchment size and surrounding land availability. Any permanent structures or urban developments shall be prohibited within the reserves.

The implementation of the flood control reserves is expected to slow down the runoff velocity by infiltration, prolong the time of concentration and hold the river banks soil together. During storm event, it acts as flood plain to detain the runoff temporarily. There should not be any structures within the reserves however it is recommended to plant trees and deep vegetation within the reserves to hold back water and partially absorb

Qunli Constructed Wetland

Bishan Park

Sarasota Bio-swale

their destructive energy. It could also be used as recreational park during dry season. During high intensity storm event, the park has to be closed for public and water would be allowed to flood the flood control reserves.

In addition to flood control, storm water management in Western Region has to look at implementation of sustainable drainage system (SuDS) to manage and re-use the storm water runoff.

SuDS regards storm water runoff as a resource. It provides an alternative approach to conventional drainage practices by attempting to manage storm water drainage systems by mimicking the natural hydrological cycle, often through a number of sequential interventions in the form of a 'treatment train'.

Principles of SuDS system are listed below:

- Manage storm water runoff quantity and quality;
- Protect and improve the water quality of the runoff draining from urban environments into the existing water bodies;
- Restore the urban water balance by maximizing storm water harvesting; and
- Increase the value of the land use around the SuDS features by integrating storm water treatment into the landscape.

There are many SuDS features that could be implemented in the Western Region such as storm water harvesting, swales, rain garden, constructed wetland, etc.

Due to space and cost constraint, it could be more difficult to implement SuDS elements in the existing development. Therefore the implementation should give priority to flood prone areas and all new developments in Western Region. The selected SuDS feature has to be further customised to suit the site requirement.

Key Projects

The critical drainage projects include the rehabilitation of the existing drainage system within the Colombo Core. This should include the rehabilitation of the Mutwal Tunnel outlet. The Mutwal Tunnel outlet is the only outlet that discharges storm water from the Colombo North area canal system directly into the sea. The Colombo Metropolitan Region has to be prioritised as it is where most of the population, business activities and high-end development would be concentrated at.

The Study on Storm Water Drainage Plan for the Colombo Metropolitan Region (JICA, 2003) has identified retention areas and channels to be improved within Colombo Metropolitan Region. If these projects have not been implemented, the future land use plan has to reserve the necessary space for future implementation.

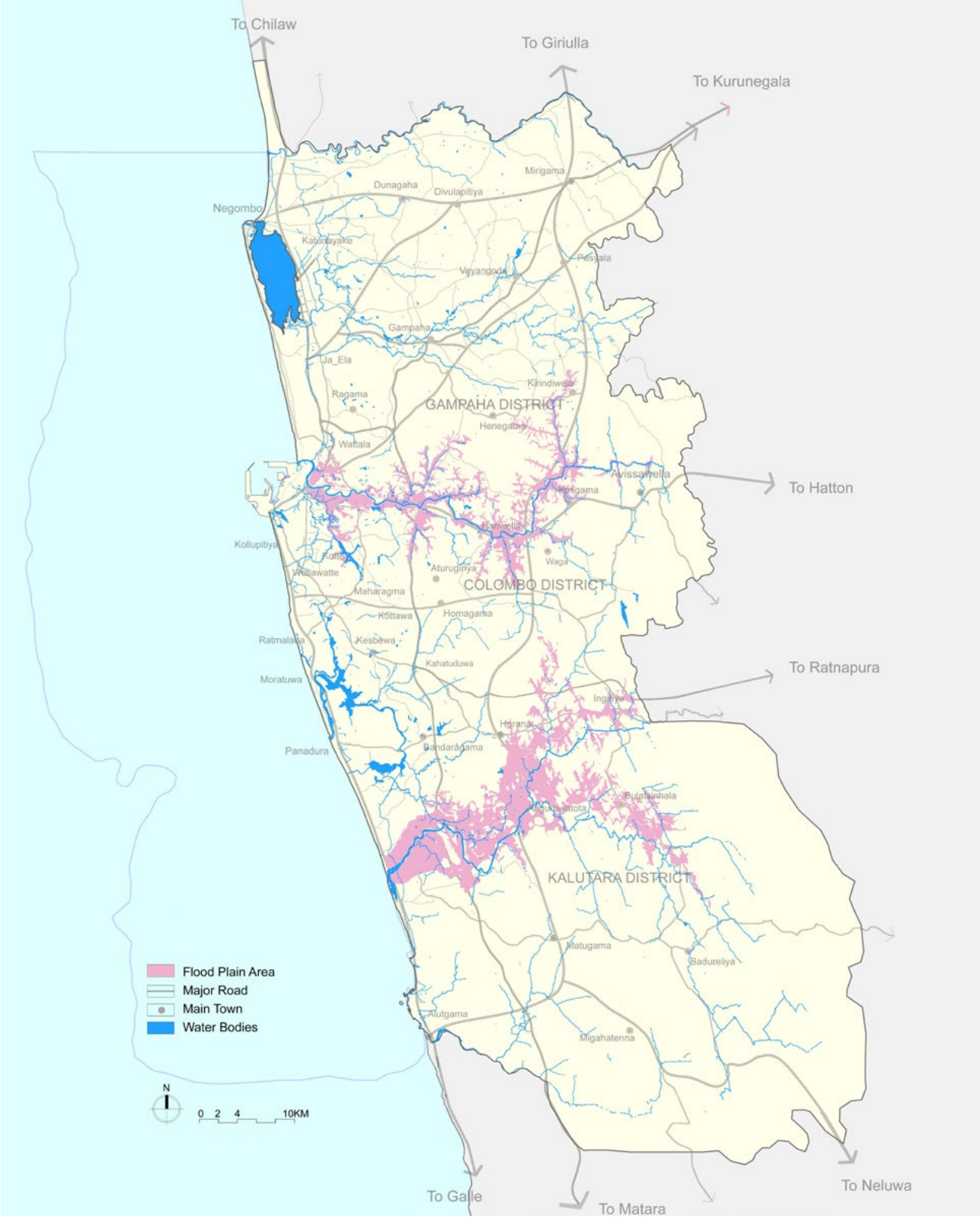


Fig 10.2 Proposed Storm Water Drainage Plan

- Rossdale Power Plant

- Al Dur Power Plant

- 75 MW Solar Farm in Kalkbult

10.4 Power & Energy Plan

10.4.1 Issues

The people in the Western Region has 100% access to electricity. The power is supplied from the national grid. There are many power plants within the Western Region that are mainly concentrated in Colombo City, e.g. Sapugaskanda and Kerawalapitiya. The total generation capacity is 3,715 MW with maximum demand of 2,100 MW. The excess power is supplied to the national grid to supply to other regions in Srilanka.

The existing power supply is able to meet the power demand in the near term. However, it will not be sufficient to cater to the future power demand that is estimated to be 6,000 MW.

Despite the 100% service coverage, the following key issues have been identified in the power supply sector:

- Difficulty to secure funding for major power supply projects;
- High cost of electricity; and
- Difficulty to secure sufficient right-of-way for transmission lines and land for substations, especially in Colombo City.

The power supply planning in the Western Region needs to ensure sufficient and reliable power supply for future development and incorporation of renewable energy sources to supplement the fossil fuels.

10.4.2 Power & Energy Supply Plan

To support the future developments in the Western Region, power supply plan must be developed for each of the planning areas, when the additional demand is announced. The power supply authority in Western Region needs to coordinate with Megapolis development plans to ensure sufficient and reliable power supply.
The following future power supply sources are considered for meeting the growing demand.

- Coal power stations in Eastern shore of the country; CEB pursues the 2nd coal power station in Trincomalee
- Natural Gas explored around Mannar,
- LNG Hub
- 600 MW Combined cycle plant
- Solar Power
- Wind Power
- Waste to heat energy using MWS

Natural Gas Industry

The success of the Gas Exploration was confirmed with Cairn India exploration finding gas in October 2011 in one of the wells dug in Dorodo & Baracuda. The available gas reserves are estimated to be adequate for running the

- Lee County Waste-to-Energy Plant

- McKay Bay Waste-to-Energy Plant

petroleum based thermal power stations in the Western shore for more than 30 years. Sri Lanka stepping into gas exploration will cut down the dependency on petroleum exports, enable the LNG hub required in the region in country and creation of highly paid jobs.

LNG operations will be set up around Colombo Ports as the second stage and the cooling energy through the CHP will be used for city cooling.

Solar Power

Sri Lanka is rich with solar radiation throughout the year. WR is somewhat hampered with year round clouds plus rains making large scale solar parks not favorable. The land cost contributes too. However solar energy source is allowed through net metering hence internal consumption using solar energy, backed by the national grid is possible. The roof tops which doesn't add land cost for solar projects will help commercial or industrial establishments to generate solar energy. Part of the additional power requirement in WR is expected from this source as well. In addition to generating power, solar energy sector has potential to create 25,000 jobs, through solar panel assembly plants as well.

Wind Power

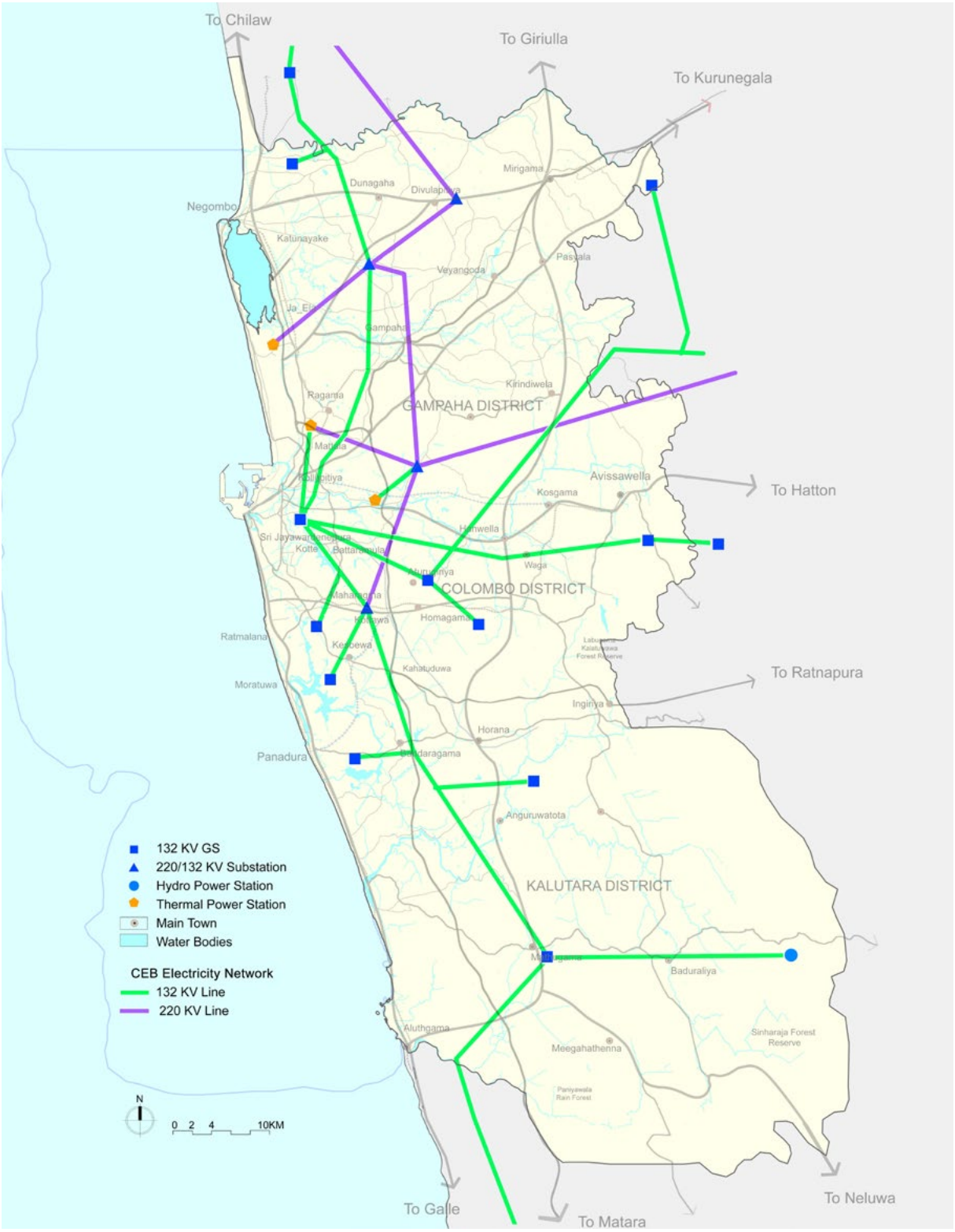
Sri Lanka is rich with wind power especially in Nuwaraeliya plains and the Mannar basin. All along the WR shores the south-west monsoon provide a substantial potential for the small wind turbines to install. However, this industry has not so far awakened in Sri Lanka. The knowledge based approach and the market in Sri Lanka and the neighboring countries paves path for industries to manufacture small wind machines and the large wind blades.

Waste to Energy

Waste to energy is not yet implemented but planned in Western Region. The daily collection of MSW exceeds 1600 MT around CMR and a rapid growth is expected with the Megaplois Development. Part of the bio degradable waste will be converted to compost and high calorific valued waste is identified for WTe plants. WTe plants, which has a potential of about 30 MW net, are seriously considered within Western Region, as a measure of disposing MSW as well.

Recommended Critical Projects

- Sapugaskanda Oil Refinery Expansion & Modernisation (SOREM)
- Gas Exploration projects in Mannar basin and Western sea.
- Natural gas pipe network and gas distribution
- LNG Hub in Colombo
- NG based combined cycled power generation in Kerawalapitiya and in reclaimed sea lands around Colombo
- Combined Heat & Power project including city cooling
- Solar power panel assembly & solutions
- 600 MW gas at Kerawalapitiya
- Clean energy systems
- All buildings to become renewable energy building regulation



- Fig: 10.3 Proposed Power Supply Plan

Chapter 11
SME, Industries and Tourism Sectors

11.1 Size and Distribution of Operations of Economic Activities- Micro, Small, Medium and Large Scale Enterprises

Small and Medium Enterprises (SMEs) have been recognized as an important strategic sector for generating high economic growth and reducing unemployment, inequality and poverty. The SMEs cover broad areas of economic activity such as agriculture, mining, manufacturing, construction and service sector industries.

11.1.1 Salient Features of Distribution of SMEs and Large units in the Western Region

In Sri Lankan context large and medium scale establishments are mostly concentrated in urban areas (50% medium and 61% large establishments) whereas the micro and small (74% of the micro and 60% small) establishments are scattered in rural areas.

Table 11.1 Distribution of Non-agricultural Units by Sector in Sri Lanka

Sector	Total	Urban		Rural		Estate	
	Number	Number	%	Number	%	Number	%
Total	1,019,681	250,828	24.6	753,655	73.9	15,198	1.5
Micro	935,736	216,204	23.1	705,074	75.3	14,458	1.5
Small	71,126	27,999	39.4	42,683	60.0	444	0.6
Medium	10,405	5,164	49.6	4,989	47.9	252	2.4
Large	2,414	1,461	60.5	909	37.7	44	1.8

Source: C & S (2014) Non - Agricultural Economic Activities Survey 2013 /2014

Among Small and Medium establishments, 39.9% and 48.4% belonged to the Service Sector. Large establishments were relatively low (2414) and were almost evenly distributed in all 3 sectors.

Table 11.2 Distribution of Establishments by SME and Large Units, Sri Lanka

Distribution of Establishments				
Group and Economic Sector				
Total	Total	Industry	Trade	Services
		%	%	%
	1,019,681	25.6	41.1	33.4
Micro	935,736	25.3	42.0	32.7
Small	71,126	28.8	31.3	39.9
Medium	10,405	32.0	19.6	48.4
Large	2,414	31.6	36.9	31.5

Source: C & S (2014) Non - Agricultural Economic Activities Survey 2013 /2014

When the contribution of SMEs and large establishments for the employment generation is considered, it is clear that as much as 91.8 % of micro enterprises in the country had employed only 44.5% whereas large enterprises in the country (0.2 %) had provided employment to 24.9% of the labor force.

The main concentrations of over 10,000 establishments in the Region are as follows:

- Colombo District- City of Colombo (DSDS of Colombo and Timbirigasyaya), Kaduwela, Homagama, Moatuwa, Kesbewa,
- Gampaha District – Katana, Divulapitiya, Ja Ela, Gampaha, and Attanagalla.

Although the number of establishments exceeded 10,000, the proportion employed was as low as 5.8% and 6.0% in Moratuwa and Homagama respectively.

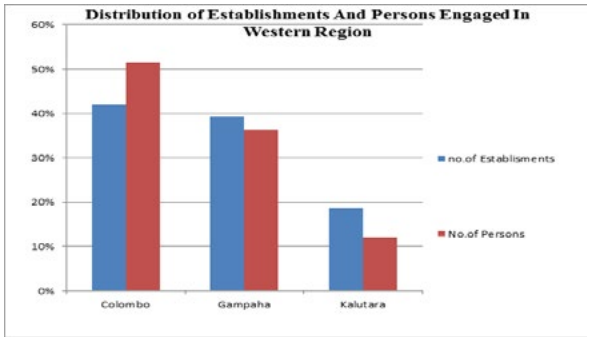


Fig.11.3 Distribution of Establishments and Persons Engaged in the Western Region

Source: Department of census & Statistic 2013/2014

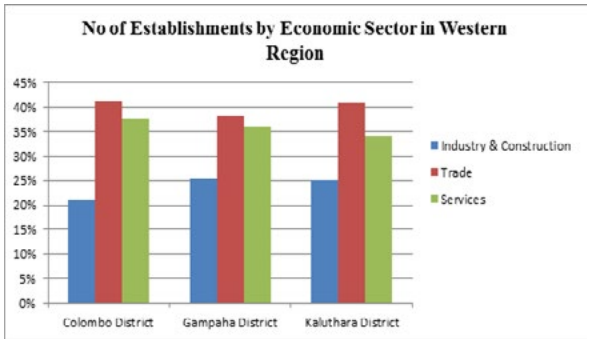


Fig.11.4 No of Establishments by Economic Sector in Western Region

Source: Non – Agricultural Economic Activity Survey 2013 / 2014 C & S

11.2 Industries

The distribution of Industries in the Western Region by Major categories and DSDs reveal the following salient features:

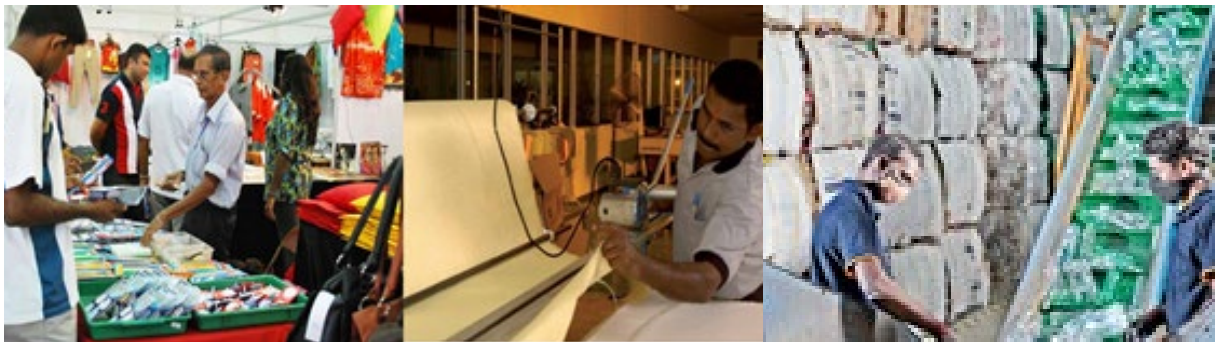
- As much as 58. 0% in the Colombo District is categorized under 'manufactured products' and 'other' industries.
- Other main groups in the Colombo District in r.ank order are paper and paper products, non-metallic mineral products and wood and wood products.
- The main industrial establishments located in the Gampaha District apart from 'other' industries are paper and paper products; chemical, petroleum, rubber and plastic products; non-metallic mineral products and wood and wood products.
- In the Kalutara District the predominant industries were non-metallic mineral products; wood and wood products and chemical, petroleum and rubber and & plastic products.

District	Colombo	%	Gampaha	%	Kalutara	%
Food, Beverage & tobacco	331	3	239	7	261	17
Textile, Wearing Apparel, Leather	296	3	121	4	110	7
Wood & Wood Products	627	6	360	11	211	14
Paper & Paper products	1254	13	481	15	19	1
Chemical, Petroleum, Rubber & plastic	481	5	433	13	177	12
Non Metallic Mineral Products	1060	11	314	10	629	42
Fabricated metal products, machinery etc.	14	0	391	12	0	0
Manufactured products (n.e.s)	4063	42	20	1	62	4
Other Industries	1543	16	943	29	31	2
Total	9669	100	3302	100	1500	100

Fig.11.5 Distribution of Industries in Western Region by major Categories

Source: Industrial Development Authority WP 2013 (IDAWP)

The majority of industries (manufacturing and construction related activities) in the Colombo District are clustered in the city of Colombo (Colombo and Timbirigasyaya) and in Moratuwa. Three other DSDs with concentrations that range from 2480-3420 are Maharagama, Kaduwela and Homagama. In the Gampaha District, industries are scattered over a wide area with Divulapitiya and Katana DSDs having only 12.3% and 9.9% of industries respectively. The DSDs of Minuwangoda,



Gampaha, Attanagalla and Mahara have 35.0% of industries while 28.2% are distributed in the DSDs of Biyagama, Dompe, Ja-ela and Mirigama. As much as 52.8% of the industries in the Kalutara District are concentrated in Kalutara, Panadura, Horana and Bandaragama. Among the SMEs, the apparel industry has provided employment to as much as 44,000 in Katana DSD and 26,000 in Seethawaka DSD, and between 10,000 to 18,000 in Attanagalla, Moratuwa, Kesbewa and Biyagama and DSDs.

11.3 Trade and Services Sectors

Trade and Service Sectors comprise 40% and 36% of the SMEs. Wholesale and Retail trade activities are concentrated in the more densely populated urbanized areas with large clusters in the City of Colombo (37%) and in Panadura, Kalutara and Beruwela. A unique feature in the region is the cluster of micro and small scale, informal sector enterprises that stretch on either side of the 1.75 Km long Pamunuwa road and its cross roads in Maharagama. In addition to the 100 permanent buildings, there are about 1,000 small semi-permanent and temporary stalls and pavement hawkers who sell fabrics, cut pieces, readymade garments, sewing accessories, soft toys and plastic goods. Another distinctive feature is the wholesale trade that starts at 2 am and ends at 8 am. Estimated Rs: 10 million is earned each day by the traders which increase up to Rs.20 million during the festival seasons. Traders and customers (nearly 100,000 wholesale and retail buyers) congregate daily.

The number of establishments in the Service sector is lower than that in the trade sector. Main clusters in administration, professional, health, education and other service sectors are located in the Colombo and Kaduwela DSDs.

11.4 Major Issues and proposed Strategies identified for the SME Sector

11.4.1 Finance of SME

Issues

- High interest rates and the emphasis on collateral.
- Access to equity and loan capital.
- Cost of borrowing.
- Management of finance.
- Proprietorship
- Poor resource-base and inability to avail economies of scale
- Outdated technology.
- Poor production facilities
- Absence of quality control.
- Lack of market orientation and relatively low profitability.

11.4.2 Appropriate technology

Issues

- Largely family-based enterprises.
- Limited access to information and technology.
- Technology adopted by many SMEs are not appropriate.
- Limited access to information on product and process technology.
- Domestic research and development (R&D) institutions including universities maintain



little or no interaction with SME sector enterprises.

- No Quality control training.
- No convenience access to better technologies.
- Inefficiencies in the diffusion of technologies among entrepreneurs by state technical support agencies.
- High financial costs involved in effective adoption of new technology.
- Lack of human resources at enterprise level
- Lack of motivation amongst producers in actively seeking out new technologies.
- Lack of motivation improves the marketability of their products in competitive markets.
- Low level of technology at enterprise level.
- Limited outreach by state agencies engaged in promoting R&D activities.

11.4.3 Market information and marketing skills

Issues

- Lack of information on domestic and international markets.
- Lack skills on product development.
- Lack of skills on packaging.
- Lack of skills on distribution and sales promotion.
- Lack the necessary market information and business advice on niche markets.
- High cost of transport.

11.4.4 Infrastructure facilities

Issues

- Lack of accessibility for key infrastructure facilities such as electricity, water, telecommunications and road network.
- High cost of utilities.
- High tariffs for utilities.
- Unreliable service of key facilities.

11.5 Proposed Interventions

- Need a proper land use and zoning plan in order to encourage private investment and different type of investment.
- Private Investment for health and education is a more vulnerable subject area.
- Therefore, national policy is needed,
- International trade agreement should be more conducive for local manufacturers.
- It is necessary to a have straight forward definition for the SME sector other vise this sector represents a marginalized group and as a results they have not benefited.
- Regularize the clear budgetary provisions for SMEs.
- Make easy accessibility for better technology as a regulatory requirement through establishment of links with state owned Science and Technical Institutions including universities with SMEs. Cost of technology should be affordable.
- There should be a strong high powered single organization responsible for development of SMEs.
- Interest for bank loans for development of SMEs should be reduced from 8% to 5% up to 2020 under the following conditions.
- Location in the industrial park/estate
- At least 50% total productions or services to be exported
- Total annual turnover shall not exceed SLRs600 million.
- More than 150 employees.
- Be value added



- Be innovative
- To be low polluted environment friendly

11.6 Strategies identified for the development of SMEs

- To make available developed land with infrastructure and preferably buildings too on long lease or rental basis.
- Fiscal incentives for export – oriented enterprises.
- Establish a technology development fund
- Establish links with state-owned Science and Technical institutions including universities and SME sector enterprises in order to address their technical problems.
- Maximize the cooperation between large-scale enterprises and SMEs.
- Establish business development services centers (BDS) on demand driven
- Encourage the clusters of small businesses.
- Create a market for local research and development.
- Introduction of an annual award scheme for the "Best Innovative Firm" and "Best SME Friendly Innovations".
- Establish a well-equipped SME website.
- Business incubator programs.
- Establish mini industrial estates in each divisional secretariats division. (10 Acres per each)
- Provide training facilities to enhance the skill of workers
- Increase the skill levels and strengthen the use of appropriate, modern technologies
- Make regulatory requirements for imports
- Provide concessionary payment method for utilities.

11.7 Long Term and Activity Plan (2016 to 2030)

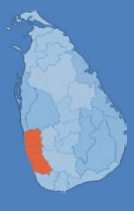
11.7.1 Setting up of mini industrial parks (Minimum 10 acres of extent).

It is identified 11 DSDs to setting up of industrial parks to facilitate SMEs. Katana, Gampaha, Attanagalla, Mahara, Dompe in Gampaha District, Hanwella, Padukka, Homagama in Colombo district and Ingiriya,Bulathsinhala, Matugama in Kautara district are the proposed location Detailed designing will be done at the project implementation stage.

It is expected to create 65000 employment opportunities in first five year period.

Proposed industrial projects for industrial parks in Gampaha District are as follows.

- Pharmaceutical/Herbal products
- Fruit processing &packaging
- Floriculture
- Cashew nut processing
- Building materials
- Steel furniture
- Wood and wooden based products/Furniture
- Rice processing and rice based products
- Garment
- Bakery and confectionery products
- Cosmetics.
- Shoes and leather based products
- Sea food processing
- Fruits and vegetables processing
- Coir based value added products
- Electronic apparatus
- Paper and printing based products
- Boats spare parts
- Equipment for water sports and excursion activities



- Coconut based products
- Chemical and chemical based products. (Adhisives, Paint, Fertilizer, etc)
- Rubber based products and plastics
- Waste oil recycle project
- Basic metal industries
- Food and beverages products including breakfast cereals.
- Re-build of three wheel tyres
- Tile and clay based products
- Electrical and electronic projects
- Fish processing industries only for export.
- Vegetables and fruits cold storages.
- Growing media out of coconut husks
- Coir based floor covering

Proposed projects identified for Colombo district are as follows.

- Software development
- Electronic devices.
- Medical services equipment including IVF workstations.
- Energy saving lamps
- TV transmission related products
- Semi - conductor Intellectual Property Design
- Development of Integrated circuit (IC) design
- New electronic product development
- Lab testing facilities for electronic engineering products.
- Training for engineers.
- Technology based SMEs in ICT
- Biotechnology and nanotechnology facility centre

Proposed projects identified for kalutara district are as follows.

- Manufacturing of bamboo based products, furniture
- Establish Pilot enterprise units using bamboo
- Establishment of community-owned and managed enterprises
- Lab facilities for machines and tools used in the production, finishing techniques and processes of bamboo products.
- Bamboo treatments facility centre
- Eco friendly art and craft products
- MICE tourism point
- Manufacturing of kithul treacle (syrup) and kithul Juggery for export market.
- Tea processing, packaging, and storage facilities.
- Manufacturing of value added tea
- Tea Information centre(technology,Marketing,and financial)
- Storage facilities for semi finish rubber products.
- Manufacturing of machinery parts and equipments related to plantation sector
- Manufacturing of compost fertilizer and sales outlet.
- Food and beverages, confectionary products
- Manufacturing of basic metal products.
- Rubber based automobile industries
- Paper and paper corrugated products
- Tyre reclaiming out of scrap tyres
- High fashion jewellery and gems
- Assembling of motor vehicles, manufacturing of spare parts and stores facilities
- Water Bottling
- Electronic products
- Casting of all types of bronze bushes
- Manufacturing of crape rubber and form
- Manufacturing of packaging materials.
- Bottling of fresh coconut/king coconut water for export market.

11.7.2 Establishment of Business Development Centres

Proposed to establish Business development centres at Homagama, Mirigama, Gampaha, Horana, Kalutara. It is estimated to create 6000 direct employment under this programme.

Business development centre expects to cater the needs of the entrepreneurs providing specialized services. Well qualified professionals attached to business centers are capable of implementing the business extension and promotional programmes. Policy changes and suggestions needed from time to time could be initiated at BDC level.

11.7.3 Establish a Technology Transfer Fund

It is proposed to upgrade the technology, encourage to use modern machineries and improvement of quality of the SMEs under this programme. It is estimated to create 10000 employment.

11.7.4 Establish Business Incubators

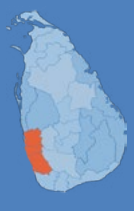
It is suggested to set up incubators at Horana, Meerigama, Moratuwa to support start up entrepreneurs in different sectors. More than 10000 employment will be created.
Proposed sectors are as follows:

- Fruits Processing and packaging
- High fashionable apparels and leather products
- Building Materials
- Bakery /confectionery/Nutritions cereals products
- Household/ office/educational Furniture
- Electronic and electrical parts
- ICT based enterprises

11.7.5 Encourage the clusters of SMEs and large scale enterprises.

Proposed clusters

- Fashion cluster Textiles, Garments ,Gem & Jewellery, Leather (Moratuwa, Ratmalana, Maharagma, Horana)
- Rubber cluster Surgical gloves, Condoms, Rubber composites, Auto parts, Latex sheets products (Kalutara, Horana)
- Culture & Creative cluster Press & publishing, Film & Video, TV & Radio, Music, Visual Arts and Performances, Heritage and Tourism (Moratuwa, Dalugama, Kelaniya, Horana)
- Bio-Medical cluster Medical devices, Biopharmaceuticals, Hospital tourism, Ayurveda system (Malabe IT Park - S&T City, Dompe, Pugoda, Attanagalla,Yakkala)
- Bamboo related production cluster(SME Sector) Furniture, High end Craft items, Toys, flooring etc. (Palindanuwara)
- Reed production cluster (SME sector) (High end craft, Mats, Bags, Packaging ,Sun shades, shoes Meegahatenna, Moragala)
- Coir and clay based production cluster (Carpets, High end craft, Geotex, etc.) Radawadunna, Webadamulla - Gampaha



11.8 Tourism Sector

This section relies heavily on the Paper presented by Fernando (2015). Within the Western region, it is essential to identify the environmental, historic and cultural assets that are unique and can be promoted to attract tourists from traditional generating markets as well as from identified new markets. Apart from identifying and developing new products, improving existing products are equally important. Measures to protect, conserve, preserve, enhance and manage such tourism assets become essential from a sustainability point of view. Apart from Colombo, tourism development in the region to a great degree hinges on coastal tourism.

11.8.1 Existing and Potential Tourism Products

The total available room capacity in Sri Lanka in 2012 was 26,267. Registered hotels accounted for 15,510 (59%) rooms, Supplementary Accommodation for 6557 (25%) rooms and 4200 (16%) rooms in the informal sector. In the Megapolis, there were 18,862 rooms accounting for 10,612 within registered hotels, 4900 as supplementary accommodation and 3,350 in the informal sector in 2012. Of the total room inventory of the island, the Western region accounted for 71% of rooms. In 2014, the composition was 18,862 rooms accounting for 10,612 within registered hotels, 4900 as supplementary accommodation and 3,350 in the informal sector (Fernando, 2015).

Fernando estimates that currently, the region would have to have a "total room capacity of 22,800 of which 12,500 as registered hotel, 5,200 as supplementary accommodation and 5,100 in the informal sector. The total room capacity within the Western region accounts for 73% of the tourism sector accommodation capacity. The registered occupancy within the formal sector registered establishments (hotels) on average is around 73%. The Colombo city occupancy averages around 77% whilst on the Southern belt, up to Bentota, average occupancy is around 71% whilst greater Colombo accounts for 73% occupancy.

The informal sector as well as the supplementary establishments too account for an estimated 65% average occupancy" (2015). It is expected that by the year 2020, the Western region will have a room capacity of 17,500 within registered establishments, 6,250 in supplementary accommodation units and around 7,500 rooms in the informal sector with an estimated total capacity of 31,250 rooms. Accordingly around 50,000 persons will be in direct employment within the accommodation sector of the Western region. A further 13,000 persons will be in employment in restaurants within the formal and informal sectors.

Tourist attractions within the Western region are predominantly beach and water sports oriented, apart from in the Colombo City zone. Colonial buildings and other large buildings in prime locations in the city have been refurbished and rented out to earn income whilst catering to the needed demand by the UDA. Most of the new mixed development projects announced has a significant retailing space (on avg. 50,000 sqft) and these spaces would be taken up by either local or foreign retailers. Other attractions are Urban Tourism, Beach Tourism, Resorts, Gourmet Experiences, Entertainment, Night life, Eco and Nature tourism as well as facilities for Golf, Fishing, Surfing, Windsurfing and other Water Sports; Sailing, Boating and Yachting; Kayaking and River Rafting Scuba Diving; Nature Tourism; Health and Wellness Swimming and Beach related activities and Cultural/ Spiritual Tourism.

It is estimated that 325,000 indirect employment opportunities had been created through tourism within the Western region in 2014. The estimated direct employment was 129,400 (Table 11.6). By 2020, it is projected that direct employment would increase to 199,200 (Table 11.7).

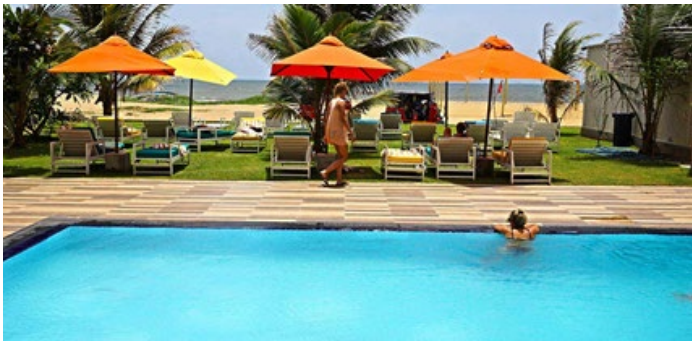


Table 11.6 Estimated distribution of tourism employment within the western region (direct) 2014

SECTOR	Est. no. of workers	Managerial	Technical/ Supervisory	Manual/ Other
Hotels & Restaurants	42,000	5,500	23,000	13,500
Travel Trade	7,800	2,200	4,400	1,200
Airlines	7,000	1,050	4,500	1,450
Recreation	1,000	120	600	280
Tourist Shops	2.000	300	1,300	400
Guides	2,400		2,400	
NTO's and Related	500	150	150	200
State	2,000	600	650	750
Total	**64,700**	**9,920**	**37,000**	**17,780**

Table 11.7 The projected distribution of tourism employment within the western region (direct) 2020

SECTOR	Est. No. of workers	Managerial	Technical/ Supervisory	Manual/ Other
Hotels & Restaurants	63 000	7,900	34,600	20,500
Travel Trade	9 500	2,600	5,200	1,700
Airlines	8 500	1,200	5,500	1,800
Recreation	2 800	300	1,700	800
Tourist Shops	3 200	500	2,100	600
Guides	3 500		3,500	
NTO's and Related	1 100	250	600	250
State	3 000	900	900	1,200
Total	**94 600**	**13,650**	**54,100**	**26,850**

11.8.2 Benefits of Tourism:

- Opportunities for entrepreneurship and self employment
- Skills requirements for direct and indirect employment within the tourism sector
- Current skill levels and gap
- Training institutions – types of training available, in-take and output capacities
- Manpower planning
- Through impact analysis, mitigating negative areas whilst planning to enhance positive contributions
- Supporting immediate community in other sectors through tourism
- Social stigma and female participation in the tourism sector
- Leakages from Provincial economy
- Retaining tourism earnings within the local economies, sector linkages and multiplying earnings
- Community relation programs within the western region
- Community based tourism development projects
- Local economic development (LED) through tourism
- Using SWOT analysis provided in report

(Limited scale) structuring to derive maximum benefits through tourism through proper integrated plans

- Inadequacy of skilled manpower.

11.8.3 Issues and threats:

Issues

- Heavily built up coastline
- Lack of clear zone/resort identity
- Below average environment spoiling opportunity to attract up market tourists
- Environmental degradation of corals and destruction of natural coastline
- Below average environmental management
- Planning void of carrying capacity limits
- High traffic congestion causing air and noise pollution and road safety risks

- Poor waste water treatment
- Generally, below average urban design and poor circulation networks within resorts
- Average tourism promotion by zones
- Mediocre image of some of the tourism zones within the Western Region
- Below average land use interface
- Non availability of precise tourism development plans
- Polluted water bodies
- Poor promotion of cultural features
- Lack of a proper system to ensure quality and standards of tourists products and service.

Threats

- Continued degradation of the coastal environment
- By passing of tourist resorts and other attractions as a result of using the Southern
- Expressway
- Spread of unplanned and uncontrolled development growth
- Pollution of natural waterways, destruction of mangroves and damage to bio diversity
- Poor environmental management practices in respect of sensitive areas
- Alienation of rural communities in the tourism development process
- Skills training within the tourism sector not keeping pace with the demand
- osing competitiveness due to pricing to other destination.
- High financial costs on borrowings for tourism development
- Below average planning in tourism development
- Lack of subject knowledge among officials handling the subject of tourism
- Garbage and solid waste disposal
- High energy costs.

11.8.4 Proposed Actions for the Promotion of Tourism Industry

- Eco tourism - Promotion of nature tourism in the Forest City Zone- establish a forest adventure park at yagirala.
- Development of marine infrastructure in the Western Province in order to develop marine tourism- to attract visiting yatchsmen.
- Shipwrecks as tourist attractions
- Development of Dedduwa river mouth and surrounding area that has many potential attractions with wetland, lakes, irrigation canals and abandoned paddy fields. It is rich in biodiversity with diverse vegetation such as mangroves, fauna, and different kinds of fresh water fish, mammals and reptiles, aquatic birds to be developed for eco tourism
- Cultural Tourism - The Megapolis Region possesses a vast array of tangible and intangible assets that are of an archaeological, architectural, religious and aesthetic value (tourists and for nature lovers (eg; nature trails have been laid out in the Pilikuttuwa Forest for outdoor recreation).

  i. Pre historic museum and research centre, craft villages in the Forest City Zone.

  ii. Other assets during the Pre-historic per iod

  iii. Development of ancient ffortress of Kotte preservation and conservation of tangible resources in the Kotte period

  a. Ralapanava at Rajagiriya
  b. Recreation of a small section of the ancient Diyavanna Bund at Rajagiriya and Recreation of the bastion at Rajagiriya
  c. Conservation of the Rampart and the Bunds that were there right round the ancient inner-city
  d. Conservation of the inner-city moat and Angampitiya Bastion

  iv. Preservation of Pettah to safeguard the 'authenticity and sites of sites and monuments/old buildings.

AREA	DESCRIPTION	ACTION BY
Restructuring and upgrading of the Coastline where required, between Marawila and Bentota	Resort/ Suburban upgrade New Pilot Projects Establishment of Eco Tourism bases and circuits New Urban fringe parks Planning and management of backwaters Encouragement of waterborne tourism	Planning by Government Agency. Development by Government Agencies, Private Sector, PPP's
Wadduwa Tourism Zone	Pilot a Resort Development Promote railway access along the Southern coastline	Planning by Government Agency. Development through Foreign and Local Investment, PPP's
Kalutara Tourism Zone	Upgrade the Urban/ Resort development Create base and circuits for Eco Tourism	Planning by Government Agency. Development through Foreign and Local Investment, PPP's
Beruwala and Bentota Zones	Create a distinct image for the Bentota tourism zone At Beruwala establish the Center hub for sailing with a marina for Yachts	Planning by Government Agency. Development through Foreign and Local Investment
Regulatory Framework - Planning, Development, Implementation, Monitoring, Control and Marketing	At a Western Province level, either strengthen the Provincial Ministry of Tourism to be responsible for overall tourism within the region or establish a local Tourist Organization with required powers Specialist areas as indicated under regulatory framework to be handled by subject experts	Government Agency
Upgrade the Railway system for Tourism use	Within the region, along the coastal line, improve on overall quality and frequency of the railway system	Government Agency, PPP's, Foreign Investment on a BOT basis
Carryout traffic safety measures along main roads and internal roads servicing tourist resorts	Traffic flow systems Introduction of bypass systems Strengthening of the Public transport system to perceived levels, encouraging greater use	Government Agencies
Improved Solid Waste Disposal	To be carried out in all zones within the Western region on a prioritized basis	Government Agencies
Sewer Treatment and Disposal	To be carried out in all zones within the Western region on a prioritized basis	Government Agencies

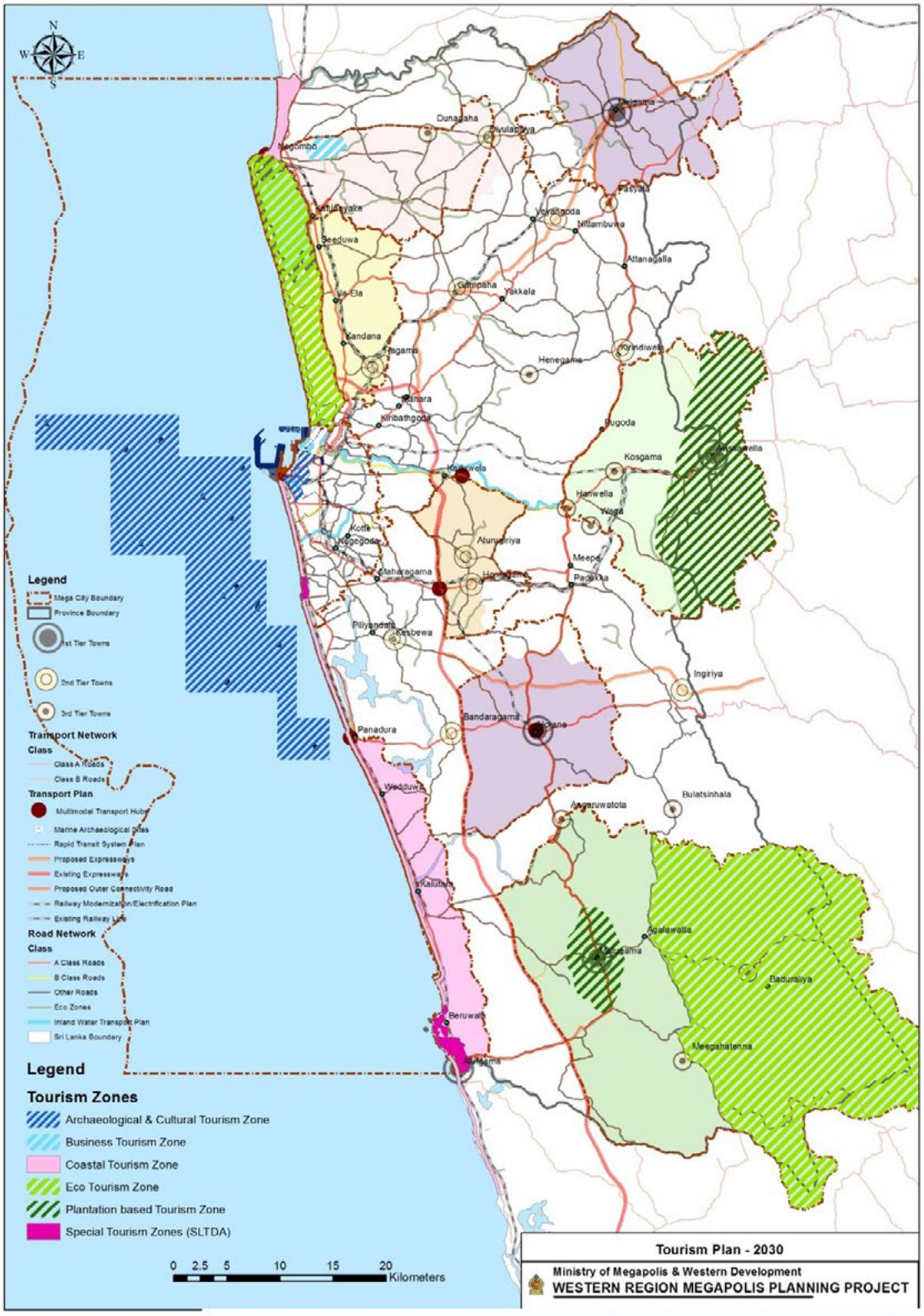


Fig. 11.1 Proposed Tourism Zone of 2030 by Western Region

Chapter 12
Key Projects

Key projects are proposed to grow the economy, attract investments and create employment. Apart from that, these projects are also aimed at improving the living environment for the masses by building well planned cities in contrast to the ribbon growth that Western Region experiences today.

The identified megacities and key projects include:

- **Airport City**
- **Logistics City**
- **Mirigama Industrial City**
- **Plantation City**
- **Forest City**
- **Horana Industrial City**
- **Science and Technology City**
- **Cental Business District**

Fig 12.1 Proposed Key Projects Location Plan

12.1 Airport City

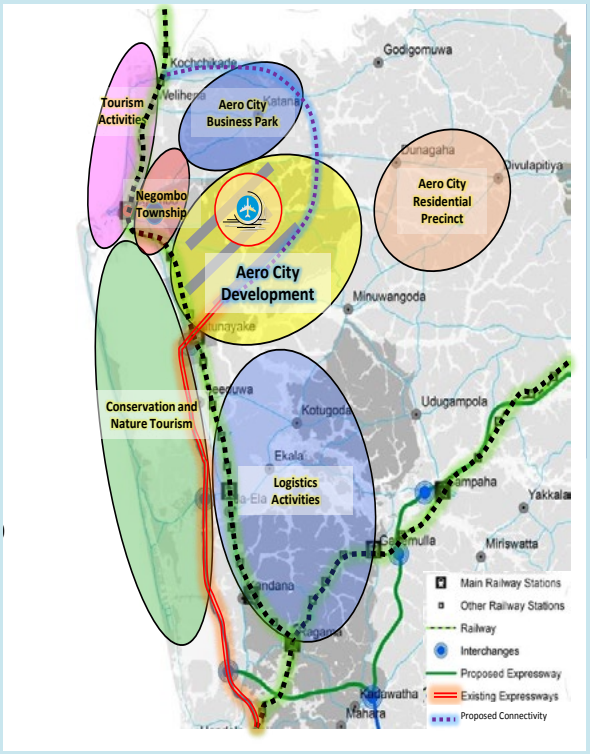
Area: 306 sq km

The Airport City is proposed around Bandaranaike International Airport in Katunayake. The project will consist of the airport cluster and the residential township clusters.

The airport cluster is aimed at growing aviation related businesses around the airport, including the development of a second runway, the airport extension, and the development of aviation industries, logistic and MICE businesses around the airport. The airport cluster is expected to generate additional 250,000 new employments.

The residential clusters will complement the airport city development by providing well planned residential areas near to the employment centre around the airport. Various types of housing, recreational, commercial and public facilities will be integrated in the township, ensuring a good quality living environment.

This project will attract investors in the airport development, airport operation & management, aviation related industrial developers as well as real estate developers.



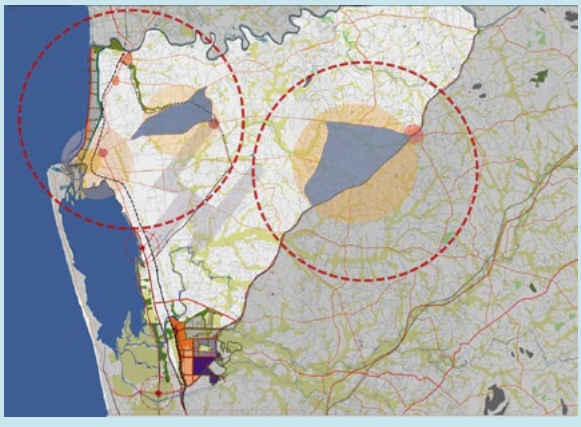
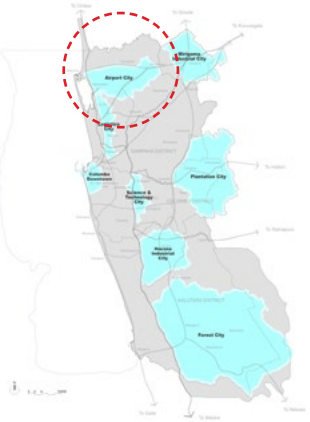


Fig 12.2 Aerocity Concept



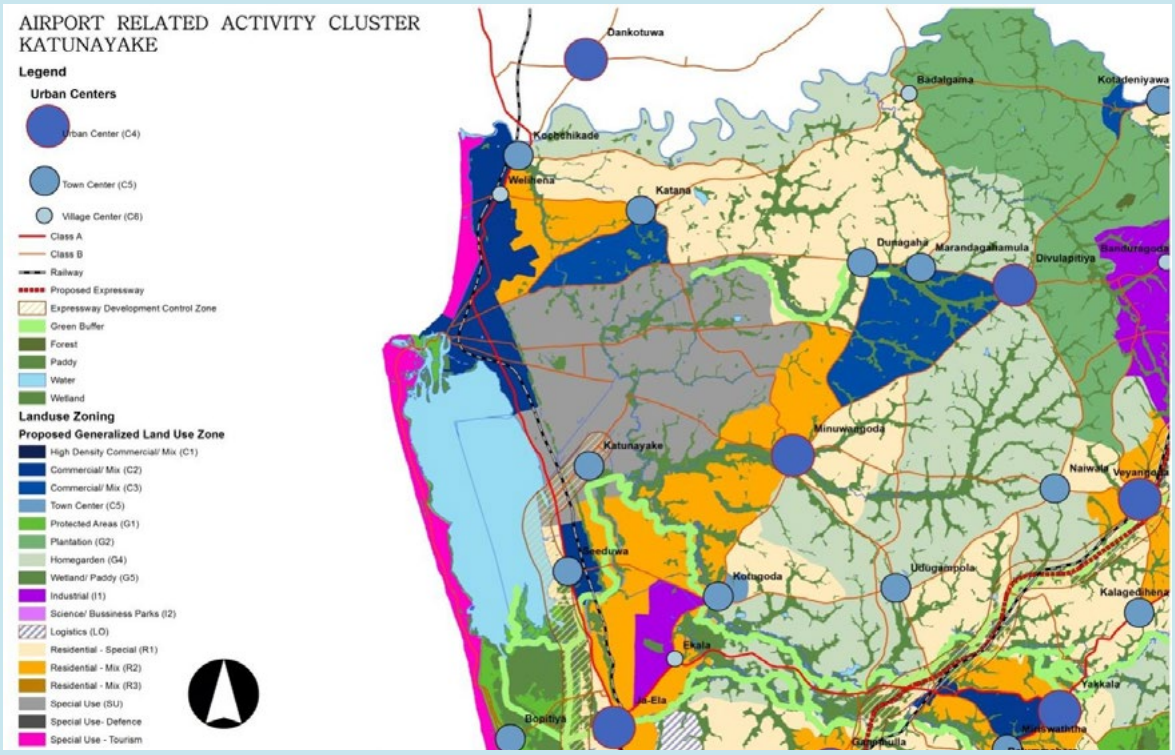


Fig 12.3 Aerocity Zoning Plan (top), Proposed Uses in Aerocity Businesspark (bottom left), Proposed Uses in Aerocity (Bottom right) Residential Precinct




12.2 Logistics City

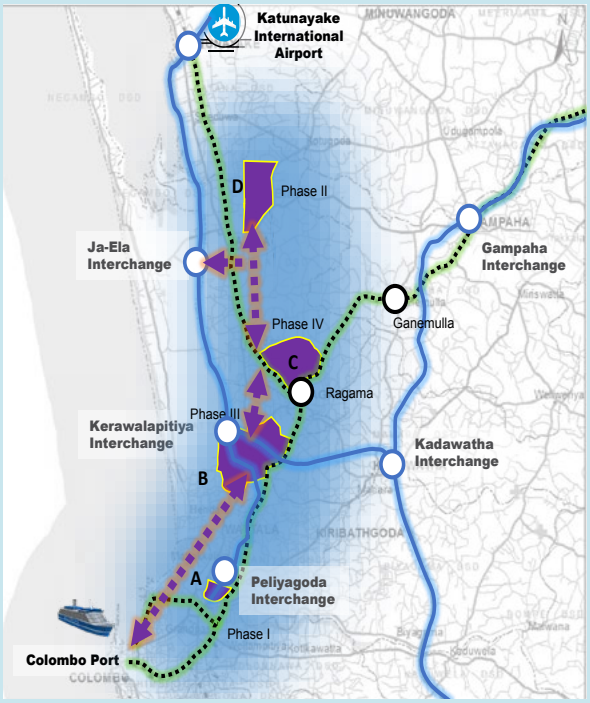
Area: 306 sq km

The Logistics City is strategically located in close proximity to the Colombo Port and the Airport, and its accesibility to other parts of the country. The Logistics City is aimed at tapping into this strategic opportunity to grow logistics industries and manage the sporadic existing logistic activities. The Logistics City is envisioned to be the primiere transport and logistics hub of South Asia.

The project will consolidate and link existing and potential logistics activities in the Western Region. Multi modal connectivity such as dedicated roads, expressways and railway links are proposed for freight handling and transportation. Industrial clusters will be developed to accomodate different facilities such as tranhsippment, dry port, warehousing, cold storage, vehical repair, and cargo distribution.

The integrated residential clusters will be developed to provide housing near to the employment centre. Various types of housing, recreational, commercial and public facilities will be provided ensuring a good quality living environment.

This project will generate around 100,000 new jobs and attract investors in the logistics sector as well as real estate developments.



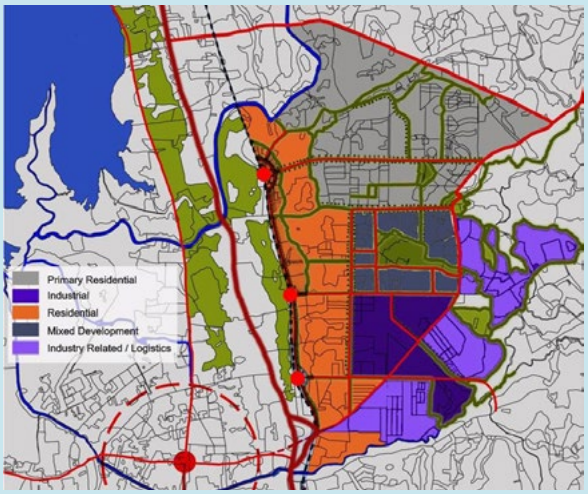


Fig 12. 4 Logistics City Concept (top), Proposed Uses at Ekala Cluster (bottom)

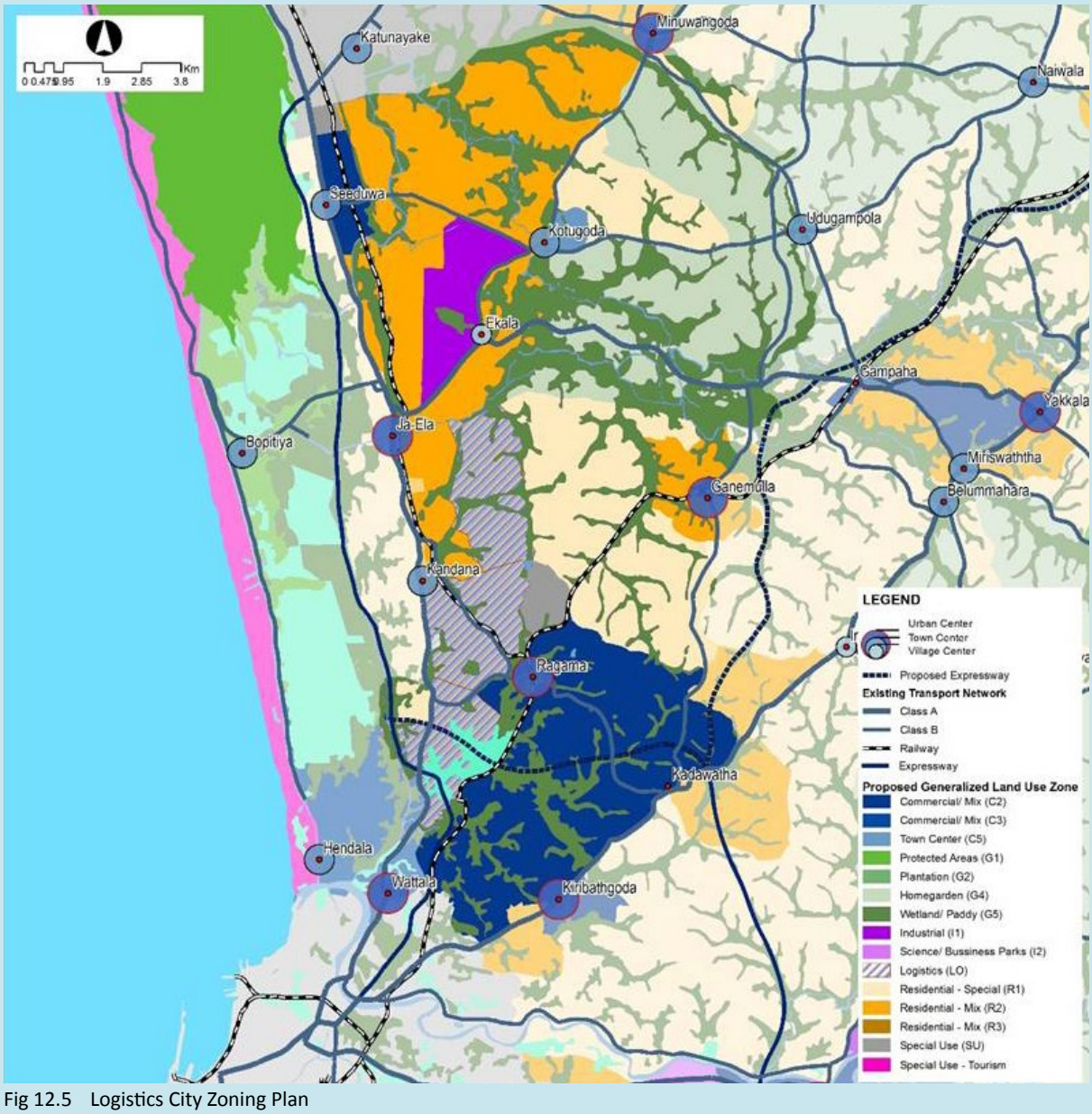


Fig 12.5 Logistics City Zoning Plan




12.3 Mirigama Industrial City

Area: 184sq km

The Mirigama Industrial City is located at the north east corner of the Western Region. It occupies approximately an area of 184 sqkm including some small towns as well as scattered villages.

The project aims to attract major players in Pharmaceuticals, electronic products Edible products manufactured out of the cultivated agricultural products , Ceramics, glassware of the mineral based products, Cosmetic products manufacturing and provide location for SME's that will support the above industries. The site in Mirigama was selected as land is still highly available, labour cost is lower, and it is located at the gateway to Western Region.

This project also aims at creating a liveable city where migrants from rural areas can settle in Mirigama without necessarily moving to Colombo, which has been overcrowded in Sri Lankan context. This project is expected to attract industrial developers, which in turn will attract investments in electronic manufacturing and create employment. The Mirigama Industrial City is expected to generate additional 100,000 new employments.

This project will also attract real estate developers, who will be counting on the industrial estate as an employment centre that will attract workers and create real estate demand.

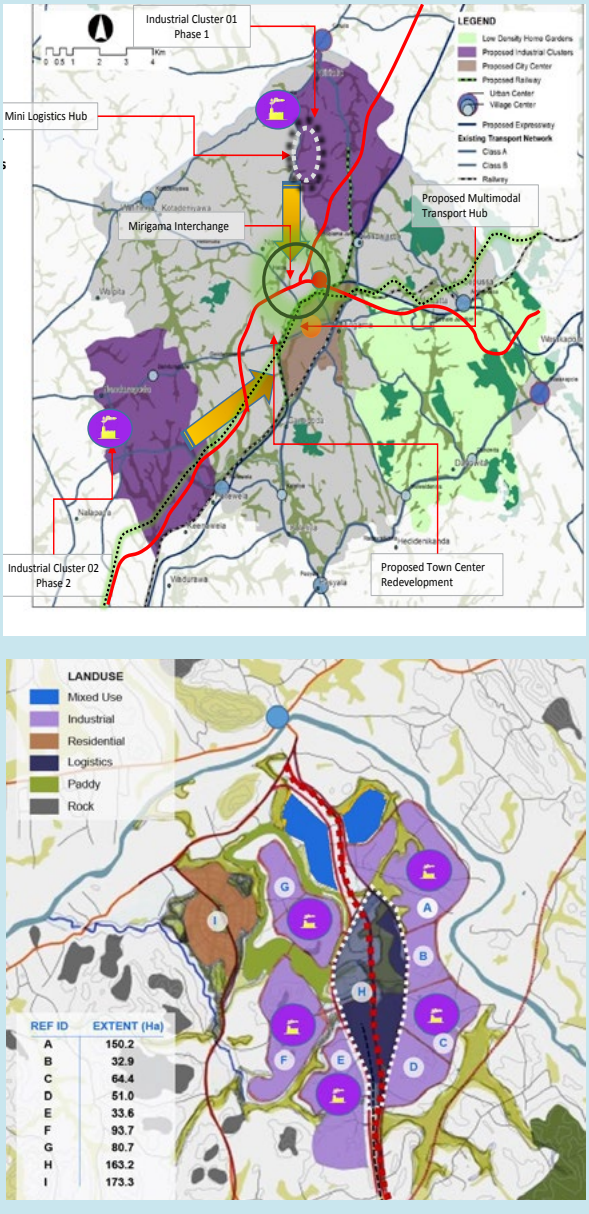
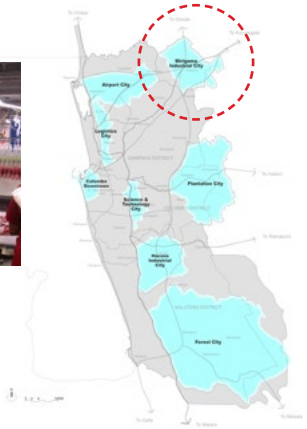


Fig 12.6 Mirigama Industrial City Concept (top), Proposed Uses at Industrial Cluster 01 (bottom)



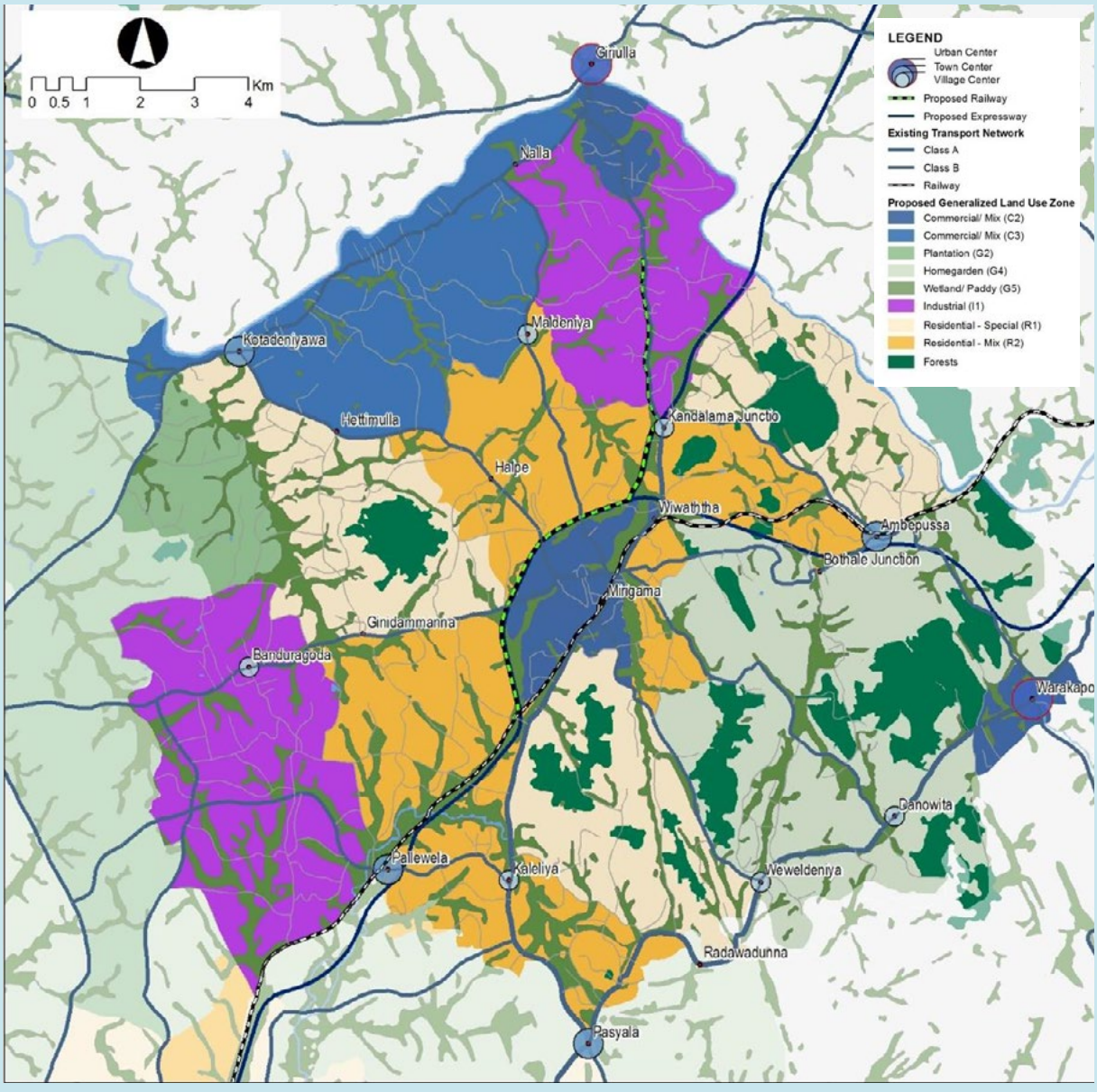


Fig 12.7 Mirigama Industrial City Zoning Plan



12.4 Plantation City

Area: 330 sq km

The Plantation City occupies an area of approximately 330 sqkm at the eastern central part of the Western Region. The project aims to build upon the existing large scale plantations and improve the livelihood of its population through promotion of plantation related business and improvement of city's facilities and infrastructure, to offer a choice of place to live in a different environment as compared to the densely populated Colombo and the surrounding areas.

This development is also aimed at receiving migrants from the rural areas by providing jobs and quality urban living at the border of the region. The Plantation City is expected to generate additional 90,000 new employments.

This project is expected to attract investors in rubber processing industries as well as real estate developers providing unique types of housing for selected buyers.

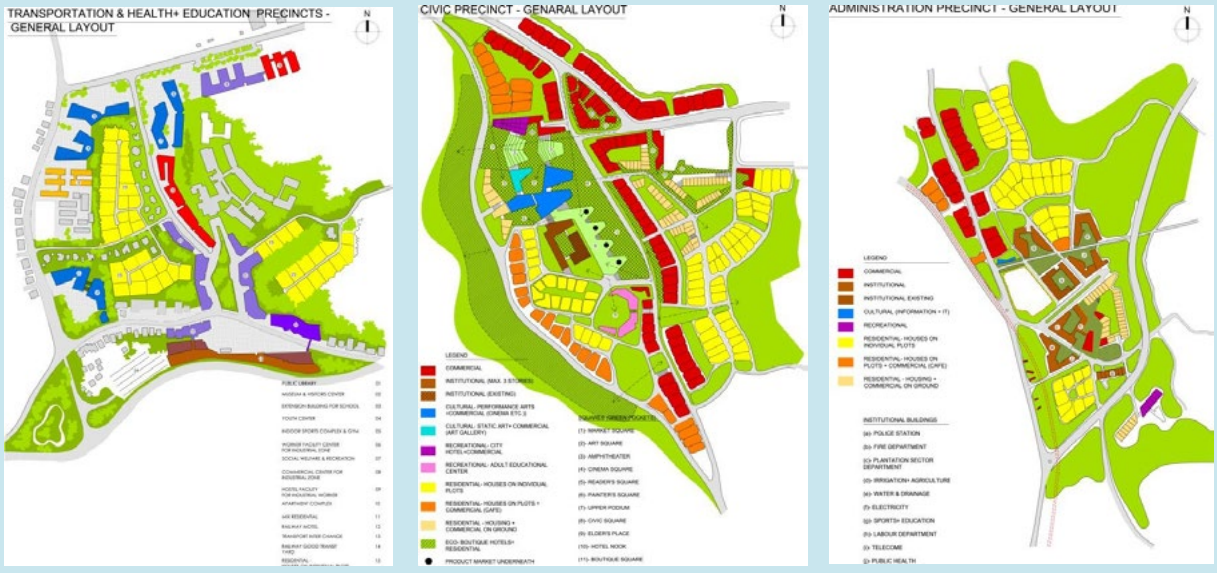


Fig 12.8 Plantation City Proposed Uses in Transportation, Health and Education Precinct (Left), Civic and Retail Precint (Centre), Administrative Precinct (Right)

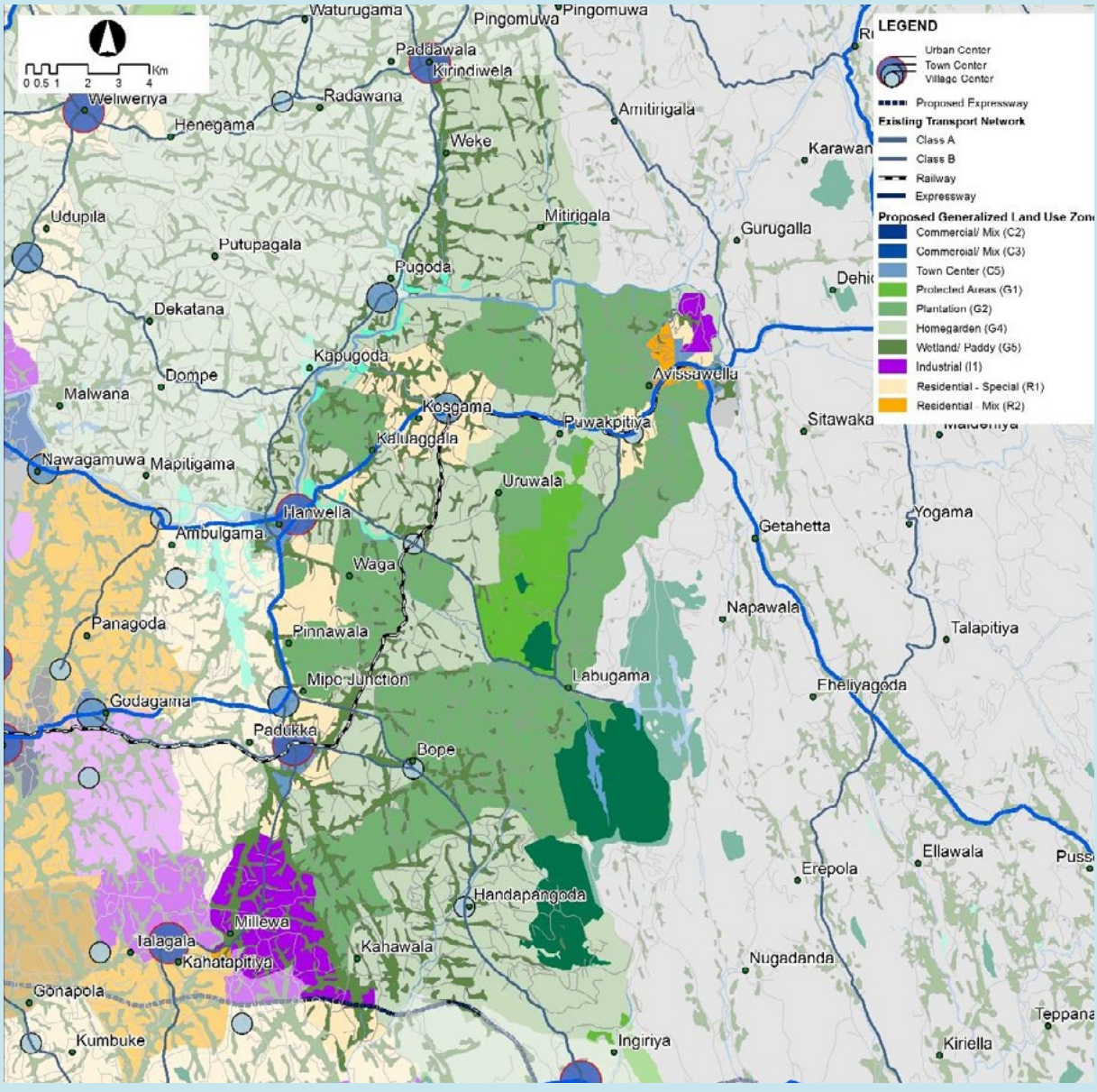


Fig 12.9 Plantation City Zoning Plan




12.5 Forest City

Area: 1,050 sq km

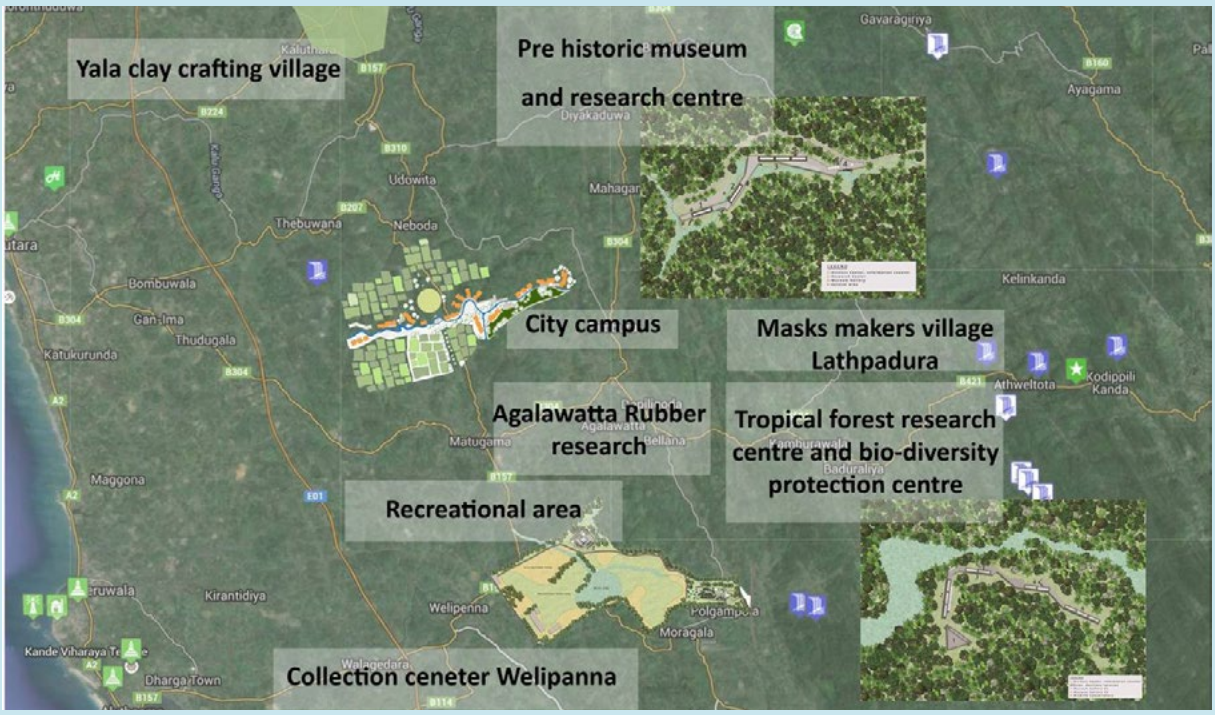
The Forest City occupies an area of approximately 1,050 sqkm at the southern most part of the Western Region. It has a very small population, mainly engaged in small scale farming and small scale forest related home industries.

The project aims to build on farms, forest and heritage to improve the livelihood of its people and to protect the environment at the same time.

The identified economic driver for the area will be tourism, including eco and agro tourism.

To improve the quality of life, few towns have been identified as a service centres where facilities and amenities will be made available for tourists and residents alike.

This project is expected to attract investors in tourism industries, especially investors in the boutique tourism sectors and is expected to create employment in the tourism and supporting service industries. The Forest City is expected to generate additional 90,000 new employments.



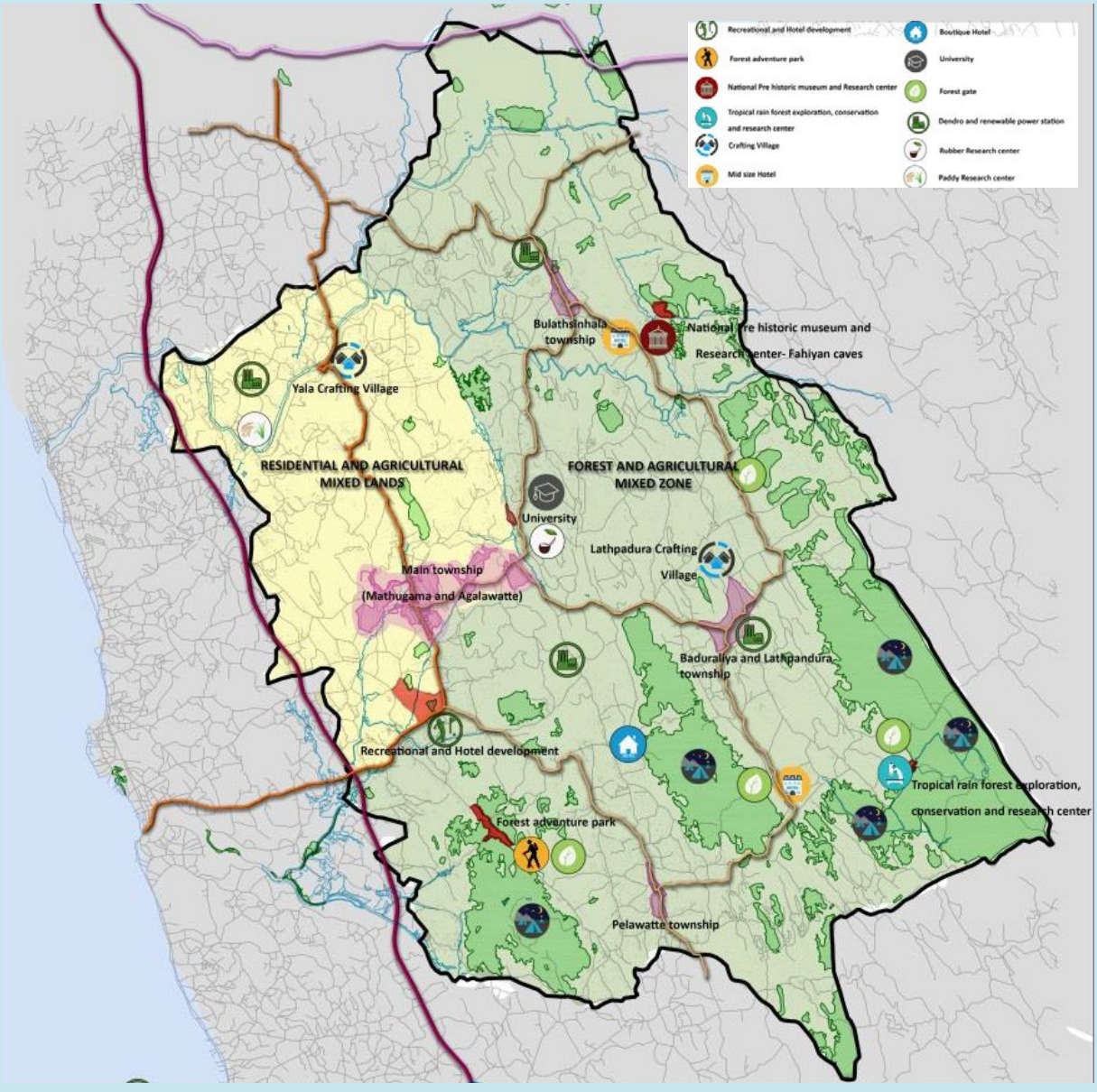


Fig 12.10 Forest City Concept Plan



12.6 Horana Industrial City

Area: 85 sq km

The Horana Industrial City occupies approximately 85 sqkm consisting of existing towns and scattered villages.

The project aims to accommodate the large numbers of large scale industries and Tyres and tubes, electronic products, Pharmaceuticals, Edible products manufactured out of the cultivated agricultural products which was scattered in the Western Region without proper industrial infrastructure, and has been identified as the source of pollution in many areas.

In line with the economic growth, these large scale industries are also expected to improve in technology and value; and thus they should be relocated to proper industrial estate with adequate infrastructure.

The site in Horana was selected due to land availability and its good connectivity via the north south highway.

Better quality new residential development including affordable housing will also be developed to support the industries. The project is expected to attract both industrial and real estate developers. The Horana Industrial City is expected to generate additional 100,000 new employments.

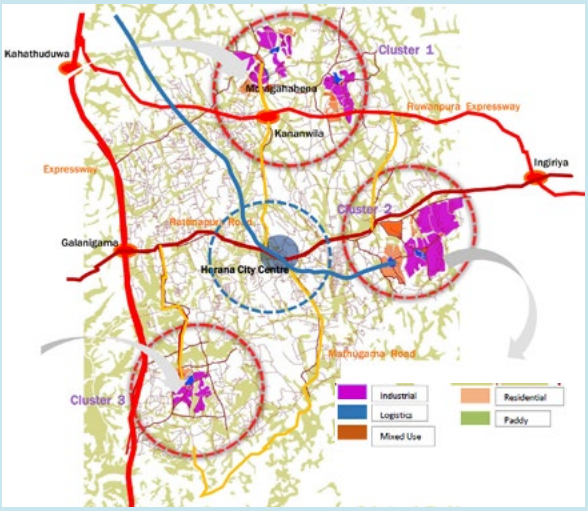


Fig 12. 11 Horana Industrial City Proposed Uses (Top), and Proposed Industries & Residential Area View

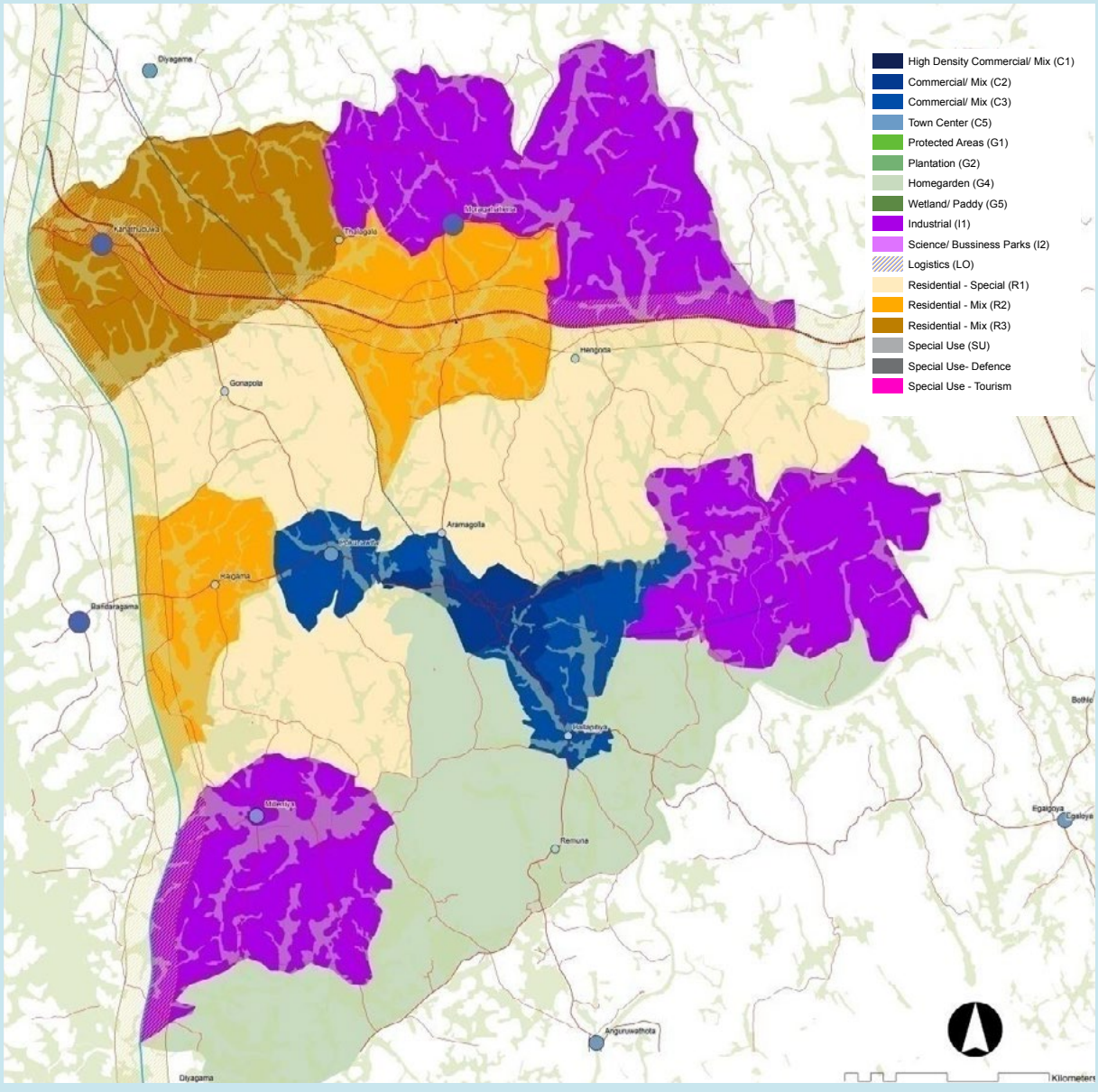


Fig12.12 Horana City Zoning Plan




12.7 Science and Technology City

Area: 165 sq km

The Science and Technology City occupies an area of 165 sqkm and is located about 10 km east of the Colombo Downtown. The proximity allows it to develop high value industries that will need large number of talents and investment from big international players.

All together the project consists of 3 clusters:

- IT parks
- Bio-Medical Hub
- Science park

These clusters will be planned with highest environmental quality.

The development will lead the transformation of Sri Lankan industries into higher value industries, promote research and development activities and position Sri Lanka as one of the high tech industrial hubs in the future.

New universities, high quality residential with ample facilities will be developed to create a conducive environment for scientists and creative individuals working and living in this area. This project is expected to attract business park developers, software houses, big players in advanced technology and bio-medical industries as well as real estate developers. The Science and Technology City is expected to generate additional 220,000 new employments.

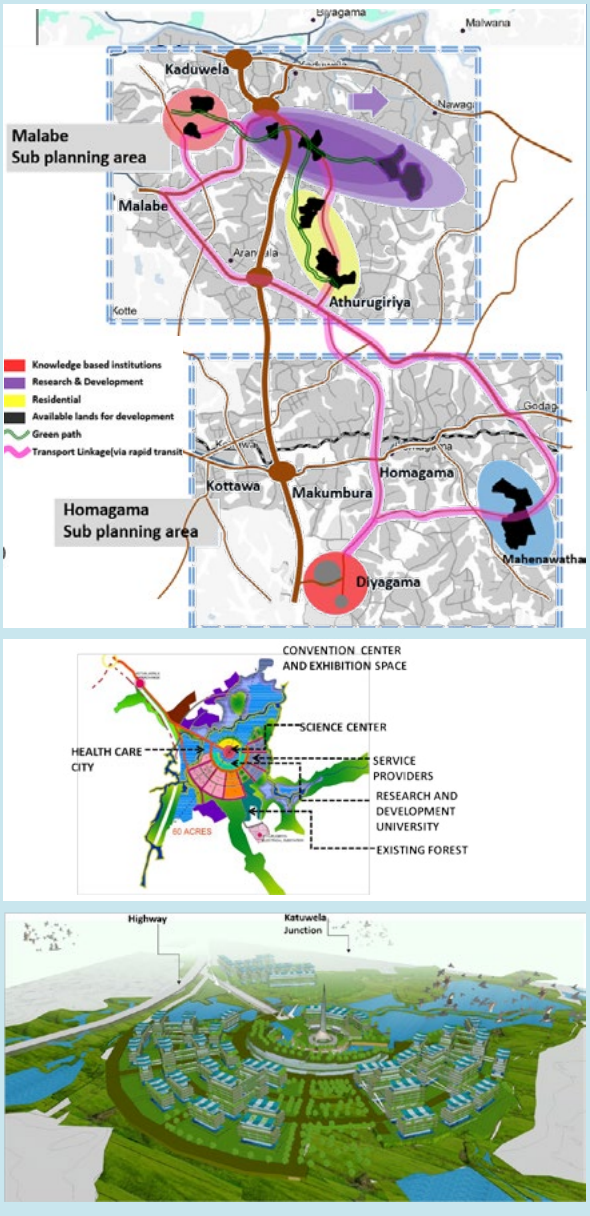


Fig12. 13 Science and Technology City Concept (Top), and Proposed Activities in Research and Development Hub (Bottom)

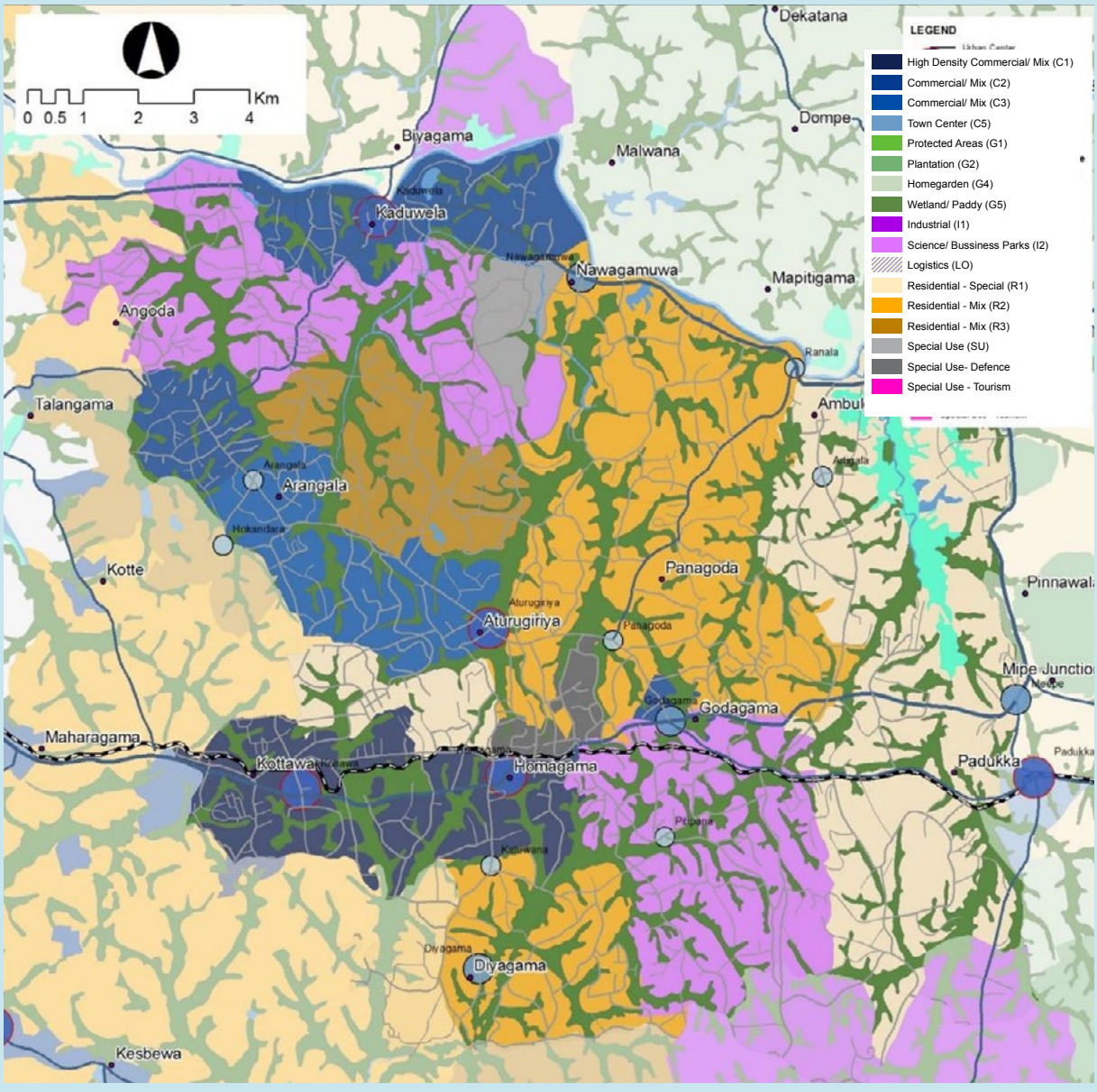


Fig 12.14 Science and Technology City Zoning Plan



12.8 Central Business District & Inner Core Area

Area: 126 sq km

Central Business District was one of the most attractive cities in the world during the early part of the 1900. Rapid increase in population, uncontrolled developments and lack of investments in infrastructure to keep pace with the needs over the years has led to the deterioration of its urban conditions.

This project aims to bring back the former attractiveness of the Downtown for "work, live and play" through:

- Development of an unique shopping district along Beira lake utilizing the railway land as one of the main landmark in Colombo downtown;
- Development of a unique entertainment district on the other side of the Beira lake as another destination in Colombo downtown;
- Development of Cruise Centre at the old port linking the new shopping district, the Fort heritage district and the Pettah bazaar district;
- Development of Fort and Pettah areas into a pedestrian friendly destination; and
- Development of green connectors that will allow pedestrians to move seamlessly between Beira lake, cruise centre, Pettah, Fort, Galle face and future new Port City.

Fig 12.15Artist's Impression of CBD (Left and Right)

Fig 12.16 3D Animation View of Beira Lake Surrounding.

CBD & Inner Core Area in Colombo is the most diverse area in terms of land use, density and building typology.

Considering the future development in Western Region, where the core area will perform as the international business and financial centre as well as regional trading and services centre, larger part of the core area will be zoned for various commercial developments as follow:

- High density commercial zone in the CBD including the future “Port City”
- Medium density commercial zones and corridors outside the CBD
- Medium density commercial corridor (waterfront) along the coastal area

Rapid Transits System (RTS) alignment and the location of RTS stations, a high density commercial nodes will be allocated around the RTS stations to optimize its roles as transit hubs.

Within the commercial zone, however, high density and good quality residential development are allowed and encouraged. This is to ensure the good mix and vibrancy in the city.

As for the housing development, good class low density housing in Colombo 7 (Kurunduwatta Area) and around the parliament house is preserved, while the remaining housing areas are proposed for medium density housing allowing densification in the long term with the increase in land price.

Areas for institutions are designated around the parliament house and in some other pockets of land, while industries and port related activities are reduced to free up land for higher value land uses, except some pockets of clean and services industries.

To improve urban development quality, urban design control is recommneded to be prepared in key areas within CBD and among other area in inner core, the waterfront areas and area around Ratmalana Airport. Heritage areas and areas with special characters will be zoned as special development areas. This include Fort, Conservation Zone, Petta Bazaar Zone, and the Old Dutch areas at Hultsdorf and around the Cathedral. Special plans and giuidelines will be developed for these areas.

The proposed Zoning Plan for the Colombo core is as shown in figure 12.17

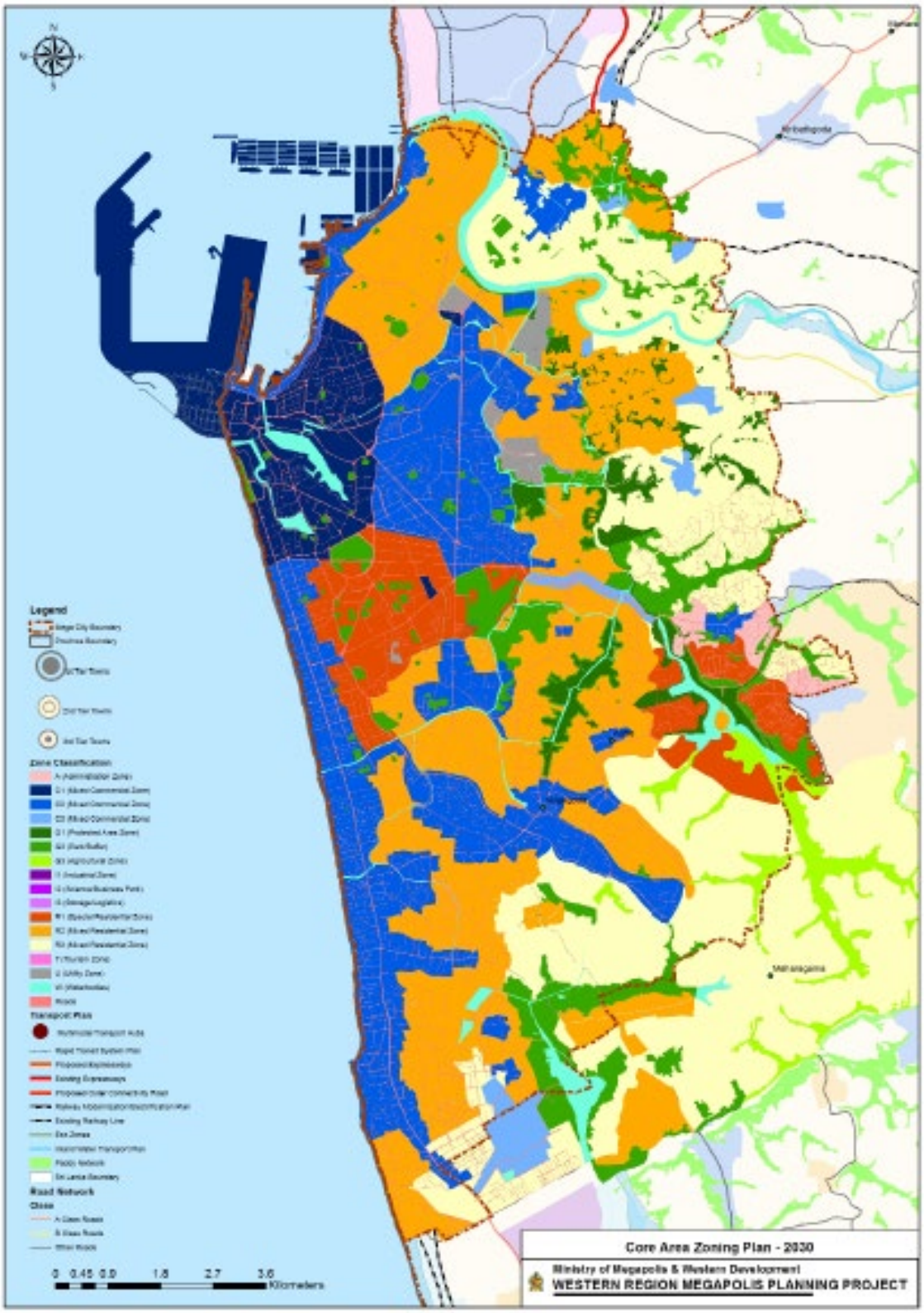


Fig 12.17 Proposed Zoning Plan CBD and Inner Core

12.9 Port City

As part of the new Downtown, the Port City is proposed as reclaimed land. The Port City Plan is under review to ensure that it will minimize the environmental impact to surrounding coastal areas.

The Port City will bring an exciting opportunity to innovate and design a new world-leading city development based on best international experience, especially adapted to the Sri Lankan context and the site specific conditions. The new city will tap into the intrinsic values of the region and environment to create a new ideal modern community for business, living and leisure. This will help attract companies and investors, to ensure it will become a became of excellence for Sri Lanka, representing an ambitious yet achievable vision.

The Port City will be guided by four core goals:

- Aspiration (a place of progress, prosperity and opportunity);
- Heritage (a place of character and culture);
- Recreation (a vibrant / youthful work and living playground);
- Gracious living (balancing functional and emotional needs).

The Port City is planned as vibrant, mixed- use district with waterfront promenade and a loop of attractions and vibrant public spaces; together with 24/7 activities based on sustainable development strategies. A circulation system that allows access to the waterfront is introduced to site by locating key public developments as a catalyst to become landmark sites.

To cater for good connectivity and seamless extension, the development parcels at the Port City are planned based on a grid urban pattern which extends from the existing road network within the downtown area. This grid creates a flexible framework with a series of land parcels that can be combined or sub-divided to meet requirements or cater to changing demands and allow the phasing of developments.

The Port City will be Sri Lanka's most exciting and ambitious urban project designed to support continuing growth as a major business and financial hub in South Asia. It will raise the international profile of Sri Lanka while spurring growth and investment.

Fig 12.18 Port- City - Proposed Land Use Plan

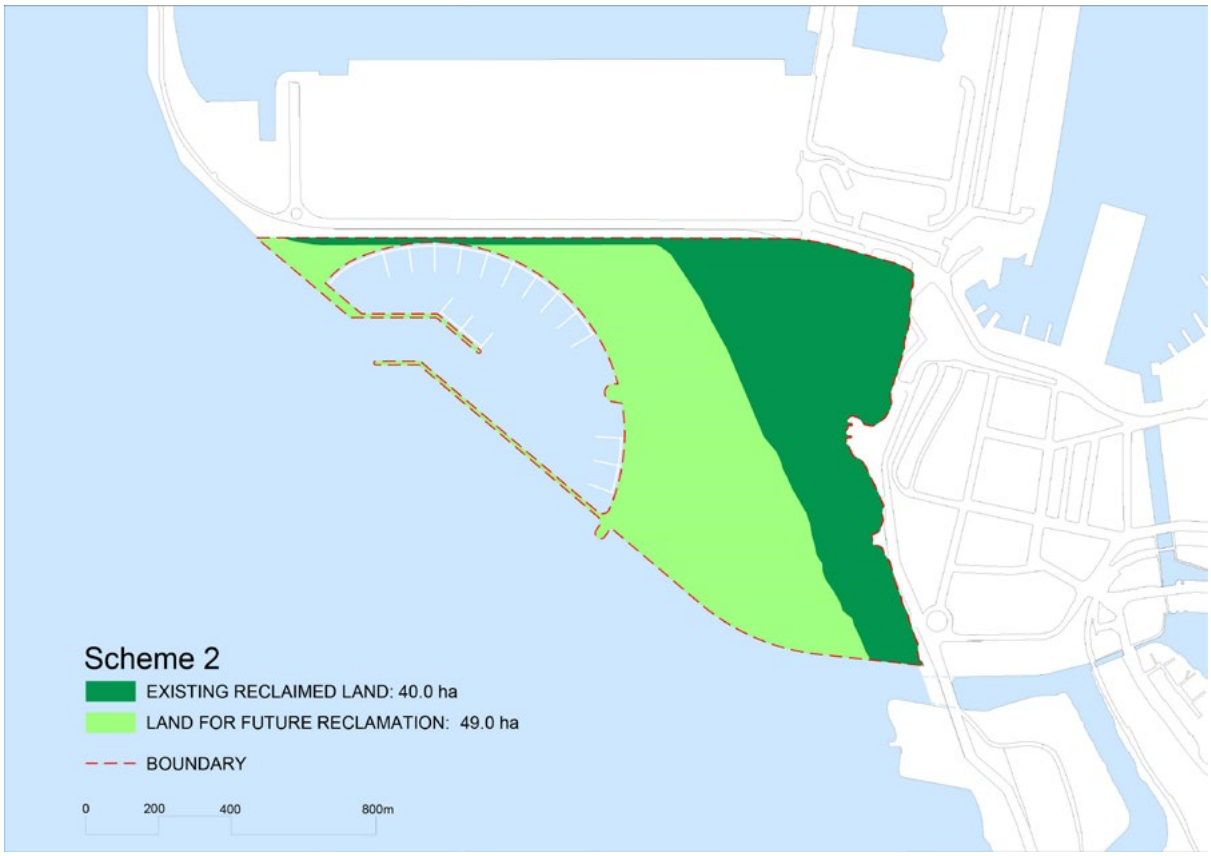


Fig 12.19 Artist's Impression of CBD (Left and Right)

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Chapter 13
Sustainability Compliance Standards & Strategic Environment Assessment

This section of the chapter on sustainability compliance mechanism evaluates the viability of development proposals and overall Megapolis plan on meeting socio-economic and environmental requirements.

13.1 INTRODUCTION OF THE SUSTAINABILITY COMPLIANCE STANDARDS FRAMEWORK (SCSF)

The matrix approach for assessment:

The Sustainability Compliance Standards Framework (SCSF) is planned to ensure that all development projects and activities of the WRMPP are assessed and approved for forty environmental, social, economic and good governance criteria while providing guidance on how to identify, avoid, mitigate and manage risks and impacts. SCSF will serve multiple requirements of the WRMPP including project development guidelines, proposal evaluation tool, project compliance guide, project monitoring and evaluation mechanism, and overall as an internal audit process.

How to put the Sustainability Assessment to use in WRMPP:

The SCSF;

1. Articulates the project's strategic commitment to sustainable development and its approach to risk management

2. Comprises project's sustainability policy and performance standards on Economic, Environmental, and Social Sustainability and Good Governance standards

3. Describes commitments, roles, and responsibilities related to economic, environmental and social sustainability

4. Provide guidance on how to identify risks and impacts, and designed to avoid, mitigate, and manage risks and impacts when planning and implementing projects in a sustainable way including stakeholder engagement and disclosure obligations in relation to project-level activities.

Methodology of Assessment:

A Sustainability Compliance Standards Scoreboard has been developed to enhance the utility of the tool and to provide tangible and quantifiable assessment criteria. (see attachment)

Category No:

1. Environmental
2. Social
3. Economic
4. Good Governance

13.2 Category 01: Environmental Sustainability Standards (Assessment and Management of Environmental Risks and Impacts)	
SCS 1: Integrate the value of Natural Capital and Conservation of Biodiversity	Intent shown. Ecological zones are to be demarcated and conserved. The project must make a clear statement that these eco-zones will not be encroached for development interventions at the minimum commitment level, and that investment will be made to further improve the natural assets. The demarcated eco-zones must be strict no-go zones for any development activity and become part of the protected asserts of the region and nation through a strict legal and regulatory framework.
SCS 2: Reduce Ecological Footprints and Enhance Ecosystem Services	The project does not take the approach of an Ecopolis. It does not plan to move away from a fossil fuel economy and transfer to a carbon neutral development pathway. The project does not demonstrate a clear understanding or appreciation of ecosystem services. The project lacks conviction of transforming into an ecological civilization and thus the success of the project in the long term may be compromised for short-term growth intensions. The rapid and high scale development interventions therefore with all probability might increase the ecological footprint. It is advised that the project conducts a strategic assessment of ecosystem services valuing also from an economic point of view to provide the decision makers of better options.
SCS 3: Conserve and Restore Forests, Parks, Wetlands, Farm Lands and Plantations	Intent shown. Ecological zones to be demarcated and conserved. However, some development interventions contradict this intent to and some extent and raises question about the level of commitment towards preserving the limited natural environment left in the region. (eg: land acquisition for waste disposal sites, airport city development, highways and roadways development).
SCS 4: Conserve and Restore Inland Fresh Water, Coastal and Ocean Resources	Intent shown yet needs specific details on how water and marine ecosystems will be conserved and developed. The project will benefit from adopting SDG Goal 14. Conserve and sustainably use the oceans, seas and marine resources for sustainable development.
SCS 5: Integrated Management of Air, Land, Water, and Natural Processes and Resources	Intent shown. Need specific details and strategy as to how the project intends to plan and integrated approach to the nexus of air, land and water.

SCS 6: Mitigation and Adaptation Interventions towards Climate Change	The project does not plan for a carbon neutral economy. No specific focus is proposed for climate change Mitigation or Adaptation. As a signatory nation to the UNFCCC and Kyoto Protocol, the project must adhere to the mandate and guidelines provided. The project should also take into consideration SDG Goal 13. Take urgent action
SCS 7: Adopt and Adhere to Air, Water, Soil and Noise Quality standards	Intent shown. Need specific details and strategy as to how the project intends to plan and integrated approach to the nexus of air, land and water and noise.
SCS 8: Prevent, Minimize and Manage Waste, Emissions and Pollution	Intent shown. The waste and water management sector proposals provide a clear strategy to ensure that increased industrial activities in the region will not negatively impact on the air quality, a strategy for emissions and pollution management should be developed in consultation or partnership with the Air Resource Management Center (AirMAC) of the Ministry of Environment and other specialized agencies.
SCS 9: Improve Resource Efficiency, Urban and Industrial Ecology	Intent shown. The overall policy intent states that polluting industries will not be allowed in industrial zones. However, the lack of a demonstrated commitment to proscribe fossil fuel dependent industries leaves a large gap that can be manipulated by investment and growth interest.
SCS 10: Demonstrate Respect for Environmental Justice and the Commons	The project does not demonstrate a conceptual understanding of respect for environmental justice and the commons. This is a serious drawback of the project and a fundamental flaw of the project. The success of the project needs to be measured on the wider access to benefits of the project by the public and its common ownership to cultural, natural and other public goods and not by the enjoyment by a small or select group.

13.3 Category 02 : Social Sustainability Standards (Assessment and Management of Social Risks and Impacts)	
SCS 11: Ensure Equality of Opportunity, Eradicate Poverty and Deprivation , and Advance Wellbeing	The project does not present assurance of equality in its development interventions. The project thinking is governed by the conviction that the development interventions resulting in high growth would translate into equality of opportunity, eradicate poverty and deprivation, and advance wellbeing. This is the same dominate development thinking model that has been widely critiqued as a monumental failure, and taking the same pathway showcases the lack of conviction for the transformation in search through the UN '2030 agenda for Sustainable Development' that Sri Lanka is signatory to. Specifically SDG Goal 10. Reduce inequality within and among countries, must be observed by the project.
SCS 12: Advance Happiness, Contentment and Mindfulness	Even though the project planners have shown high intent in advancing happiness through the development interventions, the lack of a clear conceptual framework that governs the development model prevents assurance that project will be transformational in the intangible achievements including mindfulness, contentment and happiness. The project tends to believe that advancement of material wellbeing will bring happiness, which is a fundamental flaw in the project conceptualization. The project must advance from mere referencing of the Bhutan Gross National Happiness concept and integrate its elements into the plans and embrace the positives of its implementation procedure.
SCS 13: Strengthen Social Justice, Gender Equality, Community Peace and Ethnic Harmony	The project does not present a concept of social justice or gender equality, but is concerned about community and ethnic peace. The project is well advised to take into considerations SDG Goal 5: achieve gender equality and empower all women and girls, and SDG Goal 16. Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels.
SCS 14: Preserve Cultural Heritage, Values, Lifestyles and Knowledge Systems	While cultural heritage sites are to be preserved more from a tourism and economic value, the project does not convince that it has an embedded concept of preserving traditions lifestyles or knowledge systems. The high-tech and modernization approach could lead to radical change of traditional values and systems. The project could apply appropriate technologies along with modern green technologies to balance the intensity of the need of intervention.

SCS 15: Facilitate Leisure, Recreation and Spiritual Advancement	High intent shown and has the potential of making the region a major local and international attraction. The project must ensure that local communities are not marginalized in utilizing the leisure and recreation, and that the facilities will not only be targeting high-end consumers and tourists. However, the high consumerism trend promoted by the project will have a significant impact on the spiritual advancement of the society. A special intervention need through the engagement of spiritual, cultural and mindfulness leaders and groups.
SCS 16: Facilitate Education, Lifelong Learning, Skills and Human Development	Needs specific details as how the TVET sector along with education and research is to be advanced. The project lacks a clear strategy on how we will transform the society from a brown development model to a green development model through knowledge and skill building for sustainable development. The project should integrate recommendations from SDG Goal 4. Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all.
SCS 17: Ensure Health, Sanitation, Nutrition, Safety, and Security	Intent shown. Specific examples can be drawn from waste management, environmental conservation and industrial ecology interventions proposed. SDG Goal 6. Ensure availability and sustainable management of water and sanitation for all, must be observed.
SCS 18: Ensure Access to Clean Water, Clean Modern Energy, and Public Utilities	Intent shown throughout all project proposals. The region could be transformed into high quality lifestyles. The project must ensure that these facilities are accessible to all.
SCS 19: Ensure Access to Justice, Decent Jobs and Economic Development Benefits	The proposal focuses on decent jobs and economic development benefits, but needs to strengthen access to justice through greater equality.
SCS 20: Ensure Food Security and Safety	Intent shown, but not from a self-sufficiency concept. The focused growth in the services and industry sector is not seen in agro-based development interventions. Value addition will not ensure food security and safety. The development model must therefore present a macro economic model that provides an analysis to show how the local and international trade strategy could ensure food security and safety of the regions inhabitants. The project should embrace SDG Goal 2. End hunger, achieve food security and improved nutrition and promote sustainable agriculture.

13.4 Category 03 : Economic Sustainability Standards (Assessment and Management of Economic Risks and Impacts)	
SCS 21: Leads to Poverty Eradication, Income Equity, Productive Employment, and Quality of Life	High intent shown and has the potential of a high quality of life in the region. However, the high quality of life is depend on high consumerism values rather than spiritual or cultural values, and would present other challenges of sustaining high consumerist demands. This should be factored-in if the project intends to advance sustainable development in the region. Therefore, the project could integrate recommendations from SDG Goal 3. Ensure healthy lives and promote well-being for all at all ages.
SCS 22: Promote Inclusive Growth, Green Economy, and Sustainable Enterprises	The proposal falls short of demonstrating the intent to transform into an inclusive, carbon neutral sustainable economic pathway. Instead, it appears to take the rapid economic growth pathway using some clean technology inclusions. The project is advised to integrate recommendations from SDG Goal 8. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all. The project should integrate recommendation from SDG Goal 8. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all.
SCS 23: Advance Sustainable Consumption and Production Systems	The project does not demonstrate a conceptual approach to advance sustainable consumption and production systems. It has elements of greener production but promotes high consumerist lifestyles to gain high economic growth. The project is advised to integrate recommendations from the SDG Goal 12. Ensure sustainable consumption and production patterns.
SCS 24: Adopt Carbon Neutral Technologies, Energy Efficiency Systems and Sustainable Innovations	Intent is shown, but lack of specific information on the investment model prevents an understanding of the actual application. However, the project appears to be a compromise between a fossil fuel economy with cleaner technology applications. This is not sufficient to justify as a transfomatory project. The project is advised to integrate recommendations from the SDG Goal 7. Ensure access to affordable, reliable, sustainable and modern energy for all.
SCS 25: Promote Social Responsibility, Ethical Investment and Responsible Business	A macro-economic model must be developed to demonstrate its stated intention to promote social responsibility, ethical investment and responsible business. These aspects must be a pre-requisite in selecting investors and approving business engagement and the project authority must enforce a regulatory framework with a monitoring mechanism to ensure the actual commitments are met from screening to implementation.

SCS 26: Assure Consumer Protection, Affordability, and Fair Trade	The project tends to neglect providing a framework to assure consumer protection, affordability, and fair trade. This is a loosely negotiated area in the project and must be strengthened in consultation with relevant agencies such as the Consumer Authority and Sri Lanka Standards Institution.
SCS 27: Safeguards Small and Medium Enterprises and Support Local Industries	The projects' focus on large investment based development could compromise the safety and prosperity of SMEs and micro industries. In order to maintain sustained growth, the SME sector must be harnessed properly and needs to be provided with suitable institutional capacity building programmes, incentives and regulatory support.
SCS 28: Planned for Resilience, Sustenance & Longevity	The project needs to strengthen its strategies to build a resilient region. The current development model presents a short term growth based prosperity approach and does not provide satisfactory evidence that the plans provide sustenance and longevity. The project should integrate recommendations from SDG Goal 11. Make cities and human settlements inclusive, safe, resilient and sustainable,
SCS 29: Designed for Investment, Cost Recovery, Profitability, and Continuity	Highly focused on investment, cost recovery, profitability. The strategies must demonstrate greater evidence of its potential for continuity in the long term. The current proposal must be improved to attract more futuristic and responsible investors who realize the strategic advantage in financing for sustainable development. The project must seriously consider re-strategizing to benefit from the global drive on 'Financing for Sustainable Development', specifically the Addis Ababa Action Agenda of the Third International Conference on Financing for Development, and include recommendations of SDG Goal 17. Strengthen the means of implementation and revitalize the global partnership for sustainable development.
SCS 30: Integrate Environmental Economics and Full-Cost Accounting Considerations	The project does not demonstrate a strategy to integrate environmental economics and full-cost accounting considerations, showing its low aptitude for sustainability. Environmental full-cost accounting (EFCA) is a method of cost accounting that traces direct costs and allocates indirect costs by collecting and presenting information about the possible environmental, social and economic costs and benefits or advantages. The macro-economic modeling for the project must integrate EFCA to ensure that the project is sustainable.

13.5 Category 04 : Good Governance Standards (Assessment and Management of Governance Risks and Impacts)	
SCS 31: Adhere to Rule of Law, Institutional Mandate, Policies & Regulations	The project proposes a high institutional mandate to implement the intended development interventions. It must also guarantee that such powers will not lead to manipulation of justice and thus deviate from the general rule of law and overarching regulatory framework of the nation.
SCS 32: Posses Requisite Capacity, Resources, Financing and Partnerships Strategies	The project has highest government backing to develop the requisite capacity, resources, financing and partnerships strategies. However, the project planning process has shown the lack of deeper comprehension of sustainable development and its benefits. Therefore, it is recommended that the sustainable development expertise is drawn into the programme planning and implementation processors more effectively.
SCS 33: Ability to Avoid, Mitigate, and Manage Risks and Impacts	The project demonstrates a linier rapid economic growth approach that could induce environmental and social risks. The project must develop a clear strategy for resilience and flexibility to manage and mitigate unforeseen risks and impacts.
SCS 34: Uphold Human Rights, Labor Laws and Working Conditions	Intent shown but no clear policy is demonstrated in the proposal.
SCS 35: Transparent, Responsive, Effective and Efficient	This is a grey area in the project that needs greater emphasis. The project plan does not provide adequate assurance on transparency and responsiveness to public sentiments, and need a greater focus to ensure good governance.
SCS 36: Ensure Equitable, Inclusive and Participatory Stakeholder Engagement	The project must demonstrate its intent for equitable, inclusive and participatory stakeholder engagement and not selective engagement.
SCS 37: Generates Consensus, Public Acceptance and Community Goodwill	No any evidence has been shown that the project plans to generate consensus, public acceptance and community goodwill. The lack of intent could lead to public resistance.
SCS 38: Incorporate Accountability, Transparency, Audit and Disclosure Obligations	The proposal must be explicit on accountability, transparency, audit and disclosure obligations. This is a pre-requisite for good governance.

SCS 39: Recourse for Acquisition, Disruption, Displacement and Resettlement	The scale of acquisition of land and private property without a just recourse procedure would induce massive public resistance and scale-up to descent. This could compromise the project progress, and therefore must define an attractive recourse procedure with ability to motivate the citizens to cooperate with the development plans.
SCS 40: Eliminate Marginalization, Discrimination and Injustice	The gaps in the proposal and the lack of intent to demonstrate equal opportunities could lead to unintended marginalization and discrimination of certain sectors of the population. The project plans must eliminate any room for such gaps without delay.

13.6 Conclusions And Recomendations

Resolve contradictions between stated overall objectives and proposed action projects:

There appears to be a mismatch between the stated objectives of the WRMP and several project activity proposals. While the stated objectives include becoming an environmentally sustainable and socially inclusive region, the proposed activities focusing on foreign investment lead to a high economic growth that promotes high consumerist lifestyles and large infrastructure interventions would impact both on the ecological footprint and social wellbeing within the region and rest of the country. The WRMP must ensure that individual project activities are integrating the core principles and objectives of the overall plan and is in compliance with sustainability standards. Also the WRMP must provide strategies for convergent objectives and not standalone objectives to be able to achieve sustainable development. All activities must individually and collectively be able to foster economic prosperity, social equity and environmental sustainability in convergence.

Move out of the fossil fuel economy to be a most livable city:

To be able become one of the top 10 livable cities in Asia, as proposed, the region must become ecologically and socially sustainable and must demonstrate that it is moving into a carbon neutral future and take a transitional pathway to phase-out the fossil fuel dependent economic development model. The WRMP must be confident that it can join the global transformation in make our cities and human settlements inclusive, safe, resilient and sustainable. Even though it has not embraced the ecopolis concept, the WRMP can endeavor to utilize the opportunity of planning for a transition towards sustainability without compromising economic prosperity. To be able become one of the top 10 livable cities in Asia, the WRMP should be able to enhance the environmental quality of the region significantly. As the current proposal is deeply focused on rapid and high economic growth will then have to be planned along with a clear strategy to improve resource efficiency, urban and industrial ecology administered through a strict regulatory framework of integrated air, water, and soil quality standards. Given the scale of the development interventions proposed, the

environmental quality standards will have to be high to ensure that the regions ecological foot print is kept low and climate change is managed at least to the current levels, if not to be improved.

Increase the commons, public goods and enhance quality of life, wellbeing and happiness:

The sustainability of the WRM will depend heavily on the ability to increase the wellbeing and happiness of its people. WRMP must ensure that the natural capital and public goods are increased to levels that meet development justice and

social equity. The WRMP must essentially increase the commons to ensure that the city's prosperity is shared and enjoyed by all and not limited to those who can only afford. The current approach of the economic growth driven project proposals may indirectly create barriers for commons through factors of affordability and accessibility and may compromise the good intensions of the WRM. The project tends to assume that advancement of material wellbeing will bring happiness, which is a fundamental flaw in the project conceptualization that must be addressed at the outset. The project must have an overall strategy to advance happiness, contentment and mindfulness, decoupled from economic growth and material wellbeing. The project must engage more holistic and spiritual alternatives in order to enhance quality of life, wellbeing and happiness.

Developing macro-economic model through full cost accounting strategies:

The WRMP's stated objective is to achieve a per capita GDP level of a 'High Income Developed Country' by year 2030. The strategy proposed is to enable structural transformation of the economy such that manufacturing and the tradable high-tech services with export potential constitute the major proportion of the GDP. While this is a common strategy adopted by growth based economies, the Sarkozy Commission Report on Measurement of Economic Performance and Social Progress, 2009 clearly stated that "It is time for our statistics system to put more emphasis on measuring the well-being of the population than on economic production". The WRMP must demonstrate its desire to achieve sustainability through inclusive quality of growth economic modeling and integrate environmental full-cost accounting considerations. Environmental full-cost accounting (EFCA) is a method of cost accounting that traces direct costs and allocates indirect costs by collecting and presenting information about the possible environmental, social and economic costs and benefits or advantages. Therefore as a minimum, all projects must be mandated to adopt full-cost environmental accounting to ensure that cost benefits reflect the true picture of the development interventions. This will help WRM guide Sri Lanka to join the more modern nations that are moving into wellbeing based economies towards enhancing prosperity.

Engaging stakeholders for good governance:

The proposed large scale interventions will mean that the WRMP will be exercising its authority to facilitate the planned development interventions. For example, in a region where land already has highest economic and opportunity value, the process of authoritative acquisition will generate dissent and if badly managed could turn into organized resistance. To avoid such resistance and to generate public support, the MRMP must facilitate transparent and inclusive processors from planning, designing to implementation of each project intervention.

It is proposed that the WRMP formulates and adopts a responsive public, community and stakeholder engagement mechanism to facilitate the just and effective implementation of the project activities.

Implementing the Sustainability Compliance Standards Framework to ensure sustainable development in the WRM:

The WRMP needs to integrate the qualitative and

quantitative ingredients to harness sustainable development in the region. The lack of clear guidelines for proposal development prevents harnessing the positive objectives of the WRMP and the ability to attract futuristic investors, win public support and provide the country the expected transformation pathway. Therefore, it is proposed that all project activities must be developed using the Sustainability Compliance Standards Framework (SCSF) guided by 40 indicators covering environmental, social, economic and good governance criteria to ensure that each project will take into consideration necessary sustainability standards. It must be noted that short-cuts to project development and implementation will bring adverse results and public dissent that will create obstacle to achieving the stated objectives. The SCSF will serve multiple requirements of the WRMPP including;

- project development guidelines
- proposal evaluation tool
- project compliance guide
- project monitoring and evaluation mechanism, and
- internal audit process.

13.7 STRATEGIC ENVIRONMENTAL ASSESSMENT (SEA) FOR THE WESTERN REGION MEGAPOLIS PLAN

Strategic Environmental Assessment is the systematic and comprehensive process of evaluating the environmental effects of a policy, plan or programme and its alternatives. Although the emphasis is on examining the environmental effects, most SEA's may also identify significant economic and social effects. In short its purpose is to promote integrated decision making.

SEA is in many ways similar to environmental assessments of projects. Unlike project level EIA's SEA does not require in depth analysis, as the focus is more on sustainability issues. Like typical environmental assessments, the process of conducting SEA involves answering a series of questions during the development of a policy, plan or programme. In answering these questions, any potential negative impacts of the plan or proposal can be identified and avoided or mitigated. At the same time potential positive impacts could be enhanced.

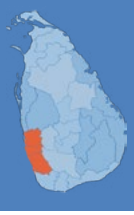
There are many benefits of SEA as follows;

- SEA provides a means for systematically incorporating environmental, as well as social and economic considerations into policies, plans and programmes.
- SEA allows for the consideration of cumulative and synergestic effects. As such, the cumulative impact of a series of smaller projects on the environment could be better understood through a SEA.
- SEA facilitates the implementation of more environmentally sustainable projects. SEA helps identify the most practicable alternatives for achieving positive outcomes and minimizing potentially adverse effects of policies, plans or programmes, thereby resulting in the implementation of more environmentally sustainable projects.
- SEA strengthens the decision making process of policies, plans and programmes.
- SEA may also reduce the requirements of detailed study during individual project EIA's.

13.7.1 METHODOLOGY USED IN PREPARING THE STRATEGIC ENVIRONMENTAL ASSESSMENT FOR THE WESTERN REGION MEGAPOLIS PLAN

The SEA for the Western Region Megapolis Plan is being carried out by the Western Region Megapolis Planning Project in collaboration with the Central Environmental Authority. Stakeholder meetings were held with the following agencies

- Coast Conservation Department
- Marine Environmental Protection Agency
- Water Resources Board
- Urban Development Authority
- Board Of Investment
- Forest Department



•Department of Wildlife Conservation
•Road Development Authority
•Ceylon Electricity Board
•Irrigation Department
•National Planning Department
•Disaster Management Center
•Industrial Development Board
•Ministry of Mahaweli Development and Environment
•Western Provincial Council
•Sri Lanka Land Reclamation and Development Corporation
•Waste Management Authority
•National Water Supply and Drainage Board
•Geological Survey and Mines Bureau
•Ministry of Agriculture
•National Building Research Organization
•International Union for Conservation of Nature

The second stakeholder meeting was held on 12th January 2016, attended by the three District Secretaries of Colombo, Kalutara and Gampaha along with the Divisional Secretaries of the following areas Gampaha, Biyagama, Minuwangoda, Mahara, Kelaniya, Divulapitiya, Wattala, Dompe, Katana, Negombo, Attanagalle, Jae la, Homagama, Thimbirigasyaya, Maharagama, Padukka, Hanwella, Kesbewa, Sri Jayawardenapura Kotte, Moratuwa, Kaduwela, Colombo, Dehiwela, Kollonawa, Ratmalana, Horana, Beruwela, Bulathsinhala, Matugama, Wallalavita, Ingiriya, Bandaragama, Milleniya, Madurawala,Panadura, Agalawatte, Dodangoda, Kalutara.

At both stakeholder meetings issues pertaining to environmental and social issues prevailing in the three districts at present, as well as issues and problems in the three districts which required to be resolved through the proposed plan were discussed at length.

The major issues identified at these meetings included traffic congestion and the urgent need to improve public transportation, proper, management of wastewater including sewerage, air pollution, water pollution and pollution of drinking water sources in particular, industrial pollution including haphazard siting of industries and nuisance from small and medium sector of industries as well as destruction of environmentally sensitive areas and wetlands in particular due to encroachments and illegal filling In order to analyze the present environmental situation within the Western Province existing information from government agencies was used. Baseline environmental data available at the CEA was used in relation to air, water, wastewater, hazardous waste and industrial pollution in particular.

In order evaluate the environmental and social impact of the Megapolis Plan the services of several experts in different fields was used such as Environmental Management Experts, Air Pollution Expert, Climate Change Expert, Hydrologist, Marine Biologist, Water Quality Expert, Waste Management Expert, Pollution Control Expert, Bio diversity Expert, Sustainability Specialists and a Sociologist.

In addition to the experts the matrix method was used in order to evaluate the environmental and social impacts of the several different options which were considered during the project planning stage. The potential environmental impacts from each of the proposed major development zones were also identified through the SEA. The extent to which the proposed plan has addressed the prevailing environmental issues within the Western Province was also evaluated in the SEA. The major environmental issues that have been identified within the Western Region which require to be resolved on an urgent basis are as follows;

• Destruction of environmentally sensitive areas, wetlands in particular
• Traffic congestion
• Air pollution especially from vehicular emissions
• Management of municipal solid waste
• Drainage and flooding issues
• Water pollution from both sewage and industrial

wastewater
- Haphazard siting of industry including High Polluting Industry and SMEs
- Issues related to Climate Change

Environmental guidelines are being developed for each of the major development areas proposed under the plan such as the Aero City, Plantation City, Forest City, Horana Industrial Zone, Mirigama Industrial Zone, Housing Areas, Port and Logistics Zone, Tourism Zone as well as for Solid Waste Management, E Waste Management etc in order to ensure the long term sustainability of the proposed zones specifically and the Western Region Megapolis in general, as well as to ensure compliance with prevailing environmental regulations and standards.

The environmental Regulations and Standards which are required to be complied with by the different sectors such as the Environmental Impact Assessment Regulation (EIA), Environmental Protection License(EPL) regulation, , Hazardous Waste Management Regulation, Water Quality Standards, Air Emission Standards, Noise Level Standards, Ambient Air and Water Quality Standards have also been identified in this report.

It should be stressed that the potential environmental impacts of not implementing the Western Region Megapolis Plan at all (no plan option) will result in continuation of the present haphazard, unplanned development and result in aggravating the existing environmental situation further. At present there are several major environmental issues within the Western Province which are mainly the result of unplanned haphazard development and lack of insufficient infrastructure to meet the requirements of the growing urban population. Implementation of the proposed Western Region Megapolis Plan will overcome these issues through the identification of policies as well as the identification of specific development zones in addition to development of specific project proposals for the provision of much needed infrastructure facilities.
The present development scenario within the Western Region could best be described as being "unplanned" development. This has resulted in major environmental and social issues within the region. Continuation of this scenario in the future is bound to aggravate the situation in the region further. Issues such as traffic congestion, air and water pollution, unplanned urbanization, haphazard waste disposal, unplanned industrial development, which are major issue within the province at the present time will be further aggravated and reach a point where finding solutions will be far more complex and expensive than at the present juncture.

As far as the major impacts of the proposed Western Region Megapolis Plan is considered, the overall environmental situation will improve due to the provision of vital infrastructure facilities and a more planned development in contrast to the haphazard development taking place at present. The major impact of the proposed plan will be due to social impacts rather than environmental impacts. If all the proposed infrastructure projects such as municipal waste treatment and disposal projects, wastewater and sewerage treatment projects, drainage management projects, and the transportation plan is implemented as proposed, there will be a definite improvement in environmental conditions within the Western Province. Implementation of the transportation plan in particular will result in a major environmental improvement through reduction in traffic congestion and resulting air pollution. Electrification of railways and the use of Natural Gas for transportation will further reduce air pollution levels by the reduction in emissions of Oxides of Nitrogen and Sulphur Di oxide. There will be a further benefit through the reduction in Carbon Dioxide emissions thereby reducing the Carbon Footprint. Similarly implementation of the Municipal Solid waste plan will result in a major environmental benefit to the Western Region. Extreme care should be taken during the implementation of the plan that the developments do not intrude into or affect in manner the environmentally sensitive areas within the province. There is an urgent need

therefore to identify such areas and bring them under protection status be the declaration of the three types of Eco Zones 1, 2 and 3.

The proposed Industrial Zones in Meerigama and Horana require to be planned very carefully by having the right mix of industries in both zones. In the Meerigama Zone, the non availability of large quantities of surface water and the fact that there is no water way with sufficient dilution factor for disposal of treated wastewater means that industries which require large quantities of water in the production process and which generate large quantities of wastewater requiring disposal should not be sited within the Meerigama zone. Only industries with a dry process of a low polluting nature should be allowed in Meerigama. It is also proposed that no further high polluting industries are allowed within the Western Province a it has already exceeded its carrying capacity as far as high polluting industries are concerned, with more than 80% of all industries in Sri Lanka operating within the Western Province.

The potential social impacts of the proposed plan require to be handled with extreme care, and full transparency. Any affected parties should be kept informed at all times regarding the implementation schedule of the plan. Affected parties should be fully and adequately compensated expeditiously prior to plan implementation. Resettlement Action Plans require to be prepared and implemented in close consultation with the affected parties in order to ensure that no problems are encountered during this process.

There are also a multiplicity of institutions which are involved with guiding the development process within the province chief among which is the Urban Development Authority and the Local Authorities. There are several institutions vested with regulatory powers under their respective Acts which grant approvals for development projects within the Western Region. These include the Urban Development Authority, Local Authorities such as Municipal Councils, Urban Councils and Pradeshya Sabhas, Central Environmental Authority, Sri Lanka Land Reclamation and Development Corporation (SLLRDC), Coast Conservation Department (CCD), Marine Environmental Protection Agency (MEPA), Forest Department, Department of Wildlife Conservation(DWLC), Board of Investment(BOI) etc. In many instances however, co-ordination between these agencies is minimal and granting of the required approvals for development projects may take several months. A major reason for this is the lack of a proper development plan for the region which clearly lays down criteria and guidance on the types of development projects which are allowed or not allowed in a given area. This is a major issue as far as the private sector is concerned as final approval of a given project may takes months or even years.

A major advantage of having an approved plan for the Western Region is that the Regulatory agencies as well as the developers themselves will be aware of the types of developments which will be allowed within a certain area. This will make the approval procedure for projects very much easier and thereby shorter. Implementation of the proposed Western Region Megapolis Plan will therefore pave the way for a smooth development process in a planned manner and resolve many of the pressing environmental and social issues within the region. It is however vital to ensure that all required safeguard measures are taken during the implementation of the plan in order to ensure effective implementation of the plan.

Chapter 14
Western Region Megapolis Development Authority (WRMDA)

14.1 Establishment of WRMDA

Western Region is consisting with western province and some adjoining parts of Sourthern and sabaragamuwa province . Western Region was divided further districts and few Municipal Councils. With such an administrative structure, planning and development in Western Region are either localized at Municipal Council level or coordinated at National level.

The proposed "Western Region Megapolis" Concept promoted a more regional and integrated approach in planning and development. In this concept, the regional body will coordinate all the planning and development initiatives, such that a strong synergy would be created through complementary efforts towards common goals of developing a vibrant and sustainable Western Region.

This will be achieved through the establishment of Western Region Megapolis Development Authority (WRMDA) which will be the main body looking after the planning and development of the Western Region. The WRMDA Acts is attached in the Appendix 1

14.2 Roles and Responsibilities

As the development authority, the WRMDA performs the following roles:

1. Custodian of Western Region Megapolis Master Plan, including preparing of detailed Master Plans for the different parts of the region.

2. Implementing body of the Master Plan, which includes:

- Conducting further studies for Master Plan implementation
- Implement land use policy (as approved by Ministry of Policy Planning)
- Carry out necessary works for infrastructural development
- Promote and coordinate urban redevelopment
- Perform coordination role in development projects
- Implement Development Control
- Develop and implement environmental and health standards
- Ensure integrated resource management
- Development of public facilities and public spaces.

In order for WRMDA to implement the Master Plan, WRMDA will be empowered for the following:

- Approve, coordinate, regulate and control development scheme or projects
- Secure funding for development
- Consolidate, acquire and dispose land as part of development framework
- Set-up agencies or companies for implementation and/or operation of certain functions.

A more detailed description on its authority and function is found in the WRMDA Acts.

14.3 Organization Structure

WRMDA will have its Boards and Chairman, who will report to the Ministry of Western Region. The day to day operation will be led by the Director General or the CEO.

In the begining, there will be 3 main departments as follows:

- Planning and Land Management
- Project Implementation
- Environmental Management and Social Development

The WRMDA organization chart is shown as below:

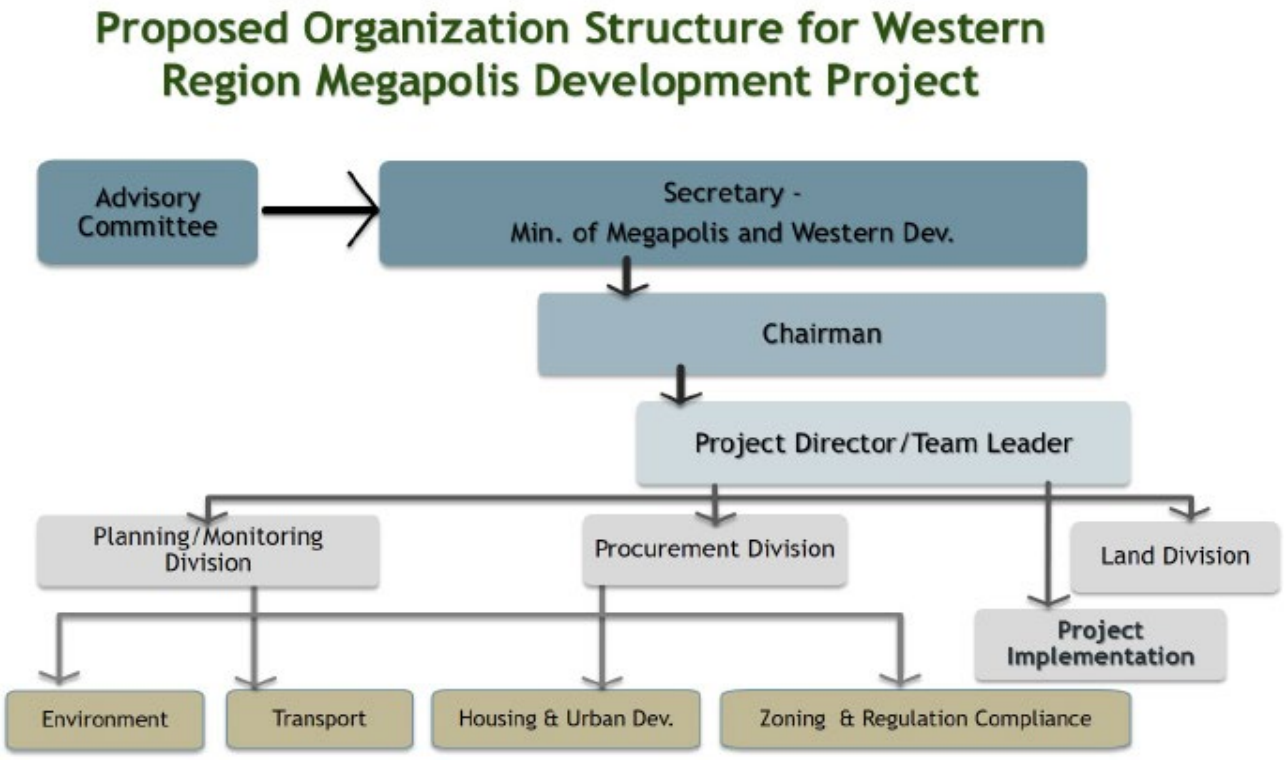


Fig 14. 1 WRMDA Organization Structure

Chapter 15
Planning, Zonning, Environment & Building Regulation

15.1 Introduction

The Planning, Zoning, Environmental and Building Regulations of Western Region Megapolis Development Authority of Sri Lanka involves with the innovative development-regulations and guidelines to control, protect, and/or abatement of air, water, ground water, noise, pollution, soil erosion and sedimentation, safety from fire, flood and other natural or man-made disasters. Also it improve the natural, historic, cultural and scenic character of the region. It further preserve and promote agricultural production, forests, aquaculture, timber resources, and open spaces. The regulations which enhance the public investment in transportation, storm water management systems, sewage treatment and disposal, solid waste treatment and disposal, schools, recreation, public facilities, open spaces and other public requirements help to promote a balance of housing choice for all income levels. These groups include religious, economic, to assure the health, safety, security, equity, and welfare of all the citizens and enhance their right to affordability, accessiblility, safety and sanitary housing. Also promote opportunities for the establishment of low and moderate income housing.

SHORT TITLE
This law may be cited as Western Region Megapolis Planning Authority Law Part II for the purpose of the implementation of Western Region Megapolis Spatial Structure Plan 2030, by introducing planning, zoning, environmental and building regulations.

Application of Law
This law shall apply within the administrative limits of Western Region of Sri Lanka.
Planning, Zoning, Environmental and Building regulations describe the procedure of how to undertake developments, requirements for approval, Terms and conditions of approval, the recommendations of committees, appeals, validity of permit, development in accordance with permit, certificate of conformity, purposes specified in the permit, removal of unauthorized constructions and legal actions.

15.2 GENERAL REGULATIONS

General and specific regulations for the areas such as Aero city, Muturajawela Tourism & Environmental Corridor, Mirigama Industrial City, Logistic City, Colombo Core Area, Outer Core Area, Environmental Regulation, Plantation City – Awissawella, Horana Industrial City, Forest City, Western Region Marine Zone, and Science & Technology City are defined in the report. (Refer map No.1)

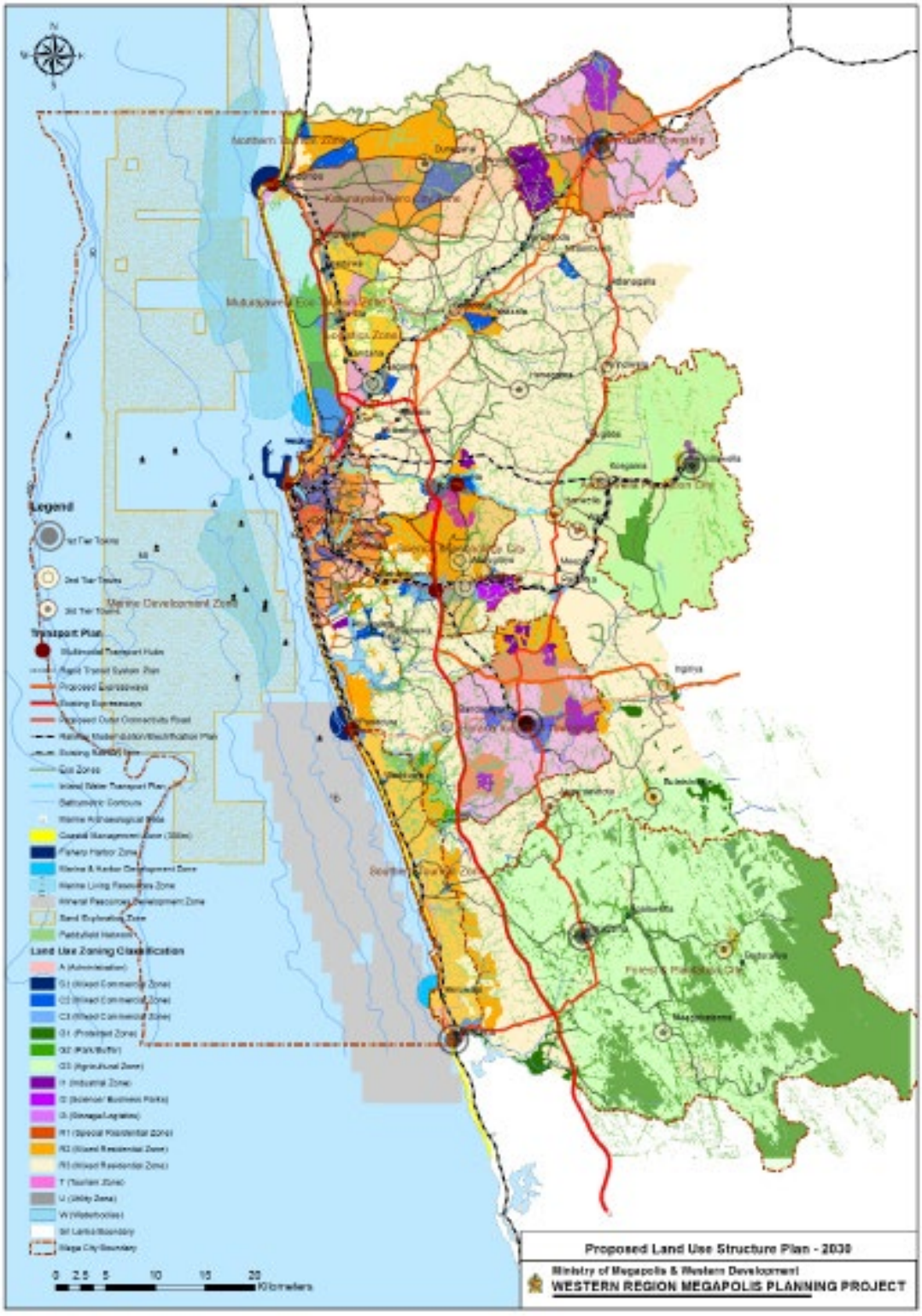


Fig :15.1 Megacity Structure Plan

General regulations are applicable within the administrative limits of WRMP Authority, where no specific regulations or guidelines are available or in such instances where the given specific regulations and guidelines are not clear.

Further this section describes,

- Submission of Plans for Approval,
- Submission of Architectural, Structural and Service Plans,
- Preliminary Planning Clearance and Approval of Plans,
- Appeals Against Refusal,
- Development to be in Conformity with the Permit,
- Suitability of Site,
- Use of the Site,
- Floor Area Ratio,
- Access through Private Roads,
- Specifications for Buildings,
- Height of Buildings,
- Street Lines and Building Lines,
- Sub Division of Land,
- Width of Carraige Way,
- Extent to be Reserved for Community and Recreation,
- Demarcation of Street lines,
- Layouts for Flats and Housing Units,
- Open Spaces around the Buildings,
- Rear Space,
- Additional Requirements for High-Rise Buildings,
- High Rise Buildings,
- Maximum Height of Buildings,
- Open Space between Building and the Boundary,
- Parking and Traffic Control,
- Splaying of Corners of Street,
- Architectural Control,
- Conservation of Places of Historical or Architectural Interest or Landscape Value,
- Landscape and Tree Preservation,
- Advertisement Control,
- Airport and Other Zones,
- Clearance from Electric Lines,
- Dimensions of Buildings,
- Dimensions of Bathrooms and Toilets,
- Dimensions of Storage Rooms,
- Minimum Height of Rooms,
- Height of Rooms with Sloping Roof,
- Stair Case,
- Lighting and Ventilation,
- Lighting and Ventilation for Rooms,
- Natural Ventilation,
- Aggregate Area of Openings,
- Requirement of Lighting for Rooms,
- Requirements of Vents for Ventilation,
- Standard Light Plane,
- Ventilation for Basement,
- Light and Ventilation for Photographic and Dark rooms,
- Mechanical Ventilation and Air Conditioning,
- Foundations,
- Foundations for Party Walls,
- Requirement of Qualified Persons in Case of Piling,
- Lifts
- Water Supply and Sewerage,
- Sewerage System and Sanitation,
- Rain Water Harvesting and Drainage,
- Waste Disposal,
- Electrical and Plumbing Work,
- Fire Safety,
- Fire Safety Requirements,
- Sumps for Water Storage,
- Certificate of Conformity,
- Inspections of before COC,
- Unsafe Buildings,
- Facilities for Disable Persons,
- Pollution Control,
- Visual Pollution and Construction of Religious Statues on Junctions & Reservations

- AERO CITY

Introduction

An Aero city (Aerotropolis) is a metropolitan sub region whose infrastructure, land use and economy are centered on an airport. It consists of an airport's aeronautical, logistics and commercial elements, and it connects transport infrastructure with clusters of aviation-oriented businesses and residential developments that continually feed off each other and their proximity to the airport.

Proposed regulations to the aero city zone, including restrict the height of the building structure and natural growth objects located vicinity of the airport approach zone, airport turning zone or airport transition zone have been formulated with the consultation of airport and civil aviation authority.

Further this section describes permissible uses for an Aero City and Specific regulations for Aero City.

- MUTHURAJAWELA TOURISM & ENVIRONMENTAL CORRIDOR

Introduction

The Muthurajawela marsh, Negombo Lagoon and coastal wetland, 6,232 ha in extent, is situated along the West coast of Sri Lanka.The lagoon, 3,164 ha in extent, is connected with the sea with a single narrow opening.The marsh with an extent of 3,068 ha, extends southwards from the lagoon. The main inflowing river, the Dandugam Oya, drains a catchment of 727 square km and discharges at the junction of the lagoon and marsh.

This section consists with the objectives, conceptual zoning map, general zoning classification (Protected area – G1, Lagoon Conservation Zone, Wetland nature Conservation Zone , Tourism & Fisheries development Zone, Low density Residential Zone, Low density Commercial Zone,Expressway Reservation Zone (Colombo – Katunayaka)), permissible uses within the zones specifications for development and general guidelines.

- INDUSTRIAL CITY - MEERIGAMA

Introduction

Under the Megapolis Development project Meerigama has been identified as one of the industrial city.

Main objectives are:

- To develop a vibrant township with industrial base
- To promote industries in designated area
- To provide modern industries and other infrastructure and utility services
- To designate physically define area for high density commercial development
- To develop residential neighbourhood at close proximity to industrial clusters
- To regulate development in existing environmentally sensitive areas

Project Components

- Develop two specialized large scale industrial clusters
- Use existing wet lands and forest areas as green buffers for industrial development
- Develop mini logistic hub with multi-modal access
- Expand and densify the existing town centre to cater to future demand
- Develop multi – modal transport hub at city centre
- Preserve environmentally sensitive areas through regulation
- Establish green link between forest patches

These guidelines are designed for the proposed industrial town area. These guidelines and regulations proposed to promote special users in each selected zone. Further it guides to maintain and promote existing social and physical characters of the proposed industrial zone. It is necessary to identify a suitable land for proposed development without any contradiction with other users. Further needs to protect and conserve the environment of the region which is more concern for sustainable development.
This section further describes proposed zoning and its Guidelines/ Regulations, General guidelines/ Regulations for Industrial Zone, permitted activities for none polluting industries, sanitation & health requirements, water supply, facilities for workers, commercial zone, residential zone, agricultural zone including permitted uses and minimum land extend for these three zones.

• LOGISTIC ZONE

Introduction
The logistic zone is located beside the Negambo – Colombo main road close proximity to Colombo port as well as Katunayake international Airport.
Creating a Logistics corridor will cater for specific type of logistic such as aviation and will provide all essential logistics related facilities (Offices, and Mixed Use) including; cargo import, export and consolidation, sea-air transit; perishables or valuable goods transportation; and warehousing, distribution and assembling and value added services. In the other hand, is to offer decent, livable accommodation facilities in a well maintained living environment that respects essential living requirements.
This section further describes about the adopted design and planning objectives, development control procedures including main zones, permitted uses, setbacks, requirements for on plot parking etc.

• COLOMBO CORE AREA

Introduction
The Core area of the Western Region Megapolis Authority (WRMPA) has two main segments called Central Business District (CBD) and the Core area which overlaps with the boundaries of the Colombo and Gampaha Districts. More especially the core area consists of the Municipal Councils, the Urban Councils and Pradeshiya Sabha of the above two districts. Within the core area the Aero city zones and coastal marine zones can be identify. The total land extent for core area is 123.64Sq.k and estimated population for the year 2030 is approximately 9 million.

The core area plan provides land use, physical development, transportation and mobility, vitality and sustainability policies and actions. All people will benefit from a high quality public and private environment and a broad range of employment, housing, shopping, and recreational opportunities, within a well-connected and attractive urban environment that embraces the country. The policies and actions are being intended to guide and influence the physical, social, environmental and economic development of the area, and to ensure a sustainable and balanced approach to growth over the next 15 years.
This Plan in conjunction with other related policies,

guidelines and regulations to evaluate the impact and suitability of public and private projects and initiatives related to land use, development, infrastructure and transportation, and will review all private and public projects and initiatives which have ability to help achieve the Plan's vision and goals.

This section further describes about planning units for CBD area and fringe area, vision of the core area, objectives, core area Policies and actions, permitted uses, general guidelines for core area, Implementing system, Building and Environment, main programme, core area zoning plan, zoning classifications, general zoning guidelines, building design guidelines for Beira Lake and surrounded area, zoning classifications & parameters, Special condition for development, guidelines and general conditions and recommendations.

• OUTER CORE AREA

Introduction

This area has been identified just outside the core area. It can be define as the interface between developed urban areas and undeveloped rural areas. The general principle for development in this area is to respect the natural environment, create an appropriate edge and to provide visual and physical linkages between urban and rural area. The linkages should be strong in order to promote the psychological well-being of the residents and thereby contribute to the quality of life. The area including main town centers such as Kiribathgoda, Mahara, Kadawatha, Biyagama, Malambe, Piliyandala, Kesbewa and Panadura.

Vision

To create an intermediate zone, to balance between more urbanized core area and the less urbanized outer area focusing on sustainable human settlement, economic development and environmental conservation.

Goals

- Promote and encourage local and regional economic development
- Protect and enhance the natural environment
- Protect and maintain access to the resource base
- Ensure adequate and appropriate services are provided
- Maintain mobility throughout the region
- Ensure adequate range of housing opportunities are available
- Promote regional collaboration on common issues

Zoning classifications

- Medium Density Residential Zone
- Medium density Commercial Zone
- Low Density Residential Zone
- Low density Commercial Zone
- Park / Buffer
- Agriculture
- Special area

Further this section includes permitted uses, Design policies, planning regulations and general guidelines of the proposed zones.

• PLANTATION CITY -AWISSAWELLA

Introduction

Awissawella shall become a commercial and services center and it became a plantation based activities. Therefore Awissawella mean to be a town which provides facilities for plantation based industries and services.

Objective of this plan were "The city, develop with plantation based economic activities and which is adding prosperity through plantation industry".

Vision of this regulation is "To enhance the productivity, profitability and sustainability of the plantation industry through ensuring an economically, socially and environmentally viable plantation sector and achieving national prosperity through development of the plantation industry in 2030"

This report consists with Objectives, Planning Guidelines for Development of the Plantation City. Awareness and public participation, Regulation

for buffer zones to be maintain, Water pollution preventing guidelines, Building Design Guildlines, Restricted Activities, Permited Uses and relevant agencies.

• INDUSTRIAL CITY - HORANA

Introduction

Under the Western Region Megapolis Authority, Horana is identified as industrial & Manufacturing City which serves for the whole region as well as the country's economic development.

According to the WRMPA, identified land for proposed industrial development that shall be as much as compatible with the surrounding land uses. As a result of that it has identified two industrial clusters viz. Talagala – millewa and Milleniya in addition to the Horana Industrial Estate. Further it is necessary to protect & conserve the environment of the area which is more concern for sustainable development.

Out of these industrial clusters, there are small towns and service centers, low density residential areas, commercial, agricultural & others can be observed and the regulations, guidelines under general regulations are applied in this regard.

This section describes Specific Regulations & Guidelines, such as Specifications for factory buildings, Sanitation & Health Requirements, Sanitary Convenience, Water Supply, and Facilities for workers, Fire Precautions and Planning guidelines for industrial clusters and Planning and Building Regulations for identified Urban Centers.

• FOREST CITY

Introduction

The natural forests will be allocated firstly for conservation, and secondly for regulated multiple-use productions. For the management and protection of the natural forests and forest plantations, the state will, take necessary actions where appropriate from partnerships with local people, rural communities and other stakeholders and/or introduce appropriate arrangements.

Planned conservation of forests into other land uses can take place only in accordance with procedures defined in legislation and with accepted conservation and scientific norms.

The extent of forest city is about 1,050 sqkm within the Divisional secretariat areas of Agalawata, Madurawala, Walalawita, Mathugama, Dodangoda, Bulathsinhala, Baduraliya, Ingiriya, Meegahathenna & Palawatha.

This section consist with applicable ordinance, laws and acts in the forest area, forest city zoning plan, Uses in Primary Forest Zone, Forestry Management Zone, Protected area, Forest and plantation zone and Agricultural Zone. And also introduce non permissible activities in above mention zones.

• SOUTHERN COASTAL TOURISM CORRIDORS

Introduction

Coastal and marine zone is bounded by (Maha Oya) Negambo (Lagoon) Harbour up to Bentota Bridge and 3 kms towards sea-side and 200m landside.

Goals

- A street pattern related to the landform and the surrounding natural features
- A direct relationship to the foreshore and a wide choice of uses associated with the coastal edge
- An extensive range of edge conditions, such as parks, beaches and waterfront promenades
- A range of smaller suburbs and suburban centers surrounding the city centre
- A full range of residential building types
- A full range of building heights from low scale to tall.

This section consists with description of effective planning policies for coastal & marine Zones,

Development Components, and Water Sports & Beach related Sports Activities. Prohibited Activities are “Affected Areas”, and “Conservation Areas”. Guidelines for issuing Permits for Removal of Sand, Reservation for Setback Areas. And also introduced Design guidelines, Plants for coastal areas, Practical considerations based on the proposed general zoning for the Southern Coastal Tourism Corridor declared by the WRMPA.

- ## SCIENCE AND IT CITY

Introduction

The Science and IT City occupies an area of 65 sq.km and is located about 10km east of the Colombo Outer Core Area. The proximity allows it to develop high value industries that will need large number of skills and investment from big international players. Altogether the project consists of 3 zones:

- IT parks
- Bio-Medical Hub
- Science Park

These zones will be planned with highest environmental quality. The development will lead the transformation of Sri Lankan industries into higher value industries; promote research and development activities and position Sri Lanka as one of the highest tech industrial hub in the future. New universities, high quality residential with ample facilities will be develop to create a conducive environment for scientist and creative individuals working and living in this area. This project is expected to attract business park developers, software houses and big players in high technology and bio medical industries as well as real estate developers. The Science and IT City is expected to generate additional 70,000 new employments.

This section consist with permissible uses, site extent, FAR, plot coverage within the Science and Technology City’.

13.14 ENVIRONMENTAL REGULATIONS

Introduction

Environment Regulations are enforced usually by a regulatory agency formed or mandate to carry out the purpose or provisions of a legislative for the protection of Environment.

This section includes classifications of Wetland zones; general conditions & guidelines, Wetland Zoning Regulations, Specific Development Conditions & Permitted uses of the wetland zones. Disaster Risk Reduction Regulation & Urban Planning recommendations with relevant zones & permitted users are included. Also there are Public Outdoor Recreation space planning methodology, Tree Preserving Regulations/Tree Planting Regulations, and Solid waste management regulations.

No.	Zone Classification	Zone Code	FAR	Maximum No. of floors	Plot Coverage %		Permissible use	Conditional use	Color Code	Minimum Plot size	Road Width(m)
					max	min					
1	High Density Commercial Zone	C1	12	100 or more	80	20	Retail, Hotels, Offices, Residential Public facilities ,Institutional, Parks/Green, Others	Clean Service Industries, Minor infrastructure installation,		8000sqm (2 acre)	30
	Medium Density Commercial Zone	C2	4	30	80	20				4000sqm (1 acre)	30
	Low Density Commercial Zone	C3	2	30	40	10				3000sqm (3/4 acre)	30
	Regional center/MC area	C4	2	20	80					2000sqm (2/4 acre)	30
	Town center/UC area	C5	1.5	15	80	20				1500sqm	20
	Neighborhood/ village	C6	1	10	80	50				1000sqm (1/4 acre)	15
2	Industrial Zone	I1	2.5	4	60	40	All Industries, Workers dormitory, Public facilities, Institutional, Park/Green, Infrastructure	Commercial up to 20% of total GFA,		4000sqm (1 acre)	30
	Business Science Park	I2	1.5	4	40	20	Research based/clean industries, Public facilities, Institutional, Park/Green	Commercial up to 20% of total GFA,		4000sqm (1 acre)	30
	Storage/Logistics	I3	1.5	4						1 acre	30
	Utility	U									
3	Special Residential Zone	R1			50	-	Residential, Public facilities, Institutional, Park/Green	Commercial up to 20% of total GFA, Service industry		20 perch	15
	Medium Density Residential Zone	R2	1.2		60	-				20 perch	15
	Low Density Residential Zone	R3	3		40	-				20 perch	15
4	Protected area	G1			-					-	-
	Parks / Buffers	G2								-	-
	Agricultural Zone	G3								-	-
5	Tourism	T								-	15
6	Administration Zone	A									

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Chapter 16
Way Forward

The Master Plan provides the medium and long term development directions for Western Region. To ensure that the planned development take place, it is necessary to prepare an implementation framework including:

- Preparation of detailed planning & zoning for all areas within Western Region.
- Feasibility and strategic study for the identified key catalyst projects.
- Identification and development of critical infrastructure projects.
- Project and land sale packaging.
- Land consolidation.

16.1 Preparation of Detailed Planning & Zoning and Densities

The preparation of detailed planning for all areas should ensure the transparency in the area of land use and development control in the long term. Together with the review, standardization and streamlining of the planning regulation, this detailed planning excercise is an important step towards a better planned megapolis.

16.2 Feasibility, Strategic & Environmental Study for the Key Catalyst Projects favoured by all Megapolis Project

While the key catalyst projects have been identified and broad Master Plan for each project has been proposed; these projects are subject to the feasibility, environmental and strategic study which has not been conducted yet.

These studies need to be conducted to gain clarity on project scope and size, time frame, cost/benefit, broad project costing, revenue and financing model, targeted investors, environmental impacts and mitigation, ownership and operational model etc.

These are especially important for the industrial townships, logistic, science/technology park and airport projects, as these are major projects, which may be executed on the public private partnership basis. Accordingly special approval from higher authorities may also be required for such projects.

16.3 Methodology for Implementation

- Public Private Partnership (PPP)
- Expression Of Interest (EOI) - Request For Proposal (RFP) - Tendering
- Government to Government (G to G)
- Funded by WRMPP
- Fund raising by WRMPP etc.

16.4 Identification and Development of Critical Infrastructure Projects

Waste processing and Rail Transit System in Colombo are the 2 priority infrastructure projects identified. The preparation for their implementation is already ongoing.

Apart from the above, there are basic infrastructure needed for the key catalyst projects, most of which are located in the greenfield area. These projects may include building access roads, extending power and water supply to the site, as well as building the sewerage treatment plants (for industrial projects). These infrastructure have to be developed in tandem with the project development, such that it will be ready by the time the catalyst projects are being launched.

16.5 Project and Land Sale Packaging

There are smaller scale projects, which are ready to be offered to investors for development, such as the commercial development sites in the CBD, hospital project within the science park, other important tourism sites etc.

Planning, urban design and project packaging need to be done for these projects, such that the projects will bring about the expected benefits for the community (and the surrounding areas) and provide clarity for potential investors to bid and execute the project.

16.6 Land Consolidation

While information on land availability is already mapped, large part of the available land is not state owned. To acquire all the land needed for development at one go will be very challenging considering the budget limitation and the amount of work involved.

As such, land consolidation plan need to be prepared, to identify priorities for land acquisition/consolidation, strategies and time frame. This will give government clear direction in the land consolidation process.

16.7 Procedure to folow for acqusition of Lands

The procedures to follow for acquisition of lands for implementation of identified in the Megapolis Master Plan need to be based on the provisions available in the Western Region Megapolis Development Authority Act and the rules and regulations introduce from time to time. These guidelines have been prepared based on the provisions available in the draft act and the general procedures followed for project implementation

Following are the steps to be followed for acquisition of land for project implementation

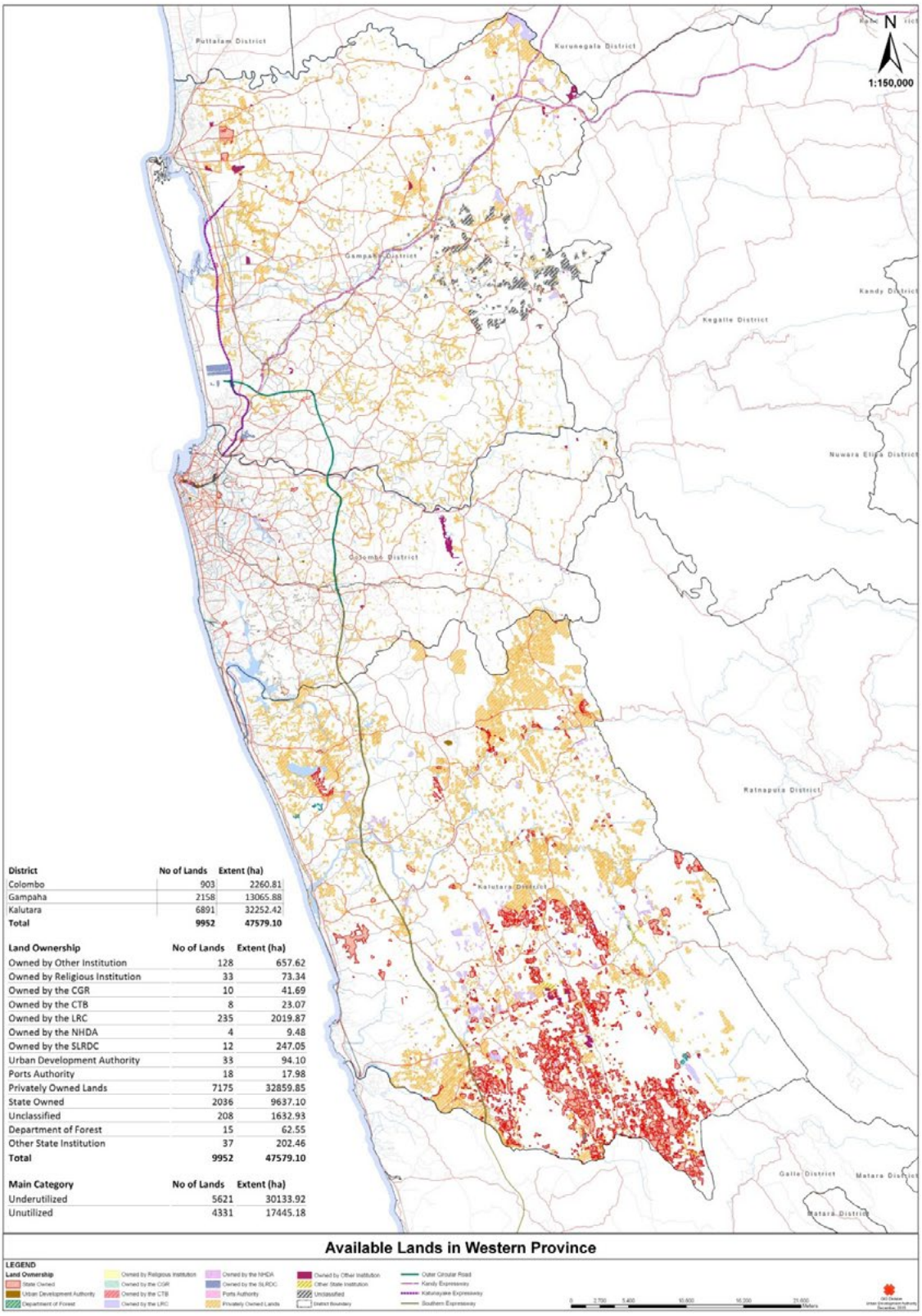
1.Identification of the development site on ground
There are different type and size of projects. It can be a building project, road project or industrial estate or science park project. As specified by the project formulation team, the location of the development site need to be identified. In case of the location, Grama Niladhare (GN)division and the Divisional Secretary(DS) area is important. Approach road is other important factor. In case of road or railway tract development, there may be several DS areas. The site can be identified on ground with the assistance of the DS and GN of the area.

2.Ascertaining the physical and legal status of the site
The physical and legal status of the site can be ascertained with the assistance of the GN.The officer visiting the site should prepare a location sketch and obtain the following information
i.availability of infrastructure and the capacity
ii.availability of houses and other development
iii.land ownership type or types.
iv.ground characteristics

3.Discuss with the project formulation team and confirm the suitability of the site

4.Send a survey requisition to the Survey Superintendent of the District with copy to DS to carry out a site survey. Identifying the different ownership types is important to decide on the acquisition procedure to follow,

5.If there are private lands or houses, it is necessary to brief the owners and indicate their position. Also it is necessary to obtain the views regarding their ownership rights and expectations for the provision of alternate accommodation or compensation. These can be arranged while the acquisition is in progress.



District	No of Lands	Extent (ha)
Colombo	903	2260.81
Gampaha	2158	13065.88
Kalutara	6891	32252.42
Total	**9952**	**47579.10**

Land Ownership	No of Lands	Extent (ha)
Owned by Other Institution	128	657.62
Owned by Religious Institution	33	73.34
Owned by the CGR	10	41.69
Owned by the CTB	8	23.07
Owned by the LRC	235	2019.87
Owned by the NHDA	4	9.48
Owned by the SLRDC	12	247.05
Urban Development Authority	33	94.10
Ports Authority	18	17.98
Privately Owned Lands	7175	32859.85
State Owned	2036	9637.10
Unclassified	208	1632.93
Department of Forest	15	62.55
Other State Institution	37	202.46
Total	**9952**	**47579.10**

Main Category	No of Lands	Extent (ha)
Underutilized	5621	30133.92
Unutilized	4331	17445.18

Fig:16.1Available Lands in Western Region

6.On completion of the survey plan acquisition procedure can be commenced
Procedure to follow vary depending on the land ownership type. Generally the following ownership types are available.
(a)Private land
(b)State land
(c)Local Authority land
(d)Statutory Organization land
(e)LRC land

7.In case of a private land or LRC land action can be taken under the provisions of Section 21 of the WRMP Act. Issues including the payment of compensation and resettlement are included in this section of the Act.

8.In case of state land action can be taken under the provisions of Section 20 of the WRMP Act

9.In case of Local Authority or Statutory Organization land action can be taken under the provisions of the Section 19 of the WRMP Act.

10.On receipt of the survey plan indicated in item 4 , It would be necessary to prepare a report to the DG/Chairman indicating the estimated compensation. Resettlement requirement if any , provision of additional services if necessary for the management to grant approval for acquisition and to make provision for meeting the costs involved

Appendix

A. List of Contributors to the Master Plan

B. List of identified Projects

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205	Dr.(Ms) Madura M.Wehella	Director - Ministry of Education
206	Mr. R.P.Samarakkodi	Deputy Director General - Disaster Management Center
207	Dr. Y. Abeysundara	Civil Engineer - Ministry of Education
208	Mr. C. Kularathna	Civil Engineer- Ministry of Education
209	Mr. Prasad Fonseka	President - Kotte Hetritage foundation
210	Ms. M P J Tilakerathne	Director - Ministry of Education
211	Ms. Maheshi Anandasiri	Senior Manager - Cargills Lanka Pvt Ltd
212	Mr. Haridas Fernando	Deputy General Manager- Cargills Lanka Pvt Ltd
213	Dr. (Ms) T.D. Abeynayake	General Manager- National Authority for Tobbacco and Alcohol
214	Dr.(Ms)Avanthi Perera	Senior State Counsel- Attorney General Department
215	Ms. Nirmalee Perera	Assistant Director- Dept. of Probation and Child Care
216	Ms. Hasitha Perera	Assistant Director - Department of Prison
217	Mr. Chandima Hulangamuwa	Managing Director - Mitsui O.S.K. Lines Lanka
218	Mr. P.M.M.S. Senadeera	Project Engineer- Sri Lanka Ports Authority
219	Ms.Taniya Wettimuny	Director- SL Logistic & Freight Forwarding Association
220	Mr.Sean wan Dort	Executive Committee Member - SL Shippers Council
221	Dr.(Ms) Susie Perera	Director- Ministry of Health
222	Prof. Saroj Jayasinghe	Faculty of Medicine- University of Colombo
223	Prof. Vajira Dissanayake	Faculty of Medicine- University of Colombo
224	Dr. Senarath Mahamithawa	Director- Ministry of Health
225	Dr.(Ms) Sumudu Karunarathna	Medical Officer- Ministry of Health
226	Dr.(Ms) Indrika Rajapaksha	Senior Lecturer- University of Moratuwa
227	Ms. Chandana Kalupahana	Director- Urban Development Authority
228	Mr. Oliver Fernando.	President- The Association of Industrialists IE Panaluwa
229	Mr. J Ajith Fernando	Chairman- Haward Fashion pvt Ltd
230	Ms. A M P A Seneviratne	Manager- Industrial Development Board
231	Mr. D U E A Senanayake	Secrtary- Association of Industrialsts, Kalutara

232	Mr. Sugath Vithanage	Chairman- Supreme Lanka Agro Products Pvt Ltd.
233	Mr. Ravi Heiyanthuduwa	Proprietor- PolycolourPvt.Ltd
234	Mr. K L Guneratne	Secretary- Tea Small Holdings District Society, Kalutara
235	Mr. D R C Jayatilake	Director- Ministry of Industries & Commerce
236	Mr. Srimal Jayathilaka	Deputy Director- Industrial Development Board
237	Mr. S A G Senanayake	Deputy Director-Industrial Development Board
238	Ms. W A Leelawathi	Deputy Director-Industrial Development Board
239	Dr. (Ms) N.A.N.Perera	Medical Officer- Department of Health Educaion
240	Mr. H M U Chularatne	Deputy Director - SEVENATHA Agency
241	Mr. J A C P. Jayasinghe	Assistant Director - National Human Resources Development Council
242	Mr K.P P Perera	Development Officer- Human Resources Development Council
243	Mr. Sunil Jayalath	Government Agent- District Secretariat, Gampaha
244	Mr. C.P.W Gunathilaka	Divisional Secretary- Divisional Secretariat, Gampaha
245	Ms. W.H.N. Pushpamala	Divisional Secretary- Divisional Secretariat, Biyagama
246	Mr. H.M.L.S. Herath	Divisional Secretary- Divisional Secretariat, Divulapitiya
247	Mr. H.G.J.P. Wijayasiriwardena	Divisional Secretary- Divisional Secretariat, Dompe
248	Mr. D.M. Rathnayake	Divisional Secretary- Divisional Secretariat, Attanagalla
249	Ms. G.D.C. Sudarshani	Divisional Secretary- Divisional Secretariat, Ja- ela
250	Mr. K.G.H.H.R. Kiriella	Divisional Secretary- Divisional Secretariat, Katana
251	Ms. Pubudika S Bandara	Divisional Secretary- Divisional Secretariat,Kelaniya
252	Mr. G.S.I. Wimalasena	Divisional Secretary- Divisional Secretariat, Mahara
253	Mr. K.A.S.L. Gunathilake	Divisional Secretary- Divisional Secretariat, Minuwangoda
254	Mr. J.A.D.S. Jayasinghe	Divisional Secretary- Divisional Secretariat, Negombo
255	Ms. Sriyanthi Dissanayake	Divisional Secretary- Divisional Secretariat, Wattala
256	Mr. B.A.G. Wickramapala	Director- District Secretariat, Gampaha
257	Mr. Y. Indika M. Silva	Divisional Secretary- Divisional Secretariat, Mirigama
258	Mr. Sunil Kannangera	Government Agent- District Secretariat, Colombo
259	Mr. D.P. Wickramasinghe	Divisional Secretary- Divisional Secretary, Colombo
260	Mr. W.H.K.D.B. Rathnayake	Director- District Secretariat, Colombo
261	Ms. Champa N. Perera	Divisional Secretary- Divisional Secretariat, Dehiwala
262	Mr. K.S.K. Kannangara	Divisional Secretary- Divisional Secretariat, Homagama
263	Ms. H.M. Dayawathie	Divisional Secretary- Divisional Secretariat, Kaduwela
264	Mr. L.A. Kalukapuarachchi	Divisional Secretary- Divisional Secretariat,Kesbewa
265	Mr. A.U.K. Dodanwala	Divisional Secretary- Divisional Secretariat, Kolonnawa
266	Mr. Amal Edirisooriya	Divisional Secretary- Divisional Secretariat, Kotte
267	Mr. Buddhi Karunasena	Divisional Secretary- Divisional Secretariat, Maharagama
268	Mr. K.C. Niroshan	Divisional Secretary- Divisional Secretariat, Moratuwa
269	Mr. B.A.D. Chinthaka	Divisional Secretary- Divisional Secretariat,Padukka
270	Mr. D.A.H. Piyathilaka	Divisional Secretary- Divisional Secretariat, Ratmalana

271	Mr. W.A.K.P. Wanniarachchi	Divisional Secretary- Divisional Secretariat, Seethawaka
272	Ms. G. Karunarathne	Divisional Secretary- Divisional Secretariat, Thimbirigasyaya
273	Mr. U.D.C. Jayalal	Government Agent- District Secretary, Kalutara
274	Mr. K.A.D. Siriwardena	Director- District Secretariat, Kalutara
275	Mr. G.S. Kannangara	Divisional Secretary- Divisional Secretariat, Agalawatta
276	Mr. S.K. Henadheera	Assistant Divisional Secretary- Divisional Secretariat, Bandaragama
277	Mr. K.G.D. Chathura Malraj	Divisional Secretary- Divisional Secretariat, Beruwala
278	Ms. I. Weerasinghe	Divisional Secretary- Divisional Secretariat, Bulathsinhala
279	Ms. Thilanka Weththasinghe	Divisional Secretary- Divisional Secretariat, Dodangoda
280	Ms. Nishanthi Jayasinghe	Divisional Secretary- Divisional Secretariat, Horana
281	Mr. H.A.K Pushpakumara	Divisional Secretary- Divisional Secretariat, Ingiriya
282	Mr. S.P. Liyanage	Divisional Secretary- Divisional Secretariat, Madurawala
283	Ms. Sujani Mahesha	Divisional Secretary- Divisional Secretariat, Mathugama
284	Mr. S.B. Gunawardhana	Divisional Secretary- Divisional Secretariat, Millaniya
285	Mr. L.L.D. Thilakarathne	Divisional Secretary- Divisional Secretariat, Palindanuwara
286	Mr. K.G. Wijeyasiri	Divisional Secretary- Divisional Secretariat, Panadura
287	Mr. Darshana Ranasinghe	Divisional Secretary- Divisional Secretariat, Walallawita
288	Mr. J.K .Bandara	Assistant Director- District Secretariat, Kalutara
289	Ms. U.K.A. Dilhari	Divisional Secretary- Divisional Secretariat, Kalutara
290	Prof. Sirimalee Fernando	Chairperson- National Science Foundation
291	Dr. Ajith R Gunawardena	Asst. Director- Central Environmental Authority
292	Prof. Rohan W Jayasekara	Faculty of Medicine- University of Colombo
293	Dr. Rohan Karunarathne	President- Ceylon Institute of Builders
294	Dr. Ravihansa Chandrathilake	Senior Lecturer- University of Moratuwa
295	Mrs. N.S. Casseer	Director- Civil Aviation Authority Sri Lanka
296	Mr. Prabath Ranaweera	Deputy General Manager- Ceylon Fisheries Harbour Corporation
297	Mr. A.H. Gamini Hewage	Actg. Director- Coast Conservation& Coastal Resources Management
298	Mr. Nimal Chandarathne	Director General- National Aquatic Resources Authority
299	Mr. Manjula Amaranath	Deputy Director- Department of Wildlife
300	Mr. Senaka De Silva	Actg. Deputy Chief Secretary- Western Province Provincial Council
301	Mr. A E L Thilakawardena	Deputy Director- Department Of Archaeology
302	Mr. R S Wijesekera	General Manager- Water Resources Board
303	Dr. C H E Siriwardena	Deputy Director- Geological Survey and Mines Bureau
304	Mr. A A S V Dias	Director- National Building Research Organization
305	Mrs. Anoja Senavirathne	Director- Disaster Management Center
306	Mr. Veranjan Kurukulasooriya	Director General- Department of National Physical Planning

307	Mr. Hudson de Silva	Director Environment
308	Mr. B W R Balasooriya	General Manager- Water Supply & Drainage Board
309	Ms. Kamani Muhandiram	Senior Engineer- Coast Conservation & Coastal Resource Management
310	Mr. N A S N Nisshanka	Director- Urban Development Authority
311	Mr. D C S Nishantha	Deputy Conservator General of Forest- Department of Forest
312	Dr. N.S. Wijerathne	Deputy General Manager- SL Land Reclamation& Development Corporation
313	Mr. N. Nilwala	Secretary- Ministry of Agriculture - Western Province
314	Prof. Sasanka Perera	Sociologist- South Asian University – Newdelhi
315	Dr. Rohan Wijekoon	Director General- Department of Agriculture
316	Mrs. W.M.M.R . Adhikari	Secretary- Ministry of Fisheries
317	Mr. M. Y.Abdul Majeed	Acting Director General- Department of Irrigation
318	Mr. S.S.L.Weerasinghe	Additional Director General- Department of Irrigation
319	Mr. Nalin Mannapperuma	Director- Waste Management Authority
320	Dr. Herath Manthrithilake	Head- International Water Management Institute
321	Prof. Ajith De Alwis	Project Director- Coordination for Science, Technology and Innovation
322	Ms. Amali Ranasinghe	Scientist- Coordination for Science, Technology and Innovation
323	Ms. Kanthi De Silva	Director- Central Environmental Authority
324	Prof. Raj Somadeva	Archaeologist- Post Graduate Institute of Archaeology - Sri Lanka
325	Mr. Gamini Jayasinghe	Deputy Director General- Central Environmental Authority
326	Mr. S A M Azmy	Head- National Aquatic Resources Authority
327	Ms. Dammika Pindeniya	Ecologist- Sri Lanka Land Reclamation& Development Corporation
328	Ms. Nelka Perera	Assistant Director- Central Environmental Authority
329	Ms. Bimba Thilakarethne	Legal Advisor to Hon. Prime Minister- Prime Minister Office
330	Mr. N.D.B. Unamboowe	Senior Deputy Solicitor General- Attorney General's Department
331	Mr. S.R.K Gamage	Deputy General Manager- Ceylon Electricity Board
332	Ms. Indika Wijegunawardena	Commissioner- Land Commissioner General's Department
333	Ms. Gothami Gannoruwa	Director- Ministry of Megapolis & Western Development
334	Mr. G.P.K. Wijekoon	Manager- Ceylon Petroleum Corporation
335	Mr. Harsha Wickramasinghe	Deputy Director General- Sustainable Energy authority
336	Dr. Lionel Pinto	Chairman- SL Vocational Training Authority
337	Ms. Anoja Senevirathne	Director- Disaster Management Center
338	Mr. S.M.S. Samarakoon	Director- Central Environmental Authority
339	Ms. Kusala Mahalekam	Assistant Director- Central Environmental Authority
340	Mr. M.M.D.J. Senarathna	Assistant Director- Department of National Botanic Garden

Project Administrative Staff		
341	Mr. N. Kaleichelvan	Project Accountant (WRMPP)
342	Mr. A.M.S.C. Alahakoon	Logistic Officer (WRMPP)
343	Ms. Jilani De Lanerolle	Secretary to the Chairman (WRMPP)
344	Ms. Kanthi Samarawickrama	Secretary to the Project Director (WRMPP)
345	Ms. T.G.V.W. Perera	Documentation Officer / Secretary (WRMPP)
346	Ms. Kanthi. G.S. Gunasekara	Account Assistant (WRMPP)
347	Mr. S.E. Dileepa Sirimal	Office Aid (WRMPP)
348	Mr. M.A. Lionel	Office Aid (WRMPP)
349	Mr. W. Chaminda	Office Aid (WRMPP)
350	Mr. R.M.W. Rajasinghe	Driver (WRMPP)
351	Mr. W.L. Rathnasiri	Driver (WRMPP)
352	D.P.S. Dahanayaka	Driver (WRMPP)

B. List of identified projects

01 - TRANSPORT, ENERGY AND WATER

1.1 TRANSPORT

1.1.1 Railway Electrification and Modernization
1.1.2 Construction of New Electrified Railway Lines
1.1.3 Colombo Rapid Transit System (RTS) Project
1.1.4 Implementation of New Inland Water Transport System
1.1.5 Improvement of Expressway Network
1.1.6 Construction of New Expressways
1.1.7 Bonded Highway for the Logistics Corridor
1.1.8 Development of Multimodal Transport Hubs and Centers
1.1.9 Improvement of Existing Roads
1.1.10 Horana- Meerigama, Negombo- Meerigama and Ja-Ela- Divlapitiya Road improvement Project
1.1.11 Marine Drive, Duplication Road & Baseline Road Extention Project
1.1.12 Development of Off-Street Parking Facilities
1.1.13 Introduction of parking meters
1.1.14 Modernization of Public Bus Transport System in Western Region
1.1.15 Overflow Parking Facility for Long Distance Busess Entering Colombo
1.1.16 Widening and Improvements of Intersections in Colombo
1.1.17 Upgrade Signal Lights at Intersections
1.1.18 IT Based Smart Traffic Management System
1.1.19 Improvement of Pedestrian Facilities
1.1.20 Improvement of traffic flow based on Identified Interventions
1.1.21 Legal Enforcement of Traffic Law Violations Through CCTV Monitoring
1.1.22 Improvement of Taxi Transport Service
1.1.23 Introduce New School Transport Service (consultancy)
1.1.24 Encouragement of Bicycle Use and Feasibility Study on Cycle and Motorcycle Paths
1.1.25 Policy on Use of Road/Rail Right of Way
1.1.26 Minimize Fuel Usage Policy
1.1.27 Reduce Vehicle Emission
1.1.28 Restructure of Public Bus Transport in Western Region (consultancy)
1.1.29 Study on Introduction of Flexible and Staggering Working Hours (consultancy)
1.1.30 Improvement of Facilities at Bus Suburban Interchange Terminals and Bus Stands
1.1.31 Supply of Compressed Natural Gas (cng) and Establish Electric Charging Facilities (50 centres) for Buses and other Vehicle

1.2 ENERGY

1.2.1 Sapugaskanda Oil Refinery Expansion and Modernisation (SOREM)
12.2.2 600 MW Natural Gas Combined Cycle Power Plant, Kerawalapitiya
12.2.3 Conversion of 300 MW Combined Cycle Power Plant to Natural Gas, Kerawalapitiya
12.2.4 Conversion of 450 MW Combined Cycle/ GT Power Plant to Natural Gas, Kelanithissa
12.2.5 Transmission of Natural Gas from Mannar Basin to Kerwalpitiya
12.2.6 Enhancing the Capacity of Non Conventional Renewable Energy through Net-metering
12.2.7 Conversion of overhead, low and medium voltage lines in the suburbs of colombo into underground Inculated Cables and Arial Bundle Conductors

1.3 WATER

1.3.1 Welivitta Water Supply Project
1.3.2 Kelani Right Bank Water Supply Project Stage - 11
1.3.3 Kaluganga Water Supply Phase - 11
1.3.4 Kotte Area (Jubilee reservoir) Water Service Improvement Project
1.3.5 Construction of Kelani Ganga Upstream Reservoirs
1.3.6 Construction of Yatimahana Reservior in Maha Oya
1.3.7 Aluthgama, Mathugama and Agalawatta water supply project
1.3.8 Construction of salinity barrior across Kaluganga
1.3.9 Transmission and distribution system improvement of exisitng water supply schemes in Western Province
1.3.10 Katana water supply project
1.3.11 Divulappitiya water supply project
1.3.12 Mirigama, Kandalama, Kaleliya and Ganegoda group of Towns Water Supply Project
1.3.13 Mirigama industrial city water supply project
1.3.14 Ingiriya, Handapangoda water supply project
1.3.15 Kirindiwela water supply project
1.3.16 Mabima water supply project
1.3.17 Construction of treatment plant at Kethhena
1.3.18 Construction of ground reservoirs to enhance water storge facility for Colombo city

02 - HOUSING, TOWNSHIPS AND RELOCATION OF ADMINISTRATION OFFICES

2.1 HOUSING

2.1.1 Social housing development project (CBD Zone)
2.1.2 Middle Income Housing Development Project (Fringe Zone)
2.1.3 Malabe Residential Development (Middle Class and Luxury Housing)
2.1.4 Social Housing Development Project (Fringe Zone)
2.1.5 Housing developent project -Horana Industrial Zone(Middle Class and Luxury Housing)
2.1.6 Aero City Housing development Project -Katana and Divlapitiya
2.1.7 Multi-Story Middle Income Housing Complex at Ragama
2.1.8 Multi-Story Luxury Housing Complex at Kirimandala Mawatha
2.1.9 Avissawella residential development project (Middle Class and Luxury Housing)

2.2 TOWNSHIPS

2.2.1 Aero city business township development project- Katana
2.2.2 Aero city residential township development project - Divulapitiya
2.2.3 Center for Non-Communicable Diseases (Cancer, Kidney, Heart)
2.2.4 Town Centre Upgrades (Sukithapurawara)

2.3 RELOCATION OF ADMINISTRATION OFFICES

2.3.1 Relocation of Government Offices located in and arround CBD

03 - ENVIRONMENT AND WASTE MANAGEMENT

3.1 SOLID WASTE

3.1.1 Solid waste management-Colombo and suburban area
3.1.2 Integrated solid waste management for Local Authorities
3.1.3 Implemetation of an intregated hazardous waste management facility
3.1.4 Implementation of clinical waste management facility
3.1.5 Establishment of electronic waste recyling facility
3.1.6 Sanitary land fill for the region or district wise

3.2 SEWERAGE

3.2.1 Waste water collection and disposal system for Negombo township
3.2.2 Kelaniya-Peliyagoda waste water collection and disposal project
3.2.3 Sri Jayawardenapura Kotte wastewater collection and disposal project
3.2.4 Maharagama, Boralesgamuwa wastewater disposal project
3.2.5 Waste water collection, treatment and disposal system for Ja-Ela/Ekala and Ratmalana / Moratuwa stage-i phase-ii project
3.2.6 Expansion of pipe borne sewerage coverage for Dehiwala-Mt.Lavinia Municipal Council Area
3.2.7 Wastewater collection, treatment and disposal system for Gampaha Municipal Council Area
3.2.8 Wastewater collection, treatment and disposal system for Horana industrial zone
3.2.9 Wastewater collection, treatment and disposal system for Mirigama industrial zone

3.3 NATURAL ENVIRONMENT IMPROVEMENT

3.3.1 Riverine buffer zone development and management in Kelani, Kalu,Attanagalu and Deduru river systems
3.3.2 Declaration of Eco Zones in the Western Region
3.3.3 Protection of inland water bodies in the western Region
3.3.4 Improvement of Landuse Pattern In Kelani River Catchment Area In Western Region
3.3.5 Public private partnerships (PPPs) towards Effdective Environment Management in the Kelani and Kalu river Basiins
3.3.6 Air and water quality baseline establishment and continous monitoring
3.3.7 Assessment of Health Costs of Air Pollution, and Recommendation on Policy Mitigatory Intervention
3.3.8 Riverine buffer zone development and management in Kelani, Kalu, Attanagalu and Deduru river systems while paying attention to environment sensitive, cultural and heritage sites
3.3.9 Disaster risk management in WRMP including climate change including desasters caused by climate cahange
3.3.10 Characterization of environmentally sensitive areas (ESAS)
3.3.11 Creating the enabling environment to access green funds
3.3.12 Enhanced capacity to track the climate change impacts on the WRM ecosystem including sea level rise, rainfall changes and temperature increase related impacts
3.3.13 Promotion of cleaner / renewable energy sources in transportation, power and domestic sectors
3.3.14 Management of areal emissions from waste burning
3.3.15 Encouragement Environmenttal Friendly Technologies
3.3.16 Preparation of Cadastral map for WRMP Area
3.3.17 Preparation of the drainage master plan for WRMP area

3.3.18 Kolonnawa Basin , new mutuwal tunnel / Torington tunnel, St, Sebestian South diversion, Madivela diversions, storm water drainage and flood contral projects
3.3.19 Rathmalana – Moratuwa Storm Water Drainage and Environment Improvement Project (Weras ganga project is ongoing)
3.3.20 Master plan for wetlands and assessment of water quality in the inland waterways and lakes within the Western region

04 - AERO, MARITIME TRADE HUB

4.1 PORT & AIRPORT/ LOGISTIC
4.1.1 East container terminal of Colombo Port
4.1.2 Improvement of UCT, PVQ and Guide Pier of Colombo Port
4.1.3 Facilitating Cruiser Liners And Yatchs In Colombo Port
4.1.4 Establishmnet of logistic corridor in Colombo Port
4.1.5 Construction of shipping and maritime center building
4.1.6 Developemnt of west containaer terminal (WCT-1) of Colombo Harbour
4.1.7 Extension of Colombo port expantion project breakwater and development of west container terminal 2
4.1.8 North port development project
4.1.9 Extension of ECT and SAGT as combined back to back terminal
4.1.10 Establishment of cargo village
4.1.11 Establishing a Marina by Converting Southern Part of Dickkowita Fisheries Harbour
4.1.12 Rehabilitation of Panadura fisheries harbor
4.1.13 Establishment of the logistic hub
4.1.14 Second runaway and assossiated infratructure at Bandaranaike internationl airport
4.1.15 Port Related Infrastructure Development (Dry Dock, Floating Dock, Slipway ,Syncro Lift
4.1.16 Constructing Deep Sea Coastal Fishing Crafts
4.1.17 Construction of Multipurpose Crafts
4.1.18 Construction of Maritime Defense Crafts
4.1.19 Port related Industries- Chains, Generators and Other Port Related Equipment
4.1.20 Port Related Shipping Services – Bunkering etc.
4.1.21 Specialist and Skilled Labor Training Centre
4.1.22 Research and Development, Innovation Incubators Related to Marine Sectors
4.1.23 Establishment of Transshipments Centre

4.2 COASTAL AND MARINE
4.2.1 Formation of Recreational Beach Area Along the Shoreline South of Colombo (in the form of perched beaches)
4.2.2 Commercial Extraction of Offshore Sand for Economic Development

05 - HIGH RISE

5.1 Colombo Business District (CBD) mixed development project
5.2 Preparation of Urban Designs, Architectural Concepts and Design Guidelines for Revival of Colombo – Pettah Area

06 - INDUSTRIAL AND TOURIST CITIES

6.1 INDUSTRIES

6.1.1 Meerigama Industrial Township Development Project
6.1.2 Horana Industrial Township Development Project
6.1.3 Establishment of Bamboo Products Training & Services Centre at Palindanuwara in Kalutara District
6.1.4 Establishment of a Marketing Hub in the Western Province
6.1.5 Establishment of Industrial Parks (Katana, Gampaha, Attanagalla, Mahara, Dompe, Hanwella, Padukka, Ingiriya, Homagama, Bulathsinghala, Mathugama)
6.1.6 Establish a packaging service centre for SMEs
6.1.7 Establishment of a financial assistance scheme for small and medium enterprises to obtain good manufacturing practices (GMP) certification
6.1.8 Establishment of business development centers
6.1.9 Establishment of business incubators
6.1.10 Micro and small apparel enterprise development in Pamunuwa, Maharagama
6.1.11 Development of Marine Infrastructure in the Western Province in order to develop boat building industry
6.1.12 Promote value added Agriculture and Agro based Industries.
6.1.13 Identification of industrial parks for high polluting industries and the SME sector
6.1.14 Mineral Sands Development
6.1.15 Establish Wood Craft and Furniture Industry Cluster

6.2 TOURISM

6.2.1 Marina Development in the Outer Habour Area of Beruwala Fisheries Habour
6.2.2 Dedduwa River Mouth and Surrounding Area Tourism Development
6.2.3 Development of Marine Infrastructure in the Western Province in Order to Devlop Marine Tourism
6.2.4 Negombo Township Tourismdevelopment and expansion of facilities Development
6.2.5 Development of Hamlets with Research and Nature Tourism Activities.
6.2.6 Development of Ancient Fortress of Kotte/ Conservation of Monuments of Kotte Kingdom
6.2.7 Development of Archeological Conservation Plan
6.2.8 To Declare a Specific Area in the Colombo City as Historical and a Strict Planning Zones
6.2.9 Muthurajawela Eco-Tourism Zone

07 - SCIENCE AND TECHNOLOGY CITY

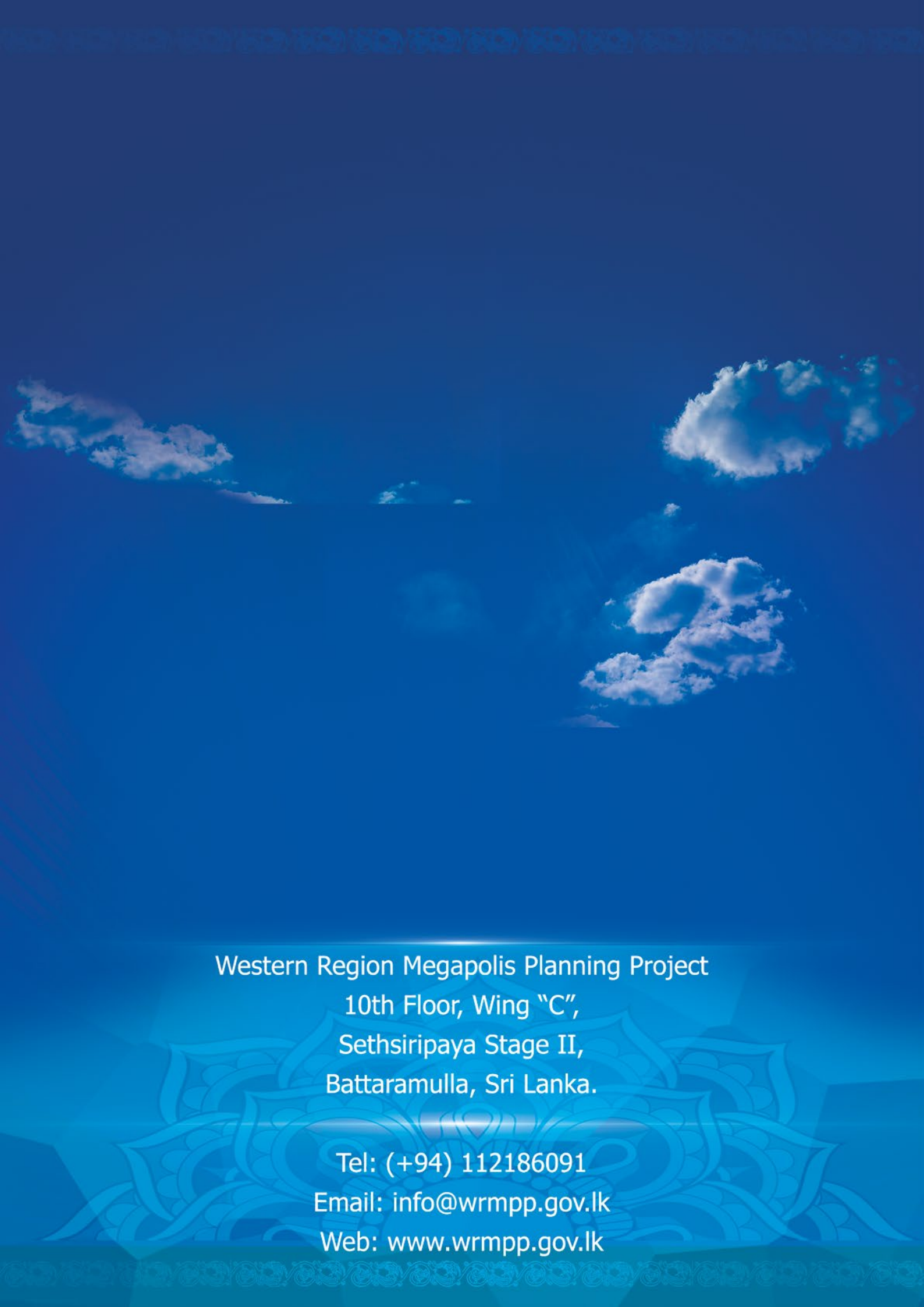
7.1 Cluster for electronics and electronic based products in the science and technology corridor
7.2 Homagama Technology city project
7.3 Malabe Science city project
7.4 Establish Outreach Campuses of the more Compact Universities in the Megapolise
7.5 Gampaha Education Hub

08 - ECO HABITAT AND PLANTATION CITY

8.1 Diversification of unproductive tea, rubber and coconut lands in the Western region.
8.2 Establishment of Food parks
8.3 Utilization of abandoned Paddy lands for sustainable and environmental friendly Agriculture
8.4 Avissawella plantation city development project

09 - 'TRANQUALITY' THE SPIRITURAL DEVELOPMENTFACILITATION

9.1 Establishment of Buddhist Cultural and Educational Centre at kelaniaya
9.2 Develop and maintain cultural and religious centers
9.3 Establishment of Multi-Cultural Centers
9.4 Establishment of Buddhist Religious Cultural Centre
9.5 Establishment of Catholic Religious Cultural Centre
9.6 Establishment of Hindu Religious Cultural Centre
9.7 Establishment of muslims religious Cultural Centre
9.8 Promoting Ethnic Harmony
9.9 Establishment of Community Reconciliation Center
9.10 Senior Recreation and care Villages
9.11 Establish Arts and Cultural Complexes
9.12 Mahamaga Mithuro' - The Project to Move from the Street to Home (Rehabilitation of Begger Folks)
9.13 Caring of Stray Animals
9.14 Establish Childcare Centers; Including Mechanisms for Delivering Proper Education and Skills Developmenet



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