Chapter 1

INTRODUCTION

1.1 General

> *" Travel by water is very ancient. It predates the wheel and remains a vital part of the transport mix for millions of people in rural and urban areas. Yet in a world which associates road and motor vehicles with progress and development, water transport is neglected and undervalued."*
>
> *Colin Palmer, 1998*

Waterborne transport is a very old concept. It dates back to the earliest periods of civilization in the Asian region. People settled along water bodies not only for ease of obtaining water for agricultural purposes but also for ease of movement. Rivers and canals have often served as major lifelines to these settlements for the purpose of obtaining food, consumer goods and services necessary for their sustenance. As a response, the buildings located along the banks usually faced the water bodies while all the activities of people revolved around these water bodies.

However, with the rapid progress in land transport technologies the importance of waterways as arteries of settlements has gradually diminished. Roads have taken over the function of water bodies as the primary means of serving transport needs. With these new developments waterways have been neglected and become backyards of buildings. That is why the above statement by Colin Palmer in 1998 is true to each and every country that had a rich history of waterborne transportation.

Waterways are natural water streets, which are natural transport infrastructures rarely used by the present communities. In places where water transport is viewed as outmoded and inefficient, planners turn their backs on the waterways and try to redesign the settlements to conform to the geometry and demands of the road network. Rivers and canals are eyed for their potential to provide new routes for roads. Waterways are often on government owned land and by definition people do not live (permanently) on them. It makes the task of securing the land relatively simple and roads can then be built without displacing settlements. This is plain to see in modern Bangkok. Once a city of waterways, it is now a frantic maelstrom of cars and lorries fighting for space on roads that were often laid over unfilled canals.

The idea that this traffic mode can be used as a way to combat the ever-increasing road congestion is more of recent date. Which has originated from examination of more and more alternative transport modes to relieve the roads of their heavy burdens. Hence many countries are examining the feasibility of reverting back to water transport to overcome this common road problem.

Water transport can be broadly divided as, in to two groups (Fig. 1.1), inland water transport and shipping. Inland water transport, in turn, can be again divided into three categories, Public transport, Freight and Recreational. While, shipping, can be categorised into Coastal Shipping and Overseas shipping.

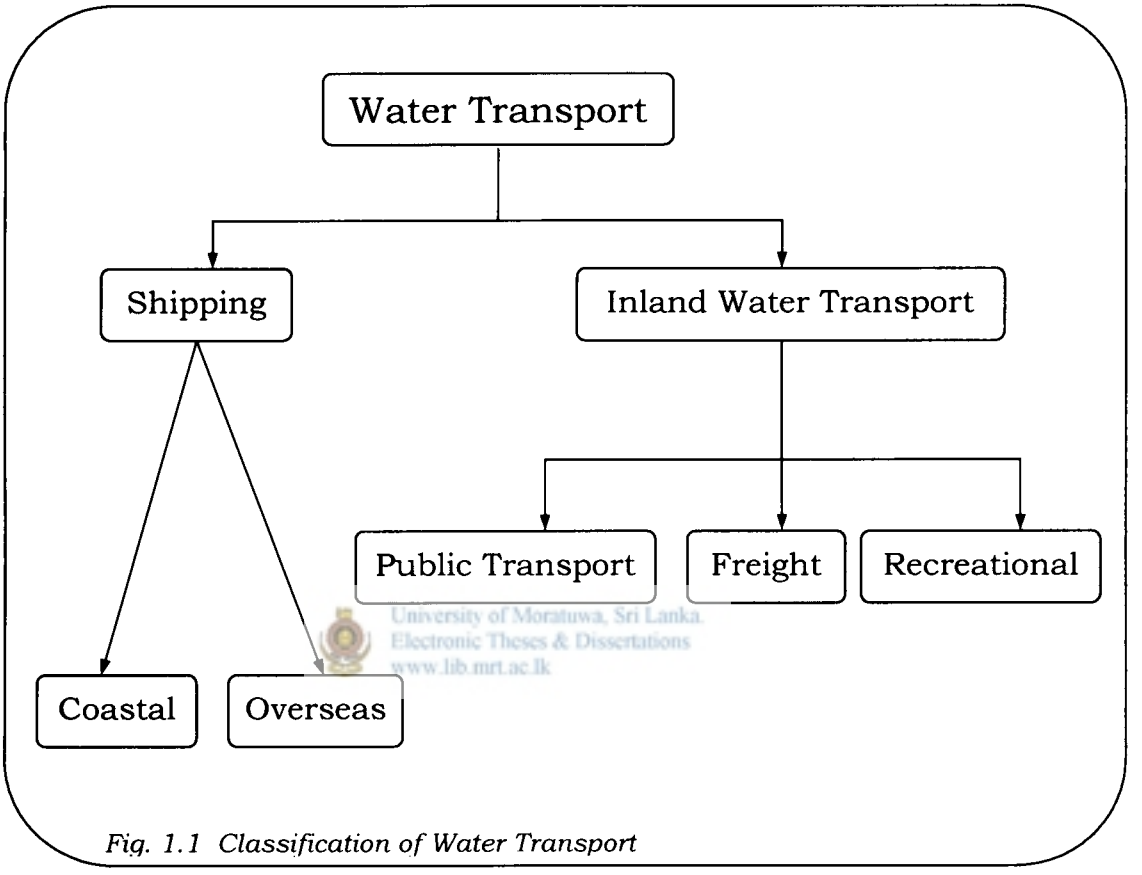


Fig. 1.1 Classification of Water Transport

Shipping and Inland Water Transport have many inherent advantages, which include large capacity, low cost, minimal pollution, energy efficiency, safety, and least consumption of land and least investment requirement.

Recent studies by the European Commission in 2002 (Inland Waterway Transport, 2002) have revealed that capital cost of inland waterways range between 5-10 percent of the cost of construction an equivalent 4-lane road or rail link. Maintenance cost is also relatively lower for inland waterways at about 20 percent of road maintenance cost. It is estimated that vessels can transport 105 ton-km of freight

per litre of fuel, in comparison to 85 by rail and 24 by road. This is partly because vessels use the natural flow of waterway, together with engine power to provide propulsion.

Unfortunately, these advantages and the great potential of Water Transport have not always been well utilized. In the case of shipping, the development has been stymied by the constraints of port capacity and custom procedure problems. Inland Water Transport has its spatial limitation. Most of the waterways suffer from navigational hazards like shallow water and narrow width of channel during dry weather, siltation, bank erosion, and absence of infrastructural facilities like terminals and inadequacy of navigation aids.

Thus there is a need to remove the constraints faced by these modes of transport so that they become viable alternatives to surface modes of transport.

1.2 Scope of the Study

The research was aimed to study the feasibility of water transportation in Colombo Metropolitan Region (CMR). The research would concentrate only on the area of public transport on Inland waterways out of the different classification of water transport given in Fig. 1.1.

The scope of the study is illustrated in Fig. 1.2. It shows that a feasibility of a transport project should question the technical, financial, environmental and social aspects of the project. But the research would concentrate only on the technical and financial side of the feasibility while other areas will be outlined.

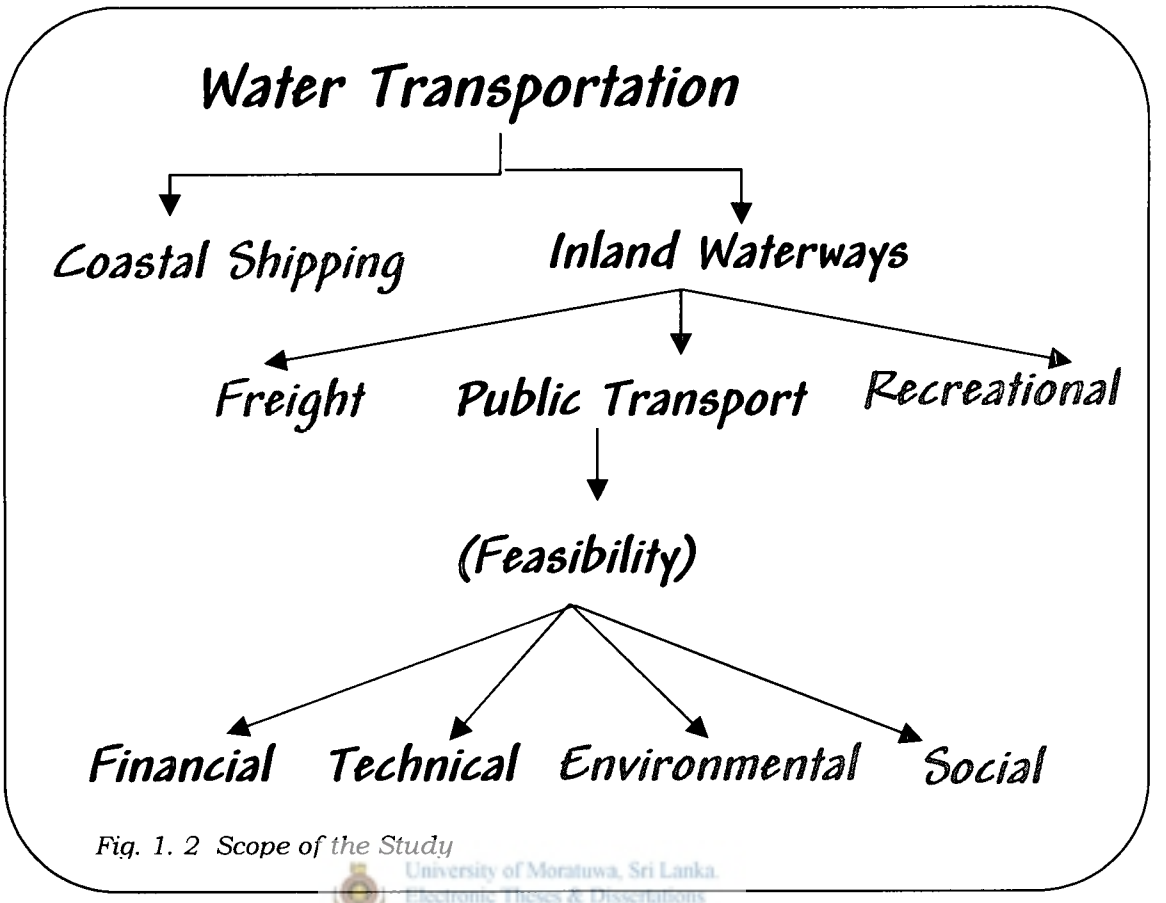
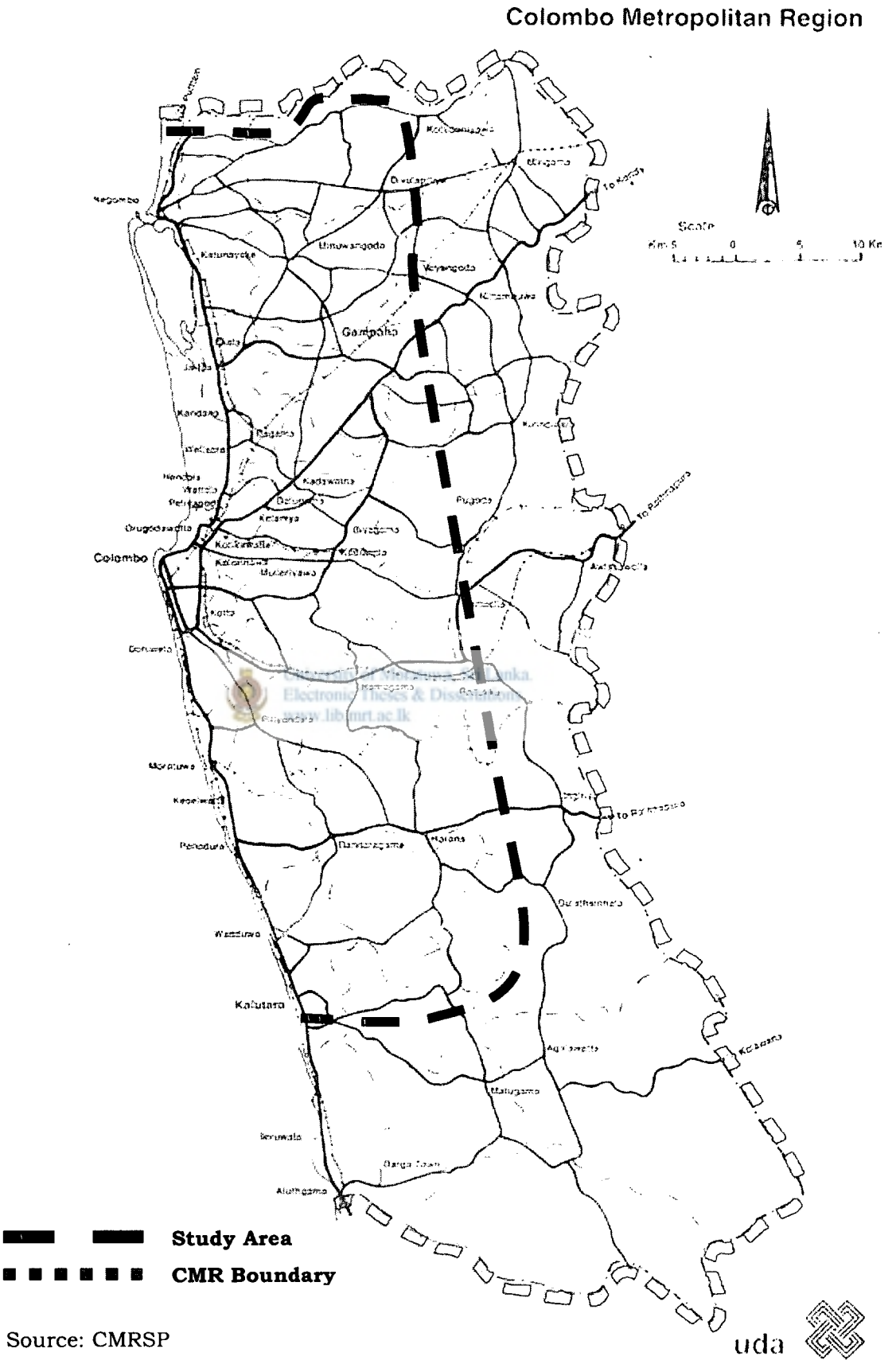


Fig. 1. 2 Scope of the Study

1.2.1 Study Area

The defined study area is Colombo Metropolitan Region (see Fig 1.3). CMR is made of 33 Divisional Secretary Divisions and consists of three districts, namely Colombo, Gampaha and Kalutara. It is bounded by, the districts of Kegalle and Ratnapura on the Eastern boundary, Puttalam and Kurunagala on the Northern boundary, Galle on the Southern boundary and Indian Ocean on the Western Boundary. CMR has a total extent of 3,593 sq. km., and covers 5.6% of the total area of the country. The area of CMR is identical to the Western Province. (CMRSP, 1993). The population of the CMR is estimated at 5.4 million in 2001, which is 29% of the total population of the country. (Statistical Abstracts, 2001).



Source: CMRSP

Fig. 1.3 Map of Colombo Metropolitan Region

Though the CMR extends from Maha Oya at Kochikade to Bentara Ganga at Aluthgama in the North – South axis, the study area boundary has been redefined from Maha Oya at Kochikade to Kalu Ganga at Kalutura along the western coastal belt, as shown in Fig. 1.3. This is due to that existing waterway system not being developed beyond the coastal strip because of the rugged terrain. Hence the potential waterways are found only within the specified boundary.

1.2.2 Study Area Boundaries.

The study area defined on above is further divided into three areas which are considerd as separate systems. (Fig.1.4). Namely, Northern CMR, Central CMR & Southern CMR.

The Northen CMR is from Maha Oya at Kochikade to Kelani river in Colombo, which consists of many natural waterways such as rivers, lakes, lagoons and also man made canals.

The Central CMR is from Kelani river to Werasa Ganga at Borupana, much of which belongs to the CMC limits. Majority of waterways are part of a canal system which was created for flood control purposes. It also consists of the man made Beira Lake constructed in the 15th century to link the Port of Colombo with the inland waterways in the western coastal belt.

The Southern CMR extending to Kalu Ganaga from Werasa Ganga, mainly consists of natural waterways along with some man made canals to link together inland water bodies. Further it contains the countries largest natural lake, the Bolgoda Lake.

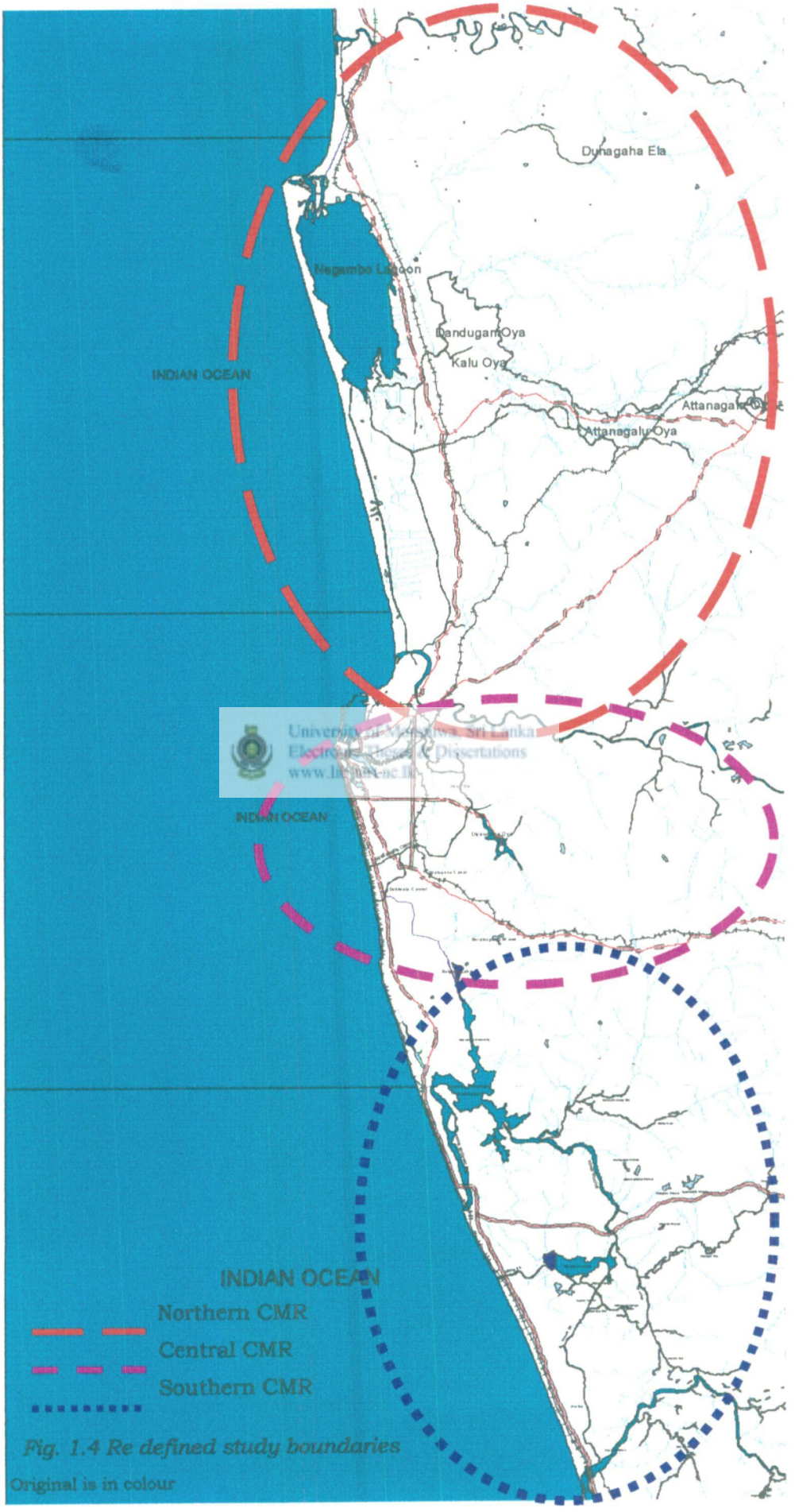


Fig. 1.4 Re defined study boundaries

Original is in colour

1.3 Thesis Outline

This thesis provides the study of technical & financial feasibility of Public transport in inland waterways in Colombo Metropolitan Region. It provides a comprehensive analysis within the Central CMR, which have the most potential waterways in the region for public transport. Due to non-availability of calibrated demand estimation models and generalised cost functions for water transport, available traffic models have been used, after appropriate adjustments to treat canals as another mode of public transport.

Chapter 2 reviews the literature from other countries that have intensive water transport networks and the historical background of canal network within the Colombo Metropolitan Region. Chapter 3 gives the methodology of the study on which the scope of the research is obtained step by step.

Chapter 4 presents the observations and data collection on the existing water bodies in the CMR under each study areas. Chapter 5 & Chapter 6 present the technical and financial feasibility of the identified waterways as a mode of public transport while external factors affecting the feasibility is discussed in Chapter 7. The conclusions and summary based on the findings of the thesis together with recommendations for future research are addressed in Chapter 8.