

LB/DON/64/02

(65)

A PLANNING APPROACH FOR IDENTIFICATION OF LAND
FOR URBAN DEVELOPMENT
A CASE STUDY OF MUTHURAJAWELA MARSH

A DISSERTATION PRESENTED

TO



University of Moratuwa, Sri Lanka
Electronic Theses & Dissertations
www.lib.mrt.ac.lk

THE DEPARTMENT OF TOWN AND COUNTRY PLANNING
UNIVERSITY OF MORATUWA, SRI LANKA

711"89"

711.4

ප්‍රචාරකාලය
මොරටුව විශ්ව විද්‍යාලය, ශ්‍රී ලංකාව
මොරටුව

IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE
DEGREE, MASTER OF SCIENCE IN
TOWN AND COUNTRY PLANNING

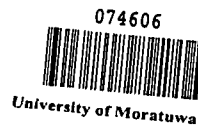
TH

1989

P.K.S MAHANAMA

74606

1989



74606

SYNOPSIS

The aim of this dissertation is to examine the possibilities to identify lands for urban development in order to mitigate the land scarcity problem in the Greater Colombo Economic Commission (GCEC) area. In this connection, this study is concerned with identification of possibilities in order to utilize low-lying lands for urban development in planned manner.

This dissertation is in five parts, problem identification and need for the utilization of low-lying lands, data collection and analysis of definition and concepts, identification of case study area with potentials for urban development, identification of potentials and constraints and conclusions and recommendations. The body of the dissertation is divided into five chapters.

Chapter one deals with the significance of the utilization of low-lying lands for urban development. It focuses the importance of land in the process of urban development. The characteristics of low-lying lands and their functions are also discussed in terms of physical, ecological and economic spheres. It goes on further to deal with the importance of the utilization of low-lying lands for urban development activities.

Chapter two deals with the needs for the utilization of low-lying lands for urban development in the GCEC area. It points out the nature and extent of demand for land for urban activities in the GCEC area. This chapter identifies the



factors affecting demand for land. It goes on to deal with the nature and extent of supply of land for urban activities. In that land use profile and the magnitude of the land scarcity are examined. This chapter examines the problem pertaining to land supply in the GCEC area. It also discusses some strategy options in order to resolve the problem of land scarcity and need for the utilization of low-lying lands for urban development in the GCEC area.

Chapter three deals with the analysis of the case study area of Muthurajawela Marsh. It discusses the development feasibility of the marsh in order to identify the potential for urban development. Technical feasibility is discussed in terms of aspects of physical, ecological, hydrological infrastructure etc., The financial viability of the development of Muthurajawela Marsh is also concerned in this chapter. It goes on further to deal with the consideration of socio-economic aspects of the development of Muthurajawela Marsh.

Chapter four deals with the allocation of identified activities in the potential areas of Muthurajawela Marsh. It attempts to apply the potential surface analysis (PSA) in order to identify the potential areas for residential and industrial activities. The application and process of the PSA is discussed in detail in this chapter.

The final chapter (Chapter five) spells out the conclusions and the recommendations of this study which are arising from the analysis. This chapter concludes the possibility of utilization of low-lying lands for urban development and makes the recommendations which need to develop low-lying lands for urban development in a planned manner.

ACKNOWLEDGMENTS

I take this opportunity in expressing my heart -felt gratitude to my supervisor Mr. K.D. Fernando, lecturer in the Department of Town and Country Planning of the University of Moratuwa, Sri Lanka for his advice and guidance.

My sincere thanks are also due to Mr. A.L.S. Perera, Head of the Department of Town and Country Planning, and Director of Post-Graduate Studies, who advised me by providing necessary guidance to successfully carry out this dissertation. I also wish to thank to Mr. Neil G. Karunaratne, Lecturer in Town and Country Planning, who also advised me to carry of this dissertation.

I extend my profuse thanks and I am deeply indebted and grateful to the Board of Directors of the Greater Colombo Economic Commission for affording me this opportunity by granting me adequate study leave enabling me to follow the MSc. course in Town and Country Planning. I also thank Mr. G.K. Amaratunge, Director, Regional Development, Mr. L.D. Dickman, Senior Manager, Area Administration, of the GCEC for their co-operation and Dr. J. I. Samarakoon, senior lecture, Department of Zoology, University of Kelaniya and Project Manager of Muthurajawela Ecological Survey.

My thanks are due to all officials and institutions for assisting me in numerous ways in this study and in particular to Dr. Hiran Jayawardena, former Director General, National Aquatic Resource Agency, Mr. P.D.S. Malallgoda, Deputy General Manager, Sri Lanka Land Reclamation and Development Corporation, and officials of Urban Development Authority, Irrigation Department and the university of Moratuwa.

It is with great appreciation I record my indebtedness to my wife, Devika for her co-operation to successfully carry out this dissertation.

P. K. S. MAHANAMA

28th, February 1990



University of Moratuwa, Sri Lanka.
Electronic Theses & Dissertations
www.lib.mrt.ac.lk



C O N T E N T S

	Page
Synopsis.....	i
Acknowledgements.....	iii
List of Contents.....	v
List of Tables.....	vi
List of Figures.....	viii
Introduction.....	x
CHAPTER 1 ; SIGNIFICANCE OF THE UTILIZATION OF LOW-LYING LANDS FOR URBAN DEVELOPMENT..	1
CHAPTER 2 : THE NEED FOR THE UTILIZATION OF LOW-LYING LANDS FOR URBAN DEVELOPMENT IN THE GREATER COLOMBO ECONOMIC COMMISSION (GCEC) AREA.....	17
CHAPTER 3 : AN ANALYSIS OF THE DEVELOPMENT POTENTIALS OF MUTHURAJAWELA MARSH FOR URBAN DEVELOPMENT.....	46
CHAPTER 4 : IDENTIFICATION AND ALLOCATION OF ACTIVITIES IN THE POTENTIAL AREAS OF MUTHURAJAWELA MARSH.....	110
CHAPTER 5 : CONCLUSIONS AND RECOMMENDATIONS.....	121
APPENDIX : A	135
: B	136
: C	144
: C - 1	150
: D	154
BIBLIOGRAPHY.....	158

LIST OF TABLES

TABLE PAGE

CHAPTER ONE

1.1. Comparison of population density and land-man ratios at different spatial levels in 1971 and 1981..... 10

CHAPTER TWO

2.1. Land use information - GCEC area..... 34
2.2. Estimated land requirement in the GCEC area at present according to the UNO standard.....37

CHAPTER THREE

3.1. Monthly average rainfall (ml.m)..... 63
3.2. Peak discharge of water into Negombo lagoon....66
3.3. Flood levels of the Muthurajawela Marsh..... 70
3.4. Ecologically sensitive areas within Muthurajawela Marsh..... 83
3.5. Population growth in Muthurajawela 1964 -1989...92
3.6. Population of Muthurajawela by age and sex-1990..93
3.7. Housing condition of Muthurajawela Marsh..... 94
3.8. Unemployed population of Muthurajawela Marsh.. 95
3.9. Employment level of Muthurajawela Marsh..... 95

APPENDIX - B

01. Land values of urban centres in the GCEC area (in current prices) - 1976, 1978, 1981 & 1988....136
02. population density, land-man ratio & density increase in GCEC area- 1963, 1971, 1981.....137

03.	Number of approved building applications by GCEC by activity. From 1980-1989.....	138
04.	Number of housing units approved by local authorities from 1980 - 1986.....	139
05.	Population data in the GCEC area- 1963, 1971 & 1981. (local authority wise).....	140
06.	Projected population for 1991 - 2001.....	141
07.	Migration of population in Sri Lanka by Districts - 1981.....	142
08.	Distribution of industrial establishments	
09.	Employment generation in Export Processing Zones. (KEPZ & BEPZ From 1978 to 1989).....	143
01.	Elevations of the Muthurajawela Marsh.....	144
02.	Preventive measures taken to control the Hydrology of the Muthurajawela Marsh.....	145
03.	List of aquatic plants.....	146
04.	List of Fauna in Muthurajawela.....	147
05.	Cost calculation for reclamation of Muthurajawela Marsh.....	148
06.	Number of houses, families & Population in Muthurajawela Marsh.....	149

APPENDIX - C-1.

Socio economic survey - Muthurajawela Marsh	
1990- Survey questionnaire.....	150

APPENDIX - D

01.	Selection of factors for PSA.....	154
02.	Selection of indicators for PSA.....	156



LIST OF FIGURES

FIGURE	PAGE
INTRODUCTION	
01. Location of GCEC area in Colombo Metropolitan Region.....	xiv
02. Methodology of the study.....	xvi
CHAPTER ONE	
1.1. Distribution of Low-lying lands in CUA and GCEC area.....	8
1.2. Distribution of reclaimed lands in and around the city of Colombo.....	13
CHAPTER TWO	
2.1. Migration of population in Gampaha District - 1981.....	26
2.2. Population density - 1981 in GCEC area.....	28
2.3. Concentration areas of economic activities in the GCEC area.....	31
CHAPTER THREE	
3.1. Location of Muthurajawela Marsh.....	48
3.2. Regional setting of Muthurajawela Marsh.....	50
3.3. Linkages with Muthurajawela Marsh through water ways.....	51
3.4. Muthurajawela and its surrounding facilities.....	53
3.5. Topography of Muthurajawela Marsh.....	57

3.6.	Soil structure of Muthurajawela Marsh	61
3.7.	Existing Environmental Conditions in MUTHURAJAWELA and Negambo Lagoon.....	64
3.8.	Drainage canals - Muthurajawela Marsh.....	68
3.9.	Relatively high water retention areas - Muthurajawela Marsh.....	70
3.10.	Vegetation pattern in Muthurajawela	73
3.11.	Distribution pattern of Fauna in the Muthurajawela Marsh.....	78
3.12.	Ecological sensitive areas of Muthurajawela Marsh,.....	82
3.13.	Existing land use map of Muthurajawela.....	85a
3.14.	Electricity net - work around Muthurajawela Marsh.....	87
3.15.	Locations of squatter settlements in: Muthurajawela Marsh.....	90

CHAPTER FOUR

4.1.	The process of the potential surface analysis (PSA).....	113
4.2.	Potential areas for residential activities.....	118
4.3.	Potential areas for industries.....	119

CHAPTER FIVE

5.1.	Proposed planning methodology for the utilization of low-lying lands for urban development.....	128
5.2.	Proposed land use plan for Muthurajawela.....	129