

# **An Integrated Management Plan to Sustain the Restoration of Lunawa Lake**

**By**

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The dissertation was submitted to the Department of Civil Engineering of the University of Moratuwa in partial fulfillment of the requirement for the Degree of Master of Science in Environmental Engineering Managements

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## **Abstract**

Lunawa Lake, located in the western coastal belt south of Colombo (Sri Lanka) is a small lagoon of 20 ha. with a catchment area of 6.15 km<sup>2</sup>. Industrial effluent discharged through the storm water drainage system connected to the lake and urbanization had converted the Lunawa Lake into one of the most polluted lakes in Sri Lanka. Encroachment of drainage canals by the inhabitants and sand bar formation at the mouth of the lagoon had caused serious flood problems in the catchment during rainy season. Lunawa Environment Improvement and Community Development Project which is being implemented with JICA fundings helps to convert the polluted Lunawa Lake from an eyesore to an environmentally attractive lake and alleviates flood damage through an improved storm water drainage system. Apart from the engineering works, series of community upgrading activities have also been carried out to uplift the quality of life of the low-income inhabitants of the catchment. The maintenance of the improved lake system is of prime importance for sustainability of the project. The water quality monitoring reveals the signs of gradual transformation of the polluted lake into a more acceptable water body and this is more so evident by the emerging aquatic life and flocking of birds in the lake.

This research intends to provide overall insights on Canal and lake water pollution sources in terms of point and non point including identification of stake holders involvement in the Lunawa Lake basin area those who may change the quality of basin environment towards the direction of positive or negative sides as a result of their direct or indirect interventions.

The ultimate intention of this research is to find out an Action Plan to form a well-defined integrated type stake holders' initiated "Lake Basin Management Plan to Sustain the Restored Lunawa Lake Basin"

## Declaration

I hereby declare that this submission is my own work and that to the best of my knowledge and belief, it contains neither materials previously published nor written by another person, nor material which to a substantial extent has been accepted for the award of any other degree or diploma of an university or other institute of higher studies, except where an acknowledgement is made in the text



.....  
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8<sup>th</sup> February 2010

This is to certify that this thesis submitted by G.D.S.D. Gunawardena is a record of the candidate's own work carried out by him under my supervision. The matter embodied in this thesis is original and has not been submitted for the award of any other degree.



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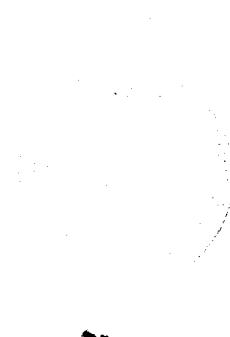
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# Contents

## Chapter 1 : General Introduction

### Chapter 1 : General Introduction

|      |   |   |
|------|---|---|
| 1.1  | Global Context of Lakes   | 1 |
| 1.2  | Importance of Lakes and Lake Basins in the Social, Economic & Environmental Perspective | 2 |
| 1.3  | Importance of Managing Lakes with its Basin   | 2 |
| 1.4  | The Seven Principles of the World Lake Vision   | 3 |
| 1.5  | The Problem   | 4 |
| 1.6  | Objective of the Study  | 4 |
| 1.7  | Scope and Limitations   | 5 |
| 1.8  | The Research Methodology  | 5 |
|      | 1.8.1 Primary data collection   | 5 |
|      | 1.8.2 Secondary data collection   | 6 |
|      | 1.8.3 Interviews  | 6 |
| 1.9  | Steps Followed to Collect Information for the Purpose of Analysis                       | 6 |
| 1.10 | Main Out comes  | 7 |
| 1.11 | Guide to Report   | 7 |



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### Chapter 2: Background & Present Status of the Lunawa Project

|     |  |    |
|-----|--|----|
| 2.1 | History of the Lunawa Project  | 8  |
| 2.2 | The Lunawa Environmental Improvement & Community Development Project (LEI&CDP) | 9  |
|     | 2.2.1 Main Development Objective of the Project                                | 9  |
|     | 2.2.2 Specific Development Objectives of the Project                           | 10 |
| 2.3 | Project Background   | 10 |
|     | 2.3.1 Location   | 10 |
|     | 2.3.2 Description of the Lake & its Catchment                                  | 10 |
|     | 2.3.3 Rain fall data of the Project area                                       | 13 |
| 2.4 | Present states of the Lunawa Lake Basin Development:                           | 13 |
|     | 2.4.1 Current Issues at the lunawa lake basin Management                       | 14 |

## Chapter 3 :Literature Review

|         |  |    |
|---------|--|----|
| 3.1     | Global Extent and Distribution of Lake   | 16 |
| 3.2     | Types of Lakes   | 16 |
| 3.2.1   | Basin Types  | 16 |
| 3.2.2   | Origin and Age   | 19 |
| 3.2.3   | Climate, Salinity, Mixing and Stratification are also influencing to change the Biophysical characteristics of the lake waters | 20 |
| 3.3     | Long Retention Time  | 20 |
| 3.3.1   | Long retention time due to Littoral effect of sand Bar Formation   | 20 |
| 3.4     | Complex Response Dynamics  | 21 |
| 3.5     | Human use of Lakes   | 22 |
| 3.5.1   | Resource Value of Lakes and their Basins   | 22 |
| 3.6     | Common Uses of Lakes and Lake Basins   | 23 |
| 3.6.1   | Lakes Uses   | 23 |
| 3.6.2   | Lake Basins  | 23 |
| 3.7     | Total Economic Values  | 26 |
| 3.7.1   | Use Value  | 26 |
| 3.7.2   | Non Use Value  | 26 |
| 3.8     | Typical Problems Facing the World's Lakes  | 27 |
| 3.8.1   | The occurrence and management of lake problems is influenced by the three defining characteristics of Lakes                    | 27 |
| 3.8.1.1 | Their Integrating Nature   | 27 |
| 3.8.1.2 | Long Retention Time  | 27 |
| 3.8.1.3 | Complex Response Dynamics  | 28 |
| 3.8.2   | Past studies on an identification of Lake Problems   | 28 |
| 3.8.2.1 | In lake problems   | 28 |
| 3.8.2.2 | Littoral Zone Problems   | 29 |
| 3.8.2.3 | Lake Basin Problems  | 30 |
| 3.9     | Response to the problems   | 31 |
| 3.9.1   | Structural measures  | 31 |

|          |  |    |
|----------|--|----|
| 3.9.2    | Non structural measures  | 31 |
| 3.10     | The characteristics of lakes have an influence on the management lake basin problems         | 32 |
| 3.10.1   | Components of Lake Basin Management  | 32 |
| 3.11     | Problems Associated with the Lunawa Lake & its Environs                                      | 33 |
| 3.11.1   | Identified Major Cause of Lunawa Canal and Lake Water Pollution                              | 33 |
| 3.11.2   | Water Quality in the Lakes and Canals  | 34 |
| 3.11.3   | Flood and run off Problem  | 35 |
| 3.11.4   | The littoral zone problems   | 35 |
| 3.11.5   | Solid Waste Problem  | 36 |
| 3.12     | Water Quality of Drainage Canals flowing into Lunawa   | 37 |
| 3.12.1   | Lake   | 37 |
| 3.12.2   | Selection criteria of test locations:  | 38 |
| 3.12.3   | Introduction of Modelling  | 38 |
| 3.13     | Collection of data to Analyze domestic waste Water discharge in the Lunawa Lake and Canals   | 43 |
| 3.13.1   | Water and Sanitation status in 2007  | 44 |
| 3.13.2   | Collection of data to Analyze Industrial waste Water discharge in the Lunawa Lake and Canals | 45 |
| 3.14     | Details of runoff water discharge  | 47 |
| 3.15     | Water Quality of Lunawa Canals & Lake  | 47 |
| 3.15.1   | Spatial Variations in Canal Waters   | 47 |
| 3.15.2   | Water Quality of Lunawa Lake   | 48 |
| 3.15.2.1 | Spatial Variability within the Lake  | 48 |
| 3.16     | Mitigatory Measures Taken  | 49 |
| 3.16.1   | An integrated Institutional approach   | 49 |
| 3.16.1.1 | Waste Water Disposal System by NWS&DB  | 49 |
| 3.16.1.2 | Coastal Resources Management Project (CRMP)  | 49 |
| 3.16.1.3 | Lunawa Environmental Improvement & Community Development Project (LEI&CDP)                   | 49 |
| 3.16.1.4 | Development Objectives and Components  | 50 |

## Chapter 4 : Analysis & discussion of Results

|         |   |    |
|---------|---|----|
| 4.1     | Analysis of water quality in the canal and Lake   | 51 |
| 4.2     | Observations regarding the water quality of the Canals & Lake:  | 52 |
| 4.3     | Analysis of Actions taken for minimization of pollution through restoration of lake & the basin:  | 53 |
| 4.4     | Observation Summary of the Analysis:  | 56 |
| 4.5     | Planning of Integrated Lake Basin Management Mechanism for Lunawa Lake Basin.   | 57 |
| 4.5.1   | Component of Lake Basin Management:   | 57 |
| 4.5.1.1 | Institution:  | 59 |
| 4.5.1.2 | Policies available to govern Peoples use of Lunawa Lake:  | 61 |
| 4.5.1.3 | Involvement   | 61 |
| 4.5.1.4 | Technology  | 62 |
| 4.5.1.5 | Information   | 65 |
| 4.5.1.6 | Financing   | 65 |
| 4.6     | Action plan for Development of Integrated Lake Basin management Plan for Lunawa Lake Basin:   | 66 |
| 4.7     | Comparison of National and International Lake Basin Management Plans developed in terms of six parameters with respect to the Lunawa Basin. | 68 |

## CHAPTER 5 : Conclusions & Recommendations

|     |                      |    |
|-----|----------------------|----|
| 5.1 | Conclusions:         | 74 |
| 5.2 | Recommendations:     | 76 |
|     | List of references:- | 78 |
|     | Annexures            | 78 |



## LIST OF FIGURES

|            |  |    |
|------------|--|----|
| Table 1:   | Origin, Number and Extent of the World Lakes (>1 ha)   | 1  |
| Table 2:   | Description of the Lake & its Catchment :  | 12 |
| Table 3:   | International Biodiversity Designations for 28 Lake Basins considered in the ILEC.2005 Study | 25 |
| Table 4 :  | Ambient Water Quality standards  | 43 |
| Table 5:   | Domestic Water Discharge by Canals   | 43 |
| Table 6:   | Details of Industrial Waste water Discharge:   | 46 |
| Table 7:   | Industrial Discharges by Canals  | 47 |
| Table 8:   | Comparison of the average mean values of Canal and Lake Water quality                        | 51 |
| Table 9:   | Details of Pollution source & Actions taken Against  | 53 |
| Table 10:  | Selection of Sanitation Options:   | 54 |
| Table 11:  | Details of the settlement level Workshops conducted  | 63 |
| Table 12:  | Technology involvement for Lunawa Lake Basin Management (Basin Level)                        | 63 |
| Table 13:  | Technology involvement for Lunawa Lake Basin Management (Canal Level)                        | 64 |
| Table 14:  | Technology involvement for Lunawa Lake Basin Management                                      | 64 |
| Table 15:  | Proposed Action plan   | 66 |
| Table 16:  | Institutions Interventions   | 68 |
| Table 17:  | Policies Applications  | 69 |
| Table 18:  | Involvement of Stake holders   | 70 |
| Table 19:  | Technology Applications.   | 71 |
| Table 20 . | Details of the Information's Available for Use and Monitoring:                               | 72 |
| Table 21.  | Possible sources of financing  | 72 |

## List of Tables

|           |  |    |
|-----------|--|----|
| Table 1:  | Origin, Number and Extent of the World Lakes (>1 ha)   | 1  |
| Table 2:  | Description of the Lake & its Catchment  | 12 |
| Table 3:  | International Biodiversity Designations for 28 Lake Basins considered in the ILEC.2005 Study | 25 |
| Table 4 : | Ambient Water Quality standards  | 43 |
| Table 5:  | Domestic Water Discharge by Canals   | 43 |
| Table 6:  | Details of Industrial Waste water Discharge  | 46 |
| Table 7:  | Industrial Discharges by Canals  | 47 |
| Table 8:  | Comparison of the average mean values of Canal and Lake Water quality                        | 51 |
| Table 9:  | Details of Pollution source & Actions taken Against  | 53 |
| Table 10: | Selection of Sanitation Options  | 54 |
| Table 11: | Details of the settlement level Workshops conducted  | 63 |
| Table 12: | Technology involvement for Lunawa Lake Basin Management (Basin Level)                        | 63 |
| Table 13: | Technology involvement for Lunawa Lake Basin Management (Canal Level)                        | 64 |
| Table 14: | Technology involvement for Lunawa Lake Basin Management                                      | 64 |
| Table 15: | Proposed Action plan   | 66 |
| Table 16: | Institutions Interventions   | 68 |
| Table 17: | Policies Applications  | 69 |
| Table 18: | Involvement of Stake holders   | 70 |
| Table 19: | Technology Applications  | 71 |
| Table 20  | Details of the Information's Available for Use and Monitoring:                               | 72 |
| Table 21. | Possible sources of financing  | 72 |

## ABBREVIATIONS

|         |  |
|---------|--|
| BOD     | Biochemical Oxygen Demand                                      |
| CBO     | Community Based Organizations                                  |
| CCD     | Coastal Conservation Department                                |
| CEA     | Central Environment Authority                                  |
| CGR     | Ceylon Government Railway (called also SLGR)                   |
| CMC     | Colombo Municipal Council                                      |
| CMR     | Colombo Metropolitan Region                                    |
| CMRSP   | Colombo Metropolitan Region Structure Plan                     |
| COD     | Chemical Oxygen Demand   |
| CRMP    | Coastal Resource Management Project                            |
| DMMC    | Dehiwala/Mt. Lavinia Municipal Council                         |
| DS      | Divisional Secretariats  |
| GND     | Grama Niladari Divisions                                       |
| GOSL    | Government of Sri Lanka  |
| JBIC    | Japan Bank for International Cooperation                       |
| JICA    | Japan International Cooperation Agency                         |
| LEI&CDP | Lunawa Environment Improvement & Community Development Project |
| MSL     | Mean Sea Level   |
| MMC     | Moratuwa Municipal Council                                     |
| NARA    | National Aquatic Resource & Research Agency                    |
| NBRO    | National Building Research Organization                        |
| NE      | Northeast  |
| NGO     | Non-governmental Organization                                  |
| NH3     | Ammonia  |
| NWSDB   | National Water Supply and Drainage Board                       |
| O&M     | Operation and Maintenance                                      |
| RDA     | Road Department Authority                                      |
| SAPROF  | Special Assistance for Project Formation                       |
| SCCAP   | Sustainable Colombo Core Area Programme                        |

|        |  |
|--------|--|
| SLLRDC | Sri Lanka Land Reclamation and Development Corporation |
| SS     | Suspended Solids                                       |
| SW     | Southwest  |
| TP     | Total Phosphorus                                       |
| TN     | Total Nitrogen   |
| UDA    | Urban Development Authority                            |
| UOM    | University of Moratuwa                                 |
| WB     | World Bank   |



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