

LB/DON/87/03

AN ANALYSES OF THE THERMAL COMFORT POTENTIAL OF VEGETATION, IN TROPICAL
URBAN OUTDOORS, WITH SPECIAL REFERENCE TO URBAN STREETS IN COLOMBO.



A DISSERTATION PRESENTED TO THE DEPARTMENT OF ARCHITECTURE,
UNIVERSITY OF MORATUWA, SRILANKA
FOR THE FINAL EXAMINATION IN M.Sc (ARCHITECTURE)

UNIVERSITY OF MORATUWA, SRI LANKA
MORATUWA



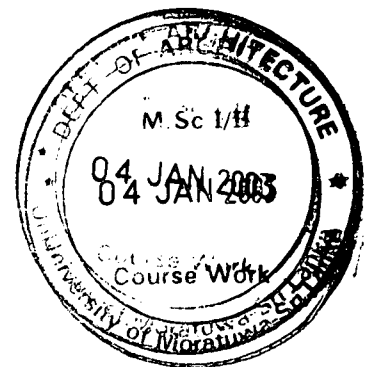
University of Moratuwa, Sri Lanka
Electronic Theses & Dissertations
www.lib.mrt.ac.lk

72°03"

711.7:551:568



P.V.J.PANAWALA
M.Sc. (ARCHITECTURE)
2003
DEPARTMENT OF ARCHITECTURE
FACULTY OF ARCHITECTURE
UNIVERSITY OF MORATUWA



79032

79032

400

ACKNOWLEDGEMENT

First and foremost, my deepest gratitude is to my supervisor Dr, R. Emmanuel, Department of Architecture, Faculty of Architecture, University of Moratuwa for offering me the opportunity to undertake this study and his invaluable guidance, supervision and generous help given throughout this study.

I am extremely grateful to Dr. Samitha Manawadu (.Year Master and Head. Department of Architecture) , Archt. Gamini Weerasinghe, Archt. Damith Fernando and all other members of the Department of Architecture, Faculty of Architecture, University of Moratuwa for direct and indirect encouragement, which have been a great help for this study.

I am very much thankful to Sudantha, Nuwan, Damith and all the members of "Bawana" who have extended their fullest support in enormous ways to make this dissertation a success. I would acknowledge my gratitude to Prasad, Thanuja, Pavithra, Upeka and Madavi for the generous help they conferred while doing graphics, keying and proof reading of the report. Suranga and Shamika have helped me in numerous ways in the research study.



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

I express my thanks to Mr. Chathura for his kind cooperation for the research.

I am very much grateful to my dear parents who nourished me and always looked after me.

LIST OF ELUSTRATION

Figures


Figure 1	City of Colombo	9
Figure 2	Source 1977-1985, city of Colombo Development plan 2. 2010 project by UDA	10
Figure 3	Sources 1977-1985, city of Colombo Development plan 2. 2010 project by UDA 3. Land use survey, 1996, UDA	11
Figure 4		13
Figure 5		13
Figure 6		14
Figure 7		14
Figure 8		15
Figure 9	Map of Colombo	16
Figure 10	Plan of Lauries Road	17
Figure 11	Plan Sir Chittampalam A Gardiner road	17
Figure 12		21
Figure 13		23
Figure 14	THI & BVF at day time on Sir. Chittampalam A Gardiner road	24
Figure 15	THI & SVF at day time on Sir. Chittampalam A Gardiner road	24
Figure 16	THI & BVF at nighttime on Sir. Chittampalam A Gardiner road	24
Figure 17	THI & SVF at nighttime on Sir. Chittampalam A Gardiner road	24
Figure 18	Elevation along the Sir.Chittampalam A. Gardiner road	25
Figure 19		25
Figure 20		25
Figure 19	THI & TVF at day time along Lauries road	26
Figure 20	THI & BVF at day time along Lauries road	26
Figure 21	THI & SVF at day time along Lauries road	26
Figure 22	Elevation along the Lauries Road	26
Figure 23	THI & TVF at night time along Lauries road	27
Figure 24	THI & BVF at night time along Lauries road	27
Figure 25	THI & SVF at night time along Lauries road	27
Figure 26		28
Figure 27		28
Figure 28		28

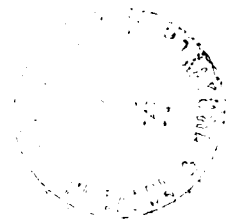
Figure 29	THI & TVF at day time along Temple Avenue	29
Figure 30	THI & BVF at day time along Temple Avenue	29
Figure 31	THI & SVF at day time along Temple Avenue	30
Figure 32	Galle Road with heavy traffic	30
Figure 33		30
Figure 34		31
Figure 35		31
Figure 36		31

Tables

Table 1	Source: Climate changing Asia: Sri Lankan Country report, (1994)	6
Table 2	Source 1. C.M.C. 1963 2. U.D.A. 1996	10
Table 3		22



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



CONTENTS

ACKNOWLEDGEMENT

LIST OF ELUSTRATION

CONTENTS

Chapter one –INTRODUCTION	1
1.1 Justification	1
1.2 Scope Of Study	
1.3 Methodology	2
Chapter two-BACK GROUND	3
2.1 Tropical Climate & Thermal Comfort	4
2.1.1 Sri Lankan Climatic Conditions	4
2.1.2 Climate Change Predictions In Sri Lanka	5
2.1.3 Thermal Comfort Measurements in Tropics.	6
2.2. Urbanization & climate	8
2.2.1. Urban Heat Islands	8
2.2.2 Urbanization in the city of Colombo	9
2.3. Foliage impacts on environment of cities	12
2.3.1. Solar radiation	13
2.3.2. Temperature control	13
2.3.3. Wind and shelter	14
2.3.4. Sound pollution	14
2.3.5. Air pollution.	15
Chapter three- METHODOLOGY	16
3:1 Site selection, Characteristics of the selected site	16
3:2 Method of study	18



3:3 Analysis techniques	19
3:4 Hypotheses	20
Chapter four- ANALYSIS	21
4.1 Comparison of values of Sir Chittampalam A, Gardiner Mawatha.	24
4.2 Comparison of values of Lauries road.	26
4.3 Comparisons Of Values Of Temple Avenue.	29
4.4 Design Implications	30
CONCLUSION	32
Future directions	34
BIBLIOGRAPHY	35
Appendix	36

