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DEVELOPMENT OF A LAND USE/COVER MONITORING SYSTEM USING SATELLITE IMAGES

JAYAKODY ARACHCHILAGE
SWARNALATHA JAYAKODY



This thesis was submitted to the
Department of Earth Resource Engineering
of the University of Moratuwa in partial
fulfillment of the requirements for
the Degree of Master of Philosophy.

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Department of Earth Resource Engineering
Faculty of Engineering
University of Moratuwa
Sri Lanka

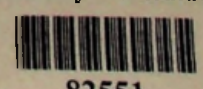
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DECLARATION

This dissertation had not been previously presented in whole or part, to any University or institution for a higher degree.

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ABSTRACT

Remote Sensing and Geographical Information System are modern tools for ecosystem management. Remotely sensed data gives convenient and rapid solutions to problems in a variety of applications.

Land is limited, and vital as it is the main provider of important natural resources. The fast growing human population has created many problems, due to the increasing demands for food, water, shelter and fuel. Thus such socio-economic factors often dictate how land is used regionally.

Land use affects land cover and in turn, changes in land cover affect land use. Thus land plays a major role in any development process. In tropical countries, due to the impact of human beings, the rates of change in vegetation cover and land use are high. Hence frequent updating of land use maps is necessary to provide the information needed by planners and politicians.

The main objective of this research is to investigate the possibility of using different remote sensing satellite images for developing a land use/cover monitoring system.

This research is carried out in an area of approximately 400 square kilometres in the southern part of Sri Lanka. Imageries of SPOT, IRS and Landsat satellites are used. Different colour combinations are prepared and false colour composite images are used for image processing.

Maximum likelihood method is used for image classification and the overall accuracy of the classifications is more than 90%. Using this classification, change detection matrices are developed to give changes for every land use class considered. A primary problem encountered in the study area is the mixed pixels. It is difficult to separate crop land from residential area, as some people reside in houses within the cultivated area. Filtering techniques can only partially remedy this problem.

In order to monitor the land use/cover, image differencing method is applied and the extent of the detected changes in terms of pixels or hectares is calculated.

A procedure is proposed as the land use/cover monitoring system using satellite images. Under this monitoring system, the extent of land use/cover changes can be computed by using different satellite images with varied spatial and spectral ranges.

ACKNOWLEDGEMENTS

The research presented in this thesis was carried out at the University of Moratuwa, Department of Earth Resource Engineering under the financial assistance from the Asian Development Bank (ADB). I sincerely thank ADB and the University of Moratuwa for giving me this opportunity to conduct this research project.

This thesis could not have been written without the research carried out by others and the valuable discussions with supervisors, colleagues, friends and family. Hence I would like to express my gratitude to those who assisted me in developing my knowledge within the framework of this research.

I would like to express my sincere thanks to Prof. J. W. D. Somasundara (former Vice Chancellor, Sabaragamuwa University) and Mr. M.P. Salgado (former Head, Department of Surveying Sciences, Sabaragamuwa University) for giving me this opportunity. Also I am thankful to Prof. I.K. Perera, (Vice Chancellor, Sabaragamuwa University) and Mr. K.R.M.U. Bandara (Co-Supervisor and Head, Department of Surveying Sciences, Sabaragamuwa University).

My thanks go to Dr. U.G. Senarath (former Head and former Supervisor, Department of Earth Resource Engineering, University of Moratuwa) and Mr. S. Weerawarnakula (former Head, Department of Earth Resource Engineering, University of Moratuwa). I am also grateful to Dr. D.M.D.O.K. Dissanayake (Head, Department of Earth Resource Engineering, University of Moratuwa) regarding his valuable contributions.

I am most grateful to my supervisor Dr. U.G.A. Puswewala (Senior Lecturer, Department of Civil Engineering, University of Moratuwa). He directed me on many occasions and also gave me valuable advice.

I am thankful to Prof. P.G.R. Dharmaratne (Senior Lecturer, Department of Earth Resource Engineering, University of Moratuwa) for his valuable suggestions and the encouragement.

I am indebted to the Survey Department of Sri Lanka for their support by providing me with high expensive satellite images. I would like to thank Mr. K.D.P. Shantha (Superintendent of Surveys), Mrs. A.L.S.C. Perera (Superintendent of Surveys), Mr. S. Sivanandaraja (Superintendent of Surveys) and all the academic staff of the Institute of Surveying and Mapping for their innumerable support and advice. Thanks are also due to Dr. H. Manthrilake (former Director, Mahaweli Upper Catchments), who also provided me with a set of satellite imageries.

I would like to give my thanks to Prof. P. Wickramagamage (Senior Lecturer, Department of Geology, University of Peradeniya) regarding his immense support.

I wish to thank Mr. H. G. Kamal Chandana (Statistical Officer), Divisional Secretariats Office, Hambantota. He gave great support in collecting some secondary data and field data.

I wish to thank the academic and non-academic staff of the Department of Surveying Sciences, Sabaragamuwa University and Departments of Earth Resource Engineering and Civil Engineering, University of Moratuwa.

In the field, residents of the study area and security staff of the Lunugamvehera Reservoir helped and gave me essential details. I appreciate their support and am thankful to them.

My gratitude goes to all the authors and publishers whose books and articles I used, in the preparation of this thesis.

I express my gratitude to my mother whose moral and emotional support helped me immensely.

Finally I am indebted to my husband Saman for his valuable assistance, encouragement given throughout this research. My children, Sasanka and Denethi are presently at a playful age, and due to the heavy workload it was impossible for me to devote much attention to them. I appreciate their tolerance.

J. A. S. Jayakody

B.Sc. (Surveying Sciences)
Department of Surveying Sciences
Sabaragamuwa University of Sri Lanka.

08.08.2004.

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