APPLICATION OF GEOGRAPHIC INFORMATION SYSTEM FOR LAND CLEARANCES IN THE CITY OF COLOMBO SRI LANKA

M. Sc. Full Time (Research)

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by

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DECLARATION

I certify that this thesis does not incorporate any material previously submitted for any degree or diploma in any university and to the best of my knowledge and belief it does not contain any material previously published or written or orally communicated by another person except where due reference made in the text.

Date : H. H. Leelananda

To the best of my knowledge above particulars are correct.

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ABSTRACT

The study aims to improve land clearance processes in Urban Development Authority (UDA) with the support of Geographic Information Systems. The objective is realized through the conduct of geographical analysis, query, and modeling. The study takes Thimbirigasyaya Ward in the City of Colombo as a case for developing the land clearance system.

UDA is the main Government Agency dealing with physical planning in Sri Lanka. The primary activity of the UDA is the preparation, implementation, and maintaining of National Physical Plans, Regional Structure Plans, and Local Development Plan within its declared areas.

A study is done to understand the context of land clearance processes in UDA and to develop a digital system for land clearances. The study takes a critical look at how UDA practices land clearances and monitoring, and applies information technology tools to support such functions. It reviews UDA regulations and identifies issues in land clearances and database management.

The method that has been exercised in developing a Land Information System (LIS) is basically in three forms. They are (1) Identifications of shortcomings in the present system. (2) Identifications of targets. (3) Finding ways in reaching the targets. Collection of data is first subjected to detailed study in order to find its accuracy and a database has been to developed using data layers and attributes by converting analog maps and statistical data into digital form. Then land information were tested and verified for its accuracy.

Selection of the study area was done through a suitability analysis and availability of updated data. A model was then developed using GIS tools, its data accuracy was checked and found that the results had been in proper order. The developed LIS was compared with the existing processing system and was proved effective.

The accuracy of the data is very important in the process of developing a good LIS. In this study checks were carried out to ensure data accuracy. Numerical checks including stepwise calculations and field measurements were done to verify the model. The system developed using GIS has a significant advantage over the existing system. Clear improvements were visible in the area of labour and time saving and also in the provision of alternative solutions. System output identified the present distribution and use of land parcels. This gives rise to the need of establishing norms for rational decision making. UDA is basically benefited by this system on followings. (1) Serve as platform to integrate data and facilitate data exchange, (2) provide immediate access to data, (3) spatial analysis for selection of alternative sites, and (4) easy decision-making.

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LIST OF ABBREVIATIONS

UDA	Urban Development Authority
CMC	Colombo Municipal Council
SLLR & DC	Sri Lanka Land Reclamation & Development Corporation
NHDA	National Housing Development Authority
ULAs	Urban Local Authorities
LA	Local Authority
GIS	Geographic Information System
LIS	Land Information System
SPRZ	Special Primary Residential Zone
PRZ	Primary Residential Zone
MDZ	Mixed Development Zone
MRAE	Mean Ratio of Absolute Error
GPS	Global Positioning System
GCPs	Ground Control Points
LCS	Land Clearance System
IS	Information System
IT	Information Technology
NGOs	Non Government Organizations
PPC	Preliminary Planning Clearance