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**AN INTEGRATED INDEX TO ASSESS
URBAN SPRAWL
CASE STUDY – KALUTARA CITY AND ITS SUBURBS**

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**MASTER OF SCIENCE IN TOWN & COUNTRY PLANNING
2007/2008 GROUP
DEPARTMENT OF TOWN & COUNTRY PLANNING
UNIVERSITY OF MORATUWA**

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CASE STUDY – KALUTARA CITY AND ITS SUBURBS**

D. S. N. SAMARATUNGE (07/9622)



University of Moratuwa, Sri Lanka.
Electronic Theses & Dissertations
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Submitted in partial fulfillment of the requirements of the Master of
Science Degree in Town & Country Planning

**DEPARTMENT OF TOWN & COUNTRY PLANNING
UNIVERSITY OF MORATUWA**

DECEMBER 2009

DECLARATION

I declare that this Research Project Report represents my own work, except where due acknowledgement is made, and that it has not been previously included in a thesis, dissertation or report, submitted to the University of Moratuwa or to any other institution for a degree, diploma or other qualification. I wish to also declare that the total number of words in the body of this report (excluding the Appendices & the Bibliography), is 10,487.

Signed : *UOM Verified Signature*

Name of Student : D. S. N. Samaratunge

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Registration No : 0779622

Date : 01 / 12 / 2010

CERTIFICATION

I certify herewith that Mr. D. S. N. Samaratunge, Registration No. 07/9622 of the 2007/2008 Group, has prepared this Research Project under my supervision.

UOM Verified Signature

Signature of Principle Supervisor

Name: Plnr Prof. P. K. S. Mahanama
Dean
Faculty of Architecture
University of Moratuwa
Date: 01/12/2010

UOM Verified Signature

Signature of Head of the Department

Name: Architect/Plnr Dr. Jagath Munasinghe
Department of Town & Country Planning
Faculty of Architecture
University of Moratuwa
Date: 28/12/10



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ABSTRACT

The previous works on the subject of urban sprawl showed that urban sprawl is a complex phenomenon but they have not identified a clear definition of what exactly urban sprawl really is. Assessing urban sprawl is even a more difficult task even though there are numerous attempts that have been made to assess urban sprawl. Different scientific methods and approaches were used for this task. Some researchers have attempted to assess urban sprawl in a simple manner while some attempted multi dimensional approaches such as multi factor approach, integrated urban sprawl approach, geo-spatial approach etc.

The problem is that these assessment methods are not appropriate in the Sri Lankan context, because most of them address urban sprawl as experienced in the Western world. Therefore, this research attempted to fill this gap by identifying a suitable method for assessing urban sprawl in Sri Lanka.

It is noteworthy that, this is the first attempt for assessing urban sprawl in Sri Lankan context as surveys of previous studies indicate. Generally speaking urban sprawl in Sri Lanka is on the increase. But it has not yet been empirically assessed or calculated in detail. Major cause that influenced urban sprawl in Sri Lanka was the rapid urban expansion. It may be that this might have been encouraged by not having a proper definition of "urban" applicable to the country.

Under these circumstances and the present phase of development, the research identified a multi-factor approach to assess urban sprawl in Sri Lanka. For this purpose 12 indicators have been selected which have been associated with urban sprawl, viz. urban built up density, residential population density, leapfrog development, strip highway development, loss of arable land, encroachment of open space, damages to eco sensitive areas, segregated land use, proximity to urban functions, availability of local area development plans, land values and road density. Combining all these indicators in a rational weighted manner the research formed an Integrated Urban Sprawl Index (IUSI) for assessing urban sprawl in Sri Lanka.

Land use changes which have been taken place in between 1992 and 2002, highlighted the gradual increase of urban expansion of the selected area. For instance, by 2002, some rubber plantation areas are completely converted into residential purposes. Further, it is found that the low land values of these areas are directly influenced for land conversion.

The validity of the formulated IUSI was tested in ground situation of 2002 in the city of Kalutara and its suburbs. For this purpose, GIS techniques such as mapping, modeling and overlaying; photo interpretation, spread sheets, Graphs and word processing were applied to analysis urban sprawl in Sri Lanka.

Finally, the urban sprawl assessment in Sri Lanka carried out in two ways; (1) Urban sprawl assessing by individual component and (2) urban sprawl assessing by IUSI. The results of individual component analysis illustrated four clusters of urban sprawl that can be identified in the area such as highly compact, compact, sprawling and highly sprawling while the integrated urban sprawl index revealed only three types of development patterns such as highly compacted, compacted and sprawling areas.

Key words: *Urban sprawl, assessment methods, indicators, assessing, Kalutara, land use, integrated urban sprawl index, clusters, development patterns*



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