



**SDI Review Form 1.6**

Journal Name:	<a href="#">Physical Science International Journal</a>
Manuscript Number:	2014_PSIJ_9211
Title of the Manuscript:	URBAN SPRAWL ANALYSIS AND TRANSPORTATION USING CELLULAR AUTOMATA AND MARKOV CHAIN
Type of the Article	Original Research Article

**General guideline for Peer Review process:**

This journal's peer review policy states that **NO** manuscript should be rejected only on the basis of '**lack of Novelty**', provided the manuscript is scientifically robust and technically sound.

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**PART 1: Review Comments**

	Reviewer's comment	Author's comment (if agreed with reviewer, correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)
<b>Compulsory</b> REVISION comments	<p><b>While the article presents an interesting approach to examining sprawl by assessing land consumption rate and land absorption coefficient, the article fails to clearly define the criteria used with the chosen metric. The abstract suggests using the context of three LGA's to investigate effects of urban sprawl using maps, yet the author's mapping is poorly presented – lacking clear legends, scale, context, or relationships between maps.</b></p> <p><b>The abstract suggests the processing, classifying, and analysis of Landsat imageries but the article does not provide documented evidence of how these imageries were processed from original data to processed data; from original classification to new classification.</b></p> <p><b>The study is based on the re-classification of Landsat data into 5 classifications, but the author does not define or demonstrate the criteria or empirical evidence of how these new classifications are valid.</b></p> <p><b>The author makes many general statements</b></p>	<p>LCR and LAC are often used in measuring progressive spatial expansion of a city and measuring the change in consumption of new urban land by each unit increase in urban population respectively. They have clear concepts and global applications. The maps have been restructured. Maps are well presented and have clear legends, scale, and context. There exist good relationships between maps.</p> <p>Details on how to process an image or classifying images should not be taught here. For the paper to be concise and not verbose we tried to avoid details on these.</p> <p>Some comments have been added and supervised classification was carried out. On the use of 5 classifications see below.</p>



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	<p>without credible cited references to support such claims. A developed literature review is needed to provide the framework of why this article's methods are relevant to the literature.</p> <p>The author should provide their own definition to sprawl and how that definition was developed based on this method of examining sprawl.</p> <p>The author states that changes in land cover over time help to predict possible continued changes, yet the author does not clearly define how land cover is measured, described, or interpreted. The use of GIS to interpret Landsat data is not defined. Land Use classifications are often broken into 9 to 15 general categories, and often these are broken into more specific categories. The author has not produced evidence of why the data classification should be limited to 5 classifications.</p> <p>The general structure of the article needs improvement. The introduction is broad and lacks a direction. It begins with general perspective of sprawl with no indication of the need to measure sprawl. It jumps to GIS and its usefulness with measuring temporal data and defining spatial patterns, and possibly observing these patterns when making land use decisions. The introduction does not frame the context of the article, nor the need to find new ways of measuring</p>	<p>No general statements were made that are not related to this research objectives. Relevant literatures were reviewed and the use of LCR, LAC, Markov Chain analysis and Cellular Automata (CA) were adopted to predict future urban sprawl.</p> <p>There are different definitions on urban sprawl and what is the basis for formulating another one when the existing ones agreed with our goal for this research. We are interested in using available methods to predict future urban sprawl.</p> <p>Land cover measurement, description, or interpretation are not new to those who are very familiar with Remote Sensing and GIS software packages. Also from the work, to the novice the land covers can visually be viewed. There are authors who have overclassified and underclassified images but we felt 5 classifications clearly grouped the features we are interested in this research. For examples: (1) ZIMOVA, Katerina (2013) on "The Determination of Factors Causing the Urban Sprawl in Open Space" sorted their data into 4 classes. GIS and aerial photos were used; (2) Ajoke Onojeghuo &amp; Alex Onojeghuo (2013) on</p>
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	<p><b>sprawl.</b> The study area is described with limited context. The author places the site with coordinates, yet no scale is used to describe the size of the site or selected areas of interest. What do these sites have to do with the previous definitions of sprawl cited in the opening introductory paragraph? The author should relate the relevance of the site to sprawl, to the methods used in measuring sprawl.</p> <p><b>Define and describe the research methodology.</b> Simply giving data sources does not describe the rationale for these methods or how these methods provide unique or added value to previous methods in measuring sprawl.</p> <p><b>Why is this method needed? How has this method been used before and what were the results? How does this context provide unique or parallel reasoning of the usefulness of this method?</b></p> <p><b>Landsat imagery should be shown in its raw state, and its manipulated state to demonstrate evidence of re-classification of land uses. Olaleye, Abiodun and Igbokwe did not limit classification of land use, how is this article relevant?</b></p> <p><b>What determines a grassland from being categorized as either simply a grassland or a dry grassland?</b></p> <p><b>Landcover categories need empirical data to demonstrate how they have been determined</b></p> <p><b>Author is using imagery from 1984, 2000, and 2006, to determine change, but the author does not define</b></p>	<p>“Mapping and Predicting Urban Sprawl Using Remote Sensing and Geographic Information System Techniques: A Case Study of Eti-Osa Local Government Area, Lagos, Nigeria”, classified the Landsat data into 4 (this study area is part of our own study area)- they used Remote Sensing and Geographic Information System Techniques; and (3) Heng Sun &amp; Wayne Forsythe &amp; Nigel Waters (2007) on “Modeling Urban Land Use Change and Urban Sprawl: Calgary, Alberta, Canada”, sorted their data into 6 classes- they used GIS and Remote Sensing and based their predicted future spread of sprawl on using Markov Chain analysis and Cellular Automata. None of them came up with new definition for urban sprawl, neither did they give details on image processing, image classification, etc.</p> <p>The introduction is concise with direction on urban sprawl. The implications of uncontrolled urban sprawl cannot be overemphasized, especially for developing city like Lagos. Therefore, the need to map the rate of urban sprawl in this part of Lagos, that is experiencing rapid growth, is crucial to aid quick and useful decision-making process by all stakeholders especially government agencies. The use of CA-Markov for urban sprawl is still relatively new to us in this part of the World.</p>
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	<p><b>or describe the units of measure: percentage change/trend, observed change, or sum of change. Provide examples of each.</b></p> <p><b>No evidence of how the LCR or LAC were measured, the author simply provided a formula without the supported data used within the formula.</b></p> <p><b>Data must be represented with clearly represented Landsat imagery at the demonstrated dates above.</b></p> <p><b>Without documentation of how imagery was measured showing areas, data points, etc. the article is based on assumption.</b></p>	<p>The map showed the study area (Lagos-Island, Eti-Osa and Ibeju-Lekki LGAs) which is over 972 square kilometres. The study area from our research is experiencing fast uncontrolled growth (i.e. urban sprawl), therefore, there is need to carry out a thorough study on this challenge.</p> <p>We have define and describe the research methodology. We mention data sources, data processing, equations and methods used. We are not proposing a new method but using existing methods to achieve our goal.</p> <p><i>Many authors in this field have used different methods in determining urban sprawl e.g. ZIMOVA, Katerina (2013) used. GIS and aerial photos, Ajoke Onojeghuo &amp; Alex Onojeghuo (2013) used Remote Sensing and Geographic Information System Techniques and Heng Sun &amp; Wayne Forsythe &amp; Nigel Waters (2007) used GIS and Remote Sensing and based their predicted future spread of sprawl on using Markov Chain analysis and Cellular Automata. Markov Chain analysis and Cellular Automata in a GIS environment on Remote Sensing images. The integration of Cellular Automata and Markov Chain being more recent method was used by us.</i></p> <p>In our work grassland fell under vegetal cover, therefore classifying them separately will lead to unnecessary overclassification. Showing Landsat original image and its classification/ or re-classification are not new to remote sensing experts.</p>
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**Comment [01]:** Just added comment.



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		<p>Olaleye, Abiodun and Igbokwe did not limit classification of land use but they described in their work image classification.</p> <p>It is possible to overclassify an image (even up to 30 classes or more e.g. having 8 different classes of buildings), but we are only interested in general/major landcover classification. The study area is a familiar environment, therefore, Supervised classification was carried out. Tables 3, 6, 9 and 10 describe the units of measure: percentage change/trend, observed change, or sum of change for these periods and the future (2020).</p> <p>LCR and LAC basically consist of two variables: A (areal extent of the city in hectares) and P (population). Tables 3 and 5 provided the data used in calculating LCR and LAC.</p> <p>In our manuscript, we specified data type, production date, scale and sources of data. On GLCF website, once you specify the image type, the year and the extent i.e. area of coverage, you can download it if it is available. Our work was not based on assumption.</p>
<b><u>Minor</u></b> REVISION comments		
<b><u>Optional/General</u></b> comments		