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Judul karya ilmiah (paper) : Changes of Settlement Environmental Quality in Semarang City Center

Jumlah Penulis : 4 orang

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## Changes of Settlement Environmental Quality in Semarang City Center (Conference Paper) [\(Open Access\)](#)

Pigawati, B.<sup>a</sup> , Yuliastuti, N.<sup>a</sup>, Mardiansjah, F.H.<sup>a</sup>, Suryani, M.A.<sup>b</sup>

<sup>a</sup>Departmenten of Urban and Regional Planning Engineering, Faculty of Engineering, Diponegoro University, Indonesia

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### Abstract

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City center is the core of a city that was originally used as settlement, it is, further, developed into a center of economic activities and as a center for settlement facilities and infrastructure. The city center area is a city growth center which often experiences rapid changes. The development of the city center has resulted in the conversion of landuse non built up area into a built up area. The wide increase in built up area indicates a reduction in green open space and catchment areas that can cause degeneration in environmental quality. Semarang as the capital of Central Java Province develops quite rapidly. This condition is seen in the increasing of the built up area that functions as a settlement and commercial activities. The development of settlements in the City Center, however, can cause a decline in environmental quality if it is not balanced with a good environmental arrangement and the availability of sufficient facilities. This study aimed to analyze the changes in the quality of the residential environment over 10 years and to determine the typology of the area of the area in the Semarang Tengah District located in the City Center of Semarang. This study used spatial approach by utilizing Geographic Information System and Remote Sensing (GIS/RS) technology. The results of the research showed that there was a change in the quality of the settlement environment in Semarang Tengah District. Settlement areas that experienced a decrease in quality were block settlements in Brumbungan Village and Miroto Village, it was due to reduced vegetation protection and facilities. On the other hand, the quality improvement occurred in Sekayu Village which developed as a commercial area. Settlements in Semarang City Center can be divided into 3 topologies based on the characteristics and quality of the environment. © Published under licence by IOP Publishing Ltd.

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## Analyzing of Land Use Pattern Changes in Mukim Pengerang, Johor

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Urbanization and urban land-use transition have a competitive environment to ensure and provide good facilities for human welfare. The landscape patterns resulting from urbanization influence processes at local, regional, and global scales. Quantifying the spatio-temporal pattern of urbanization is important for understanding its ecological impacts and can provide basic information for appropriate decision-making. The growth of urbanization in Mukim Pengerang, Johor has undergone rapid changes in agriculture, settlements, townships and various activities. The changes of land use take place in Mukim Pengerang due to rapid the economic development, especially in industrializations which are Refinery and Petrochemical Integrated Development (RAPID) project and Pengerang Integrated Petroleum Complex (PIPC). The industrialization boosts the growth in land property and commercial which progressing in rapid development since 2012, in resulting whether it can give good, bad or both impact to the human and surrounding. Therefore, the main objective of this paper is to quantify the changes of landscape pattern or land use pattern between 2008 and 2017 occurred in Mukim Pengerang. In monitoring the spatial pattern changes, and the changes of landscape structure, the matrix landscape were analyzed with determination of the Shanon Diversity Index (SHDI), the number of patches (NP), Edge Density (ED) and Total Edge (TE) in the period of 8 years. The results shows that the changes occurred with the three types of land use showed significant changes in the types of land use which are forest, agricultural land use and development land use. Based on SHDI analysis, the value show increases from 2008 until 2017. This situation illustrates that the higher the value of SHDI for an area, the level of land use is also higher. This is because the growing pattern of land use is reflected by the large number of patches due to the diversification of land use activities in this mukim. Overall from the matrix statistics test was found that there was a changes in land use that took place within 8 years.

**Keywords:** *Land use pattern changes, spatio-temporal, Fragstat*

# Evaluating the Performance of Machine Learning Based Slum Mapping using Very High Resolution Imagery in Support of Slum Upgrading Programs: The Case of Bandung City, Indonesia

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The Survey-Based Slum Mapping (SBSM) conducted by the Indonesia Government to reach the national target "city without slums" by 2019 shows inconsistencies of the output due to the dependency on surveyors experiences. Thus, slum upgrading programs relying on such inconsistent maps face series problems to monitor the implementation of the national target. Remote sensing imagery combined with machine learning algorithms could help to address these consistency problems. This study evaluates the performance of two machine learning algorithms. i.e. Support Vector Machine (SVM) and Random Forest (RF) for slum mapping in support of slum upgrading programs in Bandung, Indonesia. The study used sequential feature selection (SFS) combined with the HSIC criterion to select significant features for classifying slums. Overall, the highest accuracy (88.5%) was achieved by the SVM with SFS using contextual, morphological, and spectral features, which is higher than the estimated accuracy of the SBSM. To evaluate the potential of such a machine learning based slum mapping approach in slum upgrading programs, interviews were conducted with several local and national stakeholders. Results show that local acceptance for a remote sensing based slum mapping approach varies among stakeholder groups. Therefore, a locally adapted framework is required to combine ground surveys with robust and consistent machine-learning methods to allow a rapid extraction of information on the dynamics of slums at large scale.

**Keywords:** machine learning; slums; slum upgrading programs, Bandung, Indonesia

# Time Travel Estimations using MAC addresses of Bus Passengers: A Point to Path-QGIS Analysis

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Currently, the development of WiFi is proliferating, especially in the field of transportation and smart cities. At the same time, WiFi is a low-cost technology, which offers a longer survey time and is able to support the Big Data era. This paper describes our study, which first uses a WiFi scanner to capture media access control (MAC) address data of bus passengers' WiFi devices and then identifies each MAC address travel time to confirm the bus passengers. The MAC address is a unique ID for each device used such as mobile phones, smartphones, laptops, tablets, and other WiFi-enabled equipment. The WiFi scanner was placed inside the bus to capture all the MAC addresses inside and around the bus. The survey was conducted for one day (eight hours). The paper describes the procedure of the time travel estimation for each MAC address using the "point to path" analysis in QGIS open source software. This procedure, using point to path-GIS, produced 70,000-80,000 raw data points cleaned into 100-130 new data points. The procedure determined how many passengers traveled and explained which bus passengers used based on travel time.

**Keywords:** Time travel estimations, Path-QGIS analysis

## **Assessing Landscape Pattern Relationship with Dengue Incidence**

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Dengue is the most common urban disease that is most prevalent in tropical areas. WHO 2009 stated that this diseases has grown a public health concern due to the risk of dengue infection that has increased dramatically between 50 and 100 million cases every year. This issue were very correspond with landscape and environment changes. The objective of this paper is to discuss on how landscape pattern in relation to dengue incidence. Open website; idengue were highly contributed in this study to locate the most risky area for dengue fever incidence at township level. Geographic information system (GIS) was used to demonstrate the spatial patterns of all dengue cases in Johor Bahru and Geoprocessing was used to measure the boundary of risk according to the distribution of dengue outbreak. After that, to analyze the spatial landscape pattern, satellite images were used. Spatial descriptive analysis shows non-strata housing, open space, road, planned commercial, strata housing and drainage system network is the most prevalence land use activity for dengue incidence in Iskandar Region. The finding shows the common landscape composition that relate to dengue cases. In conclusion, the future development of land use should be considered on landscape pattern towards rapid urbanization.

*Keywords: Landscape pattern, Dengue incidence, Georgraphic Information System*

## Changes of Settlement Environmental Quality in Semarang City Center

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City center is the core of a city that was originally used as settlement, it is, further, developed into a center of economic activities and as a center for settlement facilities and infrastructure. The city center area is a city growth center which often experiences rapid changes. The development of the city center has resulted in the conversion of land use non built up area into a built up area. The wide increase in built up area indicates a reduction in green open space and catchment areas that can cause degeneration in environmental quality. Semarang as the capital of Central Java Province develops quite rapidly. This condition is seen in the increasing of the built up area that functions as a settlement and commercial activities. The development of settlements in the City Center, however, can cause a decline in environmental quality if it is not balanced with a good environmental arrangement and the availability of sufficient facilities. This study aimed to analyze the changes in the quality of the residential environment over 10 years and to determine the typology of the area of the area in the Semarang Tengah District located in the City Center of Semarang. This study used spatial approach by utilizing Geographic Information System and Remote Sensing (GIS/RS) technology. The results of the research showed that there was a change in the quality of the settlement environment in Semarang Tengah District. Settlement areas that experienced a decrease in quality were block settlements in Brumbungan Village and Miroto Village, it was due to reduced vegetation protection and facilities. On the other hand, the quality improvement occurred in Sekayu Village which developed as a commercial area. Settlements in Semarang City Center can be divided into 3 topologies based on the characteristics and quality of the environment

**Keyword:** *Settlement, Environmental Quality, Semarang City Center*

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