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Measuring service capacity of public facilities based on supply aspect (case study: elementary school in Malang City)

Deni Agus Setyono^{a*}, Deny Dwi Cahyono^b, Masdar Helmy^b

^aUrban and Regional Planning Department – Brawijaya University, MT. Haryono 167, Malang City 65145, Indonesia

^bUrban and Regional Planning Department – Brawijaya University, MT. Haryono 167, Malang City 65145, Indonesia

Abstract

Public facilities have various types and functions to support community activities. Provision of public facilities in Indonesia is carried out on the base of population size and spatial approach, which for the development of new facilities used the scale and capacity of services analysis on related facility. This study carried out the capacity of services measurement related to the elementary school in the Malang City based on supply aspect, which mean school locations and numbers. In general, the measurement was done with the administrative boundary as analysis units but grid/cell approach were used to obtain accurate results. Based on the analysis result, service capacity of elementary school in the Malang City defined by the administrative boundary approach was 560.82% but when using grid/cell approach the value defined on 271.95%. It is means that people in Malang City can access elementary school not only in their administrative boundary but also they access school in their neighborhood areas.

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* Corresponding author. Tel.: +62 82221000108; fax: +0-000-000-0000 .
E-mail address: deni.setyono08@gmail.com

1. Introduction

Public facilities in Indonesia have various types and functions in order to support community activities, such as educational facilities. Adequate provision of educational facilities needed to improve the quality of human resources. Provision of the facilities is carried out in the base of population size and spatial approach, which for the development of new facilities used the scale and capacity of services analysis on related facility.

Procurement education in adequate sufficient is necessary to increase the quality of human resources. This study focused on the service elementary school facilities in because the Indonesian government had *Wajib Belajar 9 Tahun* program whereas people obliged to obtain education services elementary and junior high schools. Until now, provision of elementary school as well as other public facilities some are still based on the number of people which will determine the number of new facility. The government tried to provide elementary school in various areas yet sometimes not supported by adequate planning procedure. The planning process must consider the existing education services by the number and distribution of elementary school in order to analyze the level to access school. Public access to school quite different between areas, especially between the urban and rural area or the centre and fringe areas because the development of facility was generally concentrated on the center. Especially in rural areas, it is often represented have access relatively low to the public school.

Hitherto, the measurement of accessibility on education facilities still not represented in detail because method that used still normative. First, measurement considered only the number of existing schools inside of the administrative unit areas. Then the number comparing with the population numbers to obtain ratio that can used to define new facility number. Second method using service areas or radius of services, which mean this method consider service of facilities not only came from facilities which are located inside of administrative areas but also from outsides.

The weakness for the first is not considered the availability to access the education facilities that are located outside of each area. Meanwhile the community can access the facility independently. It causes each administrative area was served with more facilities (overlapping) on the other hand there are areas was not served on adequate facilities. Likewise with the previous method, on the second method, facilities that are located outside of area were calculated using the administrative boundary. Compared with the first, the second method is more accurate. Weakness on the second method is not considered the land use. This caused the service scale were not effective mainly related as the education facility would not serve the unbuilt areas.

In this research, the weakness of previous methods will be corrected using the cellular/mash approach. To define which method has valuable result then Moran's I was used. Later method perceived have accurate result in order to determine services scale because consider the location of facilities and interaction between community and facility. In mash/cellular approach, the calculation of service area focused on the built-up areas. Hence, author through this research want to give comparison to decide the most accurate method in determining scale services in aim to provide new education facility in Malang City.

2. Methods

The study focuses on Malang City. The city located in East Java Province as second largest city, also known as education city. Area of the city about 110 km² and there are about 873.205 peoples live inside of city area. Malang City consist of five districts which are Blimbing District, Kedungkandang District, Klojen District, Lowokwaru District and Sukun District and all the city area is directly adjacent to Malang Regency area. Numerous educational facilities from elementary schools up to universities are located in this city. Regarding the facility, this study focuses on elementary school which is related with national program on education sector "*Wajib Belajar 9 Tahun*". Provision of elementary school is important in order to increase the accessibility level of community. As yet, the number of elementary school in Malang city about 323 units which spread in all five districts.

There are several procedure use in this research. At an early stage, services scale elementary education facilities assessed according to its distribution imaginary sphere on using a circular looking (layer) according to the administrative boundaries. The next step, determined mash/grid in accordance with the admin based on the cellular Approach (CA) concept. The result will be analyzed using Moran's I to examined the links between area on spatial views. Based on author's knowledge, Moran's I analysis used to calcualte spatial bounds, find a spatial model, etc. In

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