Available online at www.sciencedirect.com

ScienceDirect

Procedia - Social and Behavioral Sciences 227 (2016) 70 – 74

Procedia
Social and Behavioral Sciences

CITIES 2015 International Conference, Intelligent Planning Towards Smart Cities, CITIES 2015, 3-4 November 2015, Surabaya, Indonesia

Urbanization and Change in Cilacap Regency

Ken Martina Kasikoen[a*]

[a]*Department of Urban and Regional Planning – Esa Unggul University, Jalan Arjuna Utara 9 Tol Tomang Kebon Jeruk, Jakarta 11510, Indonesia*

Abstract

Cilacap regency is one of many regencies in Central Java province, having anarea of 2,138.50 $Km^{2.}$. In 2011 the population was 1,755,268with 284 villages in 24 districts. Since the development over the region has been more concentrated in the industrial areas, the changing of agriculture area becoming urban area took place rapidly and significantly. Therefore knowledge of urban area determination to support development policy over region is needed.

The availability of abundant data of the region enable Multivariate data analysis be used to determination of urban area. The steps of determination are selection of available data, factor analysis, principal component analysis, and cluster analysis. This study aims to determine the urban area in Cilacap regency by multivariate analysis. The results is: there are 41 villages meet characteristic ofurban area. The villages that is considered urban areas are around the major road network indicated by having higher population and more facilities as compared to the surrounding area.

Peer-review under responsibility of the organizing committee of CITIES 2015

Keywords: urban area; multivariate analysis; factor analysis; principal component analysis; cluster analysis.

1. Introduction

Cilacap regency is one of the regency in Central Java province, as an area of 2138.50 km^2, with 284 villages in

* Corresponding author. Tel.: +62 811988304; fax: +0-000-000-0000 .
*E-mail address:*kenm_km_at@yahoo.com

Peer-review under responsibility of the organizing committee of CITIES 2015
doi:10.1016/j.sbspro.2016.06.044

24 districts. In 2011, the total population was 1,755,268 and the GRDP per capita was 14,124,430 rupiahs. As a regency with higher GRDP compared to other regencies in Central Java province, and has big regional potential, mainly due to the existence of vital facilities such as oil refinery, cement industry, agricultural, and in the future, an ocean port may be built with capability of receiving third generation vessels. The condition has brought rapid development of Cilacap regency from rural areas to urban areas. Since many villages in this regency potentially become urban areas, a policy is needed tosupport an even development over the region. This policy should be supported by the knowledgeof the urban area determination in Cilacap regency. The aim of the study is determination of urban areas in Cilacap regency by multivariate analysis.

Various studies have been conducted in identifying urban areas, but in line with more complex data, as **Joseph F. Hair Jr. et al** (2010) pointed out that "some of information can be analyzed and understood with simple statistics, but much of it requires more complex, multivariate statistical techniques to convert these data into knowledge". Urban and rural areas has been identified by **Kasikoen, Ken Martina** (2005), in West Java province by multivariate analysis, with district as the smallest area, and determination of urban area in Cilacap regency using villages as the smallest area. In implementing multivariate data analysis, program SPSS version 22 was used.

There are bundles of data by Village Potency Data (**PODES**) of Cilacap regency, and by multivariate data analysis, from 284 villages in Cilacap regency, has identified 41 villages as urban areas. The urban areas lies surrounding major road network with higher population and more facilities compare to the surrounding area.

2. Methodes

The important point of multivariate analysis is identification of variables which have simultaneous relationships among variables (**Dillon**, 1984). There are 571 variables from each of 284 villages in Cilacap regency from Villages Potential Data (PODES) 2011 produced by **Central Berau of Statistic** (2012). The major techniques determination of urban area in Cilacap regency, factor analysis and cluster analysis.

Factor analysis is an interdependence technique whose primary purpose is to define the underlying structure among the variables in the analysis (**Hair**, 2010). And principal component of analysis is factor analysis which is all data is analysis without assumption the unique variance in the data (**Dewi Savitri and Sri Maryati**, 2015).

Cluster analysis is a group of multivariate techniques whose primary purpose is to group objects based on the characteristics they posses, it classifies object on a set of user selected characteristics (**Hair**, 2010). It is a technique which purpose is dividing bundles of objects in sub clusters which are relatively homogeneous (**Dewi Savitri and Sri Maryati,** 2015**).**

In this study, the first step is identifying variables which can be used to determine urban areas. Since each object has a set of different data which have complex relation, factor analysis and principal component analysis are used to transforms variables to simple variable but still can explain the variation data of the object. Cluster analysis is used to determine the urban areas in Cilacap regency.

3. Result and Discussions

Cilacap regency, as data from Cilacap in Figures 2012 produce by Central Berau of Statistic - Cilacap Regency. (2012), is one of the regencies in Central Java province located in the southern part of the province as shown in **Fig. 1(a)**. The borders of Cilacap regency in the north is Banyumas and Brebes regencies, in the south Indonesian Ocean, in the west is West Java province and in the east is Kebumen regency. Cilacap regency comprises of 24 (twenty four) districts with 269 (two hundred sixty nine) villages and 15 (fifteen) *kelurahan*[i] spreading from north to south. Its area is 2,138.50 $Km^2$with administrative borders of each districtshown in **Fig. 1(b).**

Cilacap regency has total population of 1,755,268 with the density of 820.79 person/ Km^2 in 2011. The highest density is in the district which formed the city of Cilacap, and the density more than 1000 person/Km^2 are the districts which lies along the regional roadways from west to east, such as districts: Majenang, Kroya and Gandrungmangu. The lowest density is KampungLaut district, which lies in the seashore.

The data of characteristic of each villages are plentiful and variously available as produced by Potential Village/PODES of Cilacap regency. As the method of multivariate analysis, the data will be chosen by principal component analysis. The result, there are 18 (eighteen) variable chosen from the available data shown in **Table 1**.