

The Socio-economic Transformations in the Peri-urban of Bandung Metropolitan Area

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ABSTRACT

Urban growth is referred to as the expansion of an urban area into the surrounding environment. The expansion gives rise to sub-urban development phenomena called peri-urbanization, which occurs in physical, economic, and social changes. This paper identifies the socio-economic transformations in the peri-urban Bandung Metropolitan Area, based on the theoretical determination of socio-economic variables and peri-urban typology. The study emphasizes the main feature of the socio-economic changes in each peri-urban typology based on the discriminant analysis. Socio-economic transformation is analyzed on the variables of population density, household economic sectors, people's education, and the number of prosperous families. A Peri-urban area is divided into three typologies: Predominantly Urban (dominantly urban characteristics), Semi-Urban, and Potential Urban Area (dominantly rural characteristics). The data and information required for the study are generated mainly from secondary sources. The study shows that socio-economic transformation occurs in each peri-urban typology at different levels of change. The different characteristics of peri-urban typology and its proximity to the city center result in a high socio-economic transformation rate.

Keywords : socio-economic changes, peri-urban typology, metropolitan area

INTRODUCTION

The phenomenon of urbanization occurs in many large cities in Indonesia, which are observed at the interface of rural and urban (peri-urban) societies. The urbanization process impacts the creation of a peri-urban area (McGee, 1991). The peri-urban area is defined as a rural area - urban fringe, which is a transitional area in terms of land use, social and demographic characteristics (Pryor, 1968). The peri-urban area becomes a transition zone from rural to urban nature. The peri-urban area is also often referred to as the future face of urban areas because the transition to urban nature will increasingly dominate activities and grow into new urban centers (Yunus, 2008). The transformation of peri-urban areas brings changes to the physical and socio-economic conditions, such as competing for land use in the suburbs or around the city and increasing urban socio-economic characteristics in the countryside.

Bandung is one of the metropolitan cities in Indonesia. A Metropolitan area that is fast-growing, full of competition, and has an essential role in regional economic development, society's welfare, modernization, and sustainable development (Yunus, 2000). This growth has resulted in a more significant urban land area. As the availability of land in metropolitan cities is fixed and limited, urban activities will take non-urban land in peri-urban areas to meet the needs of residential space in suburban areas (Yunus, 2000).

The transformation of peri-urban areas brings changes to the physical and socio-economic aspects resulting in spatial implications (Ritohardoyo, 2013), such as competing for

land use in the suburbs or around the city and increasing urban socio-economic characteristics in the countryside. The development can provide different characteristics between parts of the region. The closer to the built urban land, the thicker the physical urban characteristics are visible. This condition is always spatially associated with socio-economic changes, including kinship, social institutions, and socio-economic strata. This implication brings social changes in lifestyle in rural areas (Antrop, 2000).

Peri-urban development can be defined as a process in which rural areas located on the outskirts of established cities become more urban, in physical, economic, and social terms' (Webster, 2002). The Expansion from urban areas to the suburbs of metropolitan encourages social mixing to happen (McGee, 1991). The peri-urban development usually involves rapid social change, with an agricultural community transforming into a city or industrial life in a short period (Webster, 2002). This development can provide different characteristics between parts of the region, especially in its physical and socio-economic aspects. The closer to the built urban land, the thicker the physical urban characteristics are visible. This condition is always spatially associated with social-economic changes, including kinship, social institutions, and socio-economic strata (Yunus, 2006).

The urban growth implies the need for land in the peri-urban area, some of them without any proper plans due to the lack of understanding of socio-economic transformation. The transformation also gives the potential socio-economic disparity in the peri-urban area. Understanding this transformation and its factors could inform a more strategic planning approach in peri-urban development.

New urban structure, due to the socio-economic transformation needs new or improved urban infrastructures and facilities. Following the IFAM Basic Principle, urban infrastructure and facilities need to be well planned and designed (Suprayitno & Soemitro, 2018). Thus, socio-economic transformation needs to be well understood.

This study aims to identify the socio-economic transformations in the peri-urban of BMA. The transformations are identified in each peri-urban typology. The objectives of this study are as follows:

- To identify variables of social transformation in the peri-urban area;
- To identify social transformation in the peri-urban of BMA;
- To analyze variables that significantly change in each peri-urban typology of BMA.

Some research questions further emerge from the research problems, aim, and objectives, which need to be answered, as follows:

- Are there any socio-economic transformations in the peri-urban of Bandung Metropolitan Area (BMA)?
- If there is a socio-economic transformation in the peri-urban of BMA, which factors that significant differences among peri-urban typology?
- If there are different socio-economic transformations in each typology, which factors that significant changes in each typology of peri-urban BMA?

STUDY AREA, DATA AND METHODS

Peri-urban typology of BMA as a case study follows the results of a previous study (Budiyantini, 2016), which indicates that from 61 districts in BMA, 28 districts are peri-urban areas, which are divided into three peri-urban typologies, there are Predominantly Urban, Semi-Urban, and Potential Urban (Figure 1). Predominantly Urban has extensive non-agricultural land, higher housing density, better accessibility, and higher human resources productivity compared to the villages in the Semi-Urban and Potential Urban. Semi-Urban is an area with mixed urban and rural characteristics. Potential Urban is an area with a steeper

slope, located at a higher elevation, and has a wider agricultural land, a lower density of housing, and a population, the economic structure in this area is still in the primary sector.

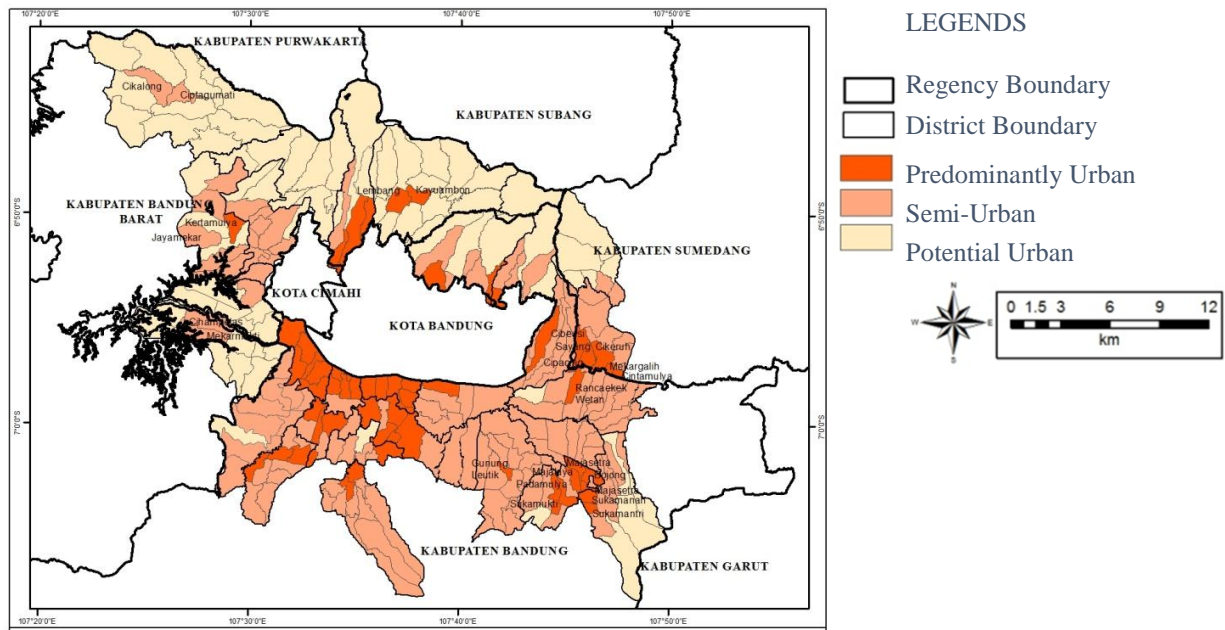


Figure 1. Peri-urban Typology of Bandung Metropolitan Area (Budiyantini, 2016)

Data collection in this study was obtained mainly through a secondary survey from various government agencies in Bandung Regency, West Bandung Regency, and Sumedang Regency, especially the Central Bureau of Statistics (BPS) and Regency Planning Boards (Bappeda).

The variables are derived and selected based on literature reviews and research objectives, then adjusted to the field's availability of data. Variables are selected based on the concept of the rural-urban characteristics, as follows:

- population density;
- the number of in-migration;
- household sectors (primary, secondary, and tertiary)
- population-based on education (elementary, secondary school, high school, and tertiary education), and
- the number of prosperous families.

This study used descriptive analysis to identify socio-economic transformation in the peri-urban of BMA during the five years of 2011 to 2016. Using discriminant analysis, the variable significantly changed was identified as the differentiating factor of socio-economic transformation in each peri-urban typology.

Several steps as the necessary process in the discriminant analysis are as follows (Santoso, 2002):

- Sorting the variables into dependent variables (Dependent) and independent variables (Independent);
- Determine the method to define discriminant functions:
 1. Simultaneous Estimation; all variables are entered together, and then a discriminant process is carried out;
 2. Step-Wise Estimation; variables are entered one by one into the discriminant model.

- Test the significance of the discriminant function formed using Wilk's Lambda, F test, and significant test;
- Conducting discriminant function validation tests.

RESULTS AND DISCUSSION

The identification of socio-economic transformation in the peri-urban of BMA was carried out by descriptive and discriminant analysis, as explained in the methodology. The discussion below is to seek answers to the research questions.

The Socio-economic Transformation in the Peri-urban of BMA and the Differentiating Factors Among Peri-urban Typology

Based on data analysis, there are socio-economic transformations in all peri-urban areas of BMA. Predominantly Urban has the highest rate of change (17,79%) compared to those in other areas, especially in increasing urban characteristics. The Semi-Urban area, an area with mixed urban and rural characteristics, shows slightly lower socio-economic changes (16,71%), and the Potential Urban area has the lowest socio-economic changes (5,54%) compared to those of other peri-urban regions.

The population density in all peri-urban areas of BMA increases, especially in Predominantly Urban areas. On the other side, the most massive in-migration changes occur in Semi-Urban Area, which indicates the most attractive area to migrants. Terms of changes in the number of households working in economic sectors seem to be similar in all peri-urban typologies, the number is increasing in all sectors at a different rate, except in Potential Urban Area, decreasing in the number of households in tertiary sector economic. Furthermore, the transformation in terms of people's education shows similarities in all peri-urban typologies. The increase is at a different rate, especially in Semi-Urban and Potential Urban areas.

Figure 2 below shows the rate of its transformations in each peri-urban typology. Two factors that change the most are the number of prosperous families and in-migration.

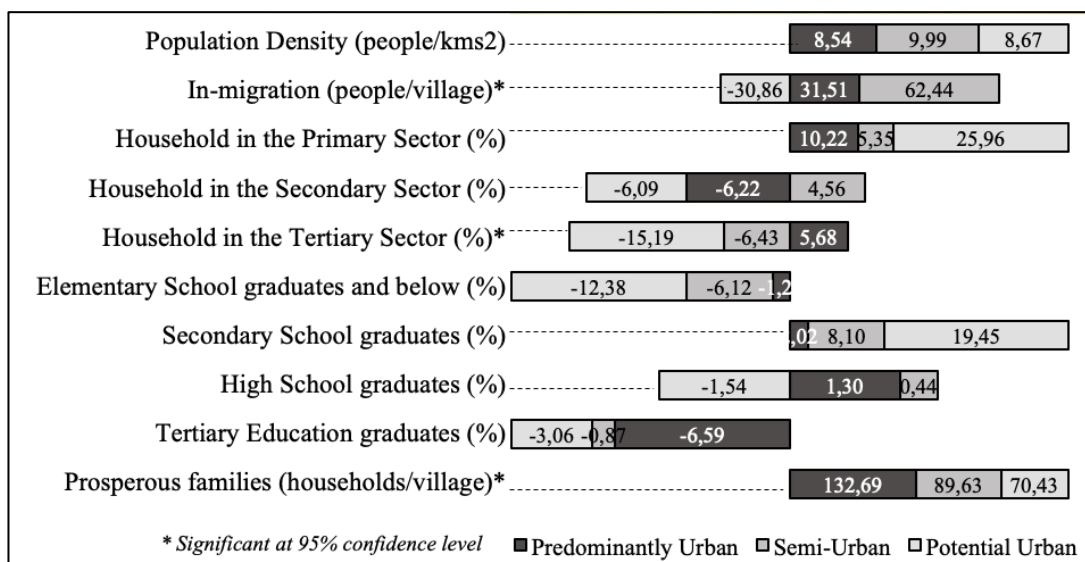


Figure 2. The rate of socio-economic transformations in the peri-urban of BMA

Even though the study shows that there are socio-economic transformations in all factors, the significant transformation only occurs in increasing human resource quality and in-migration. There are statistical differences in socio-economic transformations among the peri-urban typology of BMA, as follows:

- The number of in-migration changes significantly in Semi-Urban and Predominantly Urban, a contrast to out-migration in Potential Urban areas.
- The number of prosperous families increased in all areas. Areas with urban characteristics experience the highest rate of change compared to rural areas.
- The households in the tertiary sector have changed significantly in Predominantly Urban areas, and the opposite occurs in Semi-Urban and Potential Urban Areas.

Based on the study results, the transformations fitted to the peri-urban typology and the rural-urban characteristics. The closest area of peri-urban to the city center, the highest rate of rural to urban changes.

The Socio-economic Transformations in Each Typology of Peri-urban BMA

Predominantly Urban Area

The socio-economic transformation in the Predominantly Urban area which is characterized as the most urban area among other peri-urban typologies-, shows that the significant changes occur in two factors: the number of in-migration and the prosperous family which is related to its proximity to the city center. The change in the number of prosperous families is the largest compared to those in other areas. The socio-economic transformation data in predominantly urban are presented in Table 1.

Table 1. The Socio-economic Transformations in the Predominantly Urban BMA

Socio-economic Factors	2011	2016	Change Rates
Population Density (people/kms ²)	4611	5005	8.54
In-migration (people/village)*	949	1248	31.51
Household in Primary Sector (%)	8.10	8.93	10.22
Household in Secondary Sector (%)	50.35	47.22	-6.22
Household in Tertiary Sector (%)	41.55	43.91	5.68
Elementary School graduates & below (%)	33.16	32.76	-1.20
Secondary School graduates (%)	26.84	27.38	2.02
High School graduates (%)	31.57	31.98	1.30
Tertiary Education graduates (%)	8.44	7.88	-6.59
Prosperous families (households/village) *	8155	18976	132.69
Average			17,79

**Significant at 95% confidence level*

Source: Analysis Results, 2020

Semi-Urban Area

Like the Predominantly Urban area, the socio-economic transformation in Semi-Urban shows the significant change occurring in the number of in-migration and the change in the number of prosperous families. Even though the number of in-migration is not as large as those in the Predominantly Urban, the migration in this area is the highest in all peri-urban typologies. This area becomes a destination for migrants. The socio-economic transformation data in the semi-urban area is presented in Table 1.

Table 2. The Socio-economic Transformations in the Semi-Urban of BMA

Socio-economic Factors	2011	2016	Change Rates
Population Density (people/kms2)	3123	3435	9.99
In-migration (people/village) *	663	1077	62.44
Household in the Primary Sector (%)	16.42	17.30	5.35
Household in the Secondary Sector (%)	40.92	42.79	4.56
Household in the Tertiary Sector (%)	42.66	39.91	-6.43
Elementary School graduates & below (%)	39.56	37.14	-6.12
Secondary School graduates (%)	29.11	31.47	8.10
High School graduates (%)	25.58	25.70	0.44
Tertiary Education graduates (%)	5.74	5.69	-0.87
Prosperous families (households/village) *	9939	18847	89.63
Average			16.71

*Significant at 95% confidence level

Source: Analysis Results, 2020

Potential Urban Area

Based on the analysis, the Potential Urban Area has four factors that significantly change, namely: the number of in-migration, the percentage of households in the primary sector, the percentage of secondary school graduates, and the number of prosperous families.

Table 3 shows the decline of the number of in-migration in this area, which might be correlated to the decline of tertiary and secondary sector economies. In terms of education, the increase in the number of secondary school graduates is in line with the decrease in the number of elementary school graduates. The socio-economic transformation data in potential urban are presented in Figure 3.

Table 3. The Socio-economic Transformations in the Potential Urban of BMA

Socio-economic Conditions	2011	2016	Change Rates
Population Density (people/kms2)	2195	2385	8.67
In-migration (people/village) *	1481	1024	-30.86
Household in the Primary Sector (%) *	28.38	35.74	25.96
Household in the Secondary Sector (%)	38.61	36.26	-6.09
Household in the Tertiary Sector (%)	33.02	28.00	-15.19
Elementary School graduates & below (%)	40.22	35.24	-12.38
Secondary School graduates (%) *	28.54	34.09	19.45
High School graduates (%)	25.37	24.98	-1.54
Tertiary Education graduates (%)	5.88	5.70	-3.06
Prosperous families (households/village) *	5542	9445	70.43
Average			5.54

*Significant at 95% confidence level

Source: Analysis Results, 2020

CONCLUSIONS

Based on the analysis of socio-economic transformations in the peri-urban Bandung Metropolitan Area, some conclusions are as follows:

- The rapid growth of the Bandung Metropolitan Area has resulted not only in spatial change but also in the transformation of socio-economic factors. The socio-economic transformation differs in each peri-urban typology. The study has proved that the

different characteristics of peri-urban typology and its proximity to the city center result in a high socio-economic transformation rate.

- It is statistically significant that the socio-economic transformations in all peri-urban areas are the number of in-migration and the number of prosperous families.
- In Predominantly Urban and Semi-Urban Areas, the number of prosperous families and the number of in-migration changes significantly. The changes in number of prosperous families in the Predominantly Urban is the largest compared to those in other areas. On the other hand, the number of in-migration in Semi-Urban is the largest, describing an attractive area for migrants. Unlike the other two regions, the Potential Urban area, which is the most rural characterized, has experienced more change significantly, i.e., the increase in out-migration, education quality, and a prosperous families.

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