

Mapping of Banten Province Population Quantity

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Abstract—Population aspects functionally form a unity of regional ecosystems, therefore information on population development is strategic information and is needed for planning development policies that are population-oriented and sustainable. Population problems, especially those related to increasing the quantity of population in Banten Province, have become one of the strategic issues recorded in the Banten Province Medium-Term Development Plan (RPJMD) for the period 2017-2022, another strategic issue regarding population growth in the RPJMD not yet increased use of Contraception Tools, Lack of new Family Planning Participants, Increased population migration between provinces and between regencies / cities residents of 5 years and above. The purpose of making population quantity mapping is to make a description of the data that has been obtained and display in the form of simple statistics so that people can more easily get a picture of the situation of the quantity of population in the Banten Province. The population quantity variables analyzed were Population Growth Rate (PGR), Population Density, Population Composition, Birth Rate, and Birth Rate by Age. Since the formation of Banten Province in 2000, in general all regions in Banten Province experienced a decrease in the amount of PGR. Exceptions occurred in South Tangerang City, the population increased by 51.22%, population density increased by 40%, the composition of the most dominant population was the age group 0-4 and 5-9 years, a significant change for Sex Ratio, reduction in birth rates and numerical parameters births in the 15-19 year age group received special attention because in this age group the proxy for prenatal early marriage at the age of adolescents in Banten Province.

Keywords: Mapping, Population Quantity

I. INTRODUCTION

Population is the happenings related to the amount, structure, development, distribution, mobility, deployment, quality and welfare conditions concerning the political, economic, social, cultural, religious and neighborhood residents. Aspects of the population is functionally mambentuk a whole ecosystem. therefore update the demographic development and strategic information is needed for planning policies pertaining to the population and sustainable development. Pertaining to the population significant development tailored to the potential development and condition of the existing population. Improved quality of population is positioned as an indicator outcome of all program development activities and the implementation of local government affairs. Therefore, it needs information about the demographic development in a sustainable manner that presents information so it can be studied for the benefit of development planning, priority selection indicative ceiling construction, the action plan of public service, and the development of institutional models of democracy.

Population Development is a condition associated with changes in demographic circumstances that can influence

and be influenced by the success of sustainable development. Indicators of success of development seen from the Human Development Index. Growth theory emphasizes the important role of government, especially in increasing HDI and encourages research and development to increase human productivity. The reality can be seen by investing in education will be able to improve the quality of human resources is shown by the increasing knowledge and skills of a person. The higher the person's level of education, the knowledge and expertise will increase, so will encourage increased produktivitas works.

Thoughts on the development of the population as well as various aspects of the interplay gives a phenomenon of how problems of the population to be decomposed into simpler aspects. The quantity of population is one aspect of the demographic parameters that can describe the success of development in Banten Province in addition to aspects of quality and mobility of the population.

II. LITERATURE REVIEW

2.1. Population Growth

Population growth is a state change in the population, both experienced the addition or subtraction within a certain time (Demography Institute FE UI, 2015) or it can also be said population growth is a dynamic equilibrium between the forces that add and forces that reduce the amount of population.

Population growth can be seen from the aspect of quantity and quality. Both these aspects are studied with respect to patterns, distribution, growth, and composition. The main variables, namely population growth fertility, mortality and migration are factors that affect the dynamics of these components directly. The birth rate, mortality and migration will affect and determine the number, age structure, sex composition, distribution and population density. From the aspect of quantity and quality of the population will affect development in various fields including social development, economic, cultural, environmental, legal, security and political.

2.2. Fertility

Fertility is a major component of population growth is increasing the number of residents. Indicators of fertility among others include:

1. Crude Birth Rate (Crude Birth Rate / CBR), the number of births per 1,000 inhabitants in mid-year;
2. Fertility Rate by Age (Age Specific Fertility Rate /ASFR), namely women at a certain age is the number of births to women of certain age per 1,000 women of the same age in the mid-period;

- Total Fertility Rate (Total Fertility Rate / TFR), which measures many children will be born to a cohort of women during their reproductive years.

2.3. Mortality

Mortality or death is the loss of signs of life permanently. Mortality is one of the main population of the three components that can influence population changes in addition to fertility and migration. Mortality data is indispensable, among others for the projected population for development planning in addition to the benefit of evaluation of programs of population policy. Size of death indicates a number or index that is used as a basis to determine the level of mortality rate of a population.

2.4. Mobility

Population mobility is the movement of the population, while the migration is the movement of the population with a view to settling on a place / area that goes beyond administrative boundaries of an area that is known as migration (Setiadi, 1999). Population migration will move to other areas beyond the minimal level administrative region II with the purpose tend to settle or a minimum period of 6 months, unlike the case with mobility. In this case the migration is part of the Population Mobility. For more details, Population Mobility can be divided into:

- Permanent Mobility / Migration, the movement of the population with a view to settling on a place / area that goes beyond administrative boundaries of an area that is known as migration.
- Mobility Non-Permanent, the movement of the population but is not intended to settle in the area of interest.
- Return movement of population mobility in the short term and tends to be repetitive.

III. METHOD

The method used in this research is quantitative method with descriptive spatial analysis techniques. Stages of the explanations may include data collection, data processing, as well as the determination of variable digital map overlays. Limitation of the study area or unit of analysis in this study was the District. There are four (4) Districts and four cities in the province of Banten.

Unit Analysis is the area expected by researchers to learn and then drawn conclusions. In a study conducted in the province of Banten, unit of analysis is District / city. Eight (8) Districts / municipalities in the province of Banten

Pandeglang, Lebak, Tangerang, Serang District, and Cilegon, Serang, Tangerang and South Tangerang City.

Activity data mapping based on the results of data classification variables that include classifying the population growth, population density and composition of the population into three categories, namely Category High, Medium and Low with units of analysis of Districts / cities in Banten province. This classification using statistical formula, namely: number of Pattern Classification Mapping Population Growth, Density and Composition of Population conducted for 2000 and 2017.

The next step is overlay a ntara Map Population Growth Rate, Population Density and Population composition to know the trend of the development pattern of the quantity of population in Banten province in the period 2000-2017 year.

IV. DISCUSSION

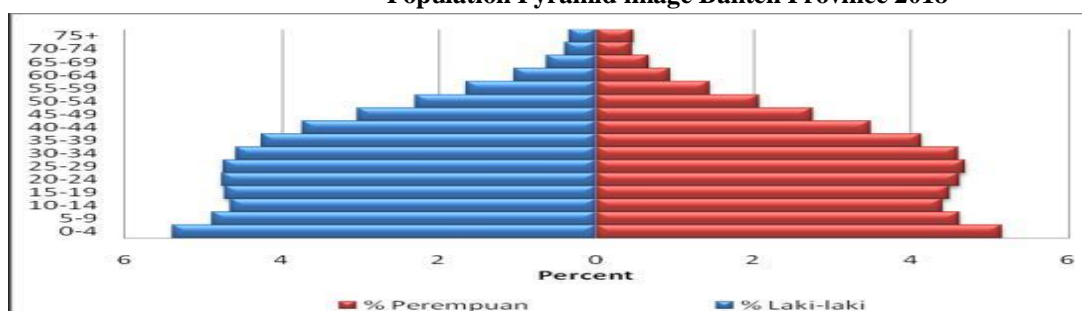
Development pertaining to the population is the most suitable concept be applied in relation to the issues raised in both the local and regional scope for involving residents as well as the subject object under construction. The development concept is to trace the development strategy of a 'bottom-up planning'. Under this concept, the main purpose of the whole development process is more evenly the welfare of the population rather than concerned with the rate of economic growth. Because the bottom-up approach seeks to optimize the deployment of their resources and potential to the entire region and build in accordance with the potential and specific problems faced by each region.

Population problems mainly related to the increased quantity of population in Banten Province become one of the strategic Issues recorded in the Medium Term Development Plan (RPJMD) Banten Province 2017-2022 period, more strategic Issues on population listed in RPJMD is still high population growth some adalah. belum contributing factor increasing use of Contraceptives / CPR, lack of new family planning participants, the increasing population migration among provinces and districts / cities population 5 years and over. In addition, several other population issues is still high Pre-prosperous family, is still lack of birth certificate, lack of marriage certificate, yet optimal ownership of e-ID card.

4.1 Mapping Population Quantity in Banten

As mentioned earlier, the population of the province of Banten latest data recorded as many as 12. 448 160 inhabitants consisting of 6,344,428 inhabitants of the male and female population of 6,103,732 inhabitants. Banten Province has become the fifth province in Indonesia, which has the highest population after West Java (48.0 million), East Java (39.3 million), Central Java (34.3 million) and North Sumatra (14.3 million).

FIGURE 1
Population Pyramid image Banten Province 2018



Becoming one of the supporting factors Demographic Bonus events taking place in the province of Banten. For amplify this phenomenon will appear Population Pyramid image Banten Province in detail shows the composition of the population by age and gender to clarify the demographic situation in the province of Banten.

Demographic Bonus is a phenomenon, which is very advantageous population structure of the building. This is because the number of productive age population is very large, while the proportion of young people is getting smaller and the proportion of elderly population has not been much. Demographic Bonus begin enjoyed if the numbers continue to decline dependency burden to be under 50. Demographic Bonus can not necessarily be used in Banten Province. To really get to enjoy it, the quality of Human Resources Banten must be continuously improved. In addition, the availability of jobs should also be increased, in order to accommodate the number of people of productive age. After a phase of demographic bonus, the aging population (aging population) will be an important issue in the future.

Aging population is a demographic phenomenon, which occurs when the median age of the population increases due to rising life expectancy and declining fertility rates or. In addition to median age.

populationaging can also be measured by the proportion of the population aged 65 years and over. Called aging, if the rates are already above 7 percent. Banten alone is projected to begin to enter the era of aging of the population between 2030 and 2035. This resulted in the necessity to provide a variety of support facilities and increased pension coverage for the elderly this. When the Demographic Bonus can enjoy it in Banten province will experience what is called the second demographic bonus. This second Demographic Bonus is a condition, in which the proportion of the elderly population is increasing but is still productive, so it is still able to contribute to the regional economy.

4.2.Mapping of Population Growth in Banten

Population growth is the change in the number of people, both experienced the addition or subtraction within a certain time One technique used to determine the state of the population (according to age and sex composition) in the future is the Population Projection. Population projections are not forecasts, but a scientific calculation based on the assumption of demographic components above are: births, deaths, and migration (migration). Learn more about Population Growth Rate (PGR) in Banten Province can be seen in the table below :

Serang	-	1,99	1,99
Tangerang Selatan	-	3,44	3,44
Provinsi Banten	3,21	2,20	-1,01

Source; Banten in Figures 2001 and 2018, BPS Banten

Population Growth Rate (PGR) in Banten Province recorded have gaps in both North and South America for a period in the early days of Banten province to the latest data in 2017. Banten Northern Territory represented South Tangerang City has the highest PGR is equal 3.44 in the year 2017, while in 2000 the highest PGR is the Tangerang District 4.35. At that time, South Tangerang City is still in an administrative entity in Tangerang District. While the southern part represented Banten which is Pandeglang decreased PGR for each year and recent data only shows the range of 0.62 among the lowest in the province of Banten. This is not only due to the different geographical location, given South Tangerang City are adjacent to the State Capital is also characteristic of the area in the southern part of the province of Banten is more characterized by the dominance of rural agricultural land use.

However, if the initial data analysis PGR see that since the formation of the Banten province in 2000, then in general all regions in Banten Province has decreased the amount of PGR. Increased public education, awareness regulate birth spacing, as well as changes in lifestyle make population growth tends to slow down. Exceptions occurred in South Tangerang City which is a relatively young region that directly led to the highest PGR in Banten Province, the same thing also happened in the city of Serang. Interesting phenomenon is a very significant decrease in PGR actually occurred in the central and western part of the District of Serang Banten Province which decreased significantly PGR from 2.98 to 0.84 and Cilegon from 3.21 to 1.75.

In connection with population growth, the population in Indonesia in 2018. According to projections by Bappenas is as much as 265 million, with 133.17 million males and 131.88 million women. As for the province of Banten total population in 2017 was 12 448 160 inhabitants consisting of 6,344,428 inhabitants of the male and female population of 6,103,732 inhabitants. The population density in Banten Province is 4.70% of the total population in Indonesia. From the data obtained from 2012 to 2016 obtained by the trend of population increase. The total population of Banten from 2012 to 2016 showed an increase of 0.088%. The largest increase occurred from 2013 to 2014 amounted to 2.34%.

The purpose of making the mapping of population growth is to create a description of the data have been obtained and displays it in simple statistical form so that people can more easily get an overview of the situation of the population growth in the province of Banten. First, note the number of classes to be made and to determine how long the interval of each class. This helps in distributing the values that exist in the data. The formula to determine the number of classes is as follows (Susanti, 2010).

$$K = 1 + 3.3 \log N \dots\dots\dots(1)$$

The number of classes is obtained based on the formula

(1) with the amount of data (N) 8 Districts / cities is as follows:

TABEL 1
Developments Table Population Growth Rate (PGR) in Banten Province Periods 2000-2017

Kabupaten/Kota	PGR Periods	PGR Periods	PGR Periods
	1990-2000	2010-2017	2000-2017
Pandeglang	1,71	0,62	-1,09
Lebak	1,72	0,91	-0,81
Tangerang	4,35	3,32	-1,03
Serang	2,98	0,84	-2,14
Tangerang	3,83	2,43	-1,4
Cilegon	3,21	1,75	-1,46

$$K = 1 + 3.3 \log N = 1 + 3.3 \log 8 = 1 + 3.3 (0.903) = 1 + 2.98 = 3.98 \approx 4 \text{ class}$$

Number of classes of the data of this deployment is 3.98 and rounded to four classes. Having obtained the necessary number of classes in each class are calculated interval

Grade intervals were calculated using the following formula (Susanti, 2010):

$$\frac{\text{Highest Data} - \text{Lowest Data}}{\text{Number of Classes}} \quad \dots\dots\dots (2)$$

Number of Classes

Grade intervals in this study is calculated by taking the data growth rate of population growth per District / city in Banten Province in 2000-2017. The smallest data value for the development of the population growth rate is in the District of Serang, namely - 2.14 and largest data value growth rate of population growth is in Lebak is - 0.81. Interval class to class number of developments population growth rate based on the formula 2 is as follows:

TABLE 2
Distribution of Population Growth Rate Class Developments In Banten Province Years 2000 -2017

Class	Population Growth	District/City
I	-2,14 until -1,81	Serang District
II	-1,8 until -1,47	-
III	-1,46 until - 1,13	Cilegon, Tangerang City
IV	≥ -1,12	Tangerang, Pandeglang, and Lebak District
V	No Data	South Tangerang and Serang City

Source: Data Processing, 2019

From the table above shows, the whole District town in Banten Province Population Growth Rate has decreased since the formation of Banten Province so that all PGR is negative. Pandeglang and Lebak which has been recorded as a region has the lowest population growth rate in Banten Province, when compared with the development of its PGR since Banten Province was formed in 2000 was among the most high-PGR conjunction with Tangerang District. Serang District is the lowest region the PGR development when viewed from since the formation of Banten Province.

4.3.Mapping of Population Density in Banten

The population density is the ratio between the number of residents in a region inhabited (Ida Bagoes Mantra, 2007). Size commonly used is the number of inhabitants per 1 km² or every 1 square miles. Generally speaking population is too dense will give a great pressure on the environment in line with the emergence of the problem of settlement expansion, the increasing need for jobs, education, food, health care and declining quality itself. This is also reflected in Banten province in which each district / city shows the pattern of population distribution is uneven between regions. Districts / cities which tend to be situated in the northern part namely Tangerang Banten Kingdom (Tangerang District, Tangerang and South Tangerang City) has a population

with many solid status and region, contrary to areas located in southern Banten such as Pandeglang and Lebak District which have low intensity population densities.

The population density in Banten Province in 2000 reached 920 inhabitants / km² with an average number of residents per household 4. Population Density in 8 districts / cities are quite diverse with the highest population density is located in Tangerang with a population density of 7,206 inhabitants / km² and lowest in Lebak district of 360 inhabitants / km². In connection with the density of population per district / city in Banten Province.

From the table above recorded overcrowding in Banten Province reached 1,288 inhabitants / km² with an average number of residents per household 4. Population Density in 8 districts / cities are quite diverse with the highest population density is located in Tangerang with a density of 13 902 inhabitants / km², and the lowest in Lebak district of 376 inhabitants / km².

From the table above shows that the residents of Tangerang Kingdom (Tangerang, Kota Tangerang and South Tangerang City) reached 59.20% increase from the previous year which is 58.72% of the total population of Banten whereas more than 50% of the area of Banten Province is located in Banten South (Pandeglang and Lebak). The population density in the region of North and South Banten look significantly different, the North region (Kota Tangerang) population density is 36.97 times more than in the area of South Banten (Lebak).

TABLE 3
Percentage and Population Density by District / City in Banten Province Year 2017 Population Density Percentage Increase in Banten years 2000-2017

District / City	Percentage of Population Density	Population Density (people / km ²)	Percentage Increase Year Population Density 2000-2017
Pandeglang	9,68	439	19,29
Lebak	10,35	376	4,44
Tangerang	28,80	3.343	33,45
Serang	12,00	861	-10,22
Tangerang	17,19	13.902	92,92
Cilegon	3,41	2.422	44,08
Serang	5,36	2.499	0,00
Tangerang Selatan	13,21	11.175	0,00
Provinsi Banten	100,00	1.288	40,00

Source: Data Processing, 2019

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Interesting phenomenon saw overcrowding in Banten Province in 2000 and 2017 are generally overcrowding in Banten Province increased by 40%, Tangerang City is a region whose population almost suffered doubling time since the formation of Banten Province until now the area becomes congested almost doubled or more precisely a solid increase of 92.92%. Lebak among the most slightly increase the population density increased 4.44% or only 16 people to its population from 2000 to 2017. The Serang District was the only region which decreased the population density caused - 10.22%. changes in the status of the territory, while on the contrary, South Tangerang relatively young directly occupy the second most populous region in the province of Banten.

Grade intervals in this study was calculated by taking the percentage increase in the data density of population per district / city in Banten Province in 2000-2017. The smallest data values to the population density is in Serang District is - 10.22 and the largest data value percentage increase in density of population in 2000-2017 was in the city of Tangerang, 92.92 , Interval class to class a population based formula 2 is as follows:

$$92.92 - (-10.22) / 4 = 25.79$$

Frequency distribution table for the population density is obtained based on calculations by the number of classes (K) is 4 class and class interval 25.79 percentage increase population density in each class are shown in the table below:

TABLE 4
Distribution Class Percent Increase Population Density Banten Province Years 2000-2017

Class	Population Density	District/City
I	-10,22 – 15,57	Lebak and Serang Districts
II	15,58 – 41,37	Pandeglang and Tangerang Districts
III	41,38 – 67,17	Cilegon City
IV	≥ 67,18	Tangerang City
	Formed Yet	South Tangerang and Serang City

Shows that there is a significant gap with regard to overcrowding in Banten Province, besides Tangerang and South Tangerang City identified very solid, the other region except Lebak identified Simply Solid far below the city located in the northern province of Banten. The above data also illustrate areas that have high population densities occur in urban areas (Tangerang and South Tangerang City) is positively correlated with many of the migrants who come to the towns and cities. The impact of population density of concern is the decline in the quality of the population (education, health, income and employment). With a low education will enter the work in the informal sector with low income. With low income they are unable to meet the needs of both health, food and shelter, this makes it difficult for them to achieve a prosperous or quality life.

4.4. Mapping Composition of Population in Banten

The composition of the resident population describes the arrangement made by grouping people according to the same characteristics (Rush, 1983). The composition of the population is one of the tools used to describe the conditions that exist in society. The composition of the population that will be addressed in this study is the composition of the population by age and sex.

The composition of the population by age and sex is one of the main characteristics of the population. From the data of population by age and sex can be known population of productive age, school age, the workforce, the dependency burden and the ratio of sex / sex ratio. A region is said to be young any structure when the population group aged below 15 years of more than 40%, while the size of the population aged 65 years and less than 10%. There is an interesting phenomenon that can be drawn from the population by age group and gender in Banten Province, according to the table above shows that the most dominant

population of the age group 0-4 years amounted to 1.22306 million inhabitants followed by the age group 5-9 years 1,206,757 inhabitants and the age group of 25-29 years 1,114,052 inhabitants.

While in the 45-49 age group of women occurred depopulation significant, means women in this age group in need of attention, especially in the health sector. As for the male population a significant decline in population occurred in the age group 55-59 years. Elderly aged 64 years and over who are predominantly female can describe this higher life expectancy (AHH) the female population in the province of Banten. 0-14 years age group population amounted to 3,502,555 inhabitants (28.14%) down from 2016 by (28.36%), the population of the age group 15-64 years amounted to 8,531,161 inhabitants (68.53%) rose slightly of 2016 which (68.43%) and the age of the population over 65 years there are as many as 414 444 people (3.33%) rise of 2016 which (3.21%). From the picture above shows there is a shift in the population age group although slightly but steadily, especially them addition of the elderly population is one of the main signs of domination began shifting toward aging population of productive age population (the elderly).

To see the composition of the population by gender in Banten Province compared to the population of male and female population so that the resulting Sex Ratio. The

following table illustrates the composition of the population per kabupaten / cities for 2000 and 2017. Population Composition, Birth Rate, and Birth Rate by Age. Since the formation of Banten Province in 2000, in general all regions in Banten Province experienced a decrease in the amount of PGR.

TABLE 5
Composition Residents and Sex Ratio District / Cities in Banten Provinces Periods 2000 and 2017

District /City	Sex Ratio Year 2000	Sex Ratio Year 2017
Pandeglang	105,26	104,30
Lebak	106,33	105,01
Tangerang	99,77	104,69
Serang	100,50	102,80
Tangerang	99,53	104,17
Cilegon	104,46	104,28
Serang	-	105,11
Tangerang Selatan	-	101,46
Provinsi Banten	102,64	103,94

Source: Banten in Figures, 2001 and 2018. BPS Banten Province

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