

Analysis of Factors Influencing Population Growth in East Banjarmasin District

Rahmadana Ade Novitriyani*, Sidharta Adyatma, Parida Angriani, Deasy Arisanty, Eva Alviawati

Geography Education Study Program, Universitas Lambung Mangkurat

*rahmanvtrynii@gmail.com

Abstract

The main population problem in Indonesia is rapid population growth. Although the rate of population growth has slowed in recent decades, the large population still influences various development sectors, including education, health, and employment. East Banjarmasin District, migration, birth and death rates are the main factors causing high population growth. Rapid population growth in large cities requires planning and management to ensure urban sustainability. This research aims to determine the factors that influence population growth in East Banjarmasin District using a statistical descriptive approach with multiple linear regression analysis methods using secondary data on population growth in East Banjarmasin District from 2018 to 2022. The research method used in the research namely statistics and document study. This research uses secondary data, obtained through related agencies such as the Banjarmasin City Central Statistics Agency (BPS), Banjarmasin City Population Service, and Banjarmasin City Health Service so there is no population and sample. Data processing techniques in this research were carried out using data editing, data transformation (coding), data tabulation, multiple linear regression, T test, and F test. Research results The research results show that the crude birth rate, crude death rate and incoming migration has a strong influence on population growth in East Banjarmasin District. Partially, the influence of the crude birth rate is the most significant main factor influencing population growth in East Banjarmasin District

Keywords: Birth Rate, Death Rate, Migration

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*Corresponding Author

1. Introduction

Indonesia is a rapidly developing country with the fourth largest population in the world. As a developing nation, Indonesia faces various challenges in its efforts to improve the welfare of its people. Despite making significant progress in the fields of economy, education, and health, there are still a number of issues that need to be addressed to achieve sustainable development. One of the primary population issues in Indonesia is its

rapid population growth. (Sutikno, 2020)

Major cities worldwide are experiencing rapid and sustained population growth. Factors such as urbanization, internal migration, increased birth rates, and socio-economic changes contribute to this growth. The rapid population growth in major cities leads to various challenges that need to be addressed. High population growth results in increased demand for housing. Limited availability of land and rising property prices can make it difficult for a significant portion of the population to access affordable housing. (Winarno, 2018)

In general, the phenomenon of high population growth in urban areas like East Banjarmasin has become a focal point in demographic studies and regional planning. High population growth can have significant impacts on various aspects of community life, such as land availability, infrastructure, public services, and the environment (Pane et al., 2020). However, when examining the specific conditions of East Banjarmasin, despite its small area of 23.50 Km², the population continues to increase significantly. This indicates the presence of specific factors influencing population growth in this district, which need to be identified and further analyzed.

Banjarmasin is the capital city of South Kalimantan Province, Indonesia. Situated on the island of Kalimantan, the city is renowned for its intricate network of rivers and canals. Like other major cities, Banjarmasin faces population issues typical in Indonesia, including rapid population growth, traffic congestion, and increased demand for healthcare and infrastructure services.

The population data obtained from the Central Statistics Agency (Badan Pusat Statistik) of Banjarmasin calculates the population growth percentage by subtracting the population of the observed year from the population of the previous year. This helps determine the percentage growth of the population in the observed year. In East Banjarmasin District, which is one of the districts in Banjarmasin, there was an increase of 1,369 people in 2018. This rapid population growth is an important issue to consider, given the limited space available in the district.

The increase in population in East Banjarmasin District, upon closer observation, is influenced by several natural demographic factors such as: a) Influx migration can be caused by various factors, including seeking better economic opportunities, a desire to reunite with family already residing in the area, refugees or asylum seekers seeking protection from conflict or persecution in their home country, as well as political, social, or environmental factors (Putra et al., 2021). Uncontrolled migration flows and underdeveloped local economies in a region can lead to various issues, such as the emergence of slums (slum area) (Prayojana et al., 2020). b) Birth rate is one of the key demographic indicators that provides insight into the reproduction of a population and its potential growth. The birth rate reflects how quickly a population can grow through natural reproduction (Sari & Yudiana, 2019). c) The mortality rate or mortality factor reflects the number of deaths relative to the population size within the analyzed population. There was a significant decrease in population numbers in 2021 due to the COVID-19 outbreak, which affected major cities in Indonesia, including Banjarmasin. However, over time, population growth has resumed, particularly in the East Banjarmasin District (Suhendra et al., 2022).

The combination of three main factors—migration, birth rate, and mortality—in East Banjarmasin District has led to high population growth. Rapid population growth in major cities requires planning and management to ensure urban sustainability. Appropriate policies regarding urban planning, infrastructure, housing, and public services can help address issues related to population growth and enhance the quality of life for city residents.

2. Method

The approach used is quantitative descriptive statistics. Descriptive statistics are commonly employed by researchers to provide information about the characteristics of research variables and to support the studied variables (Wahyuni, 2020). The research methods employed include statistical analysis and document studies.

This research utilizes secondary data obtained from relevant agencies, therefore there is no defined population or sample. The study focuses on two variables: the independent variables include birth rate, mortality rate, and migration, while the dependent variable is population growth in East Banjarmasin District. The variables and their indicators can be viewed in the table.

Table 1. Variables and indicators

No	Demography Variable	Subvariable
1	Natality	Crude Birth Rate (CBR)
2	Mortality	Crude Death Rate (CDR)
3	Migration	In-Migration Rate
		Out-Migration Rate

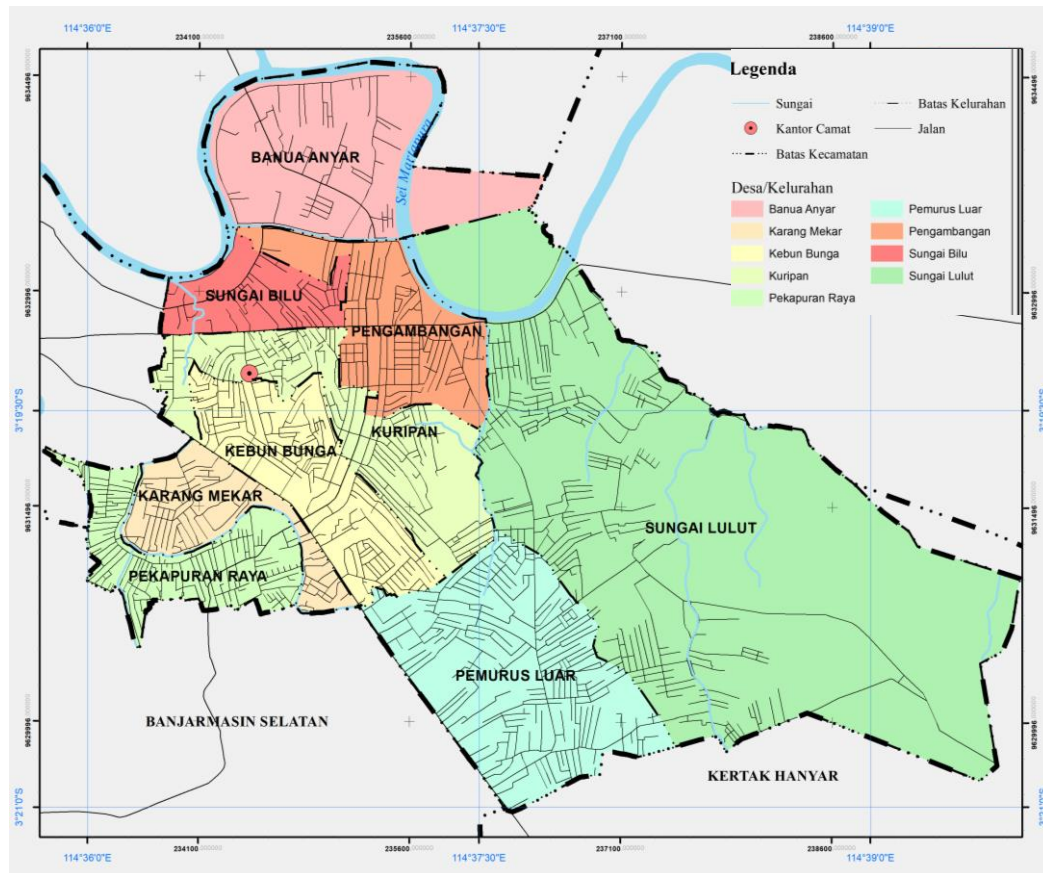


Figure 1. Research Location

Secondary data used in this research is data obtained from relevant government agencies. Data from the Central Bureau of Statistics (BPS) of Banjarmasin City consists of the Population Growth and Total Population of East Banjarmasin Subdistrict. Data from the Population Office of Banjarmasin City, i.e., in-migration and out-migration in East Banjarmasin Subdistrict. Data on birth and death rates in East Banjarmasin Subdistrict from the Banjarmasin City Health Office.

Data processing techniques in this study include data editing, data coding (transformation), and data tabulation. Testing using multiple linear regression is used to determine the effect of more than one independent variable on the dependent variable. This study shows the influence of death, birth, and migration variables on population growth. Multiple linear regression testing was conducted with the help of the IBM SPSS Statistic application. Furthermore, the T-test was conducted to test the effect of each independent variable in this study on the dependent variable. Using the T-test shows the influence of the variables of death, birth, and in-migration individually on population growth. In multiple linear regression analysis, the F test is used to test whether at least one predictor variable significantly influences the dependent variable. The F test determines the overall effect of the three independent variables on the dependent variable. Using the F test, the overall significance of the 3 independent variables simultaneously on the dependent variable can be determined.

3. Result and Discussion

A. Result

Demographic data consists of information related to the population of a specific region or group. This data encompasses various aspects such as population size, age composition, birth and death rates, migration, and other socio-economic factors. The analysis of demographic data is crucial for understanding trends, patterns, and characteristics of a population, which are fundamental for planning and decision-making in fields such as healthcare, education, social policy, and economic development.

Demographic data for East Banjarmasin District can be obtained from the Central Statistics Agency (Badan Pusat Statistik) of Banjarmasin or the Population and Civil Registration Office of Banjarmasin. Below is the data obtained from the Population and Civil Registration Office of Banjarmasin for the years 2018-2022.

Table 2. The variables are Number of Births, Number of Deaths, and Number of Inbound Migrations in East Banjarmasin District.

No	Years	Number of births	Number of deaths	Number of migrations	Number of Population at the Beginning of the Year	Number of Population at the end of the Year	Growth
1	2018	2.323	1.279	1.746	121.633	124.566	2.933
2	2019	2.355	1.528	2.183	123.199	125.935	2.736
3	2020	2.151	1.527	985	123.461	118.389	-5.072
4	2021	2.067	1.704	4.091	123.678	119.141	-4.537
5	2022	1.956	706	2.195	124.409	119.847	-4.562

Source: Banjarmasin City Population and Civil Registration Service.

The analysis of the impact of crude birth rate, crude death rate, and inbound migration on population growth in East Banjarmasin District was conducted using multiple linear regression analysis. The calculations for this analysis were performed using SPSS 25 software. The results of the analysis can be viewed in the table.

Table 3. The results of the multiple linear regression analysis

Coefficients ^a							
Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	-63960,243	1561,781		-40,953	0,016		
CBR (X1)	31,059	0,765	1,267	40,624	0,016	0,586	1,708
CDR (X2)	-6,056	0,327	-0,570	-18,506	0,034	0,601	1,663
In-migration (X3)	1,347	0,104	0,372	12,900	0,049	0,684	1,463

The detailed explanation of the results from the regression analysis is as follows:

- 1) The constant value (bo) = -63960,243, This indicates that if there are no changes in birth, death, and inbound migration rates in East Banjarmasin District, the population growth will decrease by -63.2%. In other words, if the population growth in East Banjarmasin District is 1.000 people, without any changes in birth, death, and inbound migration rates, the population growth will decrease by 632 individuals.
- 2) The regression coefficient for crude birth rate (X1) is 31,059, which means that if the birth rate increases by 1%, the population in East Banjarmasin District will increase by 31%. Therefore, if the population growth in East Banjarmasin District is 1.000 people, and there is a 1% increase in the birth rate, the population will increase by 31% or 310 individuals.
- 3) The regression coefficient for crude death rate (X2) of -6,056 means that if the death rate decreases by 1%, the population in East Banjarmasin District will increase by 6,162%. Therefore, if the population growth in East Banjarmasin District is 1.000 people, and there is a 1% decrease in the death rate, the population will increase by 6.1% or 61 individuals.
- 4) The regression coefficient for inbound migration (X3) of 1,347 means that if inbound migration increases by 1%, the population in East Banjarmasin District will increase by 1,347%. Therefore, if the population growth in East Banjarmasin District is 1.000 people, and there is a 1% increase in inbound migration, the population will increase by 1,3% or 13 individuals.

b. The t-test analysis is used to evaluate the partial effects of crude birth rate, crude death rate, and inbound migration on population growth. This is done by examining the significance level (p-value) where if the significance level (p-value) < 0.05, the null hypothesis (H0) is rejected and the alternative hypothesis (Ha) is accepted. The t-test results provide insights into the influence of these variables. The results of the t-test can be seen in the Table

Table 4. The results of the partial t-test

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	-63960,243	1561,781		-40,953	0,016
CBR (X1)	31,059	0,765	1,267	40,624	0,016
CDR (X2)	-6,056	0,327	-0,570	-18,506	0,034
In-migration (X3)	1,347	0,104	0,372	12,900	0,049

The partial effect of birth rate (X1) on population growth (Y) in East Banjarmasin District obtained a partial t-test value of $0,016 < 0,05$, thus rejecting Ho and accepting Ha. This indicates that the crude birth rate significantly influences population growth in East Banjarmasin District.

The impact of crude death rate on population growth in East Banjarmasin District obtained a partial t-test value of $0,034 < 0,05$, hence rejecting Ho and accepting Ha. This

means that crude death rate significantly influences population growth in East Banjarmasin District. The influence of inbound migration on population growth in East Banjarmasin District obtained a partial t-test value of $0,049 < 0,05$, hence rejecting H_0 and accepting H_a . This indicates that inbound migration significantly affects population growth in East Banjarmasin District.

Based on the partial t-test results above, it can be concluded that all three variables used in the study, namely Birth Rate (X1), Death Rate (X2), and Inbound Migration (X3), significantly influence population growth (Y) in East Banjarmasin District. Analysis of the F-test is a simultaneous testing of coefficients to ensure that all three independent variables used in the regression model collectively have a significant influence on the dependent variable. The results of the F-test can be observed in Table 4.10

Table 5. The results of the F-test

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	68713626,402	3	22904542,134	584,974	,030 ^b
	Residual	39154,798	1	39154,798		
	Total	68752781,200	4			
a. Dependent Variable: Pertumbuhan Penduduk						
b. Predictors: (Constant), INMIG(X3), CDR(X2), CBR(X1)						

The F-test was conducted by examining the significant F-value, which is $0,030 < 0,05$. Therefore, H_0 is rejected and H_a is accepted. This indicates that the variables of crude birth rate (X1), crude death rate (X2), and inbound migration (X3) collectively have an influence on population growth in East Banjarmasin District. The variable that most significantly influences population growth in East Banjarmasin District is the crude birth rate (X1), as it has the highest regression coefficient compared to the variables of crude death rate (X2) and inbound migration (X3).

B. Discussion

Population growth refers to the change in the number of inhabitants in a specific area over a defined period. Population growth can be measured using percentages or annual growth rates. The variation in the number of individuals residing in an area, whether through births, deaths, migration, or a combination of these factors, serves as a guideline for understanding population growth. According to research by Pancasasti R, 2018 population growth is a dynamic balance between forces that increase and decrease the population count. It is continuously influenced by the number of births (which increase the population) and simultaneously reduced by the number of deaths occurring across all age groups.

Population growth is influenced by various factors, including economic factors such as income levels, job opportunities, and availability of economic resources; social and cultural factors such as family norms, education, and religion; as well as government policies related to population, health, and education. Other factors that affect population include:

1. Natality

Natality (birth) is one of the components of population growth that increases the population count. Natality refers to the capability of giving birth and producing offspring. Birth rate in demographic terms encompasses several measures, including crude birth rate, general fertility rate, age-specific fertility rate, total fertility rate, live births, and sex ratio at birth..

The crude birth rate in East Banjarmasin District is one of the factors studied in this research. Based on the collected data, the crude birth rate for East Banjarmasin District in 2018 was 2,323 births, while the crude death rate was 1,279 deaths. From this data, it is evident that the birth rate is higher than the death rate, indicating that the population will increase and is not affected by the number of deaths. This aligns with research by Trisiana, 2022 which states that the higher the birth rate, the higher the population growth.



Figure 2. Integrated Service Post (Posyandu) Bina Sejahtera 2, East Banjarmasin District



Figure 3. Sungai Bilu Community Health Center (Puskesmas), East Banjarmasin District

Birth rate plays a crucial role in studying population dynamics and demographic trends. High birth rates can be attributed to a lack of public knowledge about contraceptives and societal beliefs, such as the notion that more children bring more blessings, as stated in the research by Fuadi & Irdalisa, 2020 One of the factors contributing to increased birth rates is the difficulty in accessing healthcare services to obtain contraceptives.

2. Mortality

Mortality, also known as death rate, is a factor that can decrease population size. Death rate serves as an indicator of public health; when public health is well-maintained, life expectancy increases and death rates decline. Measures of mortality are similar to those of birth rates, but they focus more on death-related issues such as crude death rate, age-specific death rate, infant mortality rate, neonatal mortality rate, child mortality rate, and under-five mortality rate.

Mortality factors also affect population growth, with mortality being a demographic component that reduces population size. Death rates typically vary by age, gender, and social conditions of the population. The death rate in a region is often associated with its socio-economic development.

Crude death rate in East Banjarmasin District is lower compared to the birth rate. This results in an increase in the young population in East Banjarmasin District. This finding is consistent with the research by Purba et al., 2023 which indicates that higher death rates lead to lower population growth, and conversely, lower death rates lead to higher population growth. This is also supported by Astawa & Sarmita, 2018 research that the public health services in a country, both in terms of quantity and quality, are determined by the death rate. The death rate, also known as mortality rate, is a demographic measure that reflects the number of deaths in a population during a specific period of time.

3. Migration

The income disparity between rural and urban areas, along with economic opportunity inequality, has driven individuals to seek employment in cities where income tends to be higher. While urban areas are expected to have higher incomes compared to rural areas, economic development that focused more on urban areas and less on agriculture and rural sectors in the 1950s and 1960s created economic imbalances. This has resulted in conditions and price distortions that hinder job growth in rural areas.

Related to migration, there is a migration flow between rural and urban areas. The migration rate from rural to urban areas can continue to exceed the rate of migration into rural areas. This phenomenon is based on significant differences in income expectations, where migrants move to cities to seek higher income levels. Therefore, the increasing unemployment rate in urban areas is an inevitable outcome of severe economic disparities between urban and rural areas, a disparity found in many developing countries.

In-migration is a phenomenon where job seekers move to different regions in search of higher-paying employment opportunities. This term encompasses the availability of jobs and employment prospects within an economy. The rapid increase in population and the workforce's participation in economic activities have led to general issues of labor surplus. One of the primary factors contributing to in-migration is the low income and productivity across various economic sectors in a region. Efforts to expand in-migration and distribute development outcomes across different regions can promote broader in-migration, both directly and indirectly. Increased productive in-migration can also enhance overall migration by equalizing incomes and increasing community participation in development. One population growth model focuses on job-seeking, emphasizing the significant role of in-migration in determining population growth in specific areas.

East Banjarmasin District is one of the districts in the city of Banjarmasin with relatively low population density compared to other districts in the city. The high population density in other districts of Banjarmasin prompts residents and migrants to prefer other districts, including East Banjarmasin District. Its location on the outskirts of

Banjarmasin and easier access out of the city make East Banjarmasin District a destination for migrants from rural areas or other cities seeking job opportunities.

Increasing inward migration is one of the factors contributing to higher population growth in urban areas. This is consistent with research by Hasanah et al., 2021 which reveals that inward migration not only affects population growth but also increases unemployment rates in destination areas. This finding is also supported by Zulfikar, 2019 who indicates that inward migration can occur at various scales, ranging from individual to group or even mass migration. Reasons behind inward migration can vary significantly, including economic, social, political, environmental, and other factors. Some reasons for inward migration include better job opportunities, seeking education or training, family reunification, international protection, as well as political stability or security.

4. Conclusion

The results of data analysis and statistical testing indicate that the crude birth rate, crude death rate, and inward migration significantly influence population growth in East Banjarmasin District. The high birth rate is attributed to a lack of public knowledge about contraceptives and the cultural belief that "more children bring more blessings." The low crude death rate compared to the birth rate contributes to the increase in the young population in East Banjarmasin District. Increasing inward migration is one of the factors driving higher population growth in urban areas.

Findings in the field show that the birth and death rates are relatively high in East Banjarmasin District. Therefore, there needs to be action from community health centers and Integrated Service Posts (Posyandu) for pregnancy-related counseling for pregnant women; apart from that, there is also a need for counseling related to the Family Planning program to increase the birth rate in Banjarmasin District East can be controlled. Apart from that, improvements to health facilities and health insurance for the population must be improved to be evenly distributed.

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