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Exploring The Disparity of Public Facilities in The Central Java Province

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Abstract

The significant difference between the number of public facilities in regencies/cities and the number of public facilities in Central Java Province, which is feared to result in high inequality, is the focus of this study. The objective of this research is to determine the level of inequality in public facilities and the factors that influence the inequality of public facilities in Central Java Province. Secondary data is utilized and analyzed using the Modified Williamson Index approach and Multiple Regression Analysis. The variables employed include population growth rate, transfer income, and the Human Development Index (HDI). The analysis of the Modified Williamson Index reveals an inequality level of public facilities in Central Java Province of 0.21. The highest level of inequality in public facilities is found in Cilacap Regency, Boyolali Regency, and Kebumen Regency. The factors influencing the inequality of public facilities include the significant variable of transfer income in relation to the level of inequality in public facilities. However, the variables of population growth rate and the Human Development Index (HDI) are not significant factors in relation to the inequality of public facilities.

Keywords: *Public Facilities; Inequality; Modified Williamson Index.*
JEL Classification: R53, R11, D63

INTRODUCTION

The unevenness in development in each region will lead to inequality and foster social jealousy among regions (Aprianoor & Muktiali, 2015). The differences in natural resources and demographic conditions result in each region having varying capabilities in carrying out the development process (Siara, 2021). One indicator to determine inequality in a region is by looking at the number of public facilities. The differences in the number of public facilities indicate varying growth in each area (Wontiana & Sunarto, 2018). Public facilities are physical infrastructure that play a crucial role in supporting social and economic activities. Therefore, the uneven distribution of public facilities in each district/region will result in uneven economic growth across regions (Wontiana & Sunarto, 2018). According to (Bisnis.com, 2022) Finance Minister Sri Mulyani stated that the inequality in public facilities across various regions significantly affects the

poverty level of the community. Regions with poor public facilities can hinder poverty reduction as the community lives in less than ideal conditions. Healthcare facilities are the most fundamental need to provide a normal quality of life for the community. However, rural areas face difficulties in accessing public facilities, particularly medical care, due to the high costs associated with it, which poses a challenge for the impoverished population to obtain such services (Yin et al., 2018).

The inequality trend in Indonesia is continuously increasing, primarily due to the fact that a significant portion of economic growth is enjoyed by only a few individuals. Based on several measurements, inequality in Indonesia has reached a high level. In 2002, the top 10 percent wealthiest individuals in Indonesia consumed an equal amount as the total consumption of the poorest 42 percent of the population. However, by 2014, their consumption was equivalent to that of the poorest 54 percent of the population (World Bank, 2016). The potential for inequality in Indonesia will worsen if not all children receive quality education. Children living outside of Java or in rural areas, especially those who are impoverished, have a low likelihood of accessing early childhood education, where the learning process begins (World Bank, 2016).

A previous study conducted by (Smoyer-Tomic et al., 2004) stated that impoverished communities tend to prefer living in areas with good or high levels of public facilities. Their preference for urban areas is due to the concentration of public facilities being higher in urban areas compared to rural areas. According to a study by (Chaudhuri & Roy, 2017) there is inequality in water and sanitation facilities between rural and urban areas. The research findings indicate that the government claims that development is aligned with government development goals. However, the field conditions reveal that many rural communities still engage in open defecation practices due to inadequate facilities compared to urban communities who have adopted healthier practices due to sufficient facilities (Sheehy et al., 2021).

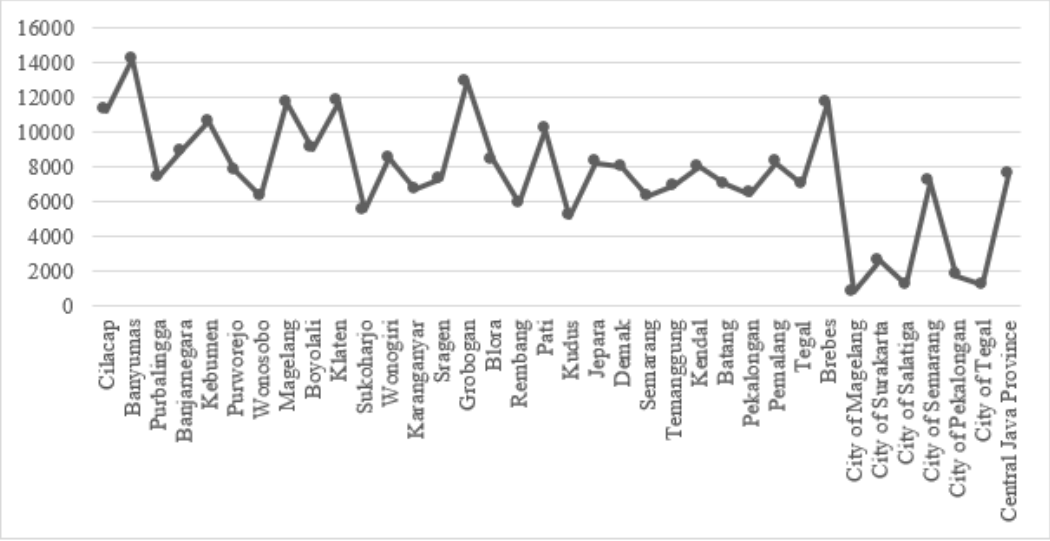

Figure 1. Number of Public Facilities in Central Java Province in 2022.
Source : BPS Jawa Tengah (2022)

Based on Figure 1, it illustrates the number of public facilities in the regencies/cities of Central Java Province in the year 2022. As observed in the graph, the average number of public facilities in Central Java Province is 7,455 units. However, based on the provincial average, Banyumas Regency has the highest number of facilities compared to other areas, reaching 14,125 units, which significantly deviates from the average. Following that, Magelang City has the lowest number of public facilities in Central Java Province, with a total of 840 units. The number of public facilities in Magelang City is considerably lower compared to the thousands of public facilities in Central Java Province. There are still many regencies/cities that have a number of public facilities above or below the average number of public facilities in Central Java Province. This creates a gap due to the significant difference between the number of public facilities in the regencies/cities and the average number of public facilities in the province. Additionally, there is also inequality in public facilities in DKI Jakarta. In 2020, the inequality in DKI Jakarta was categorized as low, with a Modified Williamson Index value of 0.27. A value of 0.27 is classified as low as it falls below 0.35 (BPS, 2022).

The high level of social inequality in an area creates various problems such as hampered investment and economic growth, increased poverty and unemployment, and social unrest or jealousy. (Chang et al., 2019). One of the causes of inequality in public facilities is distance; the distribution of public facilities results in varying distances for access to facilities for certain communities. Therefore, when the distance is too far, it becomes impractical and contributes to inequality (Dadashpoor et al., 2016). According to (Ferenchak & Marshall, 2021) there is inequality in the distribution of bicycle facilities between urban and rural areas. Low-income communities have different access to bicycle facilities compared to high-income communities. The disparities between urban and rural facilities result in mobility differences between rich and poor populations. Affluent individuals tend to relocate to urban areas with more comprehensive facilities, while impoverished individuals are compelled to migrate to more disadvantaged areas (Cronk & Bartram, 2018).

There is a significant difference between the number of public facilities in the regencies/cities and the number of public facilities in Central Java Province. This disparity is concerning as it may lead to high levels of inequality. Therefore, the aim of this research is to determine the level of inequality in public facilities. Additionally, the study aims to identify the factors that influence the inequality of public facilities in Central Java Province in the year 2022.

METHOD

The research design used in this study is quantitative research employing *cross-sectional* data. Secondary data obtained from BPS publications and relevant literature support the research. The Modified Williamson Index is the method used to measure the level of inequality in public facilities in Central Java Province in the year 2022. Multiple Regression Analysis is utilized to determine the factors that influence the inequality of public facilities. The data used consists of population growth rate, transfer income, and the Human Development Index (HDI) in the year 2022.

The theoretical framework of this research begins with the significant difference between the number of public facilities in the regencies/cities and the average number in the province. Due to concerns about high levels of inequality in public facilities, the objective of this research is to determine the level of inequality using the Modified Williamson Index method. Additionally, multiple regression analysis is employed to identify the factors influencing the level of inequality in public facilities. The ultimate aim is to generate appropriate public policies. The visual representation of this theoretical framework can be seen in the Figure 1 below:

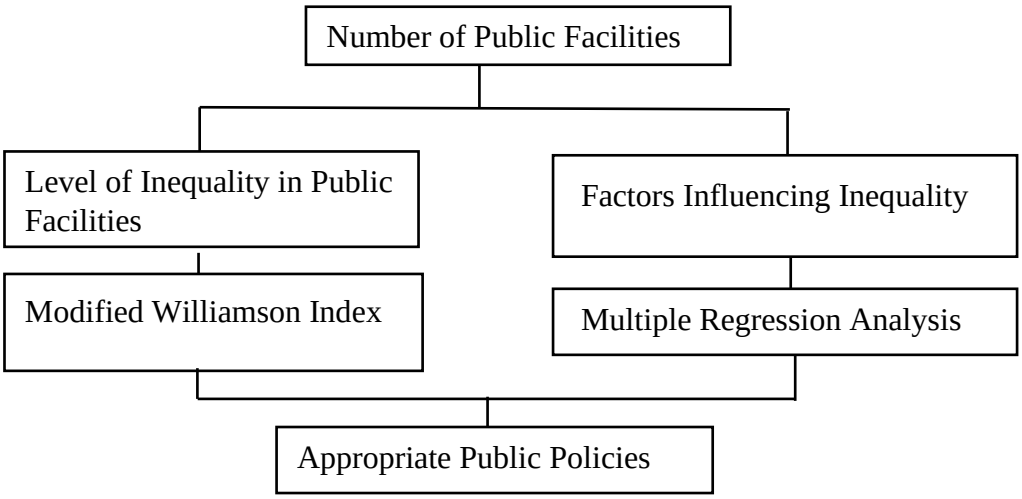

Figure 2. Theoretical Framework

The measurement of the level of inequality in public facilities is done using the data on the number of public facilities in Central Java Province, which is analyzed using the Modified Williamson Index method. When the Modified Williamson Index value is larger, it indicates higher inequality in public facilities, and vice versa (Luthfiyah & Tallo, 2020). The scale of inequality is described by an index ranging from 0 to 1. If the index shows a value of 1, it represents high inequality in public facilities, while approaching 0 signifies lower inequality in public facilities.

$$IW = \frac{\sqrt{\Sigma\,(Y1-Y)^2\,\frac{n1}{n}}}{Y}$$

Explanation:
IW : Modified Williamson Index
n_1 : Population in the regency/city area
n : Population in the province
Y_1 : Number of public facilities in the regency/city area
Y : Number of public facilities in the province

Multiple Regression Analysis is a method used to determine the factors that affect inequality in public facilities. Multiple regression analysis is used to make predictions when there is an influence between the independent variable (X) and the dependent variable (Y).

$$Y = a + B1X1+B2X2+B3X3+e$$

Explanation:
Y = Inequality in Public Facilities
X1 = Demographic Condition (Population Growth Rate in Percentage)
X2 = Transfer Income
X3 = Human Development Index (HDI)
a = Constant
B = Regression Coefficients
e = Standard Error

RESULTS AND DISCUSSION

This research aims to determine the level of public facilities inequality and the factors influencing public facilities inequality in Central Java Province in 2022. Essentially, there have been many studies discussing inequality, but those studies only focused on income inequality, such as the research by (Yunita et al., 2014) and (Damanik et al., 2018). However, research on public facilities inequality is still rare. This study discusses the level of public facilities inequality using the Modified Williamson Index. The level of public facilities inequality in Central Java Province can be observed from the calculation results of the Modified Williamson Index in Table 1 as follows:

Table 1. The level of public facilities inequality

Regency/City	IW	Regency/City	IW
Cilacap	**0.35**	Kudus	0.16
Banyumas	0.16	Jepara	0.24
Purbalingga	0.13	Demak	0.24
Banjarnegara	0.13	Semarang	0.27
Kebumen	**0.31**	Temanggung	0.15
Purworejo	0.13	Kendal	0.27
Wonosobo	0.20	Batang	0.17
Magelang	0.15	Pekalongan	0.20
Boyolali	**0.34**	Pemalang	0.17
Klaten	0.18	Tegal	0.22
Sukoharjo	0.23	Brebes	0.24
Wonogiri	0.19	City of Magelang	0.04
Karanganyar	0.20	City of Surakarta	0.08
Sragen	0.18	City of Salatiga	0.06
Grobogan	0.12	City of Semarang	0.28
Blora	0.18	City of Pekalongan	0.07
Rembang	0.19	City of Tegal	0.05
Pati	0.22	Central Java Province	0.21

Source: Data Processed, 2023

Based on Table 1, the level of public facilities inequality in Central Java Province is 0.21, which falls under the low category. Furthermore, the regencies with high levels of public facilities inequality are Cilacap Regency, Boyolali Regency, and Kebumen Regency. Cilacap Regency has a level of inequality of 0.35, Boyolali Regency has a level of inequality of 0.34, and Kebumen Regency

has a level of inequality of 0.31. Additionally, the other regencies/cities fall under the low inequality category.

The second objective of this research is to find out the factors that influence inequality in public facilities. Multiple regression analysis was used for analysis. The results of multiple regression analysis can be seen in Table 2 below:

Table 2. Results of Multiple Regression Analysis

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.232141	0.245049	-0.947326	0.3508
LAJU	0.054157	0.039201	1.381501	0.177
PEND_TRANSFER	9.66E-14	2.14E-14	4.516451	0.0001
IPM	0.002779	0.002916	0.953052	0.3479

Source: Data Processed, 2023

Based on the regression results, the equation obtained is as follows:

IW_Y = -0.232141 + 0.054157*LAJU + 9.66e-14*PEND_TRANSFER + 0.002779*IPM

The coefficient value of 0.232141 indicates that if the variables of population growth rate, transfer income, and the Human Development Index (HDI) are all 0, then public facilities inequality decreases by 0.232141, assuming *ceteris paribus.*

The coefficient value of the population growth rate variable is 0.054157, which means that when the population growth rate increases by 1%, public facilities inequality increases by 0.054157, assuming *ceteris paribus.*

The coefficient value of the transfer income variable is 9.6614, which means that when the transfer income increases by 1 Rupiah, public facilities inequality will increase to its maximum limit of 1, assuming *ceteris paribus.*

The coefficient value of the Human Development Index (HDI) variable is 0.002779, which means that when the Human Development Index increases by 1%, public facilities inequality increases by 0.002779, assuming *ceteris paribus.*

To ensure that the multiple regression analysis used in this study is valid and the best model, classic assumption tests were conducted. It can be observed that all models in this study are free from classic assumption issues. This can be seen in Table 3 below:

Table 3. Classic Assumption Tests

Classic Assumptions	Type of Test	Score/Result Scores	Description
Normality	Probability Jarque-Bera	0.886543 > 0.05	The data is normally distributed.
Autocorrelation	LM Test	0.3236 > 0.05	It is free from autocorrelation.
Multicollinearity	Variance Inflation Factor (VIF)	1.470383 < 10	It is free from multicollinearity.
Heteroscedasticity	White	0.5290 > 0.05	It is free from heteroscedasticity.

Source: Data Processed, 2023

The Modified Williamson Index analysis indicates that Kebumen Regency is classified as a regency with a relatively high level of inequality compared to other regencies/cities. This finding is in line with research conducted by (Bambang & Setiarso, 2020) which states that Kebumen Regency is one of the regions experiencing interregional inequality issues. Economic growth and development in Kebumen only focus on areas along the main road. The northern and southern areas, which have hilly topography and inadequate transportation access, are left behind compared to the central or southern areas.

The influence of population growth rate on the inequality of public facilities in Central Java Province can be observed based on the test results according to Table 2, where the calculated value t_{value} (1.381) < the table value t_{table} (2.039). Therefore, the variable of population growth rate is not significant in relation to the inequality of public facilities. This is contrary to the initial assumption that population growth rate would have an impact on the inequality of public facilities. The lack of such influence is due to the fact that high population growth does not guarantee that individuals will occupy areas that already have complete public facilities. People may reside in sparsely populated or remote areas, where public facilities are not yet fully developed. (Putra et al., 2022), which demonstrated that population growth rate has a negative impact on inequality levels in the city of Blitar from 2011 to 2020. Furthermore, in line with the study conducted by (Effendy & Djohan, 2022), similar results were obtained indicating that population growth rate (number of working population) has a negative effect on inequality levels in East Kalimantan Province.

The influence of transfer income on the inequality of public facilities can be observed based on the test results in Table 2, where transfer income has a calculated value t_{value} of 4.516, which is greater than the table value t_{table} of 2.039. Therefore, the variable of transfer income is significant in relation to the inequality of public facilities. This is in line with the study conducted by (CINTHYA, 2019), which stated that transfer income has a significant impact on development inequality in South Kalimantan Province. Transfer income influences the inequality of public facilities because the government tends to prioritize economically advanced regions, while neglecting underdeveloped areas. As a result, public facilities are insufficient and of low quality in less developed areas, while economically advanced areas receive more investments.

The influence of the Human Development Index (HDI) on the inequality of public facilities can be observed based on Table 2. HDI has a calculated value t_{value} of 0.9553, which is less than the t_{table} value of 2.039. Therefore, the HDI is not significant in relation to the inequality of public facilities. This is because the HDI does not specifically calculate aspects related to public facilities such as infrastructure, transportation, housing, or specific access to public services. Additionally, the inequality of public facilities can be caused by other factors such as government policies, resource distribution, allocation of development budget, geographical factors, and others. The results of this study align with the research conducted by (Yusniar, 2019), which indicates that the HDI variable does not have an influence on regional inequality in South Sulawesi.

CONCLUSION

Based on the research findings and discussion regarding the level of inequality of public facilities and the factors influencing the inequality of public facilities, the following conclusions are drawn: (1) The analysis of the Modified Williamson Index reveals that Cilacap Regency, Boyolali Regency, and Kebumen Regency are the regencies with the highest level of inequality of public facilities in Central Java Province. (2) The results of the classical assumption tests indicate that all models in this study are free from classical assumption issues. (3) The multiple regression analysis testing the model shows that the transfer income variable has a significant effect on the inequality of public facilities. However, the population growth rate variable and HDI are not significant in relation to the inequality of public facilities.

The findings of this study indicate that there are still regencies in Central Java Province with a relatively high level of inequality in public facilities. Therefore, the government should prioritize the allocation of development budgets to address the construction of public facilities. Development should not be concentrated only in urban areas but should be evenly distributed across both urban and rural areas that are lagging behind. Further research is recommended to expand the scope of the study to include both social and economic public facilities. Additionally, for the selection of regions, it is suggested to consider areas outside of Java Island that show indications of high inequality.

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