PHYSICAL AND NON-PHYSICAL INFRASTRUCTURE DEVELOPMENT LEVERAGE HUMAN DEVELOPMENT IN PAPUA PROVINCE

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ABSTRACT

Poverty is a picture of the conditions of people who are unable to meet basic needs according to applicable standards. Some of the ways that the government has prepared to alleviate poverty, one of which is by developing infrastructure development. The aim of the study was to find out whether the development of physical infrastructure (electricity and roads) and non-physical infrastructure such as financial institutions (post offices) had an influence on poverty levels in the province of Papua with 10 Districs in 2017-2019. The data analysis technique implied the panel data consisting of cross section data and time series data. The results of this study showed that physical infrastructure has a significant influence while non-physical infrastructure has no significant effect on poverty rates in papua province.

Keywords: poverty, physical infrastructure (electricity and roads), and non-physical infrastructure of financial institutions (post offices).

BACKGROUND

The covid-19 pandemic is considered the root cause of economy declining and low purchasing power of the community. This needs to be proven economic conditions before the pandemic occurs. The Central Bureau of Statistics (BPS) there are also some previous researchers who explained or described this problem of poverty. Here's their explanation of poverty based on Wibisono (2015) describe poverty is a lack of income to meet basic living needs or minimum living needs, namely clothing, food, boards, education, and health. Suryawati revealed based on Fadlillah, et al (2016), poverty is more often associated with the economic dimension, because it is the dimension that is most easily observed, measured and compared. Whereas poverty is also related to various dimensions, among others: social, cultural, social dimensions, politics, environment (nature and geography), health, education, religion, and ethics. Studying or studying a variety or more than one about poverty is necessary to formulate poverty alleviation policies. Hence, poverty alleviation programs are expected to run comprehensively and continuously (consistently) or continue.

Papua province is the easternmost region of the Republic of Indonesia, data from the Central Bureau of Statistics of regional native income in 2020 is the lowest compared to other provinces (BPS, 2020). Poverty data (Figure 1) in Papua Province in 10 districts in 2015 to 2019 showed concerning conditions.

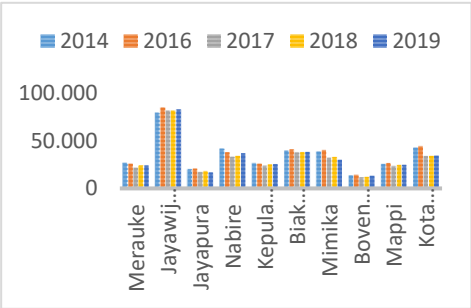

Figure 1 Poverty graphic of 10 districts in Papua province in 2015 to 2019

Government policies to rapid development in Papua Province aim is to reduce poverty levels through infrastructure development acceleration programs. In order to achieve this goal, supporting facilities and infrastructure are needed, including transportation infrastructure. The provision of road infrastructure such as the construction of highways is necessary for Encourage smooth trade and for example the construction of roads will be useful for the smooth flow of goods and services and as a unifying tool or can connect between regions. This research focused on the impact of infrastructure development in Papua Province before the pandemic in 2017-2019. Based on the description, the problem formulation of this study is as follows:

1. Does the development of electricity infrastructure have an influence on the poverty rate in Papua Province?
2. Does road infrastructure development have an influence on reducing the poverty rate in Papua Province?
3. Does the non-physical infrastructure of financial institutions (post offices) have an influence on reducing the poverty rate in Papua Province?

Poverty threat on human development

Dama et al. (2016) revealed that the category of developing countries measured on living of standard by comparing population in rich countries which tends to be very low. The low standard of living is realized one of them in the form of a very low-income level or labeled as poverty. Poverty can halt human development, set people without chance to improve wealth and enhance social capacity.

The World Bank (2007) explain the definition and measurement of poverty as follows:

- Poverty headcount index (P0), this index is the number of people who have a level of consumption below the poverty line. This measure cannot distinguish the sub-groups of the poor, nor does it show the range of poverty levels. This measure does not change even if a poorer person becomes poorer or more prosperous as long as the person is below the poverty line.
- Poverty gap index (P1), a decrease in average aggregate consumption to the poverty line for the entire population, with a value of zero (0) given to those above the poverty line.
- Poverty severity index (P2), this measure gives greater weight to the very poor by applying the poverty line distance.
- The purchasing power parity (PPP) poverty measures of 1 and 2 US dollars per day: to compare poverty between countries, the World Bank uses estimates of consumption converted to U.S. dollars using purchasing power parity (PPP), not with currency exchange rates. Here, PPP relate to infrastructure

development in rural to reduce poverty.

The life of the community is increasingly modern, then more and more households, industries, and community activities that rely on energy sources from electricity. The electricity infrastructure consumed by the community shows how much use of electrical energy can help in driving the regional economy for increased economic productivity. The use of electricity is a eminent thing in the process to increase Gross Regional Domestic Product which have an impact on economic growth. It is considered because as a major factor supporting production process activities in the manufacturing sector (Amalia, 2007). Another infrastructure inclusion for the rapid economy is road infrastructure. Sjafrizal (2012) stated that road infrastructure is a land transportation infrastructure that covers all parts of the road, including complementary buildings and equipment that is useful for traffic at ground level, below ground and / or water, and above water level, except railways, lorry roads, and cable roads. Efficiently logistic chain considered to road infrastructure availability. Roads with good conditions is a basic requirement that must be met to support the growth of an area. The road aims to support the mobility of goods and passengers between the city center with industrial and service areas, offices, and residential and residential areas and suburbs. The road also aims to support the function of the city as a growth center and encourage equitable development within the city and related to the back area (hinterland). In relation to regional and urban development, roads have a dual function. On the one hand, the road has a function as a driver of economic growth by smoothing the flow of goods and services between production centers and marketing areas or vice versa. While on the other hand, the road serves to reduce development inequality between regions because the road can reduce the isolation of socioeconomic activities in less developed areas. Therefore, the construction of roads is the main foundation of the development of an urban area (Sjafrizal, 2012).

Research Method

The regression analysis panel of the estimated model will pay attention to the effects of cross-sectional units i.e. the effects of different regions. The panel data regression model with regard to the effect of the difference in region is the fixed effect model (FEM) where the assessment method used is Ordinary Least Square (OLS) by using dummy variables if the effect of the cross section unit is assumed to be fixed. The Random Effect Model (REM) with the assessment method used is Generalized Least Square (GLS), if the effect of the cross sectional unit is assumed to be random. Hypothesis used based on supporting theory is that the development of physical and non-physical infrastructure has a negative influence on increasing the number of poor people in the regency / city of Papua province or it can befined using equation.

$$-Y_i = \beta_0 + \beta_1 X_1 + \beta_1 X_2 + \beta_1 X_3 + \varepsilon_i$$

Hence, Y_i is defined as poverty (PM), β_0 as constanta, $\beta_1 X_1$ as electrical customer (EL),β_2 X_2 as total length of road (RD), β_3 X_3 as post office (OP), and to ε_i as a error component.

Analysis Results

Data on poverty rates or the number of poor people from 10 districts / cities in Papua Province from 2015 -

2019 is still likely to increase. In response to this, the central government and local government in 2017 to 2019 moved to follow up the welfare conditions of the people in Papua Province with development adequate infrastructure programs to help the people of Papua Province in their daily activities. Here is a discussion of the results of data processing of infrastructure development in Papua Province.

Table 1 Data of Poverty Population (in thousands people)

Kabupaten (Distric)	Sum of Poverty Population (in thousands people)				
	2015	2016	2017	2018	2019
Merauke	26,800	26,000	21,870	23,960	24,280
Jayawijaya	78,700	85,000	81,120	81,120	83,000
Jayapura	20,000	20,900	17,020	18,230	16,760
Nabire	41,500	38,000	33,130	34,120	36,990
Kepulauan Yapen	26,400	26,000	23,870	25,230	25,530
Biak Numfor	39,700	41,000	37,530	37,760	38,100
Mimika	38,700	40,200	32,220	32,850	30,120
Boven Digoel	13,600	14,400	11,650	12,200	13,380
Mappi	25,400	26,800	23,460	24,600	24,820
Kota Jayapura	42,500	44,300	33,920	34,340	34,480

Source: BPS (2020)

The condition of the number of electricity customers in 10 districts / cities of Papua province is increased in Table 1 from 2017-2019. It shown that the government's concern in increasing electricity development in this area has been given a good response by the community. The results of the tests in this study can be known that electricity has a significant influence with negative signs on the number of poor people in Papua Province

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Table 2 Data of Electricity Customer

Kabupaten (Distric)	Sum of Electricity Customer				
	2015	2016	2017	2018	2019
Merauke	35,589	40,723	46,107	48,851	51,936
Jayawijaya	11,731	16,054	16,862	17,805	18,658
Jayapura	25,374	30,076	33,073	35,884	38,093
Nabire	21,187	26,417	29,056	33,841	34,915
Kepulauan Yapen	11,703	14,882	16,031	16,958	17,844
Biak Numfor	24,968	30,805	31,907	32,345	34,034
Mimika	23,111	30,623	37,627	41,832	46,474
Boven Digoel	2,737	3,498	4,379	4,991	5,347
Mappi	1,149	1,485	1,664	1,750	1,836

Kota Jayapura	56,889	63,491	71,840	78,300	82,784

Source: BPS (2020)

This shows that higher development for electricity infrastructure will result in a decrease in the number of poor people in Papua Province. As it is well known that electricity is a very influential energy in human life and is also a contributing factor for human activities such as in the household sector, lighting, communication, industry and so on.

Table 3 Data of Total Length of Road

Kabupaten (Distric)	Total Length of Road (km)				
	2015	2016	2017	2018	2019
Merauke	617.64	615.56	617.64	419.1	419.1
Jayawijaya	602.75	356.8	602.75	150.6	150.6
Jayapura	496.33	520.2	496.33	384.2	384.2
Nabire	75	380.25	75	105	105
Kepulauan Yapen	93	151.66	93	175.05	175.05
Biak Numfor	184.6	146.38	184.6	172	172
Mimika	269.02	44.07	269.02	162.1	162.1
Boven Digoel	416.73	189.01	416.73	141	141
Mappi	176	45.83	176	84.15	84.15
Kota Jayapura	241.99	289.93	241.99	104.38	104.38

Source: BPS (2020)

The infrastructure development on road impact on increasing distribution logistic (Calderon and Servern, 2010). Public investment capacity which targeted to public sector projects is defined by project as seen effective system to reduce poverty.

Table 4 Data of Total Post Office

Kabupaten (Distric)	Sum of Branch Post Office (unit)				
	2015	2016	2017	2018	2019
Merauke	17	13	13	11	11
Jayawijaya	1	1	1	1	1
Jayapura	5	7	7	7	7
Nabire	3	4	4	6	6
Kepulauan Yapen	1	5	5	1	1
Biak Numfor	14	4	4	12	12
Mimika	11	1	1	11	11
Boven Digoel	5	4	4	3	3
Mappi	5	2	2	2	2
Kota Jayapura	16	7	7	9	9

Source: BPS (2020)

This shows that higher development for electricity infrastructure will result in a decrease in the number of poor people in Papua Province. As it is well known that electricity is a very influential energy in human life and is also a contributing factor for human activities such as in the household sector, lighting, communication, industry and so on.

Table 5 Interpretation on Random Effect Model

	Constant	Physical		Non-physical	Distric	Random Effects Coefficient (Cross)	PM equation
		Electricity User (EL)	Road (RD)	Post agent (OP)			
T-test	46766.62	-7.278700	-2.387831	-0.967424	MERAUKE	-826.3081	-826.3081 + 46234.13 - 0.384686 (EI) - 6.790246(RD)
Prob.	0.0000	0.0000	0.0211	0.3384	JAYAWIJAYA	44263.25	-826.3081 + 46234.13 - 0.384686 (EL) - 6.790246(RD)
	Accepted	Accepted	Accepted	Rejected	JAYAPURA	-12035.01	-12035.01 + 46234.13 - 0.384686(EI) - 6.790246(RD)
					NABIRE	2703.281	2703.281 + 46234.13 - 0.384686 (EI) - 6.790246(RD)
					KEPYAPEN	-13918.40	-13918.40 + 46234.13 - 0.384686(EL) - 6.790246(RD).
Partial Coef.	46234.13	- 0.384686	- 6.790246		BIAKNUMFOR	5596.271	5596.271 + 46234.13 - 0.384686(EL) - 6.790246(RD)
Prob.	0.0000	0.0153	0.0000		MIMIKA	3632.675	3632.675+ 46234.13 - 0.384686(EL) - 6.790246(RD)
	Sig.*	Sig.*	Sig.*		BOVEN	-29763.12	-29763.12+ 46234.13 - 0.384686(EL) - 6.790246 (RD)
R^2	0.509322				MAPPI	-19815.10	-19815.10 + 46234.13 - 0.384686(EL) - 6.790246(RD)
*Significance in 5%					KOTAJAYAPURA	20162.46	20162.46 + 46234.13 - 0.384686 (EL) - 6.790246 (RD)

Source: Analysis Results

Previous research reveals that comprise with increasing of development on electrical energy can contribute to improve human development inside the community in this case the level of welfare of the people of a region or region. The results of this study are the same as research conducted by Hapsari (2011) said that electricity infrastructure has a significant influence on economic growth. Table 6 reveals the calculation result based on PM each district which supporting theory that is the development of physical infrastructure has a negative influence on increasing the number of poor people in the district / city of Papua province. However, the non-physical infrastructure has not significant influence reducing poverty.

Table 6. Poverty values (PM) each District

Distric	PM
MERAUKE	- 6.790221
JAYAWIJAYA	- 1.010223
JAYAPURA	- 3.020231
NABIRE	- 2.030241
KEPYAPEN	- 1.120321
BIAKNUMFOR	- 2.040211
MIMIKA	- 4.110341
BOVEN	- 1.210252
MAPPI	- 0.710233
KOTAJAYAPURA	- 8.320244

Based on the test results in the study, the development of physical infrastructure such road and electrical has reduced number of poor people in Papua Province. It emerge of the central or regional government contribution on pays attention to the development of road infrastructure in the Papua Province, it will cause a decrease in the number of poor people in the area. Hence, the road is an important infrastructure in an area. With the development of road construction, it will facilitate the local community in the process of moving or moving goods from one area to another. The test results in this study are the same as the research conducted by (NSS, et.al.2015) that road construction has a significant influence on economic business growth in the city of Semarang. This shows that road construction has been able to contribute to the handling of the level of community welfare.

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