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The Effect of Rural Development on Poverty Gap, Poverty Severity and Local Economic Growth in Indonesia

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Abstract: The effect of rural development in reducing the poverty gap and economic growth has not been much analyzed in recent studies. This study examines the effects of rural development (as calculated by using the Village Development Index, VDI) on poverty and economic growth. Precisely, poverty is measured by the depth of poverty (as measured by Poverty Gap Index, P1) and poverty severity (as measured by Poverty Severity Index, P2) using the aggregate data at the district level in Indonesia. Understandably, many factors influence the effort to reduce the poverty gap in rural areas, and it can be started by improving rural economic development. The result of this study indicates that regions with the VDI categorized as "independent" and "developed" villages have the potential to reduce the depth of poverty and poverty severity in its areas and to increase economic growth. In contrast, underdeveloped and very underdeveloped regions in their VDI category experienced a more significant gap in the depth and severity of the poverty. This result implies that the Indonesian government must accelerate and improve the development of rural areas, especially in less developed regions. Thus, a better rural development status will attract more opportunities to grow rural economic activities and improve the community welfare.

Keywords: rural development; poverty severity; the depth of poverty; economic growth

1. Introduction

Development and poverty are often the subjects of interesting discussion among researchers and academics (World Bank, 2015). The complexity of a problem in dealing with poverty exists in the development process of a country that goes along with the demands for the government to improve welfare. This is even more so on the issue of village or rural development with efforts to reduce poverty levels and inequality to achieve inclusive development (United Nations Department of Economic and Social Affairs, 2021). The Indonesian government has long been committed to promoting equitable development at the village level, including reducing poverty and inequality (van Leeuwen & Földvári, 2016). Develop Indonesia from the periphery is one of President Joko Widodo Nawacita's vision to develop regions and improve people's welfare, especially in rural areas (Alfurkon Setiawan, 2019). This aligns with Chambers (1987) thinking about the importance of development starting from the rural level by creating development starting from the bottom, which is precisely the village area.

The Government of Indonesia has implemented various village development programs with funding that increases from year to year. For example, the number of village funds in 2017 and 2018 each reached IDR60 trillion. Then in 2019, the government increased village funds to IDR70 trillion, and in 2020 village funds reached IDR72 trillion (Pusat Kajian Anggaran-Badan Keahlian DPR RI, 2020). An indicator of the Village Development Index (VDI) has also been prepared to accelerate the achievement of village development targets. The function of VDI is as a quantitative measuring tool to find out the results of efforts to transform the village into an independent village. VDI data in 2019 shows conditions that are not impressive because most villages are still in the developing stage, namely 55.47%, and the village stage is underdeveloped and very underdeveloped, reaching as much as 30.74% (Kemendes PDTT, 2019).

According to Chambers (1987), developing a village means placing the state as the main actor or at the forefront of developing a village. Furthermore, an independent village in Indonesia is defined based on Permendes PDTT No. 2/2016, which explains that a developed village can carry out village development to improve the quality of life and the welfare of the village community as much as possible with sustainable social, economic, and ecological resilience. Independent village does not mean excluding the village as an entity or region independent and separate from other regions (Eko et al., 2014). Learning from China's experience in the late 1960s to 1980s, rural and urban relations could continue to operate in a condition of village independence with the increasingly disappearing boundaries of rural and urban areas economically due to the increasing demand for and transactions for goods and services from villages and cities (Honig & Zhao, 2019). In addition, independence can also be seen from the side of the sufficiency economy. It happened in villages in Thailand which developed this concept as an effort to increase the village's ability to adapt to changes in environmental conditions (Kansuntisukmongkol, 2017).

One of the critical issues in the context of development is poverty. The study results by Mai and Mahadevan (2016) stated that "chronic poverty was more prevalent than transient poverty" in Indonesia. This study also confirms that poverty is still the dominant problem in the village. Based on BPS data, as of March 2020, the poverty rate in rural areas was 12.82% which is much higher than the poverty rate in an urban area of only 7.38% (BPS, 2020c). The condition of poverty in rural areas is still severe, as it can be seen from the depth of poverty as shown in Poverty Gap Index (2.21) and Poverty Severity Index (0.55), which are still higher than urban areas that counted 1.13 and 0.25 respectively (BPS, 2020b). Reducing poverty is a policy strategy for achieving sustainable development in rural areas (Bununu, 2020).

The low carrying capacity of rural development will result in less development of economic activity in a village area that can affect the community welfare. Saragi et al. (2021) explained the importance of village funds as financing for village development

to reduce poverty in villages. Furthermore, their study also found that the accumulated VDI number based on the VDI aggregation in each of the major islands in Indonesia tends to increase, which indicates an improvement in the status of development in the village. As measured by the VDI, VDI status can contribute to poverty reduction efforts (Saragi et al., 2021; Singh & Chudasama, 2020). Thus, the attempt to realize an independent village as the highest status of VDI becomes a necessity and, of course, regarding development that can increase human resource capacity and sustainably optimize economic resources.

However, a study conducted by Saragi et al. (2021) has not specifically explained the relationship between VDI status and conditions of depth and severity of poverty and economic growth per district/city in Indonesia. It becomes a research gap on the role of village development in reducing poverty problems in every district/city in Indonesia. Therefore, this study aims to fill this research gap by analyzing the effect of village development as measured by the VDI on the depth and severity of poverty and economic growth. It is because addressing the gap will advance our understanding of the main problem of poverty and whether the VDI tends to significantly reduce the depth and severity of poverty and increase rural economic growth. The government then can use this relation in formulating a rural development strategy to support the sustainable development goals in tackling poverty and reducing inequality in rural areas. The results of this study will be beneficial in providing academic contributions and providing policy recommendations to the Indonesian government in village development planning that is oriented towards reducing the depth and severity of poverty and regional economic development.

2. Methods

2.1. Data Collections

The research approach used in this study was the quantitative approach. This study uses secondary data analysis obtained from official publications of the Statistics Indonesia (BPS) in 2019 related to data on the depth and severity of poverty at the district level in Indonesia. The data used was sourced from VDI data published by the Ministry of Villages and Development of Disadvantaged Regions (Kemendes PDTT) in 2019, totaling 68,834 villages consisting of 840 independent villages, 8,647 developed villages, 38,185 developing villages, 17,626 underdeveloped villages, and 3,536 very underdeveloped villages. The number of 68,834 villages was still below the total number of villages in Indonesia, which reached 75,436 villages. This gap was caused by the lack of yearly VDI updated data, which does not show additional data. Therefore, it depends on the government's ability to identify and measure the criteria in the VDI for each village and then include them in the updated VDI database.

2.2. Data Analysis

Secondary data analysis examines the effect of village development status according to VDI on community welfare as proxies by the severity and depth of poverty in an area according to the poverty depth index (Poverty Gap Index - P_1). The index used as a measure of the average expenditure gap of each poor population against the poverty line is obtained by the calculation formula:

$$P_1 = \frac{1}{n} \sum_{i-1}^{q} \left[\frac{z - y_i}{z} \right]$$

P_1 = poverty gap index
z = poverty line
y_i = the average monthly expenditure per capita of the population below the poverty line (i = 1, 2, 3, ..., q), $y_i < z$
q = number of people living below the poverty line
n = total population

In addition, an index that provides information on the distribution of expenditure among the poor is obtained through the calculation formula to measure the poverty severity index (Poverty Severity Index - P_2).

$$P_2 = \frac{1}{n} \sum_{i-1}^{q} \left[\frac{z - y_i}{z} \right]^2$$

P_2 = poverty severity index
z = poverty line
y_i = the average monthly expenditure per capita of the population below the poverty line (i = 1, 2, 3, ..., q), $y_i < z$
q = number of people living below the poverty line
n = total population

VDI data is calculated based on development status per village throughout Indonesia. However, the limited data at the village level does not make it possible to analyze the poverty conditions in each village due to the absence of data on the depth and severity of poverty at the village level. Thus, data aggregation is carried out down to the district level to equalize the level of analysis. VDI aggregation is done by accumulating VDI for all villages and taking the district/city level average. When a district is referred to VDI in the independent category, the average village development status is independent within the district/city. In addition, the VDI data also only calculates the index in rural areas, so several cities with no rural areas are not included in the analysis (e.g., cities in DKI Jakarta). From this data selection process, 433 districts in Indonesia were finally obtained from the analysis.

The dimensions of VDI have quite diverse variables and indicators. There are 52 indicators and 22 variables that explain the three dimensions in the VDI. These dimensions, variables, and indicators of village development then become the determining factors of the VDI score that generates the classification of village status. The classification of village status is as follows very underdeveloped village (score: < 0.491), underdeveloped village (score: > 0.491 and < 0.599), developing village (score: > 0.599 and < 0.707), developed village (score: > 0.707 and < 0.815), and independent village (score: > 0.815). VDI describes the changes in structure and facilities in several fields quantitatively, such as education, health, economy, politics, culture, and the environment. The poverty indicators used in this study were the depth and the severity of poverty, which provide more in-depth information on the number and percentage of poverty in an area. The region's geographical location is also an independent variable by considering the location of the region on the island of Java and outside Java.

The 2019 VDI datasets were obtained from the data at the sub-district level due to the unavailability of village-level VDI data (Kemendes PDTT, 2019), while index P1 and P2 index data are at the district/city level. Therefore, pre-processing data is first carried out with data cleaning at the district level to ensure that all the attributes used have actual nominal values at the same level. Datasets with missing values were not used in the analysis and were excluded from the datasets.

Data processing begins by calculating the average index P1 and P2 and then obtaining the dummy values of the P1 and P2 indices in each districts/cities. Furthermore, the status of village development, the datasets were divided according to the VDI classification. A dummy value was obtained according to the status of village development in each districts. In addition, there is also a regional dummy value based on the geographic area by dividing the area on the island of Java and outside the island of Java. The analysis model was divided into three main models: the P1 index model, the P2 index model, and the economic growth model, each analyzed separately. These three models expanded to seven models, which included economic growth as the dependent variable. The independent variable used a dummy variable which indicates the village category as stated in the regulation of the Kemendes PDTT No. 2/2016. The developing village dummy is used as a control variable (0) in the econometric model. In addition to the village category, this analysis model also

includes other independent variables, the dummy variable for districts in Java and outside Java. The equation model is used in this study as follows:

Economic_Growth (GDRP) 2019 = α + $\beta 1$ d. independent$_i$ + $\beta 2$ d. developed$_i$ + $\beta 3$ d. underdeveloped$_i$ + $\beta 4$ d. veryunderdeveloped$_i$ + θd. location.district + e$_i$ ...... (1)

P1 = α + β_1 lnGDRP_real_2019 + β_2 d. independent$_i$ + β_3 d. developed$_i$ + β_4 d. underdeveloped$_i$ + β_5 d. veryunderdeveloped$_i$ + θd. location.district + e$_i$ .... (2)

P2 = α + β_1 lnGDRP_real_2019 + β_2 d. independent$_i$ + β_3 d. developed$_i$ + β_4 d. underdeveloped$_i$ + β_5 d. veryunderdeveloped$_i$ + θd. location.district + e$_i$ .... (3)

α	= constant
i	= 1,2,3,.......n
d.independent	= dummyVDI independent (1, independent village and 0, others village)
d.developed	= dummyVDI developed (1, developed village and 0, others village)
d.underdeveloped	= dummyVDI underdeveloped (1, underdeveloped and 0, others village)
d.veryunderdeveloped	= dummyVDI very underdeveloped (1, very underdeveloped and 0, others village)
location.district	= dummy showing district location (1, regencies/city located on Java Island and 0, outside Java Island)
GDRP_real	= Real Gross Domestic Regional Product
Economic_Growth (GDRP) 2019	= Real Gross Domestic Regional Product
P1	= Poverty Gap Index
P2	= Poverty Severity Index
e$_i$	= unobserved variables

Data were analyzed based on specific social, economic, and ecological attributes represented by the index forming VDI and then analyzed by cross-sectional regression modeling. The analysis was carried out using STATA. The advantage of STATA is that it can present detailed data from each attributes specified and can extract patterns from a large dataset of villages based on VDI scores.

3. Results and Discussion

3.1. Descriptive Analysis

The poverty conditions in the 433 districts/cities that are part of this analysis show varying percentages. Figure 1 shows the rate of poverty in each districts/cities. For example, the lowest percentage of poor people in Badung Regency, Bali Province,

Figure 1. Percentage of Poor Population by District in Indonesia in 2019
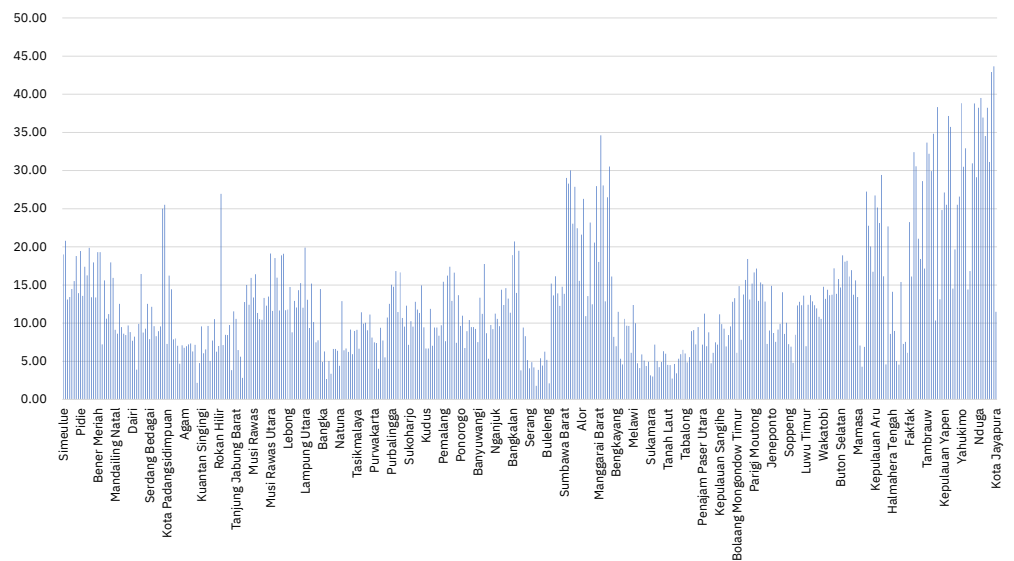
*Source: BPS (2020a) (processed)*

Notes:
1. Selected district's name appeared in the figure while others were omitted due to limited space for 433 districts
2. Minimum value: 1,78; Maximum value: 43,65; Average value: 13,03; Standard deviation: 7,91

counted 1.78% or 11,890 people below IDR547,186 per capita/month. Meanwhile, the highest percentage of poor people was recorded in Deiyai Regency, Papua Province, 43.65% or 31,870 people below IDR579,263 per capita/month.

In general, the average percentage of poor people in 433 districts/cities is 13.03%. This percentage was slightly higher than the national poverty rate covering 514 regencies/cities in the same period (March 2019) of 9.41% or 25.14 million people. However, this result means that 81 regencies/cities are excluded from the analysis due to the unavailability of VDI data.

In addition to the number or percentage of poverty, an index number is used to see the income gap in an area, namely the Gini index or Gini ratio. Nationally, Indonesia's Gini index is in a condition of moderate inequality (the Gini coefficient is between 0.3 and 0.5). Indonesia's Gini index has a downward trend from the March 2016 period of 0.397 to 0.382 in the March 2019 period. Although the decline is slow, there is a positive trend in reducing income inequality (Figure 2).
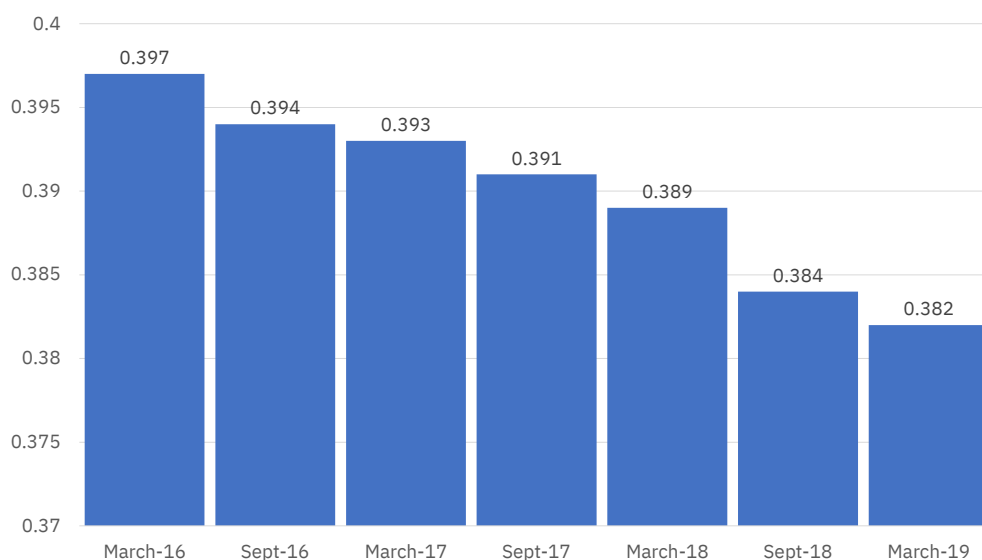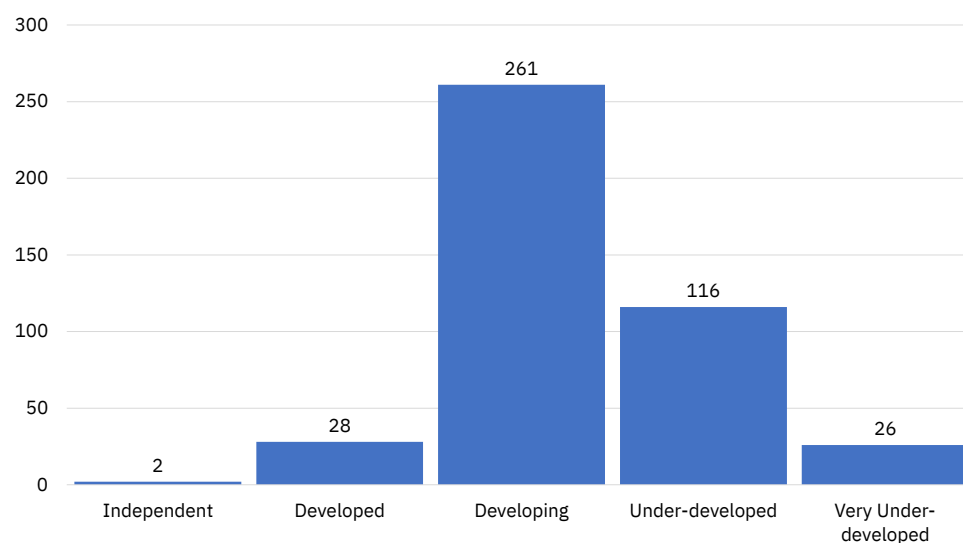

Figure 2. Indonesia Gini Index 2016–2019

Source: BPS (2020b)

Notes:
Gini < 0.3 = low inequality; 0.3 ≤ Gini ≤ 0.5 = moderate inequality; and Gini > 0.5 = high inequality

**Figure 3.** Number of Districts/Cities Development Status Based on its Aggregate VDI

Source: Kemendes PDTT (2019) (processed)

In more detail, to find out the poverty condition of an area, this study uses data on the poverty gap index (P1) and poverty severity index (P2) in 2019 from the BPS as the dependent variable. The P1 index shows the average size of the expenditure gap of each poor person against the poverty line (BPS, 2020b). The higher the P1 index value, the lower the average expenditure of the population from the poverty line. Meanwhile, the P2 index shows an overview of expenditure distribution among the poor (BPS, 2020a). The P2 index describes the higher the index value, the higher the disparity in spending among the poor.

The VDI data is calculated as the index for each villages. However, because poverty data is only available at the district level, VDI aggregation is carried out to the district/city level. As a result, development status is obtained in 433 districts/cities out of 416 districts and 98 cities in Indonesia. The difference in the number of regencies/cities is that urban areas do not have administrative village areas in DKI Jakarta and other cities such as Bandung City, Semarang City, and Surabaya City, whose general administrative areas are urban villages. However, some cities still have village areas, for example, Jayapura City. The P1 and P2 index data were obtained from the BPS (2020a) publication on poverty data and information in districts/cities in Indonesia with poverty conditions based on the results of the National Socio-Economic Survey (SUSENAS) as of March 2019.

Figure 3 shows the status of districts/cities according to the VDI data aggregation, showing that two districts have reached the independent level, 28 districts/cities in developed status. Most of the VDI districts/cities are in developing status, experienced by 261 districts/cities. There were 116 regencies/cities with underdeveloped VDI status and 26 districts/cities with very underdeveloped status, indicating that most villages in 142 regencies/cities were lag in development.

Figure 4 shows the severity and depth of poverty, which still shows a high level of inequality with a tendency for areas with a high PGI-P1 to have a high PSI-P2. In addition, P1 index data tends to be larger than P2 index data, indicated by the slope of Figure 4 which slopes towards the x-axis. This figure can be interpreted that the condition of the expenditure gap of each poor to the poverty line was higher than the disparity of expenditure among the poor.
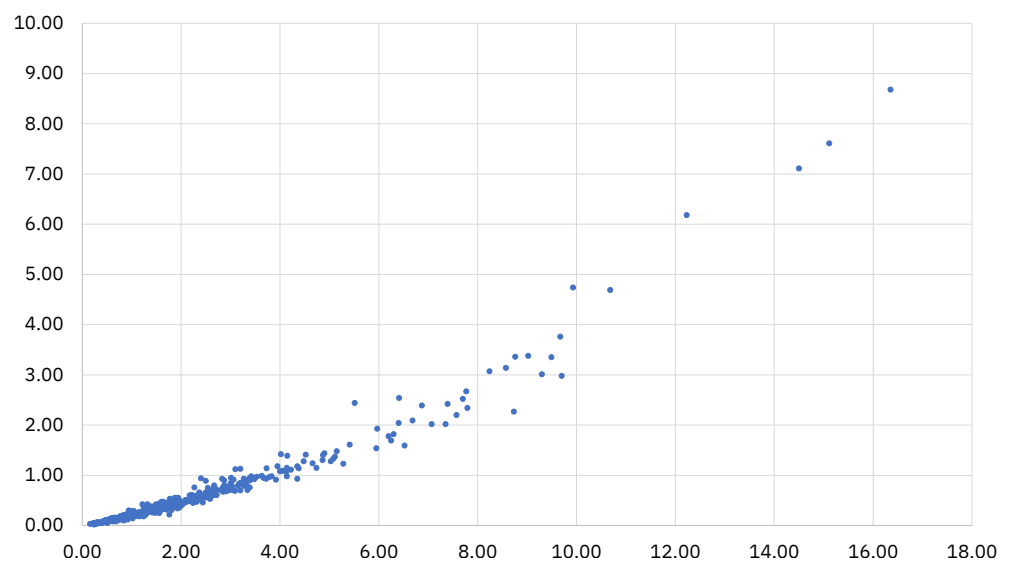
Source: BPS (2020a)

Description:
X axis = P1 and Y axis = P2

Figure 4. PGI-P1 and PSI-P2 Values by Regency/City

3.2. Regression Analysis

The regression results show that real GDRP is a statistically negative significant impact on P1 and P2. It means that increasing real GDRP by 10% contributes to decreasing P1 and P2 each by 0.0388 index points and 0.0089 index points. Moreover, the level of development villages/VDI has a statistically impact on P1 and P2 index. VDI has five categories, wherein the regression VDI variables are created as a dummy variable; we should use one category as a control/default. The regression used developing village as a control for VDI dummy variables. Then, we can interpret the impact of each of the VDI dummies compared to the developing village category (see Table 1).

Table 1. OLS Regression on Poverty Gap, Poverty Severity, and Economic Growth

Variables	P1	P2	Economic Growth GDRP
ln_GDRPreal2019	−0.388*** (0.0841)	−0.089** (0.0345)	
d.Independent	−0.781*** (0.151)	−0.200*** (0.0571)	0.997*** (0.111)
d.Developed	−0.596*** (0.136)	−0.152*** (0.0377)	0.291* (0.171)
d.Underdeveloped	1.097*** (0.219)	0.413*** (0.0958)	0.775*** (0.217)
d.Veryunderdeveloped	5.437*** (0.651)	2.277*** (0.375)	−1.849 (1.659)
Loc.districts	0.384*** (0.148)	0.0573 (0.0530)	0.481*** (0.133)
Constant	5.079*** (0.765)	1.182*** (0.313)	4.818*** (0.111)
Observations	433	433	433
R-squared	0.497	0.412	0.056

The village with an independent development category has contributed to decreasing P1 and P2 index by 0.781 and 0.200 index points compared to the developing village category. In addition, the developed village has contributed as well, decreasing P1 and P2 indexes each by 0.596 and 0.152 index points. On the other hand, the underdeveloped village and very underdeveloped village have positively contributed increasing for both P1 and P2 indexes. For example, the village with an underdeveloped category would increase P1 and P2 indexes by 1.097 and 0.413 index points. Then, the village's location in Java or outside Java shows a statistically positive significance on P1 and P2 each by 0.384 and 0.0573 index points.

In addition, the regression on economic growth results in interesting findings where the level of village development except very underdeveloped village category and location of the village have a positive impact. The villages are categorized as independent, developed, and underdeveloped have a positive contribution to economic growth, each by 0.997, 0.291, and 0.775. However, the village as a very underdeveloped category has a negative contribution to economic growth by 1.849. The village's location in Java has contributed a positive on economic growth by 0.481 compared to villages located outside Java. The results show the importance of village development status measured by VDI to decreasing P1 and P2 indexes but increasing economic growth at the district level. Then, the location of villages is important as well to decreasing P1 and P2 indexes and increasing economic growth at the district level.

3.3. Discussion

The analysis results show that the status of village development based on VDI significantly impacts P1, P2, real GDRP, nominal GDRP, and district economic growth in 2019. Meanwhile, the location of villages in Java Island has reduced the poverty severity index, although it failed to reduce the poverty gap index. However, village locations in Java can increase real/nominal GDRP and district economic growth. The

results of this study complement the results of previous studies, such as those conducted by Saragi et al. (2021), that found the increase in VDI status and the implementation of village fund allocations in 6 (six) large islands was accompanied by a decrease in poverty rates in the rural areas. Thus, the results of this study can be used as a new reference in a more detailed view of the impact of VDI status as an aggregate at the district/city level in Indonesia. Increasing the category of the village to an independent village will positively impact efforts to reduce poverty, especially in conditions of gap and severity of poverty. In addition, the increase in VDI also contributes positively to the increase in real GDRP, nominal GDRP, and economic growth of districts/cities in Indonesia.

However, poverty reduction efforts must be more targeted in determining the target of the poor in society so as not to widen the poverty gap in society (Mai & Mahadevan, 2016; Wu et al., 2015). This study also confirms the findings of Suryahadi et al. (2009), which states that the growth of the service sector in rural areas will reduce poverty. The growth of the service sector will move together with the increasing conditions of village development that support the creation of economic activity in the secondary and tertiary sectors. Economic developments that have shifted from the primary to secondary and tertiary sectors have also changed the village development approach. Village development is no longer categorized in only one village but becomes a regional approach by paying attention to inter-sectoral and inter-village linkages in a territorial development approach (Rodríguez-Pose & Hardy, 2015).

Determination of village categories based on VDI is the right step to reduce poverty levels. For example, the status of developed and very underdeveloped villages where each villages' situation and condition require a different approach and policy intervention. Of course, dealing with developed villages will have different levels of policy affirmation than very underdeveloped villages to improve the VDI status of these villages. In this context, the term village independence has been implemented partially since President Soesilo Bambang Yudhoyono (2004–2009 and 2009–2014) with an energy-independent village, food independent villages and independent seed villages programs.

One of the government's efforts to boost rural development is through the implementation of village fund transfer since 2015. Village funds can be allocated by the village government to build small-scale infrastructure facilities and to strengthen the capacity of the local community by providing some empowerment programs (Adhayanto et al., 2019; Arifin et al., 2020). Several studies have concluded that village fund transfers can reduce poverty levels in villages (Arham & Hatu, 2020; Saragi et al., 2021; Andi Setiawan, 2019). Similar to the case in Indonesia, Thailand also has a village fund called the Thailand Village and Urban Community Fund, the results of the analysis show that the transfer of funds to the village has a positive influence on the income level of the poor in the village (Boonperm et al., 2013).

The application of village funds is a way to encourage villages to get financing in economic development (Kislat & Menkhoff, 2013). In Thailand, the implementation of village funds by applying a loan scheme can increase village development financing. However, implementing village funds with a loan scheme is challenging to say successfully (Kislat & Menkhoff, 2013). Boonperm et al. (2013) found that granting financial access to villages could increase income in the lower quintile. In addition, financial support needs to be followed by the development of the agricultural sector, although not all can be successful, under certain conditions, the agricultural sector plays a vital role in village development, in addition to financing village funds is also essential (Boonperm et al., 2013; Kislat & Menkhoff, 2013; Tarlani & Sirajuddin, 2020). The hope is that with the support of village financial access, it can drive rural economic development in developing countries, including Indonesia.

Since the beginning of President Joko Widodo's administration, the BUMDes (village-owned enterprises) program has been launched in conjunction with the village fund program in 2015. Village fund and BUMDes are the program initiations directed by the central government as their efforts to achieve village economic

independence and poverty reduction (Paellorisky & Solikin, 2019; Sara et al., 2021; Saragi et al., 2021). Because it is a relatively new program and still in the development stage, BUMDes has not optimally provided benefits for village independence (Amri, 2019; Mukmin & Prayetno, 2019). BUMDes has not yet optimal because the increase of BUMDes in Indonesia has not been followed by its utilization for economic activities in the village (Arifin et al., 2020). The use of BUMDes to improve village development and help reduce poverty was also conveyed by Nugroho et al. (2020) that identified the comparative advantages of villages as the consideration to develop specific business units under BUMDes. Although the village development program through BUMDes has not been optimal in creating village independence, a study conducted by Arham and Payu (2019) explains that other government programs, namely the village fund program, already have a role in developing rural economic activities and reducing poverty in rural areas.

In addition to focusing on efforts to increase VDI, the government also needs to add some supporting programs such as community empowerment. The government must accelerate the improvement of the village development status by increasing the three dimensions of VDI in each villages based on the capacity of their resources. This result is in line with the study in Bangladesh conducted by Sudipa and Nurjani (2021) and Mahiuddin et al. (2015) that village development must be carried out by increasing government financing in productive economic sectors in rural areas that can increase the capacity of natural and human resources for village development. The government should ensure that village development will involve the community inclusively. The development process must be carried out correctly in improving economic sectors the community has mastered, for example, the agricultural sector (Arsyad et al., 2020; Shehu, 2018).

According to the result and discussion, a specific policy in each villages will make the government more focused on efforts to overcome the problems faced by each villages. It is important to achieve the efficiency and effectiveness of rural development programs based on the specific socio-economic backgrounds and local resources, including the community. Empirical results show that community empowerment and strengthening social capital affect the progressive decision-making process in rural development and poverty reduction in a rural community (Antlöv et al., 2016; Nawawi et al., 2020; Rustiadi & Nasution, 2017). The implementation of government programs in rural development that are carried out comprehensively has turned out to positively impact village development and community welfare. It implies that the improvements in the implementation of rural development programs must conducted continuously to strengthen community empowerment for rural economic development (Akita & Miyata, 2018; Watts et al., 2019).

4. Conclusion

This study makes an essential contribution in uncovering the category of villages as measured by the VDI that can influence the depth and severity of poverty. The closer to the achievement of independent villages, the lower the poverty depth and severity index will be. To reduce the level and rate of poverty and inequality, the government (central and regional) should improve the quality of life of rural communities, which is reflected in the three main aspects forming the village development index, namely economic, social, and ecological resilience. Thus, increasing the VDI can support the rural development progress and minimize the gap within the vulnerable poor people in rural areas. It can be concluded that this study provides a new explanation for the positive effect of increasing VDI status in reducing poverty and inequality in rural areas.

From the above conclusions, this study formulated some policy recommendations. First, the government should consider rural governance as the aspect/component of the village development index to maintain better rural development planning and its

implementation. Rural governance will allow local community to optimize the resources for economic activities based on their own capacity. Second, the government should connect the VDI with SDGs to develop synergy between them to improve rural development and accelerate the achievement of SDGs. Third, the government needs to provide budget planning assistance, especially in controlling village funds. It must be carried out to ensure that village funds are sufficiently used for village development progress and the welfare of village communities. Thus, village or rural development can be a way for the government to accelerate poverty reduction programs and decrease inequality in rural areas. Fourth, strengthening the village economic institutions, such as BUMDes and the community empowerment, allowing all people in the village to benefit from development programs in rural areas.

Further research could be carried out by conducting a more micro-analysis at the village level and considering factors that might influence the poverty gap, such as population size, availability of infrastructure facilities at the village level, and rural-specific poverty data. Further analysis can also be done with the addition of control variables and more data series, which will increase the trend of village development and reduce the poverty gap from year to year. Analysis with mixed methods of quantitative and qualitative methods will also be instrumental in exploring the problems in each villages by conducting direct observations and research in rural locations.

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