

**THE IMPACT OF VILLAGE FUNDS' CAPITAL PARTICIPATION TO VILLAGE-OWNED  
ENTERPRISE ON VILLAGE'S GROWTH AND DEVELOPMENT:  
AN EVIDENCE FROM BANYUMAS DISTRICT, CENTRAL JAVA, INDONESIA**

**Thesis**

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**The Impact of Village Funds' Capital Participation to Village-owned Enterprise on  
Village's Growth and Development:  
An Evidence from Banyumas District, Central Java, Indonesia**

**Qonita Rahmah<sup>1</sup>**

Abstract

This paper investigates how the existence of a village-owned enterprise would affect the growth and development in the village after the Village Funds policy started in 2015. One utilization of the Village Funds is the capital participation in the establishment of the enterprise, increasing the number of enterprises being created. Growth and development in the village is a challenging subject to measure. While the economic growth can simply be measured as GDP growth, the Regional Domestic Product is only available until the District/City level. Thus, this paper measures the growth and development in the village as the Building Village Index (*Indeks Desa Membangun*, IDM), a composite index published by the government to determine the progress and development status of the village. This paper uses a difference-in-difference estimation to find out the impact of enterprise on the IDM score while expanding the observations to include the social, economic, and ecological dimensions of the village. The DID estimator shows the positive and significant effect of the establishment of the enterprise to the IDM score. Village with enterprise found to have a higher IDM score as compared to other villages without enterprise, given that both groups did not have the enterprise before the policy intervention begins. Other observations show that the availability of medical personnel, high schools, markets, hotels, logistic services, government banks, public transportation, and disaster management system improve the IDM score. In contrast, the occurrence of natural disaster reduces the IDM score and hinder the growth and development in the village.

**Keywords:** growth, development, Village Funds, village-owned enterprise, BUMDes, Building Village Index, *Indeks Desa Membangun*, IDM, difference-in-difference

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# 1 Introduction

Indonesia experienced a highly centralized system. The centralization system changed after Local Government Law No. 22/1999 (which later replaced by Law No. 23/2014 that has been revised by Law No. 9/2015). The bill marks the beginning of decentralization by creating autonomous local governments at the Provincial and District levels. In 2014, Village Law No. 6/2014 extends the system until the village level. The comparison between village-related laws is summarized in **Appendix 1**.

One consequence of the 2014 Village Law is the start of intergovernmental fiscal transfer under the **Village Funds** program. This program allows direct transfer from the Central Government to the Village Government, adding the current allocations from District Government. The village government is encouraged to be self-empowered under the sentence "one village, one plan, one fund."

The village funds program is considered as a Community-Driven Development (CDD) program to improve the living condition of poor people in the village. It can be achieved through better access to essential services, social capital, and local governance (Wardhana, Rifin, Suhendra, & Wicaksono, 2018). The utilization of the funds is limited to village development and community empowerment programs and not for financing the village government's daily operation. As of December 2018, Village Funds has been used to build infrastructures such as 191,600KM roads, 1,140,378M bridges, and 8,983 markets. To make it more sustainable, the Central Government introduces four priority activities. Village Funds should be a way to develop/build: (1) village's top products, (2) village-owned enterprise, (3) village's water reservoir, and (4) village's sports facilities.

The research by the Ministry of Finance in 2017 found that the Village Funds program has increased the number of village-owned enterprises. The Central Government believes that creating an enterprise would help in developing the village's economy, thus, encourage the village government to establish one (Cabinet Secretariat, 2020). By December 2018, 37,830 village-owned enterprises have been built. Village-owned enterprises have proven as a place to develop entrepreneurship and improve the economy of the community through the development of a productive economy in Pejarakan Village, Buleleng Regency, Bali (Larasdiputra, Anggiriawan, Kawisana, & Putra, 2019). A study in Bleberan, Gunungkidul, Yogyakarta explains that village-owned enterprise as a social business has abilities to empower the socio-economic community in the form of network and trust (Prabowo, 2014). However, among those papers, none of them shows empirical evidence whether the enterprise has affected the village's condition.

The Village Funds is a populist policy that is popular among the voters who belong to the village community. The empirical evidence is needed to guide the policymakers whether the Village Funds and its priority areas is effective and efficient in achieving its goal. Thus, the policymakers should have evidence-based policy planning, implementation, monitoring, and evaluation. The empirical evidence is

essential, mainly when the program's budget is limited by the law that its effectiveness needs to be well-measured.

This paper intends to analyze how village-owned enterprise influences the growth and development in the villages by using data from 301 villages in Banyumas District, Central Java, as measured by the composite index: Building Village Index (*Indeks Desa Membangun*, IDM). Banyumas District is one of the landlocked regions in Java Island. The villages are an ordinary village in Indonesia. Most villages (259 or 86%) are located inland, 68 others (22.6%) are in peak/slope, and only four villages (1.3%) are located in the valley. This topography leads to similar village characteristics from one to another, such as their primary source of income on agriculture products. Even though the result may not be able to capture the whole characteristics of Indonesia, this paper would be able to provide a shred of evidence for Java Island, which represents roughly 140 million (56%) population and more than 25,000 (33.4%) villages in Indonesia.

This paper contributes to the literature in providing the empirical evidence of the effectiveness of the Central Government's policy that encourages the establishment of the village-owned enterprise to the goals of Village Funds itself. Thus, this paper will evaluate whether there is any significant difference in the growth and development between villages that have the enterprise to the villages without enterprise, after considering other relevant factors.

## 2 Data

The primary data source for this paper comes from different sources that will be combined as a panel dataset. The sources are summarized in **Appendix 2**. The information about village-owned enterprises comes from the Local Government of Banyumas District. In total, we record 301 villages in this region, and this number does not change during the period 2011-2020. We were able to gather information about the enterprises' name, address, status, establishment year, source of capital, and business operation. However, the database includes neither financial information related to revenue and profit nor the number of employees. Thus, this paper will only consider the fact that an enterprise is created in a particular village, its establishment year, and the current status, whether it is still operating actively.

The data related to the villages is obtained from the Statistical Bureau's Data Collection of Village's Potential (*Pendataan Potensi Desa*, PODES). This survey is conducted every three years. The first wave of this survey was in 1990. This paper uses data from the seventh (PODES2011), eighth (PODES2014), and ninth (PODES2018) waves of PODES. In 2019, the Bureau conducted a follow-up survey (PODES2019). The information collected in each survey covered up to three years prior. We record that PODES2011 covered village's data in 2010-2011, PODES2014 collected information during 2011-2014, PODES2018 collected the 2015-2018 ones, and PODES2019 updated some aspects as per 2018. The cut-off of the timeline used in the dataset is as follow:

Table 1 Timeline

2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
PODES2011					PODES2018				Ministry of Village's internal survey is conducted	
PODES2014										
				Village Law enacted	Village Funds starts					
					IDM2015				IDM2018	IDM2019

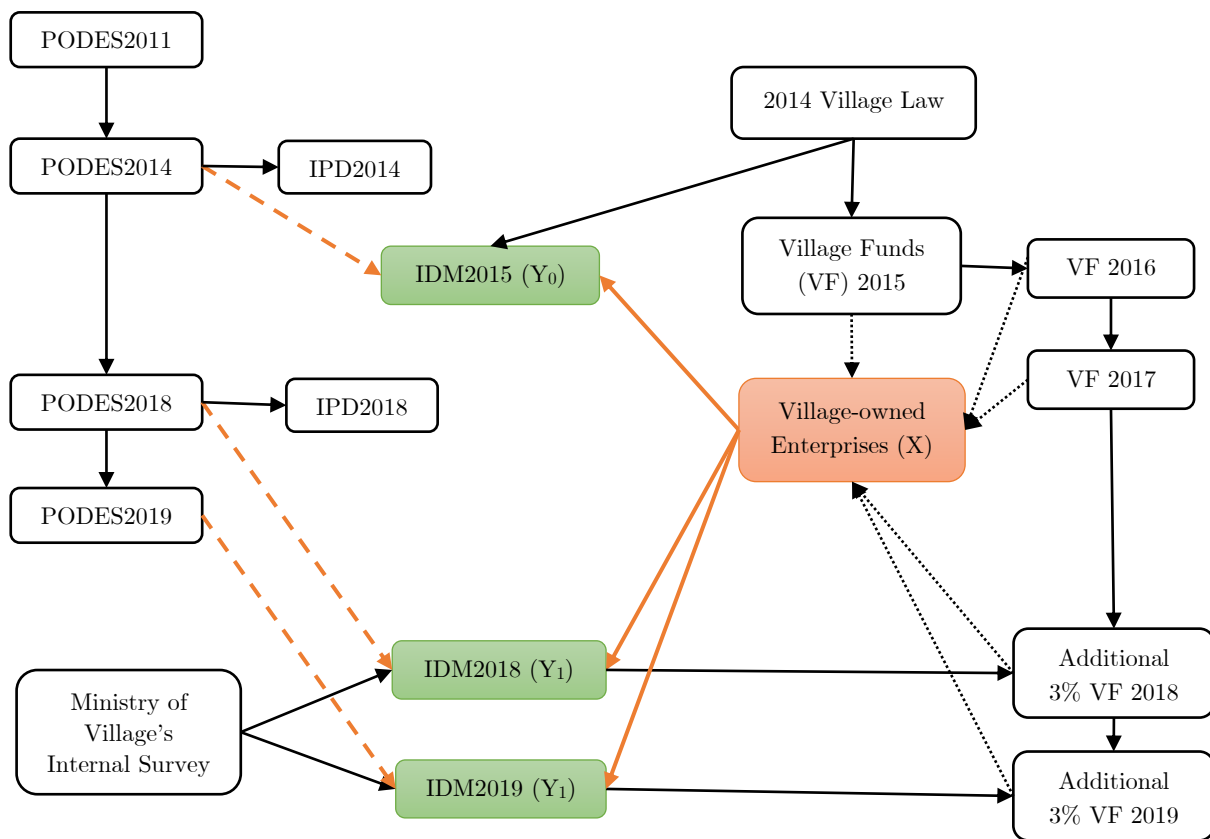
Our model consists of the information for one year before the treatment and two years after treatment. The pre-treatment period was in 2014, and the post-treatment period was in 2018 and 2019. The cut off period will be in 2015, when Village Funds start being distributed that trigger the establishment of many new enterprises (Wardhana, Rifin, Suhendra, & Wicaksono, 2018). Thus, the policy intervention that causing the growth and creation of enterprise would be the Village Funds in 2015.

PODES covers many significant aspects of the villages in 514 Districts/Cities of 34 Provinces in Indonesia. We were able to gather some information related to the village's assets and finances from PODES2014. Unfortunately, data related to the village's income, village funds, and village-owned enterprises are not disseminated by the Statistical Bureau in PODES2018 and PODES2019, despite being part of the questionnaire. It is not disseminated due to the risk of being unreliable and causing a misleading interception.

The Statistical Bureau uses PODES to calculate the Village Development Index (*Indeks Pembangunan Desa*, IPD). This index categorizes a village into three levels: (1) independent, (2) developing, and (3) disadvantaged. IPD score is used by the Ministry of National Development Planning (*Bappenas*) in formulating the National Mid-term Development Plan (RPJMN). However, the smallest IPD score is only available at the District level. Thus, there was no specific measure for development at the village level until 2014.

In 2014, the Ministry of Village, Development of Disadvantaged Regions, and Transmigration (hereafter, Ministry of Village) initiated the Building Village Index (*Indeks Desa Membangun*, IDM) that set the development status of a village. The IDM categorizes a village into five hierarchy: (1) independent, (2) developed, (3) developing, (4) disadvantaged, (5) very disadvantaged. This paper obtained IDM score 2015-2019 for villages in Banyumas District from the Ministry of Village. It is used as a measure for the growth and development in the village. The relationship between each data source is summarized in the chart **below**.

Figure 1 Relationship between Data Sources



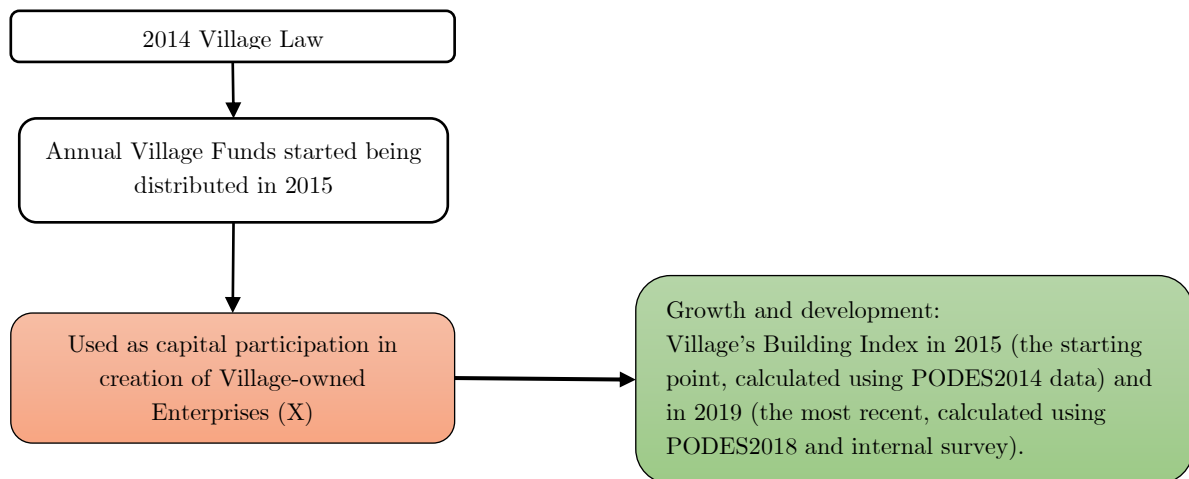
From the chart above, this paper will examine the effect of having an enterprise in the village to the IDM score as represented by the orange line. The first IDM launched in 2015 was calculated from the information in PODES2014. The second IDM in 2018 was done using the Ministry of Village's internal survey. Since 2019, the Ministry of Village's IDM questionnaire distributed to every village to obtain updated social, economic, and ecological information about the village. Thus, we use PODES datasets to set the control variables for the IDM score as represented by the orange dotted line.

The black dotted line would represent the treatment given to the village. It is determined by the establishment year of the enterprise which varies between one village to another. Because, most villages used village funds as capital participation in the creation of enterprise (Wardhana, Rifin, Suhendra, & Wicaksono, 2018). We believe that finding the causal relationship between the enterprise and the IDM score is essential, because, the IDM score determines whether a village could obtain an additional 3% of village funds. The new allocation formula in 2018 of village funds considers the development status of a village as part of the Affirmation Allocation. However, regardless the status a village would obtain, the Village Funds will still be distributed. Besides being a populist policy, it has shown to speed up the growth and development in rural area which has long been left behind.

In summary, the research framework is as the chart **below**.



Figure 2 Research Framework



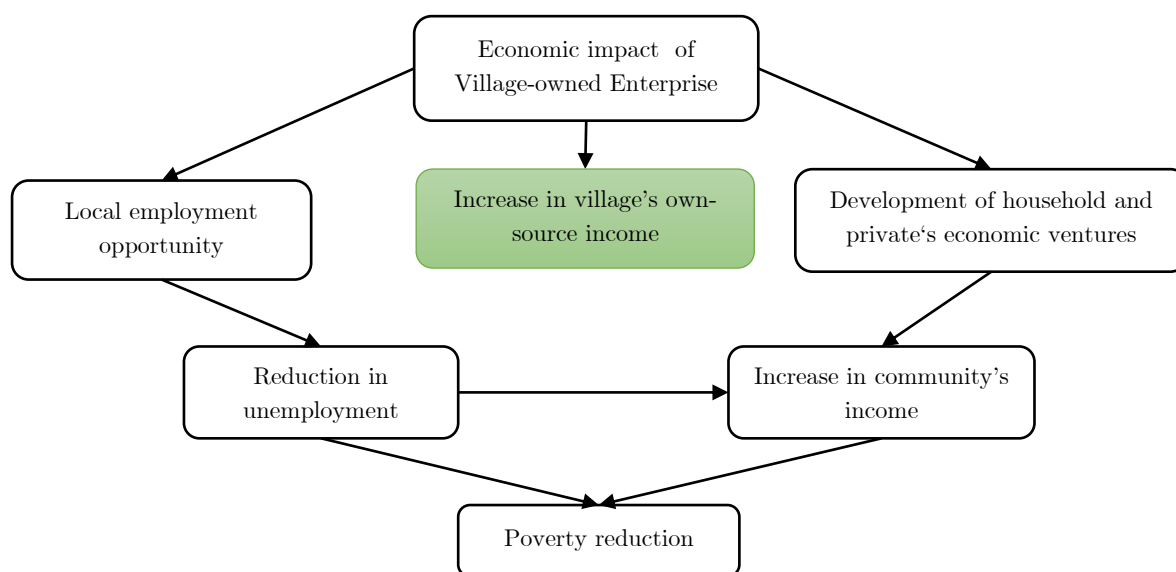
## 2.1 Village-owned Enterprise Measure

Village-owned enterprise has been introduced since **Law No. 32/2004**. Article 213 states that the village can establish an enterprise following the needs and the village's potential. Therefore, before the village funds start, some villages have already created an enterprise. Under the 2014 Village Law, the enterprise is owned by the village through direct participation by the Village Funds. Also, the enterprise can be assigned to manage the village's assets, such as building or farm. The existence of this enterprise is expected to drive the village's economy in improving the welfare of the community (Rodiyah, 2019).

The creation of an enterprise is a policy approach to the government's Nawacita program. Firstly, the enterprise is a policy strategy to bring government institutions ("*Negara Hadir*") to social life in the village, of which the government refers to "*Tradisi Berdesa*" or "Village Tradition" (Putra, 2015). Moreover, it is also an approach to develop Indonesia from the edge ("*pinggiran*") through the development of the village's collective business economy. Further, Putra (2015) describes that the policy aims to improve the living quality of the village residents, as well as a form of economic independence from creating strategic business units.

As one priority area of utilization of Village Funds, the creation of village-owned enterprises aims to speed up the development in the village. The government believes that if a village establishes an enterprise, it would have a better socio-economic condition. The enterprise has the objective of pursuing improvement of the community's welfare, aside from financial return (Sembiring, 2017). The government describes the possible socio-economic impacts from the establishment of the enterprise in the following chart:

Figure 3 Village-owned Enterprises and the Economy



Source: Ministry of Finance (2017). *Village Funds' Pocket Book*.

The establishment of enterprises also enhances the role of entrepreneurship in rural development in rural areas (Ansari, Mirdamadi, & Zand, 2013). The role includes to provide access to the required goods and services, to promote the economic growth of villages, to reduce urbanization or migration to the cities, to promote social security and welfare, to encourage the creation of new business, and to encourage the development of existing jobs. Further, Faraji et al. (2011) in Ansari, Mirdamadi, & Zand (2013) argued that entrepreneurship is the primary force in economic development in a village that also brings positive impacts on other aspects of villagers' human life. Finally, the enterprise shows a transformation of the government-driven program into a village-owned entity that plays as an arena to build managerial capacity, entrepreneurship, village governance, leadership, trust, and collective actions (Putra, 2015). Thus, in this paper, we hypothesize that villages with enterprises would have different growth and development rate as compared to the villages without enterprise.

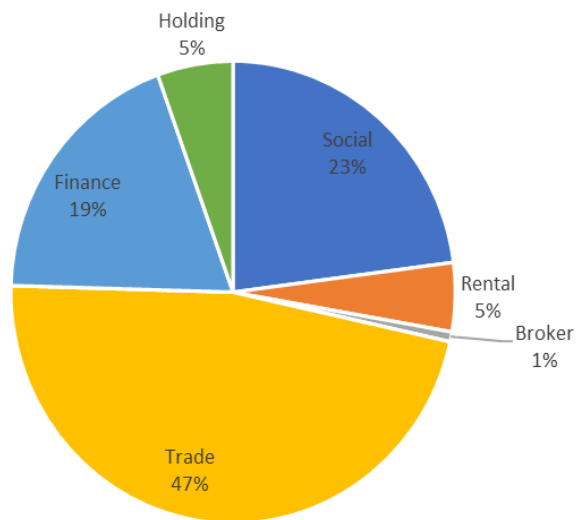
### 2.1.1 Business Operations of Enterprises in Banyumas District

Part IV of Minister of Village, DDR, and Transmigration Regulation No. 4/2015 describes six business lines for the enterprise that a village can build using the Village Funds:

- 1) Financially profitable **social businesses**, such as drinking water, electricity, food barns, and other local resources and useful technology.
- 2) **Rental services**. Such as transportation, party tools, wedding hall, shop house, land, and other rental items.

- 3) **Broker services.** Such as electricity payment gate and traditional village markets.
- 4) **Trading.** Such as ice, liquid smoke, agriculture products, agricultural production facilities, mined wells, and other productive businesses.
- 5) **Financial services** to meet the needs of micro-scale businesses, such as providing access to credit and available lending for village society.
- 6) **Business Holding.** The holding company may focus on developing larger-scale businesses such as ships for fishers, tourism.

Figure 4 Distribution of Business Lines



Source: Master Database (2020)

In Banyumas District, it is recorded that 169 villages have an enterprise that operates in one business line, whereas 100 others have more than one business line. In total, 436 businesses are being operated by 269 enterprises in 2020. The distribution of the sectors is seen in Figure 4.

Most enterprises operate in trading. It comes as simple as opening a minimarket or other stall to sell staple foods or other agricultural products. The enterprise also operates in the local industry, such as brick production, batik textile, plant nursery, and catfish cultivation.

Figure 6 Catfish Cultivation



Source: <https://madinapos.com/2018/09/18/bisnis-dan-ekonomi/panen-perdana-ternak-lele-bumdes-maju-bersama-desa-hutabanqun-jae/>

Figure 5 Brick Production Industry



Source: <https://www.republika.co.id/berita/ekonomi/makro/15/02/13/nasional/daerah/17/10/21/oy68es-industri-batu-bata-rejang-lebonq-terancam-qulunq-tikar>

In the social sector, most enterprises operate in water supply management to provide clean water to the people and waste management. It is common for every house in the village to have their well as the water source for daily life. However, some areas might hard to obtain the groundwater, or there has not any local water company operates in the region. Thus, there is a demand for clean water in most villages.

In the finance sector, the enterprise serves as a financial institution that provides credit to individuals or businesses, as well as acting as a saving account. The local term for this type of business is "*Simpan Pinjam*," literally means "Savings and Loans." The nature of this business is to provide a small loan to an individual where she/he pays the instalment daily or weekly for a given time. The customers are usually small sellers in the traditional markets or anyone who needs money in a rush.

In other sectors, some enterprises operate on the rental of concrete mixer machines, traditional stage "*trataq*," three-wheels vehicles, buildings, and wi-fi appliances. The concrete mixer machines are commonly used to speed up the house-building process. Moreover, when a village owns a building, the enterprise manages the building to be available for rent.

Figure 7 Traditional Stage “*Trataq*”



Source:

<https://nusantarapos.co.id/tmmd/43631/01/10/2019/warga-dusun-cironeng-persiapkan-pemasangan-trataq-pementasan-kesenian-tradisional/>

Figure 8 Concrete Mixer Machine



Source: <https://www.olx.co.id/>

Holding business is commonly established when a village has particular potential. It usually comes in the tourism sector. The village reservoir is one example of the tourist attractions that are being managed by the enterprise. The other examples are agritourism, fishing arena, temples, and swimming pools.

Figure 10 Fishing Arena



Source: <https://suarabantennews.com/2019/10/28/tingkatkan-ekonomi-rakyat-pemdes-serdang-wetan-optimalikan-bumdes/>

Figure 9 Water Reservoir Tourist Site



Source:

<https://www.cendananews.com/2019/10/segarnya-wisata-danau-buatan-jukung-kanoman.html>

## Summary Statistics of Village-owned Enterprises

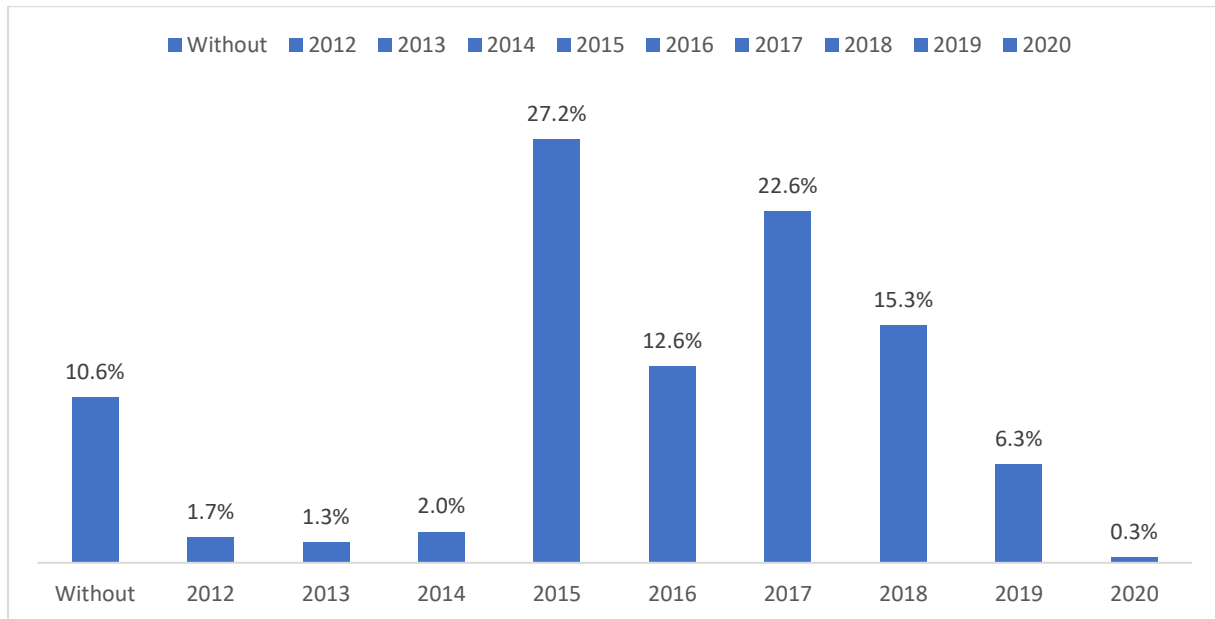
Based on the database of Village-owned Enterprise from the Local Government, by 2020, there have been 269 enterprises (89.4%) recorded in the Local Government's database. However, the Local Authority recorded that among registered enterprises, 204 (75.8%) of them are fully functioning.

*Table 2 Enterprise's Status*

Number of Villages	Enterprise's Status			
	Inactive	Active	Unknown	Total
Without Enterprise	0	0	32	32
With Enterprise	57	204	8	269
<b>Total</b>	<b>57</b>	<b>204</b>	<b>40</b>	<b>301</b>

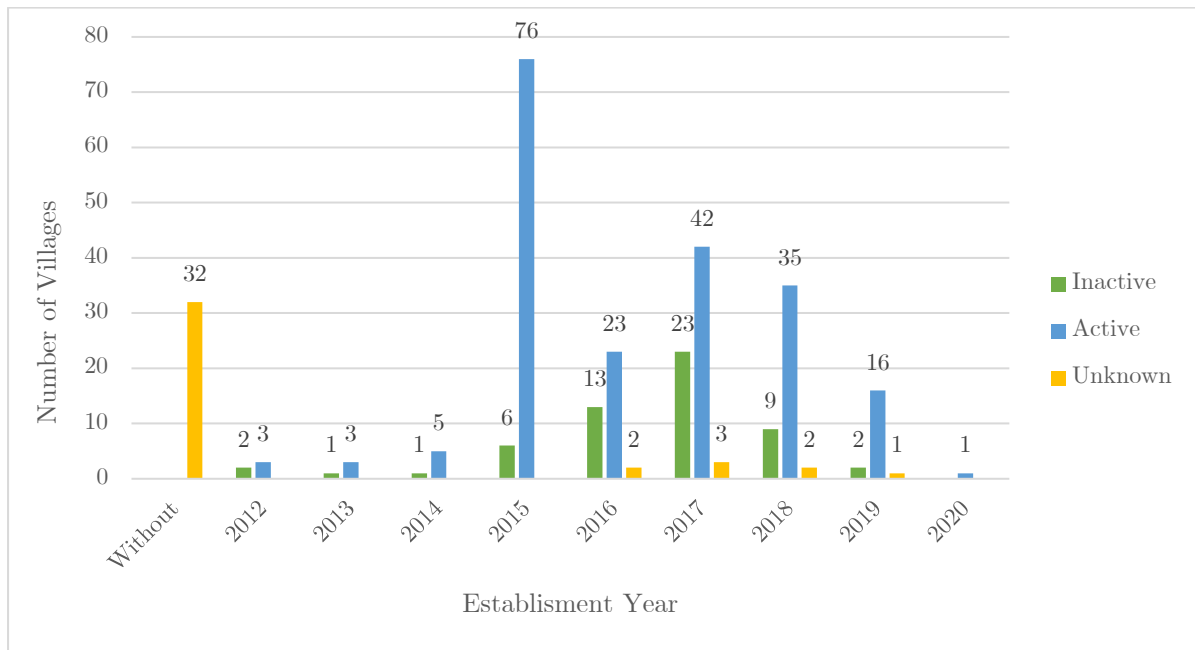
The database also recorded that there are 15 villages (5%) that have already created enterprise during 2012-2014. The number increased significantly by the time Village Funds was distributed in 2015. It is recorded that 82 enterprises (27.2%) were created in 2015. In the following year, 38 more enterprises were created. In 2017 and 2018, there were 68 and 46 enterprises created, respectively. The chart below shows the proportion of enterprises based on their establishment year.

*Figure 11 Distribution of Establishment Year of Enterprises*



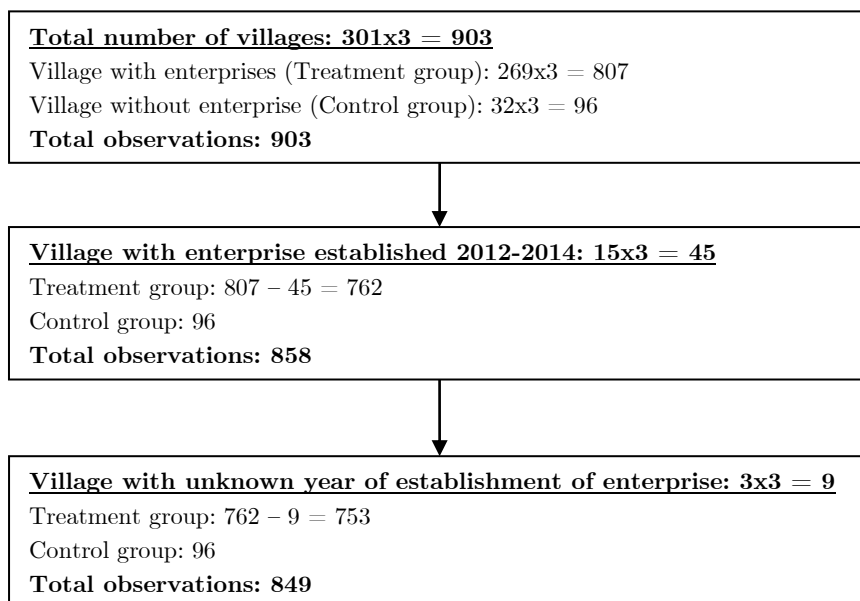
In terms of current status and its establishment year, the distribution of the enterprises is shown in the following chart.

Figure 12 Distribution of Enterprise's Status and Establishment Year



In summary, this paper uses the panel dataset to estimate the effect of the enterprise on the growth and development in the village. After selection and cleansing, this paper will include only 251 villages with the enterprise as a treatment group. We exclude the village with an enterprise that has been established before 2014 in order to find out the actual effect after the treatment. Therefore, the control group will consist of 32 villages. The following chart shows the selection mechanism.

Figure 13 Sample Selection Flowchart



## 2.2 Growth and Development Measure

There have been debates about the best measure of growth and development in villages as rural areas. Growth has long been associated with economic growth as a concept in measuring changes in income per capita. However, the economic growth in the village level is impossible to obtain since the smallest recorded Regional Gross Domestic Product (GDP) is in the District/City Level. Development is a concept that expands growth concepts from just income into other dimensions of wellbeing, such as **education and health** (Rauniyar & Kanbur, 2010). On the other hand, the development of the village has always meant infrastructure development, whether there is improvement or addition of the roads or bridges. Thus, it is a challenge on how a government would be able to measure development in its rural areas.

The issues of the underlying problems in rural area developments in Indonesia have been raised by Bachrein (2010). Firstly, the village government is usually governed straightforwardly and traditionally. Moreover, the formation of village institutions sometimes is not based on the real needs of the village residents, but the fulfilment of provisions governed by legislation or compliance with the regulations (Bachrein, 2010). Secondly, the quality of village officials is generally quite low. However, in terms of quantity, it is classified as sufficient, which is a minimum of 7 people and a maximum of 9 people (Bachrein, 2010). The quantity of village government officials has already following the organizational patterns set by the government. Thirdly, village empowerment programs and activities are conducted partially by each department within the village government through the establishment of a new entity in a top-down mechanism (Bachrein, 2010). Thus, it might damage the current structure, and the sustainability of the institutions is becoming questionable, as they might disappear once the village head changes. Finally, there was an issue of the village's officials' income inequality between one village to another. The income received by village officials highly depends on the financial capability of the village itself, mostly from yields of the village's land. Thus, this might cause a high inequality between one village to another in terms of the officials' incomes.

After understanding the four underlying problems argued by Bachrein (2010), there is a growing question on whether the conditions have been improved after the 2014 Village Law. The Village Law has shaped the village autonomy to a certain extent. It allows them to exercise a more substantial financial power from the availability of funding by the Village Funds program. Thus, the government comes up with a village's development measurement: Building Village Index.



### 2.2.1 *Indeks Desa Membangun* (Building Village Index, IDM)

As a mostly decentralized country consists of 34 provinces, 514 districts/cities, 6,592 sub-districts, and 74,954 villages, the government faces difficulty in measuring the status of each region. Village's economic development is the most crucial part of national development as it comprises the most significant area with a high population (Sardi, 1983). Rural development in Indonesia is a challenging task due to its massive number of villages located on different islands. Sardi (1983) believed that developing villages would require massive funds and efforts. He added that the development strategy should focus on basic-need projects that cover larger areas. Village Funds in 2014 marked the start of massive infrastructure development in the villages.

The effort in measuring development in villages start in the 1970s. The government released village typology scoring in 1977 and disadvantaged villages scoring in 1993. In 2007, the government started complexity scoring in village classification. In 2010 - 2017, there was an effort to simplify the index to make it more communicable. In 2014, Village Law required a reliable measurement of the village's development as the result of the Village Funds program. Thus, the Central Government comes to find a better measure of the village's development in the form of *Indeks Desa Membangun* (Building Village Index, IDM). It comprises of three sub-indexes:

- 1) Social Resilience Index
- 2) Economic Resilience Index
- 3) Ecology Resilience Index

Ministry of Villages uses the IDM score to determine the status of each village in Indonesia. IDM is part of sectoral statistics. The first IDM released by the government was in 2015. IDM2015 was initially used as a starting measure for development in the village. However, IDM2018 and IDM2019 become a part of the new Village Funds formula since 2018. The new allocation formula gives an additional 3% incentive for Disadvantaged and Very Disadvantaged villages.

IDM2015 is formulated concerning the availability of data and information from the Village's Potential Data Collection 2014 (PODES2014). Thus, we can consider IDM2015 as the development status of the village before the Village Funds program. In the next IDM, the government gathers the information needed to calculate the index by delivering questionnaires to each village government.

The IDM plots the progress and dependency of the village into five categories:

- 1) Independent Village,  $IDM > 0.8155$

It is a village that can carry out development to improve the quality of life and the welfare of the village community, the quality of human life, and poverty reduction through social, economic, and sustainable ecological resilience.



2) Developed Village,  $0.7072 < \text{IDM} \leq 0.8155$

It is a village that has the potential of social, economic, and ecological resources. Also, it can manage the potentials in order to improve the welfare of rural communities, the quality of human life, and poverty reduction.

3) Developing Village,  $0.5989 < \text{IDM} \leq 0.7072$

It is a village that has the potential of social, economic, and ecological resources. However, it has not optimally managed the potentials to improve the welfare of rural communities, the quality of human life, and poverty reduction.

4) Disadvantaged Village,  $0.4907 < \text{IDM} \leq 0.5989$

It is a village that has the potential of social, economic, and ecological resources. However, it has not managed the potentials to improve the welfare of rural communities, the quality of human life. Also, this region experiences poverty in various forms.

5) Very Disadvantaged Village,  $\text{IDM} \leq 0.4907$

It is a village that experiencing vulnerability due to natural disasters, economic shocks, and social conflicts. This region is unable to manage its social, economic, and ecological resources. This region also experiences poverty in various forms.

One goal of the 2015-2019 Mid-term Development Plan is to reduce the number of 5,000 Disadvantaged Regions and to increase the number of Independent Villages for at least 2,000. The plan states the framework for regional development as follow:

1) Village development needs to be enhanced from:

- a. Local economic empowerment,
- b. Creation of access to local transportation to the growth areas, and
- c. Acceleration of the fulfilment of basic infrastructure

2) The goals of rural area development:

- a. To realize community independence
- b. To create independent and sustainable villages that are socially, economically, and ecologically resilient.

Finally, the benefit of the IDM score is that the score is calculated in a bottom-up mechanism, which allows data validation in multiple steps. The IDM is also updated every year so that it can be used to monitor the utilization of the Village Funds and to set the development status of the village. Thus, IDM can be used in policy recommendations to encourage possible policy intervention for the village's development programs. The result of the index will determine the status of the village. Eventually, it will be used to monitor the effectiveness of the Village Funds' development program.

### 2.2.2 IDM Scoring

As stated in Regulation of the Minister of Village, DDR, and Transmigration No. 2/2016, the composite index comprises of three indexes that are formulated from variables with different indicators. Each indicator has a score of 0 - 5, of which the higher number represents a more positive meaning. The total score of indicators for each index is converted into 0 -1 by dividing the total score obtained to the total maximum score.

The IDM comprises of three indexes. The Social Resilience Index has four dimensions: (1) Social Capital, (2) Healthcare, (3) Education, and (4) Housing. It comprises of 14 variables and 38 indicators. If all the indicators are positively fulfilled by a village, the total score is 190.

$$\text{Social Resilience Index} = \frac{\text{Total score of 38 indicators}}{190}$$

The Economic Resilience Index has one economic dimension that covers five variables and 12 indicators. Thus, if all the indicators are positively fulfilled by a village, the total score is 60.

$$\text{Economic Resilience Index} = \frac{\text{Total score of 12 indicators}}{60}$$

The Ecology Resilience Index has one ecology dimension that covers two variables and three indicators. Thus, if all the indicators are positively fulfilled by a village, the total score is 15.

$$\text{Ecology Resilience Index} = \frac{\text{Total score of three indicators}}{15}$$

After each index is obtained, then the formula to calculate the composite index is simply the average of all indexes:

$$IDM = \frac{(\text{Social Resilience Index} + \text{Economic Resilience Index} + \text{Ecology Resilience Index})}{3}$$

### 2.2.3 Summary Statistics for IDM in Banyumas District

In 2015, the average IDM score was 0.668, the highest was 0.853, and the lowest was 0.440. In 2019, the average IDM score was 0.690, the highest was 0.879, and the lowest was 0.548. These changes show that there has been an improvement in overall growth and development status in the villages in Banyumas District. For example, in 2015, before the Village Funds start being distributed, there was one village with IDM score < 0.4907, which categorize as a Very Disadvantaged Village. However, in 2019, after the Village Funds program run for four years, the least benefited region belongs to the Disadvantaged Village category as its IDM score was located between 0.4907 and 0.5989.

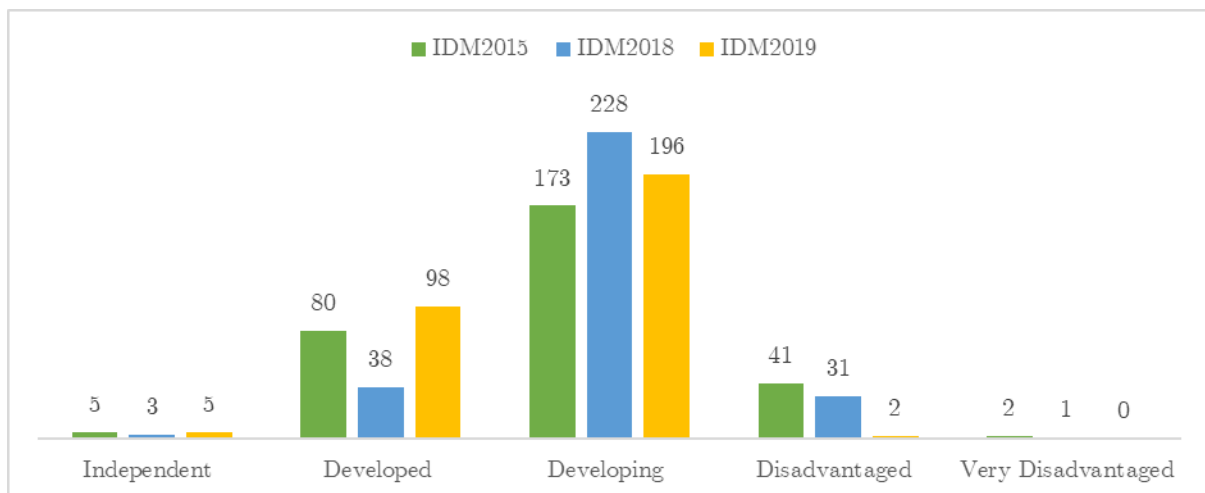
For each component of the IDM, in 2015, the average Social Resilience Index (IKS) score was 0.717, with the highest score being one and the lowest being 0.511. In 2019, the average IKS score was 0.780, with the highest score was 0.949, and the lowest was 0.611. These changes show improvement within social dimensions in the village, including healthcare and education.

For the second IDM component, Economic Resilience Index (IKE), the average score for 2015 and 2019 was 0.603 and 0.621, respectively. The highest IKE score was 0.924 for 2015 and 0.900 for 2019. The lowest for 2015 was 0.342 and 0.35 for 2019. Overall, there has no significant improvement in the economic dimension in the villages in Banyumas District. There could be a reason for this condition. Firstly, the economic indicators are mostly related to the existence of markets, hotels, restaurants, and other factors to support economic activity. Most of them would need some time for the effect to take place, as it took more than a year only to build a market. Therefore, during the period of observations, IKE shows no change.

Finally, for the ecological aspect, the average Ecology Resilience Index (IKL) score in 2015 was 0.683 and 0.67 in 2019. The recorded highest and lowest score was 1 and 0.33 for both years, respectively. Overall, there has no significant improvement in the ecological dimension in the villages in Banyumas District. Similar to the economic dimension, the indicators are the occurrence of natural disasters and the mitigation system. Most of them would need some time for the effect to take place. Therefore, during the period of observations, IKL shows no change.

In summary, the villages in Banyumas District fall into the following category. In 2015, five villages earned status as an independent village. This number did not change in 2019. However, the number of the developed village increased from 80 villages (27%) to 98 villages (33%). The number of developing villages has also increased from 173 villages in 2015 into 196 villages in 2019. Because of this improvement, the number of disadvantaged has decreased by ten villages, started from 41 to 31 villages in 2019. Finally, there is no longer a very disadvantaged village in Banyumas District by 2019. The distribution of the status is as follow:

Figure 14 Distribution of Village's Status based on IDM



Source: Master Database (2020)

## 2.3 Identification Strategy

### 2.3.1 Dependent and Independent Variables

To sum up, this paper aims to find out the effect of the village-owned enterprise on the growth and development in the village. The dependent variable is measured as the **IDM** score, a composite index calculated and published by the Ministry of Village. The independent variable is measured as a dummy variable, whether the enterprise exists and actively operates in the village.

We understand that the **IDM** score might not be the perfect measure of growth and development in the village. However, the index could have captured multiple dimensions in the village, from the social, economic, and ecological dimensions. Also, its availability in the village-level data would help in estimating the impact of a policy intervention more precisely. Therefore, despite its limitation, the **IDM** score could be the best available estimator for the growth and development in the village for the time being.

*Table 3 Identification Strategy*

Variable type	Proxy
Independent (X)	Village-owned enterprises: The availability of enterprise (ENT) Treatment group: - Village with an enterprise that is established from 2015 onwards Control group: - A village without enterprise.
Dependent (Y)	Growth and development: Building Village Index ( <b>IDM</b> ) Before treatment: <b>IDM</b> 2015 After treatment: <b>IDM</b> 2018 and <b>IDM</b> 2019

### 2.3.2 Control Variables Choices

Since we would like to see the only effect from the establishment of the enterprise to the growth and development as measured by the **IDM** score, other factors that might influence this score will be treated as control variables. Basically, all factors affecting growth and development has been part of **IDM** calculation, such as social, economic, and ecology, including education and healthcare. Thus, we include some indicators used in **IDM** calculation as an additional observation. The variables are shown in the following table.

*Table 4 Control Variables*

No	Indicators	Code
<b>Social Resilience Index</b>		
1	Availability of midwives. It is measured as the number of midwives' working in the village.	MIDWIVES
2	Availability of general practitioners. It is measured the number of doctor's office in the village	DOCTORS
3	Access to senior high school measured as a dummy variable where 1 if the distance is less than 6KM and 0 otherwise.	HIGH_SCH
<b>Economic Resilience Index</b>		
4	Availability of market in residential. It is measured by the number of markets in the village.	MARKET

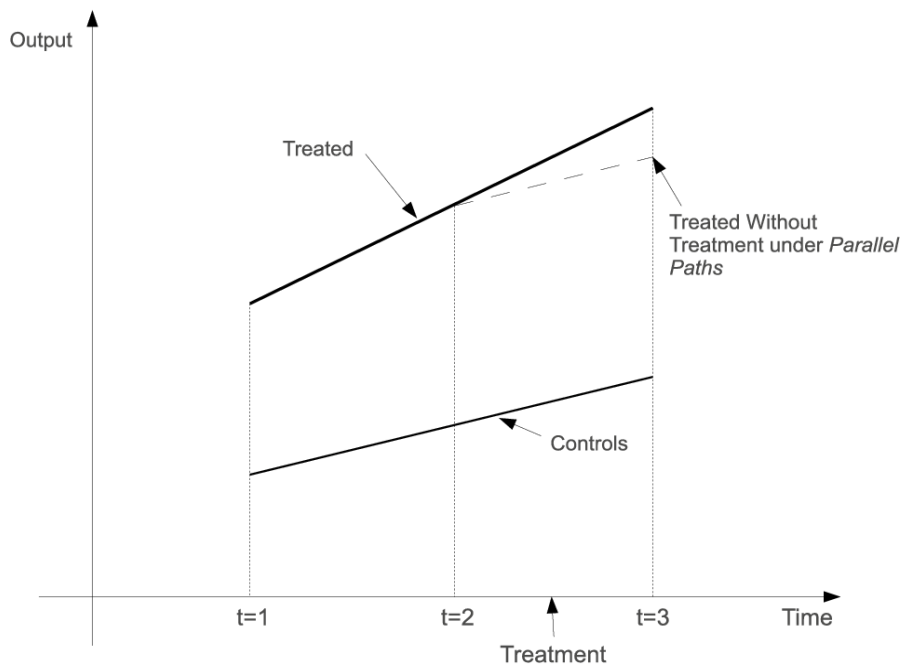
5	Availability of restaurant and hotel. It is measured by the number of hotels that operate in the village.	HOTEL
6	Availability logistic service. It is measured as the number of logistic services operates in the village.	LOGISTIC
7	Availability of general banking services: government-owned. It is measured as dummy variables: 1 if there is a bank in the village, and 0 otherwise.	STATE_BANK
8	Availability of public transportation (with the regular route and fixed operational hours). It is measured as a dummy variable: 1 if there is public transportation operating in the village, and 0 otherwise.	PUBLIC_TRANSPORT
Ecological Resilience Index		
9	The occurrence of natural disasters: landslides. It is measured by the dummy variable, where 1 if there is a natural disaster that took place in the village and 0 otherwise.	LANDSLIDES
10	The occurrence of natural disasters: floods. It is measured by the dummy variable, where 1 if there is a natural disaster that took place in the village and 0 otherwise.	FLOODS
11	Availability of efforts in mitigating the natural disasters: early warning system All of them are measured by the dummy variable, where 1 if there is mitigation effort in the village and 0 otherwise.	WARNING_SYSTEM
12	Availability of efforts in mitigating the natural disasters: the evacuation route. It is measured by the dummy variable, where 1 if there is mitigation effort in the village and 0 otherwise.	EVACUATION

### 3 Econometric Method

#### 3.1 Research Design

This paper uses a Difference in Difference (DID) estimation. DID estimation allows handling endogeneity related to time-invariant unobserved effects. The credibility of the DID estimator crucially relies on the assumption that in the absence of the treatment, the average outcomes for treated and controls would have followed parallel trends over time. This assumption is called the Parallel Path assumption (Friedman, 2013). Our strategy is to compare treated villages and controls after the establishment of enterprises using difference-in-difference (DID). The following figure helps to illustrate the DID method in measuring the effect of a policy implementation.

Figure 15 DID Illustration (Mora & Reggio, 2012)



In this paper, three sets of data are used for estimated to create panel data. Panel data help to control for unobservable non-random elements of the decision to create an enterprise that is constant over time. Finally, we estimate the growth and development in the village from the existence of the enterprise, with additional observations ( $Z$ ).

$$Model\ 1: IDM_{it} = \alpha + \beta_1 ENT_{it} * TIMETREND_i + \beta_2 ENT_{it} + \beta_3 TIMETREND_i + \beta_4 Z_{it} + \varepsilon_{it}$$

Where ENT represents the variable of whether a village created an enterprise; thus, it has value 1 for the village with enterprise and 0 for the village without enterprise. At first, we compare the enterprise's establishment year to the year when the Village Funds started being distributed in 2015. We exclude villages that have created enterprise before 2014 from the estimation because we want to focus on the villages which created enterprise as a result of the village funds. Thus, in the 2014 dataset, all villages have no enterprise, and the value of ENT is zero. Then, in the post-treatment period, we compare the establishment year with 2015. If the enterprise is created after 2015, the value will be one. The TIMETREND represents the time before and after the policy intervention. Finally, we include most indicators used in IDM calculation in  $Z$  as a set of control variables as well as to expand the observations.

The following table demonstrates the DID method used in this paper:

Table 5 DID Illustration

	IDM Score Before Policy Implementation	IDM Score After Policy Implementation	Difference
Treatment Group - Village with enterprise	5	9	4
Control Group - Village without enterprise	3	5	2
Difference in Difference of the IDM score After Policy Implementation			2

In summary,  $\beta_1$  is the coefficient of interest that shows the effect of the treatment.  $\beta_1$  represents the effect of the establishment of the enterprise after the village funds program on the growth and development of the village after controlling other factors. This research aims to find out how the growth in the village is changing as a result of the establishment of the enterprise. We believe that the enterprise has created a better situation in the village, such as giving more convenient access to the financial sector, opening job opportunities, creating a broader market, and increasing the income for the village's members.

## 3.2 Descriptive Statistics

### 3.2.1 Summary Statistics of IDM Score Before and After Policy Implementation

Before going deeper into the regression, we conducted an initial estimation from the statistical summary of the variables used in this research. Table 5 summarizes the IDM score of the village before and after they created enterprises from the Village Funds' capital participation. Based on these statistics, before the village funds begin, no enterprise is recorded in all villages in Banyumas District. The IDM score released by the Ministry of Village shows that on average the IDM score is 0.6686. Thus, villages in Banyumas District belongs to Developing Village category, since the IDM is between 0.5989 to 0.7072. Moreover, there is one least developed village, that is categorized as Very Disadvantaged Village, from having an IDM score  $< 0.4907$ . Moreover, there is one village that already belongs to the Independent Village for having IDM score  $> 0.8155$ .

*Table 6 Summary Statistics of IDM Score Before and After Policy Implementation*

<b>YEAR: 2014</b>						
	IDM	Number of villages	mean	sd	min	max
Without enterprise		283	.6686	.0659	.4399	.8528
<b>2018</b>						
Without Enterprise		52	.6606	.0555	.5290	.8089
With Enterprise		231	.6588	.0629	.3355	.8684
<b>Total</b>		<b>283</b>	<b>.6591</b>	<b>.0616</b>	<b>.3355</b>	<b>.8684</b>
<b>2019</b>						
Without Enterprise		33	.6811	.0495	.6009	.8027
With Enterprise		250	.6925	.0575	.5482	.8788
<b>Total</b>		<b>283</b>	<b>.6911</b>	<b>.0566</b>	<b>.5482</b>	<b>.8788</b>

*Source: Stata output, processed by Author.*

After the policy implementation, the capital participation of Village Funds has triggered the creation of 231 enterprises. Also, it is reported that the average of IDM score has changed. For the village that stays not establishing an enterprise, the average IDM score is 0.6606. This average is slightly lower than before every village created enterprise. For the group of villages that managed to establish an enterprise, its average IDM score also getting lower by 0.01 points to 0.6588. This small changes did not change the average status as Developing Village.

About the minimum score, in the treated group, there is one village that belongs to the Very Disadvantaged category for having IDM score 0.3355. Thus, it seems like there is one village that follows the suggestion to create an enterprise. At the same time, its social, economic, and ecological dimension is left behind from other villages. Thus, the enterprise might not fully support the development process in the village. On the other hand, in the control group, for the village without enterprise, the least developed village falls in the Disadvantaged Village, with its 0.5290 IDM score. It seems like the village decided to not creating any enterprise due to its socio-economic and ecological dimensions. Additionally, in the treated group, at least one village belongs to the Independent Village. However, in the control group, the most benefited village only belongs to the Developed Village for having IDM score between 0.7072 and 0.8155. In summary, in post-treatment period 1, three years after the Village Funds being implemented, on average, there is no significant difference in the changes of the development status of the village.

In the post-treatment period 2, more growth and development is seen from both groups. It is seen that 19 more villages decided to use the Village Funds into the creation of enterprises. In average, the IDM score for both groups is improving. For the 250 villages with enterprises, the average IDM score increases from 0.6591 to 0.6925, or an 0.0334 improvement. For 33 villages without enterprises, the average IDM score improves from 0.6606 to 0.6811, or an 0.0205 increase. Thus, in comparison, the growth and development in the treatment group are higher than the control group. Despite this difference, these value still determines the villages in both groups into Developing category.

Talking about the border, the lowest category of the village in the treatment group has improved from Very Disadvantaged to Disadvantaged category, by increasing from 0.3355 to 0.5482 showing an 0.2127 improvement. In the control group, among 33 villages without enterprises, the lowest category of the village belongs to Developing category, with its 0.6009. It shows an improvement from 0.5290, or by an 0.0719 increase. Thus, in comparison, the growth and development in the treatment group are higher than the control group, showing the possible positive impact for establishing an enterprise, even though their development status is different.

Finally, in the treatment group, among 250 villages with enterprises, the most benefited village still categorizes into Independent Village, with an increased IDM score from 0.8684 to 0.8788. The changes show 0.0104 improvements. On the other hand, in the control group, among 33 villages without enterprise, the most benefited village categorizes as Developed Village, with its 0.8027 IDM score. However, its IDM score shows a slight decrease from previously 0.8089, or a 0.0062 reduction. Thus, in comparison, the enterprises seem to bring growth and development in the village in a positive direction, despite the unchanged category.



### 3.2.2 The difference in difference in Mean of Treated and Control Group

Beside conducting simple analysis above, we were also looking at the statistical difference among other variables used in this paper, especially between treated and control group. Table 6 below shows the summary statistics for each group in each time frame. Then, we look for the difference between within the group in each pre and post-treatment period. Finally, we calculate the difference between each group in every timeframe, as summarized in Table 7 below.

From the treated group, we can see that the number of the enterprise being created is increasing over the years. For the variable of interest, among villages that establish an enterprise, the IDM score is growing by 0.0239. However, on average, the number of medical personnel available in this group of villages decreases. Moreover, since most other variables are dummy, most changes do not account for a significant amount.

From the control group, the average IDM score within-group also shows growth by 0.0125 before and after the Village Funds is implemented. The average number of midwives in the villages without enterprise also decreases by 0.2123, whereas the number of doctors grows by 0.2194. Moreover, since most other variables are dummy, most changes do not account for a significant amount.

Finally, when comparing each group's difference, we found that the average IDM score for the village with enterprises is higher than the group of villages without enterprise. The difference between difference before and after policy implementation shows that the enterprise might have improved the growth and development in the village by a 0.0114 difference.

Table 7 Summary Statistics of Other Variables in Treated and Control Group Before Policy Intervention

Variables	2014			2018					
	Without enterprise (ENT=0)			Without enterprise (ENT=0)			With enterprise (ENT=1)		
	N	Mean	St. Dev.	N	Mean	St. Dev.	N	Mean	St. Dev.
IDM	283	0.6686	0.0659	52	0.6607	0.0555	231	0.6588	0.0630
Availability of midwives	283	1.5760	0.9131	52	1.0769	0.8366	231	1.2078	0.7858
Availability of doctors	283	0.4170	0.9086	52	0.5192	0.8743	231	0.3723	0.7801
Availability of senior high school	283	0.7244	0.4476	52	0.9231	0.2691	231	0.7056	0.4567
Availability of market	283	0.1625	0.3696	52	0.1346	0.3446	231	0.1775	0.3941
Availability of hotel	283	0.1307	0.9752	52	0.1731	0.8568	231	0.1991	1.3300
Availability of logistic services	283	0.1413	0.8302	52	0.1154	0.3226	231	0.1775	0.3829
Availability of government bank	283	0.1307	0.3377	52	0.0962	0.2977	231	0.1472	0.3551
Availability of public transportation	283	0.8233	0.3821	52	0.8077	0.3980	231	0.8139	0.3901
Occurrence of landslides	283	0.1802	0.3850	52	0.2308	0.4254	231	0.3290	0.4709
Occurrence of floods	283	0.0601	0.2380	52	0.1154	0.3226	231	0.1385	0.3462
Availability of warning system	283	0.1873	0.3908	52	0.2115	0.4124	231	0.2554	0.4370
Availability of evacuation route	283	0.1272	0.3338	52	0.0962	0.2977	231	0.1472	0.3551

Variables	2019					
	Without enterprise (ENT=0)			With enterprise (ENT=1)		
	N	Mean	St. Dev.	N	Mean	St. Dev.
IDM	33	0.6811	0.0495	250	0.6925	0.0575
Availability of midwives	33	1.3636	0.8951	250	1.0600	0.9229
Availability of doctors	33	0.6364	0.8951	250	0.3960	0.9309
Availability of senior high school	33	0.8182	0.3917	250	0.7240	0.4479
Availability of market	33	0.1515	0.3641	250	0.1840	0.4181
Availability of hotel	33	0.2121	1.0535	250	0.1560	1.0920
Availability of logistic services	33	0.1818	0.5839	250	0.1360	0.3435
Availability of government bank	33	0.1515	0.3641	250	0.1440	0.3518
Availability of public transportation	33	0.8182	0.3917	250	0.8440	0.3636
Occurrence of landslides	33	0.0909	0.2919	250	0.0920	0.2896
Occurrence of floods	33	0.0303	0.1741	250	0.0280	0.1653
Availability of warning system	33	0.2121	0.4151	250	0.1640	0.3710
Availability of evacuation route	33	0.0303	0.1741	250	0.1280	0.3348

Source: Stata output, processed by Author.

Table 8 Difference in difference in Mean in Treated and Control Group Before Policy Intervention

Variables	Difference in ENT=0			Difference in ENT=1			Diff in Diff		
	2014 - 2018	2014 - 2019	2014 - 2019	2014 - 2018	2014 - 2019	2014 - 2019	2014 - 2018	2014 - 2019	2014 - 2019
	IDM	-0.0079	0.0204	0.0125	-0.0097	0.0336	0.0239	-0.0019	0.0132
Availability of midwives	-0.4990	0.2867	-0.2123	-0.3682	-0.1478	-0.5160	0.1309	-0.4345	-0.3036
Availability of doctors	0.1023	0.1171	0.2194	-0.0447	0.0237	-0.0210	-0.1469	-0.0934	-0.2404
Availability of senior high sch	0.1987	-0.1049	0.0938	-0.0188	0.0184	-0.0004	-0.2174	0.1233	-0.0942
Availability of market	-0.0279	0.0169	-0.0110	0.0149	0.0065	0.0215	0.0429	-0.0104	0.0325
Availability of hotel	0.0423	0.0390	0.0814	0.0684	-0.0431	0.0253	0.0261	-0.0822	-0.0561
Availability of logistic services	-0.0260	0.0664	0.0405	0.0361	-0.0415	-0.0053	0.0621	-0.1079	-0.0458
Availability of govt. bank	-0.0346	0.0554	0.0208	0.0164	-0.0032	0.0133	0.0510	-0.0585	-0.0075
Availability of public transport	-0.0156	0.0105	-0.0051	-0.0095	0.0301	0.0207	0.0062	0.0197	0.0258
Occurrence of landslides	0.0506	-0.1399	-0.0893	0.1488	-0.2370	-0.0882	0.0982	-0.0971	0.0011
Occurrence of floods	0.0553	-0.0851	-0.0298	0.0785	-0.1105	-0.0321	0.0231	-0.0254	-0.0023
Availability of warning system	0.0243	0.0006	0.0248	0.0681	-0.0914	-0.0233	0.0439	-0.0920	-0.0481
Availability of evacuation route	-0.0311	-0.0659	-0.0969	0.0200	-0.0192	0.0008	0.0510	0.0467	0.0977

Source: Stata output, processed by Author.

## 4 Results

### 4.1 Initial Regression

At first, we run the simple regression of the existence of enterprise on the IDM score. Table 9 below shows the result. The coefficient shows in Column (1) is the result of regressing the enterprise to the IDM score, without any additional variable. Whereas Column (2) shows the result from regressing enterprise along with other explanatory variables. The complete result is shown in Appendix 4.

We found that the existence of the enterprise shows a positive impact on the IDM score. The coefficient of enterprise shows how it brings 0.0077 improvements to the IDM score. However, the result above might be incurred from omitted variable bias, as the R-squared values are so small. The variation of the existence of the enterprise only accounted for 3.7% variations of the growth and development in the village. Thus, there must be many essential variables excluded from this regression which causing this issue. Then, we re-estimate by including twelve relevant variables as introduced in section 2. The result shows that the impact of the enterprise is getting more significant. The model is improved as seen from the higher R-squared by 37.35% in column (2). The above result implies that an enterprise can help in creating economic activities in the village. Thus, the result supports the attainment of the goals of establishing an enterprise as formulated by the government. Therefore, intuitively, having an enterprise might have shaped the village into a more developed region, as seen from the changes in the village's status based on the IDM category. Thus, the establishment of enterprise has found to encourage growth and development in the village.

*Table 9 Initial Regression Result*

	(1)	(2)
	IDM	IDM
Enterprise	0.0077* (0.0044)	0.0088*** (0.0034)
Obs.	849	849
R-squared	0.0037	0.3735

Standard errors are in parenthesis  
\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

*Source: Stata output, processed by Author.*

### 4.2 Test of Multicollinearity

We understand that we use the IDM indicators to estimate the IDM itself. There is a risk that a perfect linear relationship occurs among the predictors. Here, the existence of an enterprise (ENT) might also influence other control variables. Thus, in order to check the linear relationship between the variables used in this paper, we conduct an additional test of multicollinearity. The test used in this paper is to run VIF after the regression in the previous section. The rule of thumb is that the VIF value should be less than 10. The result is, as shown in Table 10 below. It shows that all variables have a VIF value of less than 10. Thus, it could be said that no perfect collinearity arises between the variables.

It means that the existence of an enterprise does not influence the availability of medical personnel, nor the availability of senior high school in the village. The decision to place a doctor or midwife in a village is on the hand of District Government, where they serve as a government officer. Building a senior high school is also decided by the Mayor after some assessments.

From an economic perspective, the creation of markets, hotels, logistic services, government banks, and public transportation in a residential area does not depend on whether there is an enterprise that operates in the village. Markets have been a part of residents' life before the term enterprise is introduced. The existence of hotels might be influenced by the availability of the enterprise if the business line that it operates to affect the number of visitors coming to the village. The availability of enterprise might also influence the availability of logistic services in the village, showing a higher economic activity from the distribution of goods. The availability of government banks in the village also does not depend on the existence of the enterprise, as the decision to open the branch might be depending on the demand level for savings and loans in the village. Then, the public transportation availability might be triggered by the enterprise, such as from demand in transporting visitors to the tourist attractions managed by the enterprise. However, the VIF value for all economic indicators is still less than 10, showing no linear relationship between them and the enterprise.

Finally, from the ecological perspective, the occurrence of landslides and floods might be related to the business activity of the enterprise, when it comes into natural resources. Most enterprises in Banyumas District operates financial sectors and water supply management. Thus, the probability that this business to increase the occurrence of natural disasters might be small. The availability of disaster management system also does not depend on the availability of the enterprise, because, it is a precaution effort taken by multiple authority in the region, including District Government and the Regional Disaster Management Agency. Thus, it can be seen that no linear relationship among these variables from the VIF value below.

*Table 10 Test of Multicollinearity*

	VIF	1/VIF
Existence of enterprise	1.052	.95
Availability of midwives	1.111	.9
Availability of doctors	1.393	.718
Availability of senior high school	1.063	.941
Availability of market	1.221	.819
Availability of hotel	1.065	.939
Availability of logistic services	1.172	.853
Availability of government bank	1.576	.634
Availability of public transportation	1.108	.902
Occurrence of landslides	1.060	.944
Occurrence of floods	1.065	.939
Availability of early warning system	1.201	.833
Availability of evacuation route	1.229	.814
<b>Mean VIF</b>	<b>1.178</b>	<b>.</b>

*Source: Stata output, processed by Author.*

### 4.3 Difference in difference

As mentioned in the introduction, our analysis focuses on a set of indicators of the village's characteristics and potentials, which allow us to investigate the effect of establishing an enterprise on the IDM score. We performed exercises using the difference in difference estimation with IDM score as the dependent variables and the existence of enterprise as the independent variable. Table 11 shows the result of a DID regression based on equation (1). The result in column (1) shows the impact of enterprise on the IDM score, whereas the result in column (2) is a partial result from regressing the impact of enterprise and other control variables on the IDM score. The complete result of the DID regression is shown in the Appendix 5.

We perform the DID equation as the interaction term between the existence of enterprise (ENT) and the time frame (TIMETREND). The coefficient of the interaction term shows the coefficient of interest. The coefficient represents the extent to which availability of enterprise affects the IDM score for villages that establish one in period 1, given that all villages have not created one in period 0. Also, this coefficient stands on the condition having other variables being constant. Moreover, the DID rely on the Parallel Paths assumption (Friedman, 2013). Thus, this paper would assume that the growth and development rate of both treatment and control groups would be the same, given that both do not create any enterprise. Thus, the DID coefficient would show the difference that takes place after considering the difference between the natural growth and development in the counterfactual situation, when none of the groups creates an enterprise.

Table 11 DID Regression results

	(1)	(2)
	IDM	IDM
Enterprise	-0.0732*** (0.0162)	-0.0609*** (0.0147)
Timetrend	0.0028 (0.0045)	0.0031 (0.0035)
DID: Enterprise x Timetrend	0.0308*** (0.0071)	0.0262*** (0.0063)
Obs.	849	849
R-squared	0.0446	0.4023

Standard errors are in parenthesis  
 \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Source: Stata output, processed by Author.

As expected, the DID coefficient shows a positive and significant effect. It is found that a village with an enterprise tends to have a 0.026 IDM score higher than villages without enterprise, given that they both do not have enterprise in the first place, while other factors being constant, and assumed that the growth and development would follow a parallel path when no policy intervention is being applied. From the summary statistics in the previous section, we have seen that both groups follow a similar pattern, showing that the IDM score is growing within each group. Thus, this DID coefficient would account for the difference of the growth and development rate, between those two groups' difference.

Then, as seen from the R-squared, the variation in the enterprise and other variables in this model has accounted for 40.23% variations in the IDM score. This value implies that there are 60% changes in the IDM score that could not be captured from this model. The future research might need to either add more variables or to use a better predictor for the IDM score other than the variables used in this paper.

As the IDM score has a range from 0 until 1, this incremental value would represent a 2.6% increase. Moreover, considering the range of each development status of the village (Independent, Developed, Developing, Disadvantaged, and Very Disadvantaged) is around 0.1083, the impact would account for 24% improvement. Thus, as compared to the growth and development rate in the village without enterprise, the growth and development rate in the village with enterprise would be 2.6% higher. Despite its small value, this result implies that an enterprise can help in creating economic activities in the village. Thus, this result supports the attainment of the goals of establishing an enterprise as formulated by the government. Moreover, having an enterprise might have shaped the village into a more developed region, as seen from the changes in the village's status based on the IDM category.

Finally, when the timetrend is being considered, the impact of the establishment of an enterprise is showing to the reversed direction. The negative sign for the enterprise coefficient shows that the existence of an enterprise would decrease the IDM score by roughly 0.06. This result is in line with the pattern found in the statistical summary. We found that the village that created enterprise in 2018 is part of the least developed region. Thus, it tends to have smaller IDM value than other villages that do not create the enterprise.

Moreover, this Very Disadvantaged Village decided to create the enterprise despite its least benefited situation in terms of social, economic, and ecological dimension. However, this village's decision in creating the enterprise could also be seen as an effort to improve the situation in the region through entrepreneurship role. As a result, this village managed to step up from a Very Disadvantaged to Disadvantaged category, that is shown by the positive impact of DID as explained previously.

#### 4.4 Additional Observations

We expand the observations to include social, economic, and ecological dimensions. The result, as shown in Table 7 below. From the social dimension, in the healthcare sector, the existence of midwives and general practitioners has a significant impact on the development of the village. In the first estimation, when they open the clinic in the village, each of them found to improve the IDM score by 0.004 and 0.0058, respectively. Nevertheless, these results have supported the study that the village's medical personnel are essential to ensure the quality of healthcare in the village. The existence of midwives would help the mothers deliver their babies safely. The village doctors would help taking care of people with a sudden illness or in an emergency, in addition to the existing community health centres (*Pusat Kesehatan Masyarakat*, Puskesmas).

From the education sector, we consider the distance to the nearest senior high school. Elementary school is excluded from control variables as every village has at least one elementary school which is required by the law. We use 6KM as the distance limit following the IDM measurement. The results show that the distance to the nearest senior high school has a significant impact on the growth and development of the village. A village that has access to senior high school within the 6KM range would have around 0.018 IDM scores higher than the village with farther distance. This condition was the result of an uphill battle from the central government, whether to provide a junior or senior high school in every village. Therefore, not every village is fortunate enough to have both schools in its area.

Economically speaking, the existence of the market with permanent building increased the IDM score of the village by around 0.01. A village that has a market tends to have a higher IDM score than the village that does not have any. Thus, the availability of markets in the residential area would accelerate the growth and development in the region. The market is an essential aspect of economic activity for village residents because it provides a place for trading and doing business. Therefore, the significance of market existence is in line with its impact on the IDM score.

Interestingly, a village that has a hotel operates in its area is found to have 0.0046 higher IDM scores than those without a hotel. Thus, the existence of hotels and restaurants in the village shows its level of development. The reason could be that the existence of a hotel represent how popular an area is for the visitor. The more hotels are available, the most frequent visitors come to the village for multiple occasions. Moreover, the availability of hotels with restaurant services also boosts the economy from providing job opportunities for the village residents, such as hotel employees, a waitress for the restaurants, and food suppliers.

The other observation is related to the logistic service. The existence of logistic services has found to influence the IDM score of a range of 0.007 higher when it is available in the village. The logistic services are a growing business in Indonesia as a result of the growth in the online marketplace. The logistic services also tend to be more reliable as compared to the post office, due to the availability of many small branch offices and its 24/7 services. Thus, despite its availability in every sub-district, the post office does not function very well. It is shown on its insignificant estimation result.

The regression results also show the significant impact of having a government-owned bank in the village. It is found that the existence of government-owned bank's office improved the growth and development in the village by roughly a 0.022 higher IDM score. The government-owned banks include state-owned enterprises (SoE) and regional development banks (Bank Pembangunan Daerah, BPD) owned by the local government. Thus, having a government-owned bank would help a village to develop its region.

One SoE bank with the deepest outreach in Indonesia is Bank Rakyat Indonesia (BRI), which has the smallest office unit in each sub-district. BRI and BPD are the two institutions that receive a mandate

from the central government to distribute People's Business Credit (*Kredit Usaha Rakyat*, KUR). Therefore, they play a more prominent role as compared to other types of banks. Additionally, the statistics also reported that KUR is well-distributed in Banyumas District. BPD Jateng, as the provincial development bank in Central Java, has the ambition to transform the enterprise into its agent as a branchless banking strategy. This expansion strategy is due to the difficulty in opening a brick and mortar branch offices. Hence, branchless banking through village-owned enterprises would be the most feasible strategy for banks and regional development programs in the near future.

When it comes to the transportation system, the availability of public transportation with fixed route and operational hours found to increase the IDM score in the village by 0.0165. Thus, having well-established public transportation helps the village residents to conduct multiple activities. It also shows the level of openness of the village itself.

From the ecological perspective, most variables found to have a significant impact on the growth and development of the village—the occurrence of natural disasters landslides showed a negative effect on the IDM score. When landslide occurred, it reduces the IDM score by 0.02 as compared to the village, which did not experience the landslide. A similar effect is also seen from the occurrence of floods that reduces IDM score by 0.02. A village that experiences any natural disaster would need an extra mile effort in restructuring the village after the disaster happens. Thus, the natural disaster would have slow down the growth and development in the village once it occurs.

Finally, in terms of disaster management systems, the existence of an early warning system and evacuation route is found to have a significant impact on the growth and development in the village. A village that creates an early-warning system found to have around 0.016 higher IDM score as compared to others which do not have any. Moreover, the availability of the evacuation route in the village would increase the IDM score by 0.05. This mitigation system plays a role in preparing the village residents when a natural disaster occurs. Thus, once the village establishes the system, the village government would be able to focus on the follow-up measures in disaster management.



Table 12 Regression results for additional observations

	(1)
	idm
Availability of midwives' office	0.0050*** (0.0019)
Availability of doctors' office	0.0081*** (0.0020)
Access to high school	0.0184*** (0.0041)
Availability of market with a permanent building	0.0157*** (0.0048)
Availability of hotel with restaurant services	0.0051*** (0.0011)
Availability of logistic services	0.0078*** (0.0021)
Availability of state-owned bank	0.0344*** (0.0068)
Availability of public transportation	0.0179*** (0.0048)
Occurrence of landslides	-0.0206*** (0.0046)
Occurrence of floods	-0.0201*** (0.0072)
Availability of early warning system	0.0173*** (0.0052)
Availability of evacuation route	0.0531*** (0.0060)
Obs.	849
R-squared	0.4240

Standard errors are in parenthesis

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Source: Stata output, processed by Author.

## 5 Discussion and Policy Implications

The result found by this paper suggests that those villages that created enterprises tend to have higher growth and development progress as compared to others that did not create one. The DID estimation would be on the condition that all of them did not have any enterprise at the beginning of the policy intervention when the Village Funds starts. Here, the villages with enterprises created before 2014 are excluded from the estimation. Moreover, the result is also based on the “parallel path” assumption that the growth and development rate would be the same in the counterfactual situation where none of the villages creates an enterprise.

The result shows that the IDM score, the composite index that determines the development status of the village, is higher for villages with an enterprise. Thus, the existence of the enterprise has shown to encourage a higher economic activity for the village's community, such as creating markets, providing employment, and generating income for the village. This situation would help the local economic development through the enterprise's role in creating an entrepreneurial ecosystem (Purbasari, Drahen, & Wijaya, 2019). Moreover, this positive finding shows that the enterprise has played its role as

an instrument in the village's autonomy in encouraging the village government in developing its potential according to its capability and competence (Budiono, 2015).

On the one hand, looking at the policy implication, the existence of the enterprise in the village could be seen as rural entrepreneurship. Entrepreneurship is one of the activities which can resolve many significant challenges, such as unemployment, low income, and lack of economic diversity, in rural areas and also has positive impacts on other aspects of villagers' human life (Faraji et al. (2011) in Ansari, Mirdamadi, & Zand, (2013)). Thus, the results show that the impact of the enterprise's creation has shown to lift the development status of the village, such as from a Disadvantaged Village to a Developing Village. Finally, the difference in growth and development rate shown from the establishment of enterprise has supported the argument that comprehensive development can never be obtained without rural entrepreneurship (Ansari, Mirdamadi, & Zand, 2013).

On the other hand, the availability of enterprise brings an inconsistent impact on the village's IDM score. In the DID model, having an enterprise shows a negative impact. However, without considering the pre and post-creation periods, the existence of the enterprise brings a positive impact. Regarding the first result, one reason might be that the enterprise would take up financial resources and not fully utilize it. Thus, having enterprise causing a more significant burden on the village, such as the case of government-owned enterprises with management inefficiency that could lead to corruption. The research conducted by the Ministry of Finance found that the local government's lack of involvement in fostering the enterprises as the village empowerment primary program has caused the slow development of enterprises (Wardhana, Rifin, Suhendra, & Wicaksono, 2018).

Moreover, the spirit to establish enterprises is not accompanied by policy improvement or strengthening efforts and coaching patterns from the central and local governments (Pusat Telaah dan Informasi Regional (PATTIRO), 2016). Additionally, the establishment of an institution by the village government tends to follow the top-bottom mechanism (Bachrein, 2010). Here, the formation of village institutions sometimes is not based on the real needs of the village residents, but the fulfilment of provisions governed by legislations. As a result, the existence of enterprise without sufficient assistance and proper management could hinder the attainment of its goals.

As it is very challenging to maintain a business operating in the current economic condition, both supervision and assistance are needed for enterprise development. The enterprise development program should involve multiple stakeholders, including the Ministry of Villages, Ministry of Cooperative, and MSMEs, Local Governments, Ministry of Development (Bappenas), the Financial Supervisory, and Development Board (BPKP), and Indonesia Financial Services Authority (*Otoritas Jasa Keuangan*, OJK). Furthermore, more entrepreneurial and business training programs should be made available. The assistance could be as simple as a business training. Moreover, the sectoral ego from the institutions in the implementation village development should be reduced to enhance the synergy and strengthen the integration, and eventually, would improve the effectiveness and efficiency of the policy itself. One policy

to promote enterprise development has been taken by the Ministry of Finance in terms of a special tax rate for micro, small, and medium enterprises as 0.5% of their sales.

As Fogel (2001) recommends that small businesses be given opportunities for low-cost borrowing and venture capital funds, technical support, and access to technology, the OJK would play a more significant role in terms of assisting enterprises in financial sectors for its business development. Financial and regulatory institutions in the country should create a more enterprise-friendly culture that supports entrepreneurs not only financially but also through networks, training, and business information systems. Dewi (2010) also argued that the legal aspect is the key to accelerate the function of enterprise in improving the village's own-source income and its economic activity. Thus, she proposed two alternatives to the enterprise's legal status as a public or limited company, instead of just a business entity. With the new legal status, an enterprise would be able to capture more opportunities, such as additional capital or borrowing.

Despite offering multiple opportunities, the development of enterprises is still facing many challenges (Eko, 2013). Firstly, there is a limitation in human capital capacity in the village to manage and develop accountable and well-performed enterprises. Secondly, there is a lack of initiatives from the village's community to develop a local economy to improve the community's welfare. Finally, the cooperation between stakeholders in the village in creating an independent and well-developed enterprise is not fully maximized.

From the policy aspect, village development could be seen as a wicked problem. The issue would be related to the effectiveness of the enterprise in improving the village's condition, with an improved IDM score as the outcome measure. However, indicators of economic development should not be limited to the existence of economic activity. Instead, five other indicators sign the development in the village that includes a better infrastructure, proper public facilities, sufficient access to the information, a better quality of human capital, and a better personal income.

Nevertheless, the village-owned enterprise also plays a role in the sustainable poverty alleviation model (Prabowo, 2014). As a social business, it may have the ability to elaborate on all positive aspects of the community to empower socio-economic to get out of poverty. Established and owned by the community, enterprises offer solutions for the village in identifying resources, opportunities, and problems in developing different aspects of village and environment (Ansari, Mirdamadi, & Zand, 2013). The land and environment of the village are today's condition provides new businesses such as tourism, leisure times, cultural heritage management, and producing quality food, which are the main structures of small and entrepreneurial businesses (Ansari, Mirdamadi, & Zand, 2013).

## 6 Recommendations and Conclusion

This paper aims to find out the impact of establishing a village-owned enterprise on the growth and development in the village. The findings from this study open up several avenues of approach for policy-making. Firstly, there is a need for more monitoring and assistance to the village government in creating and developing the enterprise. Otherwise, the establishment of an enterprise would likely be an effort to comply with the law or as a way to fulfil the formal requirement of some programs. Despite multiple challenges, the existence of the enterprise has brought an improvement to the living condition of the village residents. As most enterprises operate in public services by managing the water supply business, they finally provide access to clean water that most residents could not have. Also, most enterprises that operate in the financial sector offers loans and savings services. Thus, they also contribute to the improvement of financial inclusion for the village residents, especially for those who previously do not have access to the services. All the improvement brought by the availability of enterprise operating in the village is shown from the positive changes in the IDM score of the village found in this paper.

Furthermore, the evidence obtained from this paper also offers multiple opportunities for future research in this field. Firstly, talking about limitations, this paper could not capture the financial aspects of the villages. It was due to the unavailability of the financial report of the village before the village funds program. We found that financial accountability practice in the village government has been improved just after the Village Funds program has taken place. Because, in order to get the funds, the village government needs to submit a financial report, including its budget, revenue, and expenditures. As a result, the practice of reporting had just started after 2015, which shows better governance in the village government.

Since the financial aspect is excluded from the analysis, this paper could not capture the impact of enterprise in terms of growth and development, financially. Thus, there might be some other variables that could better perform as the estimator for the growth and development in the village instead of the IDM score, such as the own-source income. The analysis could be on how the enterprise might have increased the own-source income of the village. Own-source income is a part of the revenue source generated from the potential in the village, such as yields from the village's field assets or the retributions from the water reservoir's tourism park. Thus, to some extent, this type of income differs by how much assets or potentials a village might own. However, once the financial reports are obtained, researchers would need to ensure the reliability of the financial reports from the village, since the lack of reliability of financial aspects could have led to a different direction.

Finally, even after controlling multiple variables, the extent to which the growth and development in the village affected by the existence of an enterprise are still limited, that could not directly move the village into a higher status of development. One reason could be that this paper only focused on the existence of the enterprise itself, without taking into account its financial performance. So, besides the

financial report from the village, researchers might be interested in analyzing the financial reports of the enterprise itself. Here, the analysis would be expanded from only the existence of an enterprise, into the extent to which enterprises might have brought to the village. For example, the analysis could cover the number of employees, the sales and profit it generates. Hopefully, once the financial report of the enterprise is available, the result could show more shreds of evidence of how the existence and performance of an enterprise could have affected the village's growth and development.

## References

- Aidis, R., Estrin, S., & Mickiewicz, T. (2008). Institutions and entrepreneurship development in Russia: A comparative perspective. *Journal of Business Venturing Vol. 23*, 656-672.
- Andrianova, S., Demetriades, P., & Shortland, A. (2012). Government Ownership of Banks, Institution, and Economic Growth. *Economica Vo. 79*, 449-469.
- Ansari, B., Mirdamadi, S., & Zand, A. (2013). Sustainable Entrepreneurship in Rural Areas. *Research Journal of Environmental and Earth Science Vol. 5 No. 1*, 26-31.
- Anshari, K. (2018). *Indonesia's Village Fiscal Transfers Policy: Questioning the Village Government Competence*. Retrieved from <http://www.ritsumei.ac.jp/research/rdiri/file/kiyou/7-1.pdf>
- Bachrein, S. (2010). Developing Village Approach in West Java: Rural Development Policy and Strategy. *Analisa Kebijakan Pertanian, Vol. 8 No. 2*, 133-149.
- Badan Kebijakan Fiskal. (2017). *Benefits of Village Funds in Accelerating Development and Alleviating Village Poverty*. Jakarta: Fiscal Policy Agency, Ministry of Finance of Indonesia.
- Badan Kebijakan Fiskal. (2018). *Kajian Dana Desa: Analisis Empiris Badan Usaha Milik Desa, Kesempatan Kerja, dan Infrastruktur pada Seribu Desa di Indonesia (Research on Village Funds: Empirical Analysis on Village-Owned Enterprises, Employment, and Infrastructure in 1000 Villages)*. Jakarta: Kementerian Keuangan.
- Bank, W. (2015, March 20). *Village-run enterprises improve the delivery of water-services in Indonesia*. Retrieved from worldbank.org: <https://www.worldbank.org/en/news/feature/2015/03/20/village-run-enterprises-improve-the-delivery-of-water-services-in-indonesia>
- Berger, A., Hasan, I., & Klapper, L. (2004). Further Evidence on the Link between Finance and Growth: An International Analysis of Community Banking and Economic Performance. *Journal of Financial Services Research Vol. 25*, 169-202.
- Budiono, P. (2015). Policy Implementation of Village-owned Enterprises in Bojonegoro. Implementasi Kebijakan Badan Usaha Milik Desa (Bumdes) di Bojonegoro. *Jurnal Politik Muda Vol.4 No.1*, 116-125.

- Cabinet Secretariat. (2020, February 29). *Village-owned Enterprises Expected to Boost Economy in Villages*. Retrieved from setkab.go.id: <https://setkab.go.id/en/village-owned-enterprises-expected-to-boost-economy-in-villages/>
- Chandoewit, W., & Ashakul, B. (2008). The Impact of the Village Fund on Rural Household (in Thailand). *Thailand Development Research Institute (TDRI) Quarterly Review Vol. 23 No. 2*, 9-16.
- Dabson, B., Walzer, N., & Markley, D. (2009). *Entrepreneurship and Local Economic Development*. Plymouth: Lexington Books.
- Dewi, A. S. (2010). Legal Entity's Alternative Forms in the Establishment of Village-Owned Enterprises (BUMDes). Alternatif Bentuk Badan Hukum yang Tepat dalam Pendirian Badan Usaha Milik Desa (BUMDes) sebagai Upaya Meningkatkan Pendapatan Asli Desa (PADes) . *Jurnal Pamator Vol. 3 No. 2*, 114-121.
- Dinh, H., & Pearson, L. (2015). Specifying Community Economic Resilience - A Framework for Measurement. *Australasian Journal of Regional Studies Vo. 21 No.3*, 278-302.
- Douglass, M. (1998). A Regional Network Strategy for Reciprocal Rural-Urban Linkages: An Agenda for Policy Research with Reference to Indonesia. *Third World Planning Review, Vol. 20 No. 1*.
- Eagle, N., Macy, M., & Claxton, R. (2010). Network DIversity and Economic Development. *Science Vol. 328*, 1029-1031.
- Eko, S. (2013, December 2). *Policy Paper: Membangun BUMDes yang Mandiri, Kokoh dan Berkelanjutan* .
- FAO. (2019). *Country Gender Assessment of Agriculture and the Rural Sector in Indonesia*. Jakarta.
- Fogel, G. (2001). An Analysis of Entrepreneurial Environment and Enterprise Development in Hungary. *Journal of Small Business Management Vol. 39 No. 1*, 103-109.
- Freshwater, D. (2015, May 19-22). *Economic Growth in Rural Regions: SMEs, Productivity, and Entrepreneurship*. Retrieved from oecd.org: <https://www.oecd.org/cfe/regional-policy/Economic-Growth-in-Rural-Regions-DavidFreshwater.pdf>
- Friedman, J. (2013, November 21). *The often (unspoken) assumptions behind the difference-in-difference estimator in practice*. Retrieved from blog.worldbank.org: <https://blogs.worldbank.org/impactevaluations/often-unspoken-assumptions-behind-difference-difference-estimator-practice>
- Giannetti, M., & Simonov, A. (2004). On the determinants of entrepreneurial activity: Social norms, economic environment, and individual characteristics. *Swedish Economic Policy Review Vo. 11*, 269-313.

- Hardijono, R., Maryunani, Yustika, A., & Ananda, C. (2014). Economic Independence Of The Village Through Institutional Village Enterprises (BUMDes). *IOSR Journal of Economics and Finance (IOSR-JEF) Volume 3, Issue 2. Ver. III*, 21-30.
- Kusuma, G., & Krisnadewara, P. (2019). Innovation Challenges of Village-owned Enterprises . *KINERJA Vol. 23, No.1*, 54-66.
- Kusumawanti, N., Susanti, A., & Izana, N. (2017). BUMDES and ASEAN Economic Communities in Developing Rural Economy. *International Conference ASEAN Golden Anniversary: Embracing ASEAN Community, Harmonizing Diversity* (pp. 128-139). Malang: Universitas Brawijaya.
- Larasdiputra, G., Anggiriawan, P., Kawisana, P., & Putra, I. (2019). The Role of Village Owned Enterprise in Increasing the Rural Economy. *International Journal of Advance in Social and Economics Vo. 1, Issue 2*, 60-66.
- Mulyana, W. (2014). Rural-Urban Linkages: Indonesia Case Study. *Working Paper Series No. 126. Working Group: Development with Territorial Cohesion. Territorial Cohesion for Development Program. RIMISP. Santiago, Chile.*
- OECD. (2003). *Entrepreneurship and Local Economic Development: Programme and Policy Recommendations*. Paris: OECD Publication Services.
- Prabowo, T. H. (2014). Developing Bumdes (Village-owned Enterprise) for Sustainable Poverty Alleviation Model: Village Community Study in Bleberan-Gunungkidul-Indonesia. *World Applied Sciences Journal 30 (Innovation Challenges in Multidisciplinary Research & Practice)*, 19-26.
- Purbasari, R., Drahen, P., & Wijaya, C. (2019). An Entrepreneurial Ecosystem Approach to Encouraging Local Economic Development through a Village-Owned Enterprises Policy (A Case Study of Indonesian Village-Owned Enterprises (BUMDes)). *Archives of Business Research, Vol. 7 No. 4*, 254-264.
- Pusat Telaah dan Informasi Regional (PATTIRO). (2016, November 14). *Policy Brief: Mengawal Implementasi Undang-undang Desa*. Retrieved from pattiro.org: <http://pattiro.org/?wpdmact=process&did=MTU0LmhvdGxpbms=>
- Putra, A. S. (2015). *Village-owed Enterprise: a collective business' spirit. Badan Usaha Milik Desa: Spirit Usaha Kolektif Desa*. Jakarta: Kementerian Desa, Pembangunan Daerah Tertinggal, dan Transmigrasi.
- Ramadana, C., Ribawanto, H., & Suwondo. (2013). The Existence of Village-owned Enterprise to Strengthen Village Economy. Keberadaan Badan Usaha Milik Desa sebagai Penguat Ekonomi Desa. *Jurnal Administrasi Publik (JAP), Vol. 1 No. 6*, 1068-1076.

- Rauniyar, G., & Kanbur, R. (2010). Inclusive Development: Two Papers on Conceptualization, Application, and the ADB Perspective. *Working Paper of Department of Applied Economics and Management at Cornell University. WP2010-01.*
- Rodiyah. (2019). Management of Implementation of Village Government in Empowering Village Enterprises (BUMDes). *UNNES International Conference on Research Innovation and Commercialization 2018* (pp. 569-583). Semarang: UNNES.
- Sardi, J. (1983). Role of Small Cities in Developing Villages (Peranan Kota-kecil dalam Pengembangan Pedesaan) . *EKI Vol. XXXI No. 2*, 147 - 161.
- Sembiring, S. (2017). The Existence of Village-owned Enterprise in Increasing Village's Own-Source Income. Keberadaan Badan Usaha Milik Desa dalam Meningkatkan Pendapatan Asli Desa. *Kertha Patrika Vol. 39, No. 1*, 16-32.
- V.K., S., & Mavoothu, D. (2014). Financial Inclusion - The Way Towards Inclusive Growth. *International Journal of Advanced Research Vol. 2, Issue 2*, 649-655.
- Wardhana, I., Rifin, B., Suhendra, M., & Wicaksono, E. (2018). *Research on the Village Funds: Empirical analysis of Village-owned Enterprises, Employment, and Infrastructure in 1000 villages in Indonesia*. Jakarta: Fiscal Policy Agency, Ministry of Finance of Indonesia.



Appendix 1 Comparison of major laws regulating village governance, 1979 – 2014

	<b>Law 5/1979</b>	<b>Law 22/1999</b>	<b>Law 32/2004</b>	<b>Law 6/2014</b>
<b>Definition of Village</b>	Lowest level of territorial government directly under the <i>camat</i>	A legal community in district	A legal community established within a district government	A legal community (including <i>desa adat</i> ) established within the territory of a district
<b>Village Head</b>	Directly elected, appointed by and accountable to district, max terms of office 2 x 8 years	Directly elected, appointed by and accountable to BPD (Village Council), after approval from district, terms of office 2 x 5 years	Directly elected, approved by and accountable to district, terms of office 2 x 6 years	Idem, but with added accountability to BPD and <i>Musyawarah Desa</i> , terms of office 3 x 6 years
<b>Village Council</b>	Appointed Village Council (LMD) as partner	Directly elected BPD (Village Council) as separate entity	Appointed BPD as separate entity	“Democratically elected/selected” <sup>1</sup> BPD, <i>Musyawarah Desa</i> (Village Assembly) for strategic decisions
<b>Village Legislation</b>	Drafted by village head and appointed Village Council(LMD), approved by sub-district government	Drafted and approved by village head and BPD	Drafted by village head in consultation with BPD, approved by district government	Idem
<b>Village Funding</b>	Block grant from district government, plus various national initiatives such as “Left-behind Village Program” (IDT)	Block grant from district government and local sources	Idem, plus national program funding	Substantial national and district level allocations plus local sources
<b>Relations with District</b>	Strictly under the authority of the sub-district and district. No autonomy to approve regulations or budget	Far reaching autonomy provided, with weakened upwards accountability	Idem, final decision-making of budget and regulation by district	Hybrid system between “self-governing community” and “local self government”
<b>Organisational Life</b>	Only state-based organisations allowed; community organisations co-opted	Democratisation; many new community and mass-based organisations emerged	Idem, state associations specifically mentioned	Idem

Source: Antlöv, Wetterberg, & Dharmawan (2016)<sup>2</sup>

<sup>2</sup> Article 56:1 states that BPD seats should be filled in a democratic manner (*pengisiannya dilakukan secara demokratis.*) Article 57:g stipulates that BPD members should be community representatives who are chosen democratically (*wakil penduduk Desa yang dipilih secara demokratis.*) These statements could be interpreted as requirements for direct election, but ambiguity remains. In fact, implementing regulations provide for two options: direct election or representative deliberations (PP 43/2014, Article 72.). This is different from Law 22/1999 which says that BPD members are to be “elected from and by the village population” (“*dipilih dari dan oleh penduduk Desa*”) (UU 22/1999, Article 103:2) and Law 32/20014 where BPD members are to be “appointed through representative deliberations” (“*ditetapkan dengan cara musyawarah dan mufakat*”) (UU 32/2004, Article 210:1)

## Appendix 2 Data Description and Data Source

No	Title	Year	Description	Source
1	Master database of Village-owned enterprise	2020	The database covers general information of enterprise in each village, including: <ul style="list-style-type: none"> <li>- Name, address, head of the enterprise</li> <li>- Year of establishment</li> <li>- Status (active/ inactive)</li> <li>- Source of capital</li> <li>- Business units</li> <li>- Types of business</li> </ul>	Social Service and Community and Village Empowerment Authority of the Local Government of Banyumas District
2	Annual Sub-district Reports	2018	Banyumas District has 27 sub-districts. Each sub-district comprises of 9-10 villages. This report consists of characteristics of each village in the scope of: <ul style="list-style-type: none"> <li>- Geography</li> <li>- Government administration</li> <li>- Population</li> <li>- Social</li> <li>- Agriculture</li> <li>- Industry</li> <li>- Trade</li> <li>- Transportation</li> </ul>	Banyumas Statistics Agency
3	Villages Potential Data Collection	2014 and 2018	The data covers several areas, including: <ol style="list-style-type: none"> <li>1. General information about the village including status, location, and topography</li> <li>2. Population and labour including the main source of income of its residents</li> <li>3. Housing and environment such as sewage management and fuel usage</li> <li>4. Natural disaster and the mitigation</li> <li>5. Education and healthcare</li> <li>6. Social and cultural</li> <li>7. Sports and entertainment</li> <li>8. Transportation, communication, and information including the condition of road surface and availability of public transportation modes</li> <li>9. Land utilization, economy, and industry</li> <li>10. Financial and Village Asset</li> <li>11. Development and empowerment of the village's residents</li> </ol>	Statistics of Indonesia
4	Village Funds	2017, 2018,- 2019	Datasets consist of budget and distribution of village funds as integrated with OMSPAN Dana Desa - Ministry of Finance. Accessed from: <a href="https://pddi.kemendes.go.id/kemenkeu/realisasi_pagu">https://pddi.kemendes.go.id/kemenkeu/realisasi_pagu</a>	Ministry of Village, Development of Disadvantaged Regions, and Transmigration
5	Indeks Desa Membangun (IDM)	2105, 2018, 2019	IDM or Village-Building Index is a measure of how well a village is being developed. Accessed from: <a href="https://pddi.kemendes.go.id/idm">https://pddi.kemendes.go.id/idm</a>	Ministry of Village, Development of Disadvantaged Regions, and Transmigration
6	Village Funds	2015, 2016	<i>Not available</i>	

## Appendix 3 Stata Result: Summary Statistics

### YEAR: 2014

	N	mean	sd	min	max
idm	283	.669	.066	.44	.853
ent	283	0	0	0	0
midwives	283	1.576	.913	0	6
doctors	283	.417	.909	0	6
high sch	283	.724	.448	0	1
market1	283	.163	.37	0	1
hotel	283	.131	.975	0	13
logistic	283	.141	.83	0	5
state bank	283	.131	.338	0	1
public tra ~ p	283	.823	.382	0	1
landslides	283	.18	.385	0	1
floods	283	.06	.238	0	1
flashfloods	283	0	0	0	0
warning sy ~ m	283	.187	.391	0	1
evacuation	283	.127	.334	0	1

### 2018

idm	283	.659	.062	.336	.868
ent	283	.816	.388	0	1
midwives	283	1.184	.795	0	5
doctors	283	.399	.799	0	5
high sch	283	.746	.436	0	1
market1	283	.17	.385	0	2
hotel	283	.194	1.255	0	18
logistic	283	.166	.373	0	1
state bank	283	.138	.345	0	1
public tra ~ p	283	.813	.391	0	1
landslides	283	.311	.464	0	1
floods	283	.134	.342	0	1
flashfloods	283	.025	.156	0	1
warning sy ~ m	283	.247	.432	0	1
evacuation	283	.138	.345	0	1

### 2019

idm	283	.691	.057	.548	.879
ent	283	.883	.322	0	1
midwives	283	1.095	.923	0	5
doctors	283	.424	.929	0	6
high sch	283	.735	.442	0	1
market1	283	.18	.412	0	2
hotel	283	.163	1.086	0	15
logistic	283	.141	.378	0	3
state bank	283	.145	.353	0	1
public tra ~ p	283	.841	.366	0	1
landslides	283	.092	.289	0	1
floods	283	.028	.166	0	1
flashfloods	283	0	0	0	0
warning sy ~ m	283	.17	.376	0	1
evacuation	283	.117	.322	0	1

## Appendix 4 Stata Results: Initial Regression

Table 13 Simple regression result: Existence of Enterprise on IDM and its three sub-indexes

	(1) IDM	(2) IKS	(3) IKE	(4) IKL
Existence of enterprise	0.0077* (0.0044)	0.0296*** (0.0050)	0.0189*** (0.0072)	-0.0253*** (0.0084)
Obs.	849	849	849	849
R-squared	0.0037	0.0394	0.0079	0.0102

Standard errors are in parenthesis

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

Table 14 Simple regression result: Existence of Enterprise and other variables on IDM

	(1) IDM	(2) IDM
Existence of enterprise	0.0077* (0.0044)	0.0088*** (0.0034)
Availability of midwives		0.0039** (0.0020)
Availability of doctors		0.0085*** (0.0021)
Availability of senior high school		0.0185*** (0.0041)
Availability of market		0.0161*** (0.0049)
Availability of hotel		0.0049*** (0.0010)
Availability of logistic services		0.0070*** (0.0021)
Availability government bank		0.0335*** (0.0070)
Availability of public transportation		0.0184*** (0.0048)
Occurrence of landslides		-0.0265*** (0.0044)
Occurrence of floods		-0.0252*** (0.0072)
Availability of early warning system		0.0158*** (0.0053)
Availability of evacuation route		0.0529*** (0.0062)
Obs.	849	849
R-squared	0.0037	0.3735

Standard errors are in parenthesis

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

## Appendix 5 Stata Results: DID Regression

Table 15 DID regression result: Existence of Enterprise on IDM and its three sub-indexes

	(1) IDM	(2) IKS	(3) IKE	(4) IKL
Existence of enterprise	-0.0732*** (0.0162)	-0.0554*** (0.0196)	-0.0518* (0.0285)	-0.1125*** (0.0332)
Timetrend	0.0028 (0.0045)	0.0345*** (0.0052)	-0.0137 (0.0094)	-0.0122 (0.0092)
DID	0.0308*** (0.0071)	0.0173** (0.0084)	0.0346** (0.0135)	0.0404*** (0.0149)
Obs.	849	849	849	849
R-squared	0.0446	0.1463	0.0165	0.0193

Standard errors are in parenthesis

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

Table 16 Main DID regression result: Existence of Enterprise on IDM and its three sub-indexes, including other control variables

	(1) IDM	(2) IKS	(3) IKE	(4) IKL
Existence of enterprise	-0.0609*** (0.0147)	-0.0515*** (0.0193)	-0.0436* (0.0253)	-0.0878*** (0.0315)
Timetrend	0.0031 (0.0035)	0.0322*** (0.0050)	-0.0142* (0.0083)	-0.0086 (0.0074)
DID	0.0262*** (0.0063)	0.0186** (0.0083)	0.0323*** (0.0120)	0.0278** (0.0135)
Availability of midwives	0.0050*** (0.0019)	0.0078*** (0.0026)	0.0086** (0.0035)	-0.0015 (0.0040)
Availability of doctors	0.0081*** (0.0020)	0.0139*** (0.0024)	0.0169*** (0.0041)	-0.0066 (0.0050)
Availability of senior high school	0.0184*** (0.0041)	0.0256*** (0.0057)	0.0207*** (0.0066)	0.0089 (0.0088)
Availability of market	0.0157*** (0.0048)	0.0088* (0.0052)	0.0328*** (0.0092)	0.0055 (0.0113)
Availability of hotel	0.0051*** (0.0011)	0.0026 (0.0019)	0.0050*** (0.0019)	0.0079*** (0.0027)
Availability of logistic services	0.0078*** (0.0021)	0.0104*** (0.0032)	0.0040 (0.0052)	0.0092* (0.0053)
Availability government bank	0.0344*** (0.0068)	0.0204*** (0.0077)	0.0753*** (0.0125)	0.0074 (0.0134)
Availability of public transportation	0.0179*** (0.0048)	0.0005 (0.0053)	0.0704*** (0.0082)	-0.0172* (0.0096)
Occurrence of landslides	-0.0206*** (0.0046)	-0.0014 (0.0061)	-0.0145* (0.0078)	-0.0460*** (0.0102)
Occurrence of floods	-0.0201*** (0.0072)	-0.0122 (0.0091)	0.0117 (0.0129)	-0.0598*** (0.0169)
Availability of early warning system	0.0173*** (0.0052)	-0.0017 (0.0056)	0.0007 (0.0085)	0.0529*** (0.0114)
Availability of evacuation route	0.0531*** (0.0060)	-0.0021 (0.0063)	0.0252*** (0.0091)	0.1361*** (0.0139)
Obs.	849	849	849	849
R-squared	0.4023	0.2922	0.3553	0.2849

Standard errors are in parenthesis

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$