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MISMATCH OF VILLAGE DEVELOPMENT INDICATORS IN INDONESIA

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ABBREVIATIONS AND ACRONYMS

Bappenas	: <i>Badan Perencanaan dan Pembangunan Nasional</i> (National Planning and Development Agency)
BPS	: <i>Badan Pusat Statistik</i> (Statistics Indonesia)
BTS	: Base Transceiver Station
BUMDes	: <i>Badan Usaha Milik Desa</i> (Village-Owned Enterprise)
IDM	: <i>Indeks Desa Membangun</i> (Developing Village Index)
IKG	: <i>Indeks Kesulitan Geografis</i> (Geographical Difficulty Index)
IPD	: <i>Indeks Pembangunan Desa</i> (Village Development Index)
KLB	: <i>Kejadian Luar Biasa</i> (Extraordinary Event)
<i>Podes</i>	: <i>Potensi Desa</i> (Village Potential)
<i>Polindes</i>	: <i>Pondok Bersalin Desa</i> (Village Maternity Clinic)
<i>Poskesdes</i>	: <i>Pos Kesehatan Desa</i> (Village Health Post)
<i>Posyandu</i>	: <i>Pos Pelayanan Kesehatan Terpadu</i> (Integrated Village Health Post)
PPMD	: <i>Pembangunan dan Pemberdayaan Masyarakat Desa</i> (Development and Empowerment of Rural Community)
Puskesmas	: <i>Pusat Kesehatan Masyarakat</i> (Public Health Centre)
RPJMN	: <i>Rencana Pembangunan Jangka Menengah Nasional</i> (National Medium-term Development Plan)
SDM	: <i>Sumber Daya Manusia</i> (Human Resources)
SMA	: <i>Sekolah Menengah Atas</i> (Senior High School)
SMP	: <i>Sekolah Menengah Pertama</i> (Junior High School)
SPM	: <i>Standar Pelayanan Minimal</i> (Minimum Public Services)
TK/RA/BA	: <i>Taman Kanak-kanak/Raudlatul Athfal/Bustanul Athfal</i> (Kindergarten/Islamic Kindergarten Islamic Playgroup)

ABSTRACT

The aim of this paper is to analyse the achievement of village development indicators in 2014 and 2018 after the release of Rp 250 trillion in Village Funds since 2015. There are three indicators related to village development in Indonesia, namely the Geographical Difficulty Index (Indeks Kesulitan Geografis: IKG) which is used as the basis for the Allocation Formula of the Village Fund and the Village Development Index (Indeks Pembangunan Desa: IPD) which measures the achievement of basic service development to meet minimum service standards (Standar Pelayanan Minimal: SPM) at the village level, and the Developing Village Index (Indeks Desa Membangun: IDM) that evaluates the continuity of village development. The three village development measurement tools have similar shortcomings, namely that there are indicators that cannot be followed up by village officials and policies in the village. The methodology used includes the Paired Comparative Indicator Change Test, namely by applying the McNemar-Bowker Statistical Test and Wilcoxon Signed Rank Test, with paired data at ordinal or interval scale but without normal distribution. The study on changes in the category of achievements in the village development indicators for 2014 and 2018, namely: (i) the availability of, and access to, TK/RA/BA;¹ (ii) the availability of shops, minimarkets or grocery stores; (iii) the handling of extraordinary events (Kejadian Luar Biasa: KLB); (iv) village autonomy; and (v) village assets, found that there is no significant difference between 2014 and 2018. This indicates the existence of indicators that are not measured and the measurement of indicators that is not established through the Village Fund budget.

Key words: *Village Fund budget, Village Development Indicators.*

SECTION ONE: INTRODUCTION

The accelerated village development program has marked its fifth year with a total allocation of village funds from 2015 to 2019 of more than Rp 252 trillion. The acceleration program started off in 2014, following the enactment of Law No. 6/2014. One of the key achievements is a drop in the number of disadvantaged villages by 6,518 and an increase in the number of established villages by 2,665 in 2018.

The paradigm of village development has adopted the decentralisation model. This condition has given rise to a new paradigm for village economic agency by gaining an understanding of the financial system and empowering members of the community and, therefore, it is necessary to strengthen institutions at the village level to encourage the village government to perform well (Antlöv et al. 2016). For this reason, an increase in village budgets offers new hope, by providing a positive stimulus for the growth of the village economy.

As a stimulus, disbursements from the Village Fund advance the village economy at a faster rate. The acceleration of development through the restoration of infrastructure that improves access to the economy and empowerment in the form of labour-intensive projects creates a fiscal stimulus that furthers the economic advancement of the village.

The success of development at the village level depends on the roles of the village government and community empowerment. Although the Village Fund program has been created as a stimulus mechanism, in practice the village head's role as the central figure and leader motivating the village economy remains vital. In addition, all active village instrumentalities will provide more chance for success in village development.

Developing countries adopt various approaches in village development, one of which is by providing locally run revolving capital. For example, in Thailand, after the Village and Urban Fund program was launched in Thailand in 2001, people were able to provide working capital for locally owned revolving loan associations, however, because the Bank for Agriculture and Agriculture Cooperative dominated the loan market, the Village and Urban Fund had little impact on the pool of working capital sourced by low-income households (Boonperm et al. 2013). Micro-credit in Nepal has become an effective tool to increase the socioeconomic status of the poor, particularly women (Adhikari and Shrestha 2013). In addition to micro-credit, there are other countries designing villages with a master plan.

Iran has taken a different approach with the Iran Rural Development Project that has successfully increased the motivation of Iranian people to live in villages. It has also stimulated a rise in the land price and increased participation in village construction projects, improved access to agricultural inputs and markets for agricultural products as well as strengthened the foundation of steps to attract the participation of villagers (Ebrahimi et al. 2014). In Tajikistan, village leadership has a vital role in the successful management of the allocated budget so that, village leaders and their administrations are able to run development projects by using the funds allocated by the representatives of the Aga Khan Foundation (Jones et al. 2016).

In Indonesia, the acceleration of village development is closely related to the development of infrastructure. Some of the development projects that have been implemented include reservoirs, village roads, bridges, village markets, riprap, mooring docks, clean water, drainage, irrigation channels, bathing, washing, and latrine facilities, and wells. The scope of development also covers socioeconomic activities such as Village-Owned Enterprises (Badan Usaha Milik Desa: BUMDes), development of village sport centres, development of early childhood education, village maternity clinics (Pondok Bersalin Desa: polindes), integrated health services posts (Pos Pelayanan Kesehatan Terpadu: posyandu), and other infrastructure. This is consistent with the mandate of the Regulation of the Minister of Villages, PDT, and Transmigration Number 16/2018 concerning Priority for the Use of Village Funds 2019, Development of Disadvantaged Regions and Transmigration (2018 Performance Report of the Directorate General for Development and Empowerment of Rural Community, PPMD).

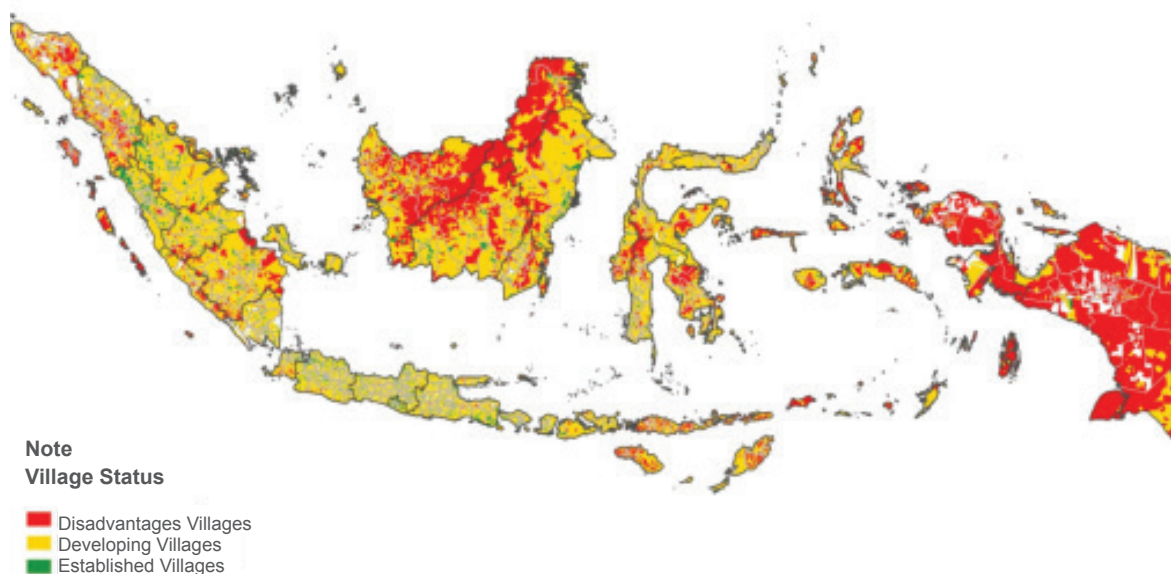
In addition to infrastructure, the impact of village development on the poverty level in villages remains the subject of debate. In fact, in a case study in Gemeh District, Talaud Islands Regency, North Sulawesi, Village Fund allocations have not affected the poverty rate (Lalira et al. 2018). In addition, village funds used for infrastructure development do not directly lead to the productivity of the agricultural sector, while the agricultural sector contributes greatly to rising poverty because most of the poor work as farmers. A similar failure occurred after the 1998 crisis, the World Bank tried to make the poor more productive, but in fact informal social security arrangements were inefficient and ineffective for a large proportion of the rural population in Java. Because, farm workers will only be employed by people who used to work with him. (Bremen 2001).

The progress of village development has been described in at least three indexes, each of which is used for different purposes. The first is the Geographical Difficulty Index (Indeks Kesulitan Geografis: IKG) which is the determining factor in the distribution of village funds. The lower of the value of IKG, the better process village development. The second index is the Village Development Index (Indeks Pembangunan Desa: IPD) which aims to achieve the development of basic services in order to meet the Minimum Service Standards (Standar Pelayanan Minimal: SPM) at the village level. The better the village development is, the more established the village would be to increase the village competitiveness. Thirdly, the Developing Village Index (Indeks Desa Membangun: IDM) that evaluates the continuity of village development. Good village development also benefits environmental and social outcomes.

These three village development indicators have similar shortcomings, in that village officials and stakeholders in the village are unable to influence them. One of the examples is school facilities as the indicator of basic education services as the village government has no capacity to build schools. Pursuant to the Minister of Villages, Development of Disadvantaged Regions and Transmigration Regulation No. 16/2018 on the Priority Appropriation of Village Funds for 2019, village governments are not allowed to build this facility because the regulation specifically sets out in detail which infrastructure that village government is allowed to build with Village Funds. In addition, there are many other indicators that cannot be actioned.

Of these three village development indicators, the IKG and IPD are closely related to one another as all indicators in the IKG also form part of the indicators in the IPD. As a result, when IPD indicators are evaluated, the IKG indicators are automatically assessed. According to the writers' note, out of 42 village development indicators in the IPD, there are only 23 indicators that can be managed by village paralegals under the guidelines of the Minister of Villages, Development of Disadvantaged Regions and Transmigration Regulation No. 16/2018 on the Priority Appropriation of Village Funds for 2019.

Figure 1.1: Distribution of Villages by Village Status (Disadvantaged, Developing, and Established)



Source: Publication of IPD (BPS 2018).

One of the impacts that the provisions in this ministerial regulation creates is that, if a village already has these 23 indicators, it is difficult for the village to gain a degree of independence. This means that the currently applied village development indicators will trap these villages in their current status as a developing village. This situation can, however, be anticipated with policies by regency and provincial governments, as the higher-level government administration above the village government. In addition to this issue, another reason for the disparity in village development is that the majority of Village Funds is absorbed in Sumatra, Java, and Bali.

Table 1.1: Number and Percentage of Villages by Region (2018)

Number	Area of Archipelago	Number of Villages	Percentage	Cumulative Percentage
1	Sumatra	23.241	30.8	30.8
2	Java – Bali	23.108	30.6	61.4
3	Nusa Tenggara	4.043	5.4	66.8
4	Kalimantan	6.624	8.8	75.6
5	Sulawesi	8.804	11.7	87.3
6	Maluku	2.268	3	90.3
7	Papua	7.348	9.7	100
	Total	75.436	100	100

Source: Processed from Village Potential (*Potensi desa: Podes*) statistics of 2018.

This uneven distribution of budget absorption is considered to be one of the reasons it becomes more difficult to redress the inequality. In 2018, Sumatra, Java, Bali, and Nusa Tenggara had 50,392 villages (66.8 percent), while there were only 25,044 villages (33.2 percent) in Kalimantan, Sulawesi, Maluku, and Papua (Table 1.1). The resulting data in Podes gives an illustration of this disparity.

In addition to the budget absorption of the Village Fund, the indicators that serve as the basis for calculating village development also need to be adjusted. It is necessary to reach a mutual agreement on the application of the SPM in accordance with the existing obligations and workload, particularly in relation to the basic service facilities that cannot be met by policy makers in the village. Regardless of this, the indicators of progress in village development that are based on the SPM approach still raise an issue, that is, "Measuring What Is Not Built and Building What Is Not Measured".

Sources of Data

In this study, the sources of data used are consistent with the sources of data used for calculating the IPD, that is, the Podes data. Podes data are area-based data in the lowest administrative unit in Indonesia—the village/subdistrict. These data are collected comprehensively by Statistics Indonesia (Badan Pusat Statistik: BPS) from all villages, subdistricts and transmigration settlement units. BPS collects this data every two years before the population, agricultural, and economic censuses are conducted.

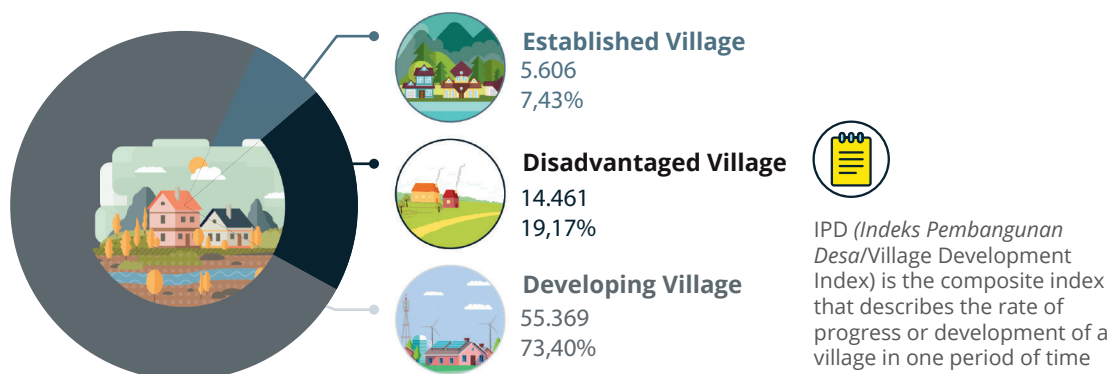
Podes data show the condition of infrastructure existing in the village within the period that the data are collected. The recorded data include: (i) village typology; (ii) population and manpower; (iii) housing and environment; (iv) disaster and mitigation; (v) education and health; (vi) social and culture; (vii) sports and entertainment; (viii) transportation, communication and information; (ix) economy; (x) security; (xi) village assets; (xii) development and empowerment; and (xiii) the condition of the village/subdistrict apparatus.

SECTION TWO: EVALUATION OF 2018 VILLAGE DEVELOPMENT

This study evaluates the IPD—the composite index that describes the rate of progress or development of a village in one period of time. We selected IPD for this evaluation so that we would be able to simultaneously produce two outcomes. The first is to evaluate the determining factors in the allocation of the Village Fund, which is the IKG, and the second is to evaluate the IPD itself.

The IPD and IKG share the same sources of data, namely the collected data on Podes. Based on the data gathered, there are five dimensions and 42 indicators which illustrate the availability and accessibility of services in the village community. Villages are classified as Established (mandiri), Developing (berkembang), or Disadvantaged (tertinggal). The results of the 2018 IPD show that there are 5,606 established villages, 55,369 developing villages, and 14,461 disadvantaged villages (Figure 2.1). Nationwide, the state of Indonesia’s village development falls into the category of developing village with an IPD of 59.36.

Figure 2.1: Number of Villages by IPD Status (2018)



Source: IPD publication (BPS 2018).

The IPD has been applied in designing the target villages under the RPJMN (*Rencana Pembangunan Jangka Menengah Nasional: National Medium-term Development Plan*) 2015-2019. The target achievement is to reduce the number of disadvantaged villages by 5,000 and to raise the number of established villages by 2,000.

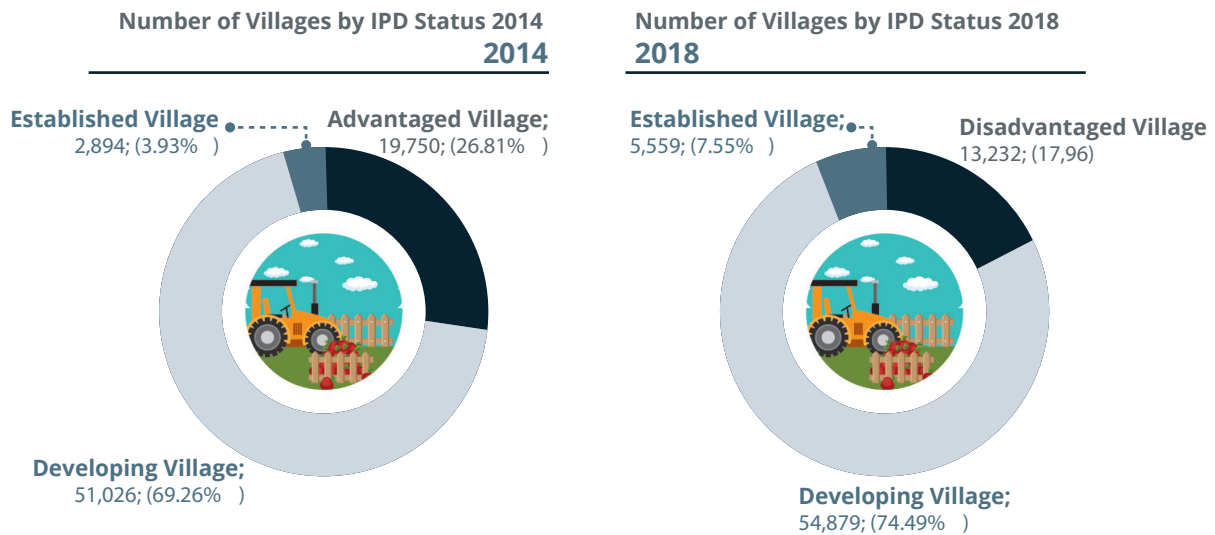
The IPD has been calculated two times—in 2014 and 2018—covering the planning and evaluation phases and with the same methods and scales of indicators used in both. The condition of the 2014 data is crucial in determining the basic indicators, such as the distance from the village to the district or regency. As an outcome of the formulation of the IPD, all villages in Indonesia are properly mapped based on the level of village development in accordance with the specifications of the IPD above.

The first phase was the planning phase in which the measurement was carried out in 2015 by measuring the villages registered under the Minister of Home Affairs (Permendagri) Regulation No. 39/2015. The *Podes* data of 2014 were used as the source. The results of the 2015 IPD were published in a book titled the “2014 Village Development Index: Challenges in Meeting the Village Minimum Service Standards” in 2015, being the product of a collaboration between the National Planning and Development Agency (*Badan Perencanaan Pembangunan Nasional: Bappenas*) and BPS.

The second was the evaluation phase in which IPD was calculated again in 2018. The calculation of the 2018 IPD used the list and data of villages resulting from the 2018 *Podes* data collection. The results of this calculation are presented in a book titled the 2018 Village Development Index, prepared by BPS. This book gives an overview of the outcomes of village development through the IPD for every village, province, and area in the big islands. The IPD summarises various outcomes of village development in accordance with the locality requirements of the respective village.

The results of the 2018 IPD show the success of the 2018 village development which is apparent in a fall in the number of disadvantaged villages by 6,518, and an increase in the number of established villages by 2,665 (Figure 2.2). The progress of the foregoing village development is observed from five dimensions of the SPM with various degrees of achievement. The highest level of achievement is evident in the government administration dimension, marking a 9.81 point increase, while the lowest level of achievement is identified in the basic service dimension of 0.92 points.

Figure 2.2: Ratio of IPD Outcomes of 2014 and 2018



Source: BPS 2018.

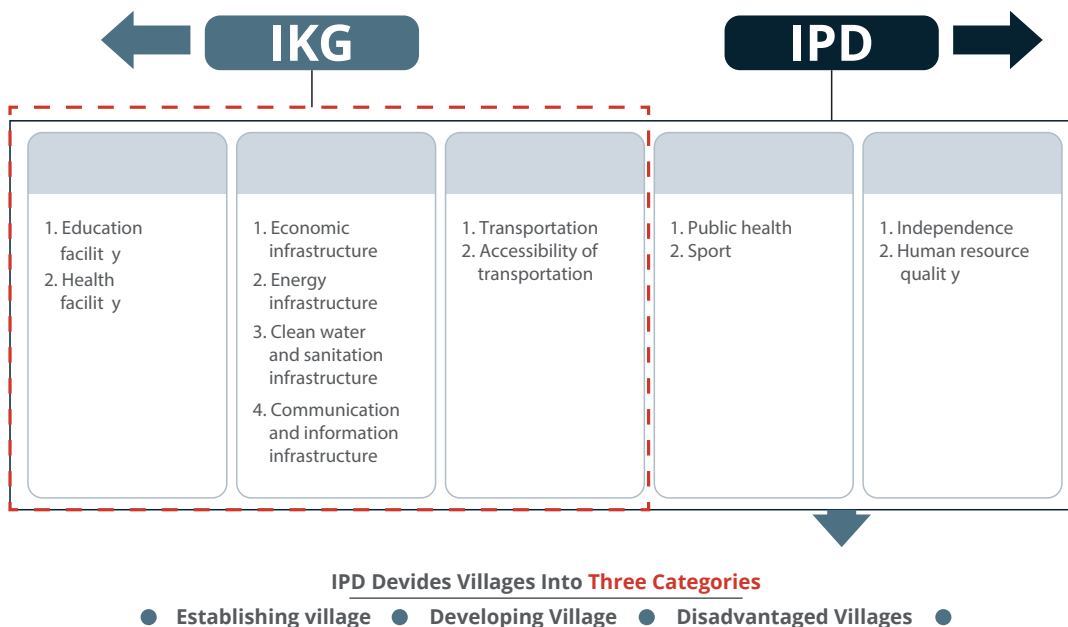
Note: The comparison made on the status of IPD uses the same number of villages as that in 2014 (73,670 villages).

SECTION THREE: VILLAGE DEVELOPMENT MEASUREMENT

Measurement of the progress in village development is designed based on the SPM approach which the village government is obliged to meet, however, this approach still creates a problem of how to measure what is not built and build what is not measured. Village government administrations carry out development in compliance with the regulations of the Minister of Villages, Development of Disadvantaged Regions and Transmigration on village funds which has been issued every year since 2015. The most recent guideline is set out in the Regulation No. 16/2018.

Both the IPD and IKG represent the indicators of achievement of basic services at the village level, however, a high IPD value indicates that the community easily reaches basic service locations, while a high IKG value indicates the level of difficulty people reach basic service facilities. The IPD covers three dimensions (availability of basic services, condition of infrastructure, and accessibility of transportation) of the IKG with two additional dimensions (public services and government administration). So, while the IPD is calculated based on five dimensions, 12 variables, and 42 indicators, the IKG is calculated based on three dimensions, 6 variables, and 28 indicators (Figure 3.1). The measurable basic services should at least comply with the set of rules established in Law No. 6/2014 on Villages and Presidential Regulation No. 2/2015 on the RPJMN 2015–2019 with regard to Village Development and Village Areas. This legal foundation serves as a reference for BPS in measuring village development through the IPD.

Figure 3.1: Correlation Between IPD and IKG



Source: BPS 2018.

3.1 Analysis Method

In this study, the test is conducted by using the paired comparative indicator change test, with two test statistics—the McNemar-Bowker Test and the Wilcoxon Test. The test statistics of McNemar-Bowker Test are applied to analyse changes in the categories resulting from the paired symmetry table, while the Wilcoxon Test is used to measure the significance of such changes from the resulting categories. Both of these tests are adopted to identify the pattern of changes in the indicators used to measure the IPD and IKG in 2014 and 2018.

McNemar-Bowker Test

The McNemar-Bowker Test is used to test the paired symmetry table with more than two categories. The resulting paired data are summarised in the $K \times K$ contingency table. This test is calculated with the formula of T_{MB} as follows:

$$T_{MB} = \sum_{i < j} \frac{(n_{ij} - n_{ji})^2}{n_{ij} + n_{ji}}$$

Hypothesis:

H_0 : No changes found in the categories of the village development indicators from 2014 to 2018.

H_a : Changes found in the categories of the village development indicators from 2014 to 2018

Condition: if the chi square is less than the chi table, H_0 is acceptable, otherwise H_a is rejected, or if Asymp. Sig. (2-sided) is greater than the allowable degree of significance, H_0 is acceptable, otherwise H_a is rejected.

Wilcoxon

The Wilcoxon Signed Rank Test is a non-parametric test to measure the significance of the difference between the two groups of paired data on ordinal or interval scale, but not distributed normally. The Wilcoxon Signed Rank Test is an alternative test to the pairing t test or t paired test if the normality assumption is not met. This test is also known as the Wilcoxon Match Pair Test. This test is calculated with the W formula below:

$$W = \sum_{i=1}^{N_r} [sgn(x_{2,i} - x_{1,i}) \cdot R_i]$$

Hypothesis:

H_0 : No changes found in the categories of the village development indicators from 2014 to 2018.

H_a : Changes found in the categories of the village development indicators from 2014 to 2018.

This test has assumptions or conditions that must be met, such as dependent variables on a scale of ordinal or interval/ratio data, but not distributed normally. The independent variables consist of two pairing categories. The forms and distribution of data between the two pairing groups are symmetrical.

Qualitative

This study reviews the authorities that the village could implement. The authorities of the village instrumentalities are set out in the Minister of Villages, Development of Disadvantaged Regions and Transmigration Regulation No.16/2018 regarding the Priority Appropriation of Village Funds for 2019. This review is conducted not only to identify which of the village development indicators could be followed up by policy makers, but also which village development indicators fall under the authority of the village apparatus. The fact that there are basic service facilities that could not be provided by the policy makers in the village shows that the authority of the village apparatus is very limited.

SECTION FOUR: RESULTS OF ANALYSIS

Every indicator which forms the index value is evaluated in this village development indicator study. The paired comparative indicator change test produces indicators that experience both significant and insignificant changes. Furthermore, this study also tests the qualitative aspect to recognize the extent of authority of the village instrumentalities to follow up policies at the village level. The outcome is in the form of indicators that could and could not be followed up under the village authorities. As a result, the generated index does not depict the entire progress of village development. Each of the indicators is analysed by dimension, from the availability of basic education and health service facilities to the human resources of the village apparatus. The complete results of the McNemar-Bowker Test and Wilcoxon Test are available in Annex 1.

4.1 Availability of Basic Services

The availability of, and access to, basic services such as education infrastructure is a key factor in how close government services are to citizens. Easy access to these services is expected to lower the cost of transportation to the education and health facilities. Furthermore, they can hopefully be used as tools to measure the government's performance in serving its citizens.

4.1.1 Education Facilities

The availability of basic education facilities is the key component in improving human resources. Under this indicator, the basic education services are measured from kindergarten to high school with access calculated from the office of the village head to the closest facility (Table 4.1).

Table 4.1: Results of Education Facility Indicator Test

Variable	Remarks	McNemar-Bowker	Wilcoxon
Education Facilities	Availability of, and access to, TK/RA/BA ¹	++	+
	Availability of, and access to, primary school and equivalent	++	++
	Availability of, and access to, SMP ² and equivalent	++	++
	Availability of, and access to, SMA ³ and equivalent	++	++

Source: Processed from Podes statistics of 2014 and 2018.

Note: * significant with alpha 0.01; ** significant with alpha 0.05.

The results of Wilcoxon test prove that this indicator does not show any changes in the significance level of alpha 0.05. The availability of facilities and access to TK/RA/BA did not experience a significant change in this category.

The list of limitations to the education facilities variable are:

- Basic education facilities cannot be built by village government. Primary schools and SMP/SMA fall under the authority of government above the village government level.
- Infrastructure indicators do not address ease of access.
- Infrastructure indicators are divided by population, not by the total school-aged population at their level.
- The nearest distance to the infrastructure is calculated based on the distribution of *Podes* data of 2014, rather than the government regulation on SPM administration.

4.1.2 Health Facilities

The availability of health facilities is the key element in the provision of government health services to its citizens. Health services are measured from access to the health facility of hospitals to the fulfillment of medication needs—that is, pharmacies. Accessibility is identified from the distance between the office of the village head to the nearest facility. Ease of access is the perception of the respondent, however, if a village already has health facilities, it is assumed that availability and ease of access to the facilities have been fulfilled.

Not all basic health facilities are able to be developed by the village government. For instance, hospitals, maternity hospitals, and public health centres (*Pusat Kesehatan Masyarakat: puskesmas*) fall under the authority of government administrations above village government. In addition to the above facilities, the community can build treatment center, polyclinics, midwives' practices, and pharmacies. In this variable, only village health posts (*Pos Kesehatan Desa: Poskesdes*) and *polindes* can be developed under the authority of the village administration.

The list of limitations related to the health facilities variable are:

- In terms of basic health facilities, the village government only has the authority to build infrastructure for poskesdes and polindes, while other health infrastructure does not fall under the village government authority.
- The indicators for education and health infrastructure are divided by total population, not by the number of people in need of the services. For example, for education infrastructure, the number of SMPs is divided by the total population, rather than SMP-aged population. Health facilities like midwives' practices are also divided by the total population, not by the number of women and children.

- The closest distance to the infrastructure is identified from the distribution of the *Podes* data of 2014, rather than implementation of the regulation on SPM.
- The involvement of other infrastructure in the calculation of lower-order indicators. For instance, in preparing the indicator of *puskesmas*, hospitals are included and in preparing the indicator of midwives' practices, hospitals, maternity hospitals, and *puskesmas* are included. The health facility indicator does not only reflect the condition of the relevant health facility, but also reflects the presence of facilities in the higher category.

Table 4.2: Results of Health Facilities Indicator Test

Variable	Remarks	McNemar-Bowker	Wilcoxon
Health Facilities	Availability of, and access to, hospitals	++	++
	Availability of, and access to, maternity hospitals	++	++
	Availability of, and access to, <i>puskesmas</i>	++	++
	Availability of, and ease of access to, polyclinic/medical centre	++	++
	Access to physician practice	++	++
	Availability of, and ease of access to, midwife's practice	++	++
	Availability of, and ease of access to, <i>poskesdes</i> or <i>polindes</i>	++	++
	Availability of, and ease of access to, pharmacies	++	++

Source: Processed from *Podes* statistics of 2014 and 2018.

Note: * significant with alpha 0.01; ** significant with alpha 0.05.

4.2 Infrastructure Condition

Infrastructure condition reflects the ease of fulfilling people's living needs. This infrastructure may include economic facilities, access to energy sources for household use, clean water and sanitation, as well as communication and information.

4.2.1 Economic Infrastructure

The economic infrastructure indicator illustrates a citizen's access to their daily needs. This dimension indicates the level of easy access of the villagers to the resources and service facilities that they require. The expectation is that they will be able to meet all of the same necessities as their counterparts in the city. BUMDes can develop economic facilities in the village. Many villages that have tourism potential have developed lodging and homestays to provide services to tourists. In addition, villages could also build village markets, including grocery stores.

Table 4.3: Results of Economic Facility Indicator Test

Variable	Remarks	McNemar-Bowker	Wilcoxon
Economic Facilities	Availability of shops, mini markets, or grocery stores	++	+
	Availability of, and access to, markets	++	++
	Availability of, and access to, restaurants, eating places, or food shops/stalls	++	++

Source: Processed from Podes Statistics of 2014 and 2018.

Note: * significant with alpha 0.01; ** significant with alpha 0.05.

Limitations:

- Village government may develop the economic facilities through BUMDes. This aims to support village economic hubs such as village developments for tourism and other economic hubs, however, financial service infrastructure (banks) does not fall under the authority of the village government.
- Availability of, and access to, banks is identified through the existing cash office in a village that does not include a bank agent.
- The market indicator is observed from the ratio of market adequacy to the total population.

4.2.2 Energy Infrastructure

The energy infrastructure indicator provides an overview of the public's ability to fulfill their day-to-day needs for electricity, street lighting, and fuel. *This dimension can show whether or not the people's daily needs—from lighting to fuel for cooking—are met.*

Table 4.4: Results of Energy Facility Indicator Test

Variable	Remarks	McNemar-Bowker	Wilcoxon
Energy Infrastructure	Access to electric power	+	+
	Access to street lighting	+	+
	Access to fuel	+	+

Source: Processed from Podes statistics of 2014 and 2018.

Note: * significant with alpha 0.01; ** significant with alpha 0.05.

Limitations:

- Most energy infrastructure is not facilitated by the village government. For example, electricity distribution to the village is facilitated by PLN, however, villages that have not been electrified could build micro-hydro power facilities that would fall under the authority of the village government. This is also the case with access to, and supply of, fuel (such as kerosene and gas) which is mostly not facilitated by the village government.
- Indicators of the energy infrastructure variable show the output of infrastructure that is directly related to energy.
- This indicator is based on an approach where the more citizens' energy need is fulfilled, the better the energy infrastructure available in that village.

4.2.3 Clean Water and Sanitation Facilities

Clean water and sanitation are vital infrastructure in the village. The clean water and sanitation indicator depicts the ability of villagers to access the essential resources, from a water source for drinking, bathing/ washing to access to sanitation for latrine for the majority of families living in the village. The clean water and sanitation variable is used to measure how easy it is for people to obtain clean water and to measure the level of cleanliness of household waste such as latrine waste.

Limitations:

- Clean water and sanitation infrastructure can be facilitated under authority of the village government.
- Sanitation is only indicated by the latrines that are accessible by the majority of families. Furthermore, the sanitation level of village people could be represented better if other supporting indicators of public sanitation are added, by including for example, garbage and liquid waste to measure the sanitation indicator.
- Sanitation and pollution are closely related, however, this indicator does not include information on pollution and slums.
- The latrine indicator is divided into four categories (0, 2, 3, 5). This is different to other indicators that consist of six categories (0-5).

Table 4.5: Results of Clean Water and Sanitation Indicator Test

Variable	Remarks	McNemar-Bowker	Wilcoxon
Clean Water and Sanitation Infrastructure	Source of drinking water	++	++
	Source water for bathing/ washing	++	++
	Latrine for majority of family	++	++

Source: Processed from Podes statistics of 2014 and 2018.

Note: * significant with alpha 0.01; ** significant with alpha 0.05.

4.2.4 Communication and Information Infrastructure

Communication needs are reflected in the communication and information variables. Indicators of this variable are the availability and quality of cellular communication facilities and access to postal or goods services. The aim is to make it easier for members of the community to communicate and send information and goods to and from the village so the community is not isolated geographically.

Table 4.6: Results of Communication and Information Indicator Test

Variable	Remarks	McNemar-Bowker	Wilcoxon
Communication and Information Infrastructure	Availability and quality of cellular communication facility	++	++
	Access to postal service or goods delivery	++	++

Source: Processed from Podes statistics of 2014 and 2018.

Note: * significant with alpha 0.01; ** significant with alpha 0.05.

Limitations:

- Communication and information infrastructure—such as the provision of a cellular network through the procurement of a BTS (Base Transceiver Station)—is mostly facilitated by government outside the village. Postal or goods delivery services are also not facilitated under the authority of the village government.
- Indicators of the availability and quality of cellular communication facilities are the presence of a BTS and the strength of a cellular phone signal.
- Indicators of postal or goods delivery services are prepared from a combination of the Internet services available at the village office, the availability of an Internet kiosk in the village, the availability of postal and mobile postal services as well as a forwarding company.
- Only the Internet services at the village office are facilitated by the village government.

4.3 Accessibility/Transportation

Accessibility and transportation services are the key factors in determining the ease of access that the village has to the basic service resources and facilities that people need so villagers can meet the necessities of life as easily as their counterparts in the city.

Table 4.7: Results of Accessibility/Transportation Indicator Test

Variable	Remarks	McNemar-Bowker	Wilcoxon
Accessibility/ Transportation Infrastructure	Traffic and road quality for inter-village transportation	+	+
	Road accessibility	+	+
	Availability of public transportation	+	+
	Public transportation operation	+	+
	Transportation travel time per kilometre to the office of subdistrict head	+	+
	Transportation cost per kilometre to the office of subdistrict head	+	+
	Transportation travel time per kilometre to the regent/mayor's office	+	+
	Transportation cost per kilometre to the regent/mayor's office	+	+

Source: Processed from Podes statistics of 2014 and 2018.

Note: * significant with alpha 0.01; ** significant with alpha 0.05.

Limitations:

- Accessibility/transportation infrastructure can be developed under the authority of the village government.
- Law No. 6/2014 on Villages mandates that a new village has access to places outside the village. The impact of this legal requirement is that all villages now have access to places outside the village. Consequently, the established categories of this indicator do not begin from 0-5, but from 1-5.
- The 1-5 categories are found in two indicators, namely traffic and road quality for inter-village transportation and road accessibility.

- The indicator of road accessibility to and from the village by water falls into indicator category 1 (the lowest). Although access is relatively easy, the villages that can only be reached by water (river, sea) cannot change the categories in this indicator.
- Furthermore, code 0 is assigned to the indicator of public transportation operation by water (the lowest).

4.1 Public Services

The public services dimension represents the community's public health environment, ranging from efforts to maintain public health to medical treatment. Due to the limited *Podes* data, the variable used to review this dimension is restricted to the handling of extraordinary events and poor nutrition as well as the availability of sporting facilities such as sport fields and sport activity groups.

Table 4.8: Results of Public Services Indicator Test

Variable	Remarks	McNemar-Bowker	Wilcoxon
Public Services	Handling of extraordinary events	+	+
	Handling of poor nutrition	+	+
	Availability of sports facilities	+	+
	Existence of sports activity groups	+	+

Source: Processed from *Podes* statistics of 2014 and 2018.

Note: * significant with alpha 0.01; ** significant with alpha 0.05.

Limitations:

- Some public services can be facilitated under the authority of the village government through *posyandu*, *poskesdes*, or *polindes*. Furthermore, sport facilities and groups are also facilitated by the village government through the village government authority. The handling of extraordinary events does not, however, fall under the village government authority, but rather *puskesmas*.
- Variations in the indicator on the handling of extraordinary events are not significant.
- The indicator of extraordinary events consists of five categories, namely 0, 1, 2, 3, and 5. Code 4 is not assigned in this indicator.
- The public services variable adopts the approach of output to identify the handling of diseases and health maintenance efforts in the village.

- The indicator of poor nutrition handling is divided into five categories which are 0, 1, 2, 3, 5. Code 4 is not assigned in this indicator.
- The availability of sports facilities and groups may be facilitated by the village government.
- The handling of extraordinary events and poor nutrition is implemented by *puskesmas* and the local health services office.

4.5 Government Administration

The government administration dimension was analysed to recognise, in general, the capacity of the village to manage its administration, particularly to identify the independence of the village government in generating village own-source revenues and to assess the human resources (*Sumber Daya Manusia: SDM*) quality of the village head and secretary. At the same time, this dimension provides a snapshot of the performance of the village government in managing its village.

4.5.1 Independence

Government administration illustrates the village government performance in the provision of administrative services. This variable is required as an indicator of village development given its nature as an instrument to achieve the objective of village development. The constituent variables include independence in: (i) village government apparatus; (ii) village autonomy; (iii) village assets/property; and (iv) the quality of human resources for example: the SDM quality of village head and village secretary.

Table 4.9: Results of Government Administration Indicator Test

Variable	Remarks	McNemar-Bowker	Wilcoxon
Government Administration	Village government apparatus	+*	+*
	Village autonomy	+	+*
	Village assets/property	+*	+***
	Public transportation operation	+*	+*

Source: Processed from Podes statistics of 2014 and 2018.

Note: * significant with alpha 0.01; ** significant with alpha 0.05.

Limitations:

- Government administration falls under the authority of the village government.
- Information on village own-source revenues (PAD) is used more than once, namely for the village autonomy and village assets/property indicators.
- The categorisation of village autonomy indicator does not depict the pattern of changes in the data used. This is apparent as the changes in the village autonomy indicator tend to be statistically insignificant in the McNemar-Bowker test.

4.5.2 Human Resources (SDM) Quality

The quality of SDM—the village head and secretary—is a reference point on the productivity of development in the village. The quality assessment is conducted by taking into account the highest education level completed by the village head and secretary. Prior to the promulgation of Law No. 6/2014, the village secretary was appointed as a civil servant, however, since this Law came into effect, the village secretary has been appointed and dismissed by the village head.

Table 4.10: Results of SDM Indicator Test

Variable	Remarks	McNemar-Bowker	Wilcoxon
SDM Quality	SDM quality of village head	+*	+*
	SDM quality of village secretary	+*	+*

Source: Processed from Podes statistics of 2014 and 2018.

Note: * significant with alpha 0.01; ** significant with alpha 0.05.

Limitations:

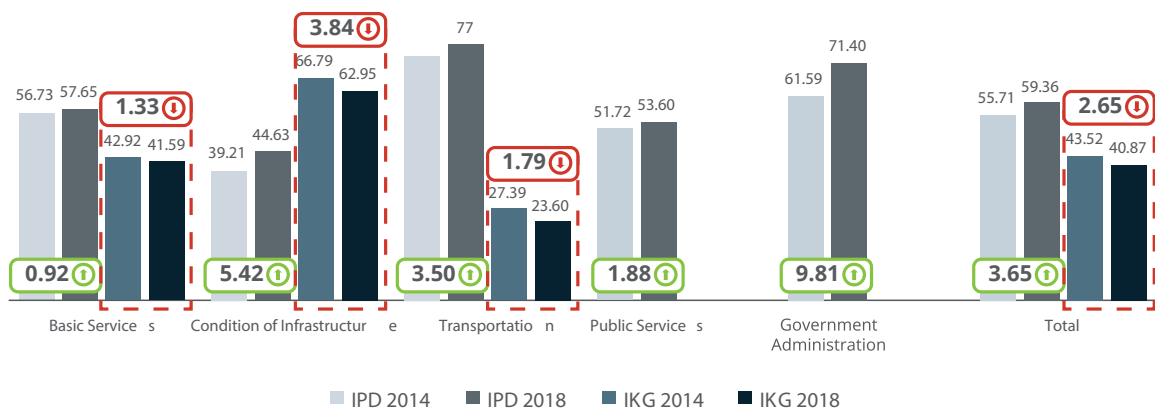
- The quality of SDM relies heavily on the public in electing the village head.
- SDM quality is measured from the highest education level completed by the village head and secretary.

4.6 Index Result Evaluation

The IPD and IKG have reverse viewpoints—the IKG reflects the level of difficulty for villagers to access basic services, while the IPD represents the achievement of village development in bringing the basic services closer to the villagers. The IKG is used in determining the distribution of Village Funds, and the IPD is used for evaluating the outcomes of village development.

As a result, the village development has successfully reduced the relatively high level of geographical difficulties in the infrastructure dimension. Nevertheless, the infrastructure condition still has a significantly higher value if compared to the average value of the IKG.

Figure 4.1: Comparison of the Results of IPD and IKG Per Dimension



Source: Processed from 2018 IPD and IKG.

The village infrastructure condition is still better than that of basic services and transportation. If compared at a glance, the dimension of IPD shows a greater increase than the IKG. This is because the IPD has more variables (14 indicators), while the IKG only has eight indicators that are part of IPD. The contrasting IPD indicators include the use of liquefied petroleum gas, latrines, and availability of postal services that are not present in the measurement of the IKG. Furthermore, the contribution of each indicator also has a different pattern.

Table 4.11: Causes of Difference in the Value of IPD and IKG in the Infrastructure Condition Dimension

Remarks	Change	Indicator of IKG	Indicator of IPD
Access to fuel	Number of villages where LPG station/agent/seller is available increased by 14% from 2014.	Yes	Yes
Latrine for majority of family	Number of villages where the majority of families use their own latrine increased by 26% from 2014.	No	Yes
Access to postal or goods delivery	Number of villages that have postal services increased by 59% from 2014.	No	Yes
Shop categories	Number of villages that have shop categories decrease by 4.74% from 2014	Yes	Yes
Non-structural market	Number of villages that have non-structural markets fell by 10.70% from 2014.	Yes	Yes
Food stand/stall	Number of villages that have food stand/stalls fell by 0.54% from 2014.	Yes	Yes

Source: Processed from Podes statistics of 2014 and 2018.

In addition due to the application of different indicators, each of the indicators that constitute the IPD and IKG also vary. The contributions produced from the main component analysis (PCA) for 2014 are presented in full in Annex 2.

SECTION FIVE: CONCLUSIONS

1. The results of the McNemar-Bowker Test and Wilcoxon Test show that several indicators have not significantly change between 2014 and 2018:
 - a. Availability of, and access to, TK/RA/BA;
 - b. Availability of shops, minimarkets, or grocery stores;
 - c. Handling extraordinary events (KLB);
 - d. Village autonomy; and
 - e. Village assets/property.
2. In general, the success of village development requires the synergy of efforts from the village apparatus itself and from the higher level of government administration above the village government. This includes the procurement of elementary to secondary school facilities, health facilities (hospital and *puskesmas*), BTS facilities and signal strength, and postal services.
3. When preparing the village development indicators which involve the distance and easy public access to the nearest facility, there is an indication that the surrounding village is also affected positively.

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Appendix

ANNEX 1

Table A1: Results of McNemar- Bowker and Wilcoxon Statistics Test (IPD 2018)

Number	Name of Indicator	McNemar- Bowker	Wilcoxon
I1	Availability of, and access to, TK/RA/BA	+*	+
I2	Availability of, and access to, primary school and equivalent	+*	+*
I3	Availability of, and access to, SMP and equivalent	+*	+*
I4	Availability of, and access to, SMA and equivalent	+*	+*
I5	Availability of, and access to, hospital	+*	+*
I6	Availability of, and access to, maternity hospital	+*	+*
I7	Availability of, and access to, Puskesmas	+*	+*
I8	Availability of, and ease of access to polyclinic/ medical centre	+*	+*
I9	Access to physician practice	+*	+*
I10	Availability of, and ease of access to, midwife practice	+*	+*
I11	Availability of, and ease of access to Poskesdes or Polindes	+*	+*
I12	Availability of, and ease of access to pharmacy	+*	+*
I13	Availability of shops, minimarkets, or grocery stores	+*	+
I14	Availability of, and access to, market	+*	+*
I15	Availability of, and access to, restaurant, eating place or food stall/stand	+*	+*
I16	Access to hotel accommodation or lodging	+*	+*
I17	Availability of, and access to, bank	+*	+*
I18	Access to electricity	+*	+*
I19	Access to street lightning	+*	+*
I20	Access to fuel	+*	+*

Indikator IPD 2018		McNemar- Bowker	Wilcoxon
Number	Keterangan		
I21	Source of drinking water	++	++
I22	Source of water for bathing/washing	++	++
I23	Latrine for majority of family	++	++
I24	Availability and quality of cellular communication facilities	++	++
I25	Access to postal service or goods delivery	++	++
I26	Road traffic and quality for inter-village transportation	++	++
I27	Road accessibility	++	++
I28	Availability of public transportation	++	++
I29	Operation of public transportation	++	++
I30	Transportation traveling time per kilometre to the office of the subdistrict head	++	++
I31	Transportation cost per kilometre to the office of the subdistrict head	++	++
I32	Transportation traveling time per kilometre to the office of the regent/mayor	++	++
I33	Transportation cost per kilometre to the office of the regent/mayor	++	++
I34	Handling of extraordinary events (KLB)	++	+
I35	Handling of poor nutrition	++	++
I36	Availability of sports facilities	++	++
I37	Availability of sports activity groups	++	++
I38	Village government apparatus	++	++
I39	Village autonomy	+	++
I40	Village assets/property	++	+++
I41	SDM quality of village head	++	++
I42	SDM quality of village secretary	++	++

Source: Processed from Podes statistics of 2014 and 2018.

Note: * significant with alpha 0.01; ** significant with alpha 0.05.

ANNEX 2

Table A2: Weight of Each Indicator in the Constituting Index

Number	Name of Indicator	IKG	IPD
I1	Availability of, and access to, TK/RA/BA	0.0345	0.0228
I2	Availability of, and access to, primary school and equivalent	0.0208	0.0116
I3	Availability of, and access to, SMP and equivalent	0.0397	0.0321
I4	Availability of, and access to, SMA and equivalent	0.0365	0.0317
I5	Availability of, and ease of access to, hospital	0.0409	0.0272
I6	Availability of, and ease of access to, maternity hospital	0.0392	0.0258
I7	Availability of, and ease of access to, Puskesmas	0.0387	0.0310
I8	Availability of, and ease of access to, polyclinic/medical centre	0.0479	0.0309
I9	Availability of, and ease of access to, physician practice	0.0454	0.0326
I10	Availability of, and ease of access to, midwife practice	0.0447	0.0299
I11	Availability of, and ease of access to poskesdes or polindes	0.0441	0.0252
I12	Availability of, and ease of access to pharmacy	0.0376	0.0254
I13	Availability of shops, minimarkets, or grocery stores	0.0298	0.0196
I14	Availability of market	0.0275	0.0180
I15	Availability of restaurant, eating place or food stand/stall	0.0227	0.0152
I16	Availability of hotel accommodation or lodging	0.0268	0.0186
I17	Availability of, and access to, bank	0.0240	0.0230
I18	Access to electricity	0.0300	0.0230
I19	Access to street lighting	0.0308	0.0188
I20	Access to fuel	0.0326	0.0178
I21	Source of drinking water	n.a.	0.0299
I22	Source of water for bathing/washing	n.a.	0.0301

Number	Name of Indicator	IKG	IPD
I23	Latrine facility	n.a.	0.0137
I24	Availability and quality of cellular communication facility	n.a.	0.0160
I25	Access to postal service or goods delivery	n.a.	0.0173
I26	Road traffic and quality for inter-village transportation	0.0268	0.0174
I27	Road accessibility	0.0238	0.0150
I28	Availability of public transportation	0.0653	0.0427
I29	Operation of public transportation	0.0648	0.0423
I30	Transportation traveling time per kilometre to the office of the subdistrict head	0.0294	0.0177
I31	Transportation cost per kilometre to the office of the subdistrict head	0.0383	0.0280
I32	Transportation traveling time per kilometre to the office of the regent/mayor	0.0228	0.0142
I33	Transportation cost per kilometre to the office of the regent/mayor	0.0348	0.0265
I34	Handling of extraordinary events (KLB)	n.a.	0.0195
I35	Handling of poor nutrition	n.a.	0.0209
I36	Availability of sports facilities	n.a.	0.0335
I37	Availability of sports activity groups	n.a.	0.0352
I38	Village government apparatus	n.a.	0.0260
I39	Village autonomy	n.a.	0.0163
I40	Village assets/property	n.a.	0.0199
I41	SDM quality of village head	n.a.	0.0186
I42	SDM quality of village secretary	n.a.	0.0279

Source: IKG Weight: Regulation of the Minister of Finance of the Republic of Indonesia Number 49/PMK.07/2016 regarding Procedures for the Allocation, Distribution, Appropriation, Monitoring and Evaluation of Village Fund.
Note: IPD Weight: Village Development Index Publication of 2018.

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