



## Village Development Inequality in Indonesia: Mapping the Influence of Human Capital and Village Funds

Lukman Hakim<sup>1</sup>; Muhammad Rizaldi<sup>2</sup>; Agus Suman<sup>3</sup>;  
Marlina Ekawaty<sup>4</sup>; Akmal Riza<sup>5</sup>; Nasywa Zhahirah<sup>6</sup>

<sup>1</sup>Faculty of Economics and Business, Universitas Syiah Kuala, Banda Aceh, Indonesia

<sup>2,3,4</sup>Faculty of Economics and Business, Universitas Brawijaya, Indonesia

<sup>5</sup>Universitas Islam Negeri Ar-Raniry Banda Aceh, Indonesia

<sup>6</sup>Digital Business and Innovation Department, Tokyo International University, Japan

<sup>1</sup>Correspondence Email: [lukmandja@usk.ac.id](mailto:lukmandja@usk.ac.id)

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### Abstract

Village-level development disparities remain a persistent challenge in Indonesia's broader economic progress. This study aimed to map and analyze regional disparities in village development across 33 provinces in Indonesia from 2018 to 2022, using the Village Development Index (VDI) as a proxy. Employing descriptive statistical analysis and spatial mapping, the study examined the roles of two key factors: human capital, measured by the Human Development Index (HDI), and fiscal transfers, proxied by the Village Fund. The findings revealed that provinces in Java generally achieved higher VDI scores compared to those outside Java, with Bali as a notable exception. The disparities were influenced by the quality of human resources, accessibility to basic services, proximity to economic centers, and the effectiveness of Village Fund management. The study underscored the importance of strengthening human capital, improving governance in fund allocation, and addressing structural inequalities to promote more equitable and sustainable village development. These insights offer valuable implications for national policy and contribute to broader discussions on inclusive development strategies in emerging economies.

**Keywords:** Village Development; Regional Disparities; Human Capital; Village Fund.

### A. Introduction

Local economic development in Indonesia remains a complex and evolving endeavor that requires continuous refinement, particularly in addressing persistent regional inequalities (Yani et al., 2024). Among the foremost challenges is the pronounced disparity between rural areas in the western and eastern parts of the archipelago (Nugraha & Prayitno, 2020). This issue is not merely economic in nature, but reflects structural imbalances in resource distribution, institutional capacity, and human development (Farida, Suman, & Sakti, 2021; Iek & Blesia, 2019). The varying levels of rural poverty across regions offer a visible indicator of these underlying disparities, as also reflected in geographical proximity to economic centers which often benefits the western regions more than the eastern ones (Robinson Sihombing, 2019).

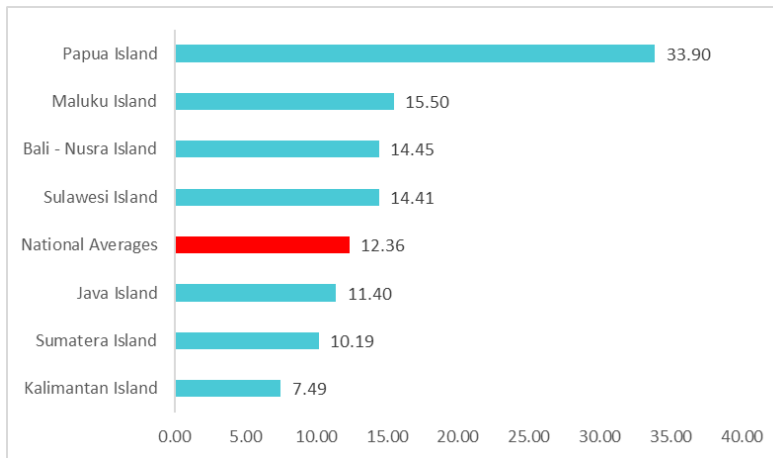


Figure 1. Percentage of Poor People in Eastern Region Villages Below the National Average (2022)

Indonesia’s geographical vastness and cultural diversity have long posed challenges to equitable development. As illustrated in Figure 1, rural areas in eastern regions such as Papua, Maluku, Bali & Nusa Tenggara, and Sulawesi consistently record higher poverty rates compared to national averages (Nugraha & Prayitno, 2020; Chotia & Rao, 2017). These patterns of underdevelopment are not only deeply entrenched but also undermine national efforts to achieve inclusive and sustainable growth (Farida et al., 2021; Iek & Blesia, 2019). The persistent lag of these regions calls for a more strategic and data-driven response, including stronger local government engagement and transparent fund management to ensure effective development outcomes (Masuda et al., 2022; Adiputra et al., 2018).

A growing body of literature has attempted to unpack the roots of these regional disparities. Sukwika (2018) highlights inter-provincial inequality as a central factor, while Juniati et al., (2022) point to labor market concentration on Java Island as a structural cause of underdevelopment in peripheral regions. Additionally, the advantage of geographical proximity to economic centers offers tangible benefits in infrastructure, investment, and access to services (Robinson Sihombing, 2019), further widening the gap between regions.

Within the broader discourse on village development, both exogenous and endogenous drivers must be accounted for (Andrew Beer & Clower, 2020). One of the most critical exogenous instruments introduced by the Indonesian government is the Village Fund policy. Several empirical studies have demonstrated its potential in alleviating rural poverty (Arham & Hatu, 2020; Dwitayanti et al., 2020; Shaaban, 2019; Boonperm et al., 2013), particularly when accompanied by enhancements in labor productivity and educational attainment. However, the transformative impact of these funds is highly contingent on robust institutional frameworks and transparent governance mechanisms to avoid inefficiency or corruption (Djatmiati et al., 2019; Aziz, 2016). As Ernawati et al., (2021) contends, Village Funds must be seen not merely as fiscal transfers, but as tools to catalyze inclusive and locally embedded growth.

To measure village development outcomes, recent studies have increasingly adopted the Village Development Index (VDI), which captures multidimensional indicators including social, economic, and environmental resilience. Hilmawan et al., (2023), for instance, found that Village Funds and Village Original Revenue significantly contribute to village advancement, while the presence of Village-Owned Enterprises (BUMDes) has had a less pronounced effect. In a similar vein, Handoyo et al., (2021) illustrated that villages with high VDI ratings – categorized as “Developed” or “Independent Villages” – tend to show stronger performance in reducing poverty severity and depth. These findings reinforce the utility of VDI as a comprehensive evaluative instrument.

However, much of the extant literature has overlooked the endogenous dimension of village development, particularly the role of human capital. The Human Development Index (HDI), as a measure of health, education, and income dimensions, is a widely accepted proxy for the quality of human resources. Studies such as those by Appiah et al., (2019) and Wijaya et al., (2021) have emphasized the link between high HDI and productive, resilient communities. Moreover, HDI plays a crucial role in

fostering equitable development by improving access to essential services and economic opportunities (Bloom et al., 2014). Thus, advancing HDI at the village level is not only a moral imperative, but a strategic necessity in closing development gaps.

Despite its critical relevance, few studies have systematically explored the relationship between HDI and village-level development as measured by the VDI. Much of the empirical focus has centered on fiscal mechanisms and infrastructure provision, leaving a significant research gap in understanding how human resource quality interacts with village-level outcomes. Addressing this gap, the present study introduces HDI as a core endogenous factor alongside Village Fund realization as an exogenous input in the analysis of village development disparities across Indonesia.

Accordingly, the primary objective of this study is to map and analyze the spatial distribution of village development using the Village Development Index (VDI) from 2018 to 2022 across 33 provinces. The VDI provides a robust framework that integrates social, economic, and ecological dimensions, offering theoretical and practical value in regional development research. Theoretically, this study contributes to the discourse by linking fiscal and human capital dimensions in explaining village disparities. Practically, it aims to inform government policies by identifying high-disparity areas and offering data-based recommendations for targeted interventions.

In this context, the study observes two primary variables: the realization of Village Funds and the Human Development Index (HDI). By juxtaposing these variables with VDI scores, the research seeks to deepen understanding of the mechanisms shaping village development. Ultimately, the findings are expected to support more precise and innovative policy designs that can effectively address regional inequalities and strengthen the foundation for inclusive, sustainable economic growth across Indonesia's diverse rural landscapes.

## **B. Method**

This study employed a descriptive statistical analysis to examine the distribution of village development across Indonesia. According to Ghazali (2018), descriptive statistics is an analytical method used to describe and present data characteristics without aiming to generalize findings to a broader population. The approach involves three primary stages: data collection, data cleaning (structuring),

and presentation—intended to make the data more interpretable and meaningful for readers (Ghozali, 2018; Walidin et al., 2015).

Descriptive statistical methods were deemed appropriate for this study, as the primary objective was to provide a general overview of the research variables without engaging in inferential analysis. The sample consisted of villages located in 33 Indonesian provinces, excluding the four newly established provinces in Papua as well as the Special Capital Region of Jakarta (DKI Jakarta), which do not have VDI scores or receive Village Fund allocations. The data period spans from 2018 to 2022, selected due to the availability of consistent and complete Village Development Index (VDI) data, and because the Village Fund policy was fully implemented during this timeframe—allowing trends in Village Fund utilization and human resource quality to be more clearly observed.

The study relies on secondary data collected from various government sources. The Village Development Index (VDI) data were obtained from the Ministry of Villages, Development of Disadvantaged Regions, and Transmigration. The Village Fund realization data were sourced from the Ministry of Finance, while the Human Development Index (HDI) data were obtained from the Central Bureau of Statistics. All three indicators were analyzed for each province for the five-year period under review.

Descriptive statistics such as mean, median, maximum, minimum, and standard deviation were used to describe each variable and were presented through tables and spatial maps. The tables summarize the statistical properties of the research variables, while the maps illustrate the spatial distribution of VDI scores across Indonesian provinces to highlight regional disparities. In addition to presenting the distribution of village development (as proxied by the VDI), the study also analyzed the total Village Fund received by each province and the quality of human resources (as proxied by the HDI). The operational definitions of the research variables are provided below:

*Table 1. Operational Definition of Research Variables*

<b>Variable</b>	<b>Definition</b>	<b>Unit</b>	<b>Source</b>
Village Development Index (VDI)	Index that can measure village developing performance based on social, economic, and environmental dimensions.	Points	Ministry of Villages, Development of Disadvantaged Regions, and Transmigration
Village Fund (DD)	Total transfer of Village Fund budget per Province by central government.	Billion	Ministry of Finance

Variable	Definition	Unit	Source
Human Development Index (HDI)	Index that can measure the quality of human resources in a region.	Percent	Central Bureau of Statistics

The calculation of the Village Development Index (VDI) is based on three dimensions: the Social Resilience Index (IKS), Economic Resilience Index (IKE), and Environmental Resilience Index (IKL). The VDI is computed using the following formula:

$$IDM = \frac{IKS + IKE + IKL}{3}$$

The results of the VDI calculation became the basis for determining the village developing performance. Villages with VDI scores  $\leq 0.4907$  were categorized as very underdeveloped villages, while those with  $0.4907 < VDI \leq 0.5989$  were categorized as underdeveloped. Furthermore, those with  $0.5989 < VDI \leq 0.7072$  were categorized as developing villages, those with  $0.7072 < VDI \leq 0.8155$  were categorized as developed villages, and finally those with  $VDI > 0.8155$  were categorized as independent villages (Kemendes PDTT RI, 2016).

The research process began with data tabulation, encompassing VDI, Village Fund (DD), and HDI values across all selected provinces. In the second stage, the average values for each variable were calculated for the 2018–2022 period. The final stage involved mapping and interpreting the results to provide a comprehensive spatial overview of village development trends across Indonesia. This research relied exclusively on secondary data obtained from publicly available government sources and did not involve human subjects or personal data. As such, formal ethical approval was not required. The study was conducted in accordance with principles of academic integrity and responsible data use.

### C. Results and Discussion

To gain a comprehensive understanding of the dynamics of village development across Indonesian provinces, this study employed descriptive statistical methods to tabulate and analyze the average values of key variables—namely the Village Development Index (VDI), Village Funds (DD), and the Human Development Index (HDI)—over a five-year period (2018–2022). These variables were examined to identify distribution patterns, assess interregional disparities, highlight key characteristics, and

detect potential outliers across 33 provinces. The analysis focused particularly on the roles of the Village Fund and HDI as exogenous and endogenous factors influencing village development. The following sections present the results of this statistical exploration, followed by a critical discussion of the underlying implications. Together, they aim to provide a foundational understanding of spatial inequality in rural development and the extent to which fiscal transfers and human capital quality affect local development trajectories.

## **1. Results**

Descriptive statistical analysis was applied in this study to systematically portray the characteristics of Indonesian provinces based on the selected research variables over the 2018–2022 period. This approach was employed to examine distributional patterns, identify regional disparities, and capture the central tendencies and variability of village development indicators across provinces. Through the use of descriptive measures, the analysis enables a comparative assessment of provinces, highlights differences in village development performance, and reveals the presence of extreme values or outliers that may signal structural inequalities. By emphasizing patterns rather than causal inference, this method provides a foundational empirical picture of village development dynamics, Village Fund distribution, and human resource quality across Indonesia during the period of full Village Fund policy implementation.

The empirical scope of this study comprised 33 out of Indonesia's 38 provinces. The Special Capital Region of Jakarta (DKI Jakarta) was excluded from the analysis because it does not receive Village Fund allocations and is not assigned Village Development Index (VDI) scores, rendering it incomparable with other provinces in the context of village-based development assessment. Furthermore, the four newly established provinces in Papua—formed between 2022 and 2023—were not included, as their statistical data during the study period remained administratively integrated with Papua and West Papua provinces. This selection strategy ensures data consistency and comparability across provinces throughout the five-year observation period. Table 2 subsequently presents the descriptive statistical results for all research variables, providing an overview of provincial-level variation and serving as the basis for further spatial and interpretative analysis.

Table 2. Descriptive Statistics Test Results

Province	VDI	HDI	Village Fund
Aceh	0.61	72.01	4806.43
Sumatra Utara	0.59	71.88	4313.91
Sumatra Barat	0.70	72.48	905.16
Riau	0.65	72.92	1404.61
Jambi	0.66	71.39	1171.48
Sumatra Selatan	0.63	70.11	2582.76
Bengkulu	0.64	71.41	1039.06
Lampung	0.66	69.73	2340.75
Bangka Belitung Island	0.70	71.47	299.93
Kepulauan Riau	0.65	75.63	246.86
Jawa Barat	0.70	72.20	5697.02
Jawa Tengah	0.68	71.93	7799.90
DI Yogyakarta	0.77	80.07	429.20
Jawa Timur	0.70	71.77	7347.75
Batam	0.63	72.58	1097.50
Bali	0.78	75.56	618.23
Nusa Tenggara Barat	0.68	68.36	1164.78
Nusa Tenggara Timur	0.58	65.20	2892.70
Kalimantan Barat	0.64	67.76	1929.58
Kalimantan Tengah	0.62	71.05	1295.56
Kalimantan Selatan	0.65	70.98	1455.76
Kalimantan Timur	0.66	76.60	833.27
Kalimantan Utara	0.60	71.07	445.18
Sulawesi Utara	0.67	73.05	1167.03
Sulawesi Tengah	0.63	69.60	1517.48
Sulawesi Selatan	0.65	71.91	2235.31
Sulawesi Tenggara	0.60	71.43	1538.45
Gorontalo	0.65	68.74	602.31
Sulawesi Barat	0.59	66.04	539.43
Maluku	0.60	69.55	1075.19
Maluku Utara	0.58	68.64	865.02
Papua Barat	0.49	64.94	1460.26
Papua	0.47	60.67	5011.99
National Averages	0.64	70.87	2064.54

Based on the table above, several preliminary insights can be drawn regarding the average values of the research variables. Bali Province recorded the highest average Village Development Index (VDI) score over the 2018–2022 period, reaching 0.78, followed closely by the Special Region of Yogyakarta (DI Yogyakarta) with a score of 0.77. On the other hand, Papua Province registered the lowest average VDI score at 0.47, with West Papua Province following at 0.49. These

figures underscore the stark disparity in village development performance across provinces. The spatial distribution of VDI scores across the Indonesian archipelago is illustrated in the figure below.

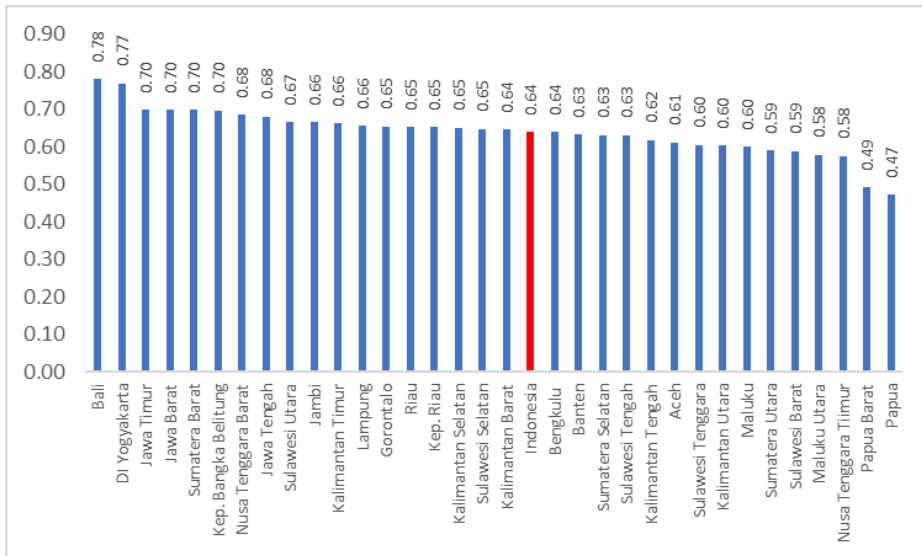


Figure 2. Distribution of Average VDI in Indonesia 2018-2022

Based on Figure 2, the national average Village Development Index (VDI) score for the 2018–2022 period was 0.64. Several provinces recorded average VDI scores above this national benchmark, including Bali, the Special Region of Yogyakarta (DI Yogyakarta), East Java, West Java, West Sumatra, and West Kalimantan. In contrast, provinces such as Bengkulu, Banten, South Sumatra, and the two lowest-scoring provinces – West Papua and Papua – fell below the national average.

In terms of spatial distribution, provinces with VDI scores above the national average were predominantly located on Java Island, with the exception of Banten. Conversely, provinces with average VDI values below the national level were largely situated outside Java. This regional clustering highlights a structural pattern in development performance. The table below further illustrates the disparity in VDI scores between provinces located on Java Island and those outside it.

Table 3. Comparison of Average VDI scores in Java and Outside Java

VDI	Indonesia	Java	Outside Java
Mean	0.6399	0.6957	0.6300
Maximum	0.8269	0.8128	0.8269

VDI	Indonesia	Java	Outside Java
Minimum	0.4563	0.5918	0.4563
Std. Dev.	0.0710	0.0544	0.0691
Sample	165	25	140

The descriptive results indicate a clear disparity in village development performance between provinces located on Java Island and those outside Java. Provinces on Java recorded a higher average Village Development Index (VDI) score of 0.6957, compared to an average of 0.6300 for provinces outside Java. This difference suggests that, on average, villages in Java are positioned at a more advanced stage of development, reflecting stronger social, economic, and environmental resilience relative to many regions beyond the island.

In terms of peak performance, the highest average VDI score among Java provinces was observed in DI Yogyakarta, reaching 0.8128, indicating that villages in this province are largely categorized as developed to independent. Outside Java, the highest average VDI score was recorded in Bali, with a value of 0.8269, which exceeds the maximum score observed in Java. This finding demonstrates that despite the general dominance of Java in development indicators, certain provinces outside Java are capable of achieving equally high—or even higher—levels of village development performance.

Conversely, the lowest average VDI scores reveal substantial regional challenges. Within Java, Banten recorded the lowest average VDI at 0.5918, placing many of its villages within the underdeveloped developing category. Outside Java, Papua exhibited the lowest average VDI score at 0.4563, indicating a concentration of very underdeveloped villages. This pronounced gap between the highest- and lowest-performing provinces underscores persistent spatial inequalities in village development across Indonesia and highlights the uneven distribution of development outcomes between western and eastern regions of the country.

The consistently higher average VDI scores in Java-based provinces may be attributed to Java’s central role in Indonesia’s national economy. This pattern reinforces the notion that development continues to be concentrated in Java, perpetuating regional imbalances. These findings align with the study by Chotia and Rao (2017), which highlights structural asymmetries between the western and eastern regions of Indonesia, noting that provinces in closer proximity to economic hubs tend to experience stronger development outcomes.

However, it is noteworthy that Bali Province – despite being located outside Java – recorded the highest VDI score nationwide. This anomaly can be explained by Bali’s unique development model, which effectively integrates traditional villages (*desa adat*) with well-structured tourism-based economic planning. On the opposite end of the spectrum, Papua Province reported the lowest VDI score, contributing to a higher standard deviation for non-Java provinces (0.0691) compared to Java provinces (0.054). This variance suggests greater intra-regional disparities in village development outside Java.

The analysis proceeds with an examination of the other two variables: the Human Development Index (HDI) and the realization of Village Funds, both of which are visualized in the figures below.

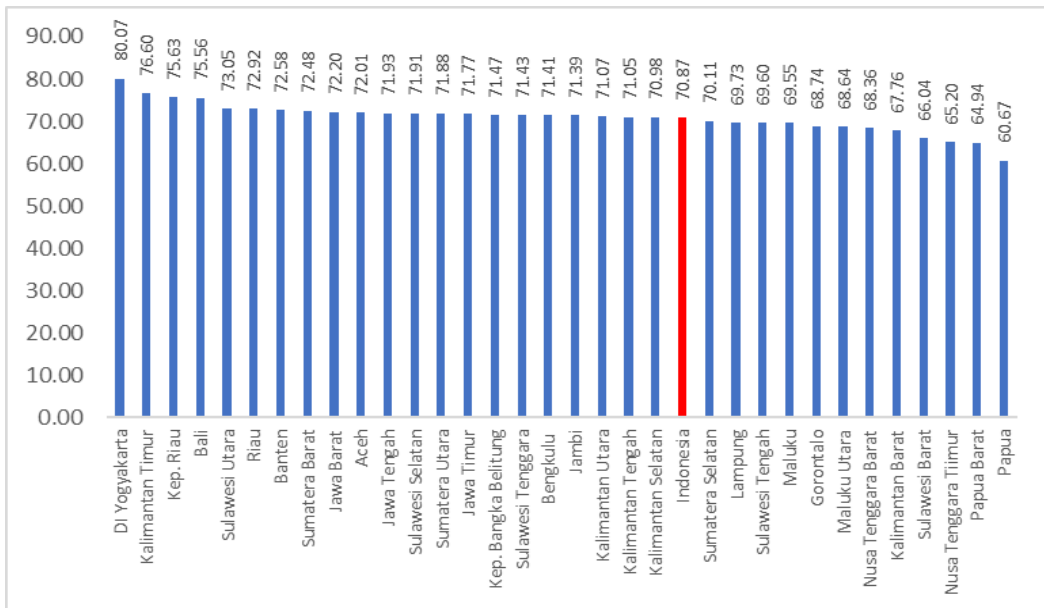


Figure 3. Average HDI in Indonesia in 2018-2022

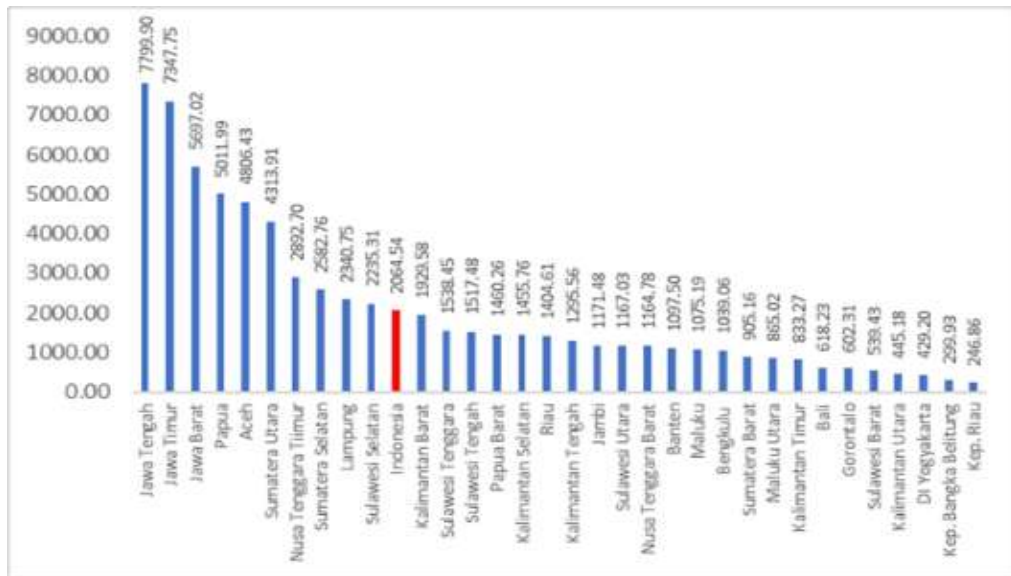


Figure 4. Average Village Funds Distribution in Indonesia in 2018-2022

Figure 3 illustrates that the national average Human Development Index (HDI) score from 2018 to 2022 was 70.87. Several provinces, including the Special Region of Yogyakarta, East Kalimantan, Riau Islands, Bali, and South Kalimantan, recorded average HDI scores above this national benchmark. Conversely, provinces such as South Sumatra, Lampung, Central Sulawesi, and the two lowest-ranking regions—West Papua and Papua—registered HDI values below the national average. The fact that West Papua and Papua scored lowest in both HDI and VDI reinforces the centrality of human capital in driving village development. These findings support the conclusions of Farida et al., (2021), who argue that high-quality human resources and active community participation are critical to fostering regional development.

Figure 4 presents data on Village Fund allocations from 2018 to 2022. Central Java received the highest cumulative allocation, amounting to IDR 7,799.90 billion, followed by East Java, West Java, Papua, and Aceh. At the opposite end, the Riau Islands Province received the lowest total transfer, amounting to only IDR 246.86 billion. The comparison of these data reveals a non-linear correlation between Village Fund allocations and VDI performance. For instance, Central Java, East Java, and West Java not only received substantial Village Fund allocations but also achieved high average VDI scores. In contrast, Papua Province received one of the

largest allocations yet reported one of the lowest VDI outcomes. These patterns suggest that while Village Funds constitute an essential fiscal tool for promoting village development, their effectiveness ultimately depends on the quality of fund management, institutional capacity, and local governance practices.

In summary, the results derived from descriptive statistical analysis—particularly the average values of VDI, HDI, and Village Fund allocations—provide a clear picture of regional disparities in village development across Indonesia. The findings highlight that provinces in Java generally outperform those outside Java, both in terms of development outcomes and human capital quality. The observed correlations suggest that both exogenous variables (Village Fund) and endogenous variables (HDI) play significant roles in shaping the trajectory of village development, though their impact varies depending on institutional and contextual factors.

## 2. Discussion

The results of this study affirm that village development in Indonesia remains characterized by significant regional disparities, particularly between Java and non-Java regions. Provinces on Java Island consistently recorded higher Village Development Index (VDI) scores, reflecting more advanced development outcomes than those outside Java. To visualize these disparities, the authors mapped the average VDI values for each province from 2018 to 2022.



Figure 5. Average Village Development Distribution in Indonesia (2018-2022)

As shown in Figure 5, most provinces categorized as having “independent” or “developed” villages are located in western Indonesia—particularly on Java Island—including DI Yogyakarta, East Java, West Java, and Bali. Conversely, provinces with a predominance of “underdeveloped” or “very underdeveloped” villages are concentrated in eastern Indonesia, such as Papua, West Papua, North Maluku, and East Nusa Tenggara. This distribution reflects disparities in access to infrastructure and public services, which are generally more developed in Java than in other regions. This observation aligns with previous studies that highlighted spatial inequalities across eastern and western regions, and between Java and non-Java areas (Chotia & Rao, 2017; Nugraha & Prayitno, 2020; Robinson Sihombing, 2019; Sukwika, 2018).

The findings reinforce the argument that geographical proximity to national economic and administrative centers plays a critical role in shaping regional development outcomes. Provinces located closer to the capital tend to benefit from more intensive state presence, stronger infrastructure connectivity, and easier access to financial institutions, education hubs, innovation ecosystems, and labor markets, which collectively accelerate development processes (Robinson Sihombing, 2019). This structural advantage is further amplified by the capacity of local governments to translate national policies into effective local development programs. Studies by Masuda et al. (2022) and Adiputra et al. (2018) underline that institutional effectiveness, transparency, and administrative competence are decisive factors in determining how development resources—such as fiscal transfers and public investment—are utilized at the local level.

From an institutional perspective, the quality of governance frameworks and legal certainty also plays a substantial role in shaping development trajectories. Mahardika (2024) highlights how governance mechanisms and legal-institutional design influence political accountability and policy implementation at the national and regional levels, which in turn affect development outcomes. Similarly, Kaharuddin et al. (2024) demonstrate that well-designed fiscal and regulatory instruments, such as tax incentives within Special Economic Zones, can significantly enhance local economic performance when supported by effective administrative capacity. In regions where governance systems are weak or fragmented, however, such policy instruments often fail to generate inclusive development benefits.

Moreover, regulatory certainty and risk management emerge as crucial dimensions of institutional quality. Suhartana et al. (2025) argue that investment decisions—particularly in resource-based and strategic sectors—are highly sensitive to legal clarity and governance stability. Provinces with stronger institutional environments are therefore better positioned to attract investment, stimulate local economic activity, and support village-level development. This institutional dimension is particularly relevant in Indonesia, where development outcomes are closely intertwined with decentralization and the varying capacities of local governments.

The role of sector-specific institutional arrangements further illustrates how governance quality shapes development disparities. For instance, Maulana et al. (2024) demonstrate that the restructuring of the banking system in Aceh following the closure of conventional banks generated both constraints and new opportunities for local communities, largely depending on the adaptability, regulatory clarity, and responsiveness of regional institutions. Similar patterns can be observed in other policy domains, where institutional design and legal frameworks determine whether sectoral interventions translate into inclusive development outcomes, as reflected in the optimization of zakat governance within Indonesia's fiscal system (Adinugraha et al., 2024). In the context of accelerating digital transformation, Anggono et al. (2025) further argue that institutional readiness and regulatory balance are essential to ensure that economic modernization supports social welfare rather than deepening existing inequalities.

At the community level, institutional effectiveness also interacts with social capital, which has been shown to strengthen household and community resilience amid systemic shocks (Zulkifli et al., 2025; Sukri et al., 2025). Moreover, evidence from public service delivery sectors indicates that institutional capacity and coordination significantly influence program effectiveness, even when funding is available (Arsawati et al., 2024; Tambunan et al., 2024). Given Indonesia's vast number of villages, each operating under distinct local government structures and institutional capacities, it is therefore plausible that variations in institutional quality—rather than fiscal resources alone—play a decisive role in shaping disparities in village development across provinces.

Building on this institutional explanation, the empirical distribution of the Village Development Index (VDI) further illustrates the spatial manifestation of these



governance-related disparities. To further illustrate regional disparities, provinces were grouped into two categories: those with average VDI scores above and below the national average of 0.6399. Most provinces in eastern Indonesia—including Maluku, Southeast Sulawesi, East Nusa Tenggara, North Maluku, West Papua, and Papua—recorded VDI scores below this threshold, reflecting long-standing challenges related to institutional capacity, infrastructure provision, and policy implementation effectiveness (Masuda et al., 2022; Adiputra et al., 2018). Additionally, several non-eastern provinces such as Aceh, North Kalimantan, West Sulawesi, and North Sumatra also fell into the lower-performing group, likely due to similar characteristics in geographic remoteness and limited economic connectivity, which constrain access to development-supporting institutions and markets (Robinson Sihombing, 2019; Maulana et al., 2024).

*Table 4. Comparison of Average VDI scores in Java and Outside Java*

<b>National average = 0.6399</b>	
Provinces above National average	Bali, DI Yogyakarta, Jawa Barat, Jawa Timur, Sumatra Barat, Kepulauan Bangka Belitung, Nusa Tenggara Barat, Kalimantan Timur, Jawa Tengah, Sulawesi Utara, Kalimantan Barat, Jambi, Kalimantan Selatan, Gorontalo, Lampung, Riau, Sulawesi Selatan, Kepulauan Riau, Bengkulu, Sulawesi Tengah, Sumatra Selatan, Kalimantan Timur, Banten.
Provinces below national average	Aceh, Kalimantan Utara, Maluku, Sulawesi Tenggara, Sulawesi Barat, Sumatra Utara, Nusa Tenggara Barat, Maluku Utara, Papua Barat, Papua.

These disparities are driven by multiple structural factors, including access to basic services, infrastructure quality, poverty levels, institutional effectiveness, and human capital development (Farida et al., 2021; Iek & Blesia, 2019). Among these, the quality of human resources stands out as a key determinant. High HDI scores often correlate with greater civic participation, innovation, and local oversight in development processes. As shown in Table 1, Papua and West Papua recorded the lowest HDI scores—60.67 and 64.94, respectively—during the study period, reinforcing the argument that underdevelopment is closely tied to human capital deficits.

Despite the government's budgetary transfers to villages via the Village Fund, and the inclusion of affirmative allocation schemes aimed at underdeveloped areas, significant disparities persist. This outcome corroborates the findings of Chotia & Rao (2017), who argue that geographical distance from national economic centers results

in slower growth trajectories. Although Village Funds serve as an important fiscal tool to reduce development gaps, their effectiveness depends largely on governance capacity and local institutional performance.

In regions like Java, relatively larger allocations of Village Funds are often associated with higher development outcomes. This aligns with prior research by Arham & Hatu (2020), Dwitayanti et al., (2020), and Shaaban (2019), which found that Village Funds can positively impact village development. However, the ability to convert these funds into tangible development depends on the efficiency of fund utilization and governance (Adiputra et al., 2018; Masuda et al., 2022; Dirwan et al., 2023). Poor fund management can exacerbate rather than alleviate regional inequality – transforming what is intended as an equalizing mechanism into a source of further disparity.

Overall, the findings of this study confirm the persistence of deep-rooted inequalities in village development across Indonesia. Java-based provinces benefit from better infrastructure, stronger human capital, and more efficient institutions, while regions outside Java continue to lag. While descriptive statistical analysis offers a useful overview of these patterns, it does not provide causal explanations. The absence of inferential techniques – such as regression analysis or data envelopment analysis – represents a methodological limitation. Nonetheless, the study provides valuable policy insights. Improving human resource development, enhancing Village Fund management, expanding access to essential services, and improving connectivity to economic hubs are essential steps to reduce disparities and promote equitable village development.

These findings also contribute meaningfully to the broader global discourse on rural development disparities, particularly in decentralized and archipelagic nations. Similar patterns of spatial inequality have been observed across various contexts in Southeast Asia, Latin America, and Sub-Saharan Africa, where structural challenges such as the concentration of economic activities in urban cores, inadequate rural infrastructure, and limited institutional capacities have consistently hindered equitable development outcomes (Chotia & Rao, 2017; Shaaban, 2019; Matsyah et al., 2025; Wahib et al., 2025). In many developing countries, the centralization of political and fiscal power often leads to a disproportionate allocation of resources, leaving remote and rural areas underserved.



By emphasizing the importance of human capital development (Farida et al., 2021), the effectiveness of fiscal transfers such as Village Funds (Arham & Hatu, 2020; Dwitayanti et al., 2020), and the critical role of local governance quality (Masuda et al., 2022; Adiputra et al., 2018), this study provides valuable comparative insights for international development scholars and policymakers. These dimensions resonate with the broader theoretical understanding that development is not merely a product of financial input but is deeply contingent upon institutional effectiveness, community participation, and governance innovation.

The Indonesian case, with its unique geographical, cultural, and political decentralization context, serves as a microcosm for exploring rural inequality in other Global South contexts. Lessons drawn from this analysis can inform global development agendas, particularly in crafting adaptive governance strategies, designing inclusive funding mechanisms, and promoting capacity-building initiatives that empower local governments and communities alike. Thus, the findings of this study are not only nationally significant but also internationally relevant in informing sustainable and inclusive rural development policies.

Despite the insights generated, this study has several limitations that should be acknowledged. First, the analysis relies exclusively on descriptive statistical methods, which, while effective in mapping spatial patterns and highlighting disparities, do not allow for causal inference regarding the relationships between the Village Development Index (VDI), Human Development Index (HDI), and Village Fund allocations. Consequently, the findings should be interpreted as indicative of distributional tendencies rather than definitive causal mechanisms. Second, the use of province-level aggregated data may obscure intra-provincial variations in village development, particularly in provinces with large geographic areas and heterogeneous socio-economic conditions. Third, although the Village Fund is treated as a key exogenous factor, this study does not account for differences in fund utilization efficiency, governance practices, or sectoral allocation at the village level, which may significantly influence development outcomes. Finally, the temporal scope of the study (2018–2022), while sufficient to capture recent trends, does not incorporate potential lag effects of policy implementation or longer-term structural changes.

## **D. Conclusion**

This study provides a comprehensive spatial overview of village development inequality in Indonesia by integrating fiscal and human capital dimensions within a descriptive analytical framework. By mapping the Village Development Index (VDI) across 33 provinces over the 2018–2022 period and juxtaposing it with the Human Development Index (HDI) and Village Fund allocations, the study demonstrates that village development outcomes remain deeply uneven and structurally patterned. Provinces located on Java Island consistently exhibit higher development performance, while many regions outside Java—particularly in eastern Indonesia—continue to lag behind, despite substantial fiscal transfers.

The principal contribution of this study lies in highlighting the interaction between fiscal transfers and human capital in shaping village development outcomes. While Village Funds are an important policy instrument, their effectiveness is strongly conditioned by local human resource quality and institutional capacity. Provinces with higher HDI levels consistently achieve better village development performance, indicating that human capital is a critical enabler of effective fiscal utilization. From a policy perspective, reducing village development inequality therefore requires moving beyond a purely budget-driven approach by strengthening governance quality, institutional effectiveness, and access to basic services, particularly in structurally disadvantaged and geographically isolated regions.

At a broader level, this study contributes to the international discourse on rural development and spatial inequality in decentralized and archipelagic contexts. The Indonesian experience illustrates that development disparities are not merely a function of resource availability but are deeply embedded in institutional arrangements and human capital distribution. As such, the insights generated here are relevant not only for national policymakers but also for scholars and practitioners engaged in comparative development studies across the Global South.

Based on the acknowledged limitations, future research should move beyond descriptive analysis by applying inferential or panel-based methods to examine causal relationships between human capital, fiscal transfers, and village development. The use of village-level microdata and qualitative assessments of local governance and fund management would allow deeper insights into intra-regional



variation and institutional effectiveness. Incorporating longitudinal designs to capture policy lag effects and institutional change would further strengthen evidence for more adaptive and context-sensitive rural development strategies.

Overall, this study underscores that village development inequality in Indonesia cannot be resolved through fiscal redistribution alone. Sustainable and equitable village development requires the simultaneous strengthening of human capital, institutional capacity, and governance quality, particularly in regions that remain structurally disadvantaged. Without addressing these foundational dimensions, development policies risk reproducing existing spatial inequalities rather than correcting them.

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### **Declaration of Competing Interest**

The authors report no competing interests in relation to this publication. This study was carried out independently, without any commercial, financial, or personal affiliations that might influence the research process or its outcomes. All analyses, interpretations, and conclusions are derived exclusively from the authors' academic assessment and the empirical evidence examined.

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