IOP Conference Series:
Earth and
Environmental Science

PURPOSE-LED
PUBLISHING™

PAPER • **OPEN ACCESS**

Sustainability Assessment of the Rural Development Index (RDI) Based on IDM Growth National Index

To cite this article: Iwan Ristanto *et al* 2025 *IOP Conf. Ser.: Earth Environ. Sci.* **1515** 012002

View the article online for updates and enhancements.

You may also like

- Utilization of village potential data to determine the sustainability status of village development in Riau Province, Indonesia
Fitri Hariyanti and Bekti Indasari

- Village Development Index on the West Java and Central Java Boundary: A Case in Ciledug, Cirebon Regency
Heni Susiati, Sunardi Sunardi, Mohammad Taufik et al.

- Analysis of environmental resilience index due to realization of village funds in the Bangka Belitung Islands Province
E Rosalina and Sucipto

This content was downloaded from IP address 103.146.185.144 on 04/10/2026 at 08:32

IOP Conf. Series: Earth and Environmental Science **1515** (2025) 012002 doi:10.1088/1755-1315/1515/1/012002

Sustainability Assessment of the Rural Development Index (RDI) Based on IDM Growth National Index

Iwan Ristanto*[1], Slamet Widodo[2], and Satoto Endar Nayono[3]

[1] Yogyakarta State University, Indonesia, Veteran Bantara University, Indonesia
[2] Yogyakarta State University, Indonesia
[3] Yogyakarta State University, Indonesia

*E-mail: iwan.ristanto@yahoo.com

Abstract. This research is very important and has the aim of sharpening the sustainability assessment of the Village Development Index (IDM) based on grouping of the classification system of independent village status, advanced village, developing village, underdeveloped village and very underdeveloped village by knowing the determinants of the picture of the competitiveness of the sustainability of rural areas. Scientific novelty lies in the scientific data approach of statistical and spatial methodologies developed in assessing how the index of rural development growth groups in Wonogiri district is against the National scale IDM. The method used to answer the basic questions of village community development and empowerment, by estimating rural Development Index (RDI) , comparison over time, data analysis, and visualizing spatial patterns of rural development levels in the study area categorized as dominant, comprehensive, and development deficiency types. in a participatory manner (participatory rural appraisal/PRA). The results of the IDM sustainability assessment status of villages in Wonogiri Regency throughout 2019-2023 did not include any underdeveloped or very underdeveloped village groups, but were dominated by developing village status groups, while advanced and independent village groups experienced slightly higher growth compared to the IDM status group on a national scale.

1. Introduction

Rural areas are the basic units of social development and accommodate the population's production and life activities, so understanding the nature of rural development is important for sustainable rural development in other countries or regions (1) . Depopulation is a major challenge for many rural areas , while the 2020 pandemic has had a major impact on internal migration . (2) . The difference between urban and rural development is usually tied to increasing socio-economic productivity while creating a large gap. (3) . Development in villages is very important, because the majority of the Indonesian population lives in rural areas. (4) . Poverty in Indonesia is dominated by rural areas with minimal access to basic infrastructure. The developing village index is expected to be a reference for the government in developing policy interventions that can overcome the problem of poverty in rural areas. (5) .

To address the unique challenges in rural areas, most policies still emphasize proximity to urban areas and population density as the main components of rural areas. New steps are needed based on the concept of sustainable development that integrates environmental, social and economic resource measures. (6) . The challenge of multidimensional relationship imbalances in the process of sustainable development in rural areas, and the weakening of rural innovation

Content from this work may be used under the terms of the Creative Commons Attribution 4.0 licence. Any further distribution of this work must maintain attribution to the author(s) and the title of the work, journal citation and DOI.
Published under licence by IOP Publishing Ltd

capacity to promote sustainable development in rural areas . (7) . Rural revitalization , through sustainable development, rural areas continue to develop into multifunctional complexes, and their development methods must be dynamically adjusted according to functional changes. (8) . Rural community development is the key to improving welfare levels. The village government is central to achieving this welfare so that the village can be independent, efficient, and far from backwardness and poverty. (9)

Village strategy in economic and social development using a two-way fixed effects model and conducting asymmetric analysis to test the influence of urban-rural income gap and development. (10) . Rural transformation on rural per capita income and rural poverty alleviation. Rural transformation to increase rural per capita income and rural poverty alleviation (11), Rural development aims to improve the quality of life of rural communities, and in the process, infrastructure variables play an important role. Given these findings, the authors suggest that a development strategy oriented towards local resources should be adopted to ensure holistic development in rural areas. (12)

There are four important areas: economic development, social development, environmental development, and institutional development, which are related to the calculation of the sustainable development index. The findings show that the modified computational approach is a reliable and relatively complete index of sustainability of development that compensates for the shortcomings of current metrics. (3)

The village development index cannot be separated from the maximum management of village funds, community participation in development, and high community trust in the government and non-governmental organizations that always support development programs. The success of village development depends on the good or bad management of village funds. (9) measures , such as consumption-based poverty measures or the Human Development Index can use socio-economic and natural aspects to categorize villages . These variables and indices help compare villages; when mapped in a GIS, local planners and policymakers can understand the analysis results (13). Qualitative descriptive research with data sources from documentation and interviews analyzes the extent to which the level and dynamics of rural area development. (13) . The Development Index, which can be used to study the different realities of rural and urban spaces through demographic and socio-economic variables , shows that less developed rural areas are at risk of depopulation. Accessibility is key to maintaining population and is demonstrated in areas with lower poverty rates . (15)

In 2014, the Government of the Republic of Indonesia has established Law No. 6 of 2014 concerning Villages. The vision of this Village Law is to realize advanced, strong, independent, just and democratic villages, and have full authority to manage/regulate themselves to achieve the welfare of village communities. (6). Strengthening of regional autonomy as stated in Law No. 32 of 2004 concerning Regional Government and Law No. 33 of 2004 concerning Central and Regional Financial Balance. The principle of regional autonomy uses the principle of the broadest possible autonomy in the sense that regions are given the authority to manage and regulate all government affairs outside of those that are government affairs stipulated in the Law. The ongoing decentralization process has provided awareness of the importance of regional independence that is based on empowering local potential.

The Ministry of Villages, Development of Disadvantaged Regions and Transmigration launched Permendesa number 2 of 2016 concerning the Village Development Index (IDM) in October 2016. IDM can be used as a reference for eradicating the number of underdeveloped villages and increasing the number of independent villages in Indonesia. Determination of IDM by placing the initiative and strong capacity of the community as the main basis for the process of village progress and empowerment. IDM uses an approach that relies on social, economic and ecological strengths without forgetting political, cultural, historical and local wisdom strengths. The Village Development Index (IDM) for eradicating the number of underdeveloped villages and

increasing the number of independent villages in Indonesia. IDM is used as a reference in carrying out affirmation, integration and development synergy. IDM is used as a reference in carrying out affirmation, integration and development synergy. The hope is to realize the conditions of prosperous, just and independent village communities. Village Development Indonesia is still faced with the reality of poverty in the Village. Therefore, the availability of data and measurements is very much needed, especially in developing policy interventions that are able to answer the basic problems of development and empowerment of the Village community.

Table 1. Classifying the status of village progress and independence according to Article 19 (1) of the Regulation of the Minister of Villages, Disadvantaged Regions and Transmigration Number 2 of 2016, with 5 (five) statuses; 1) Independent Village (or can be called a Sembada Village), 2) Advanced Village (or can be called a Pra-Sembada Village), 3) Developing Village (or can be called a Madya Village), 4) Underdeveloped Village (or can be called a Pra-Madya Village) and 6) Very Underdeveloped Village (or can be called a Pratama Village).

Table 1. Criteria for Village Development Index (IDM) Assessment Categories

Potential			**Management**	**IDM Value**	**Category**
Social	**Economy**	**Environment**			
There is	There is	There is	Able to manage to improve community welfare and sustainability every year	IDM > 0.8155	Independent
There is	There is	There is	Able to manage well for the welfare of society	0.7072 < IDM ≤ 0.8155	Advance
There is	There is	There is	Not yet optimally managed for the welfare of the community	0.5989 < IDM ≤ 0.7072	Develop
There is	There is	There is	Not yet or poorly managed and there are still many who are poor	0.4907 < IDM ≤ 0.5989	Under Developed
Prone to	Prone to	Prone to	Unable to manage	IDM ≤ 0.4907	Very Under Developed

(Source; Ministry of Village Development, 2016)

The interest of this research is to sharpen the sustainability assessment of the Village Development Index (IDM) based on the grouping of the classification system of the status of independent villages in Wonogiri considering that Wonogiri Regency is an underdeveloped area in Central Java Province which is famous for its boro or migrant people. The geographical conditions of barren mountains with up and down contours, so for sustainable rural development, it must first be known how the description of the contribution of social resilience (IKS), economy (IKE) and environment (IKL) to villages in Wonogiri Regency.

The scientific novelty lies in the scientific data approach of statistical and spatial methodologies developed in assessing how the rural development growth group index in Wonogiri district relates to the IDM on a national scale?

Figure 1. Below illustrates the growth rural development which will be the reference in this research which is based on the IDM classification assessment on a national scale in 2019-2022

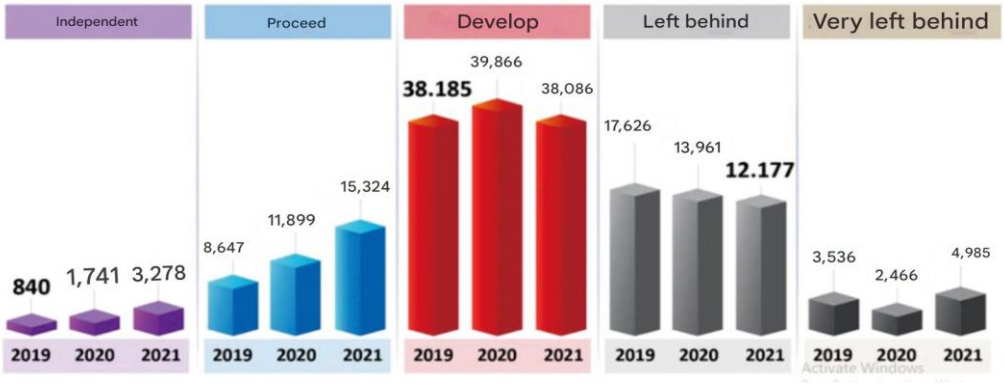


Figure 1. Development of IDM on a National Scale in 2019-2022
Source: https://idm.kemendesa.go.id

Method for estimating the Development Index, making comparisons over time, data and analysis. (15) . The Rural Development Program (RDP) on economic growth in rural areas, with a classical regression model, the spatial error model is estimated. (16) . The Rural Deprivation Index (RDI) has the potential to provide a starting point for those who want to create a summary of expansion actions taking into account rurality, or other local geographic factors, and as part of a set of approaches that can be used to allocate, or apply, resources. (17) . Rural Homestead Development Rights (RHDR) encourage rural revitalization performance in the treatment group with the RHDR reform much higher . (18) . Increasing the Human Development Index (HDI) through programs to improve cultural and civic literacy, numeracy literacy, financial literacy, digital literacy, and science literacy has been shown to increase the Community Development Index . (19) .

The formulation of regional development index measures all dimensions of development quantitatively, designed to be able to assess areas at the national, regional, and local levels. This index also allows for quantitative-based development strategies for policy formulation and development. (20) . Visualizing the spatial pattern of rural development levels in the study area categorized as dominant, comprehensive, or polarized development deficiency types. (21) . Comprehensive exploration of the rural socio-economic landscape through the lens of advanced data analysis and holistic rural development clustering techniques for policy makers in formulating adaptive and targeted strategic policies that address the specific needs of various rural groups. (22) . Formation of rural area models based on assessments of their socio-economic development potential (IKS, IKE) . (23) . The development of rural ecological environmental resilience (IKL) has the greatest influence , and can contribute to measuring qualitative assessments or bringing qualitative social assessments of resilience to a quantitative level, describing the distribution of welfare and social justice in the development of resilience in rural areas. (24) . In terms of IKL dimensions , the ecolivability score is higher than industrial prosperity, effective governance, prosperous life and civilized villages in the order. reflected between regions . (26)

Dimensions of village fund management performance, such as distribution percentage, absorption percentage, and distribution speed. used as an explanatory variable to examine its influence on the village index building (IDM) , panel data regression analysis with fixed effects model. (26) . The exploration of environmental, social, economic and institutional dimensions of variables was adopted by the Village Development Index which consists of the dimensions environmental, social and economic. A set of new variables for updating the IDM , using new spatial analysis tools . (27) . Determination of village status using the Village Development Index (IDM) by the Village Ministry as a measure consisting of 3 aspects, namely the Village

Development Index (IDM). Social Resilience Index (IKS), Economic Resilience Index (IKE) and Social Resilience Index Environment (IKL). (28) . IDM Internal control and application of information systems have a significant impact on sustainable rural development, contributing to improved resource management and decision-making at the village level . (29) . Implementation of the Village Development Index (IDM) Policy uses a qualitative approach with data analysis techniques that include data collection, data reduction, data presentation and drawing conclusions. (30) . Unweighted arithmetic/geometric mean is the most accurate methodology for combining indicators to create the Rural Development Index (RDI). (31) . actions taken in accordance with the concept of sustainable development in areas that represent the pillars of economic, environmental and social governance. (32) .

The Village Law provides a new perspective on village development. The government issued the Village Development Index which assesses the level of village independence based on social, economic and environmental aspects as a map of village development. (33) . The Village Development Index program aims to implement measurable, even and sustainable village development, the distribution of villages with independent village status is currently uneven. (34) Village Independence Status is a measure of village classification in order to determine interventions, both budget and Village Development policies, through literature studies and conducting interviews with related sources. Data analysis uses qualitative deduction. (35) . Wonogiri Regency has few human resources capable of developing and advancing the potential in Wonogiri , (37)

2. Methods

The research approach was carried out using *Mixed methods,* explanatory sequential research type, namely a literature study related to the development of village status and village independence based on the Village Development Index (IDM) from 2019 to 2023 in Wonogiri Regency. Data Analysis Techniques used include quantitative data analysis techniques (cluster and discriminant analysis) and qualitative data analysis techniques (thematic analysis). The conceptual model built in this study is how is the index of sustainable rural development growth in Wonogiri Regency against the National scale IDM ?

Formation of development growth assessment variables based on the rural development status group index in Wonogiri district against the National scale IDM using (new variable devices) which are studied using statistical and spatial integration. The economic growth of the Rural Development Program (RDP) in rural areas, with a classical regression model, the spatial error model is estimated statistically. (16) .

The method was adopted from UNDP to estimate the Development Index (RDI) , by making comparisons over time, data and analysis. (15) . And visualize the spatial pattern of the level of rural development in the study area which is categorized as a dominant, comprehensive, or polarized type of development deficiency. (21) . Exploration of environmental, social, economic, and institutional dimensions of variables is adopted by the Village Development Index which consists of dimensions environmental, social and economic. A set of new variables for IDM updating , using new spatial analysis tools . (27) .

Community participatory approach framework method *(participatory rural appraisal/PRA)* (37) . Used to collect data scientifically which is then processed through data processing. statistical and spatial methodology to describe the sustainable growth of villages in Wonogiri Regency figure 2.

Figure 2. Framework for growth index analysis activities using the participatory rural appraisal /PRA method.

3. Results and Discussion

Rural Development Index (RDI) in various parts of the world. The level and dynamics of development in rural regions of Austria and Portugal using a 'structural strength' index . The index provides a more holistic measure of socio-economic development compared to GDP per capita . Portugal continues to face regionalization, with inland regions being more likely to be structurally weak (14). RDI in India need to assess rural areas from five dimensions such as economic, education, health, environment and disposable income in understanding present level of development in rural areas. Cause and effect diagram is established contributing to the development of specified domains. The conceptual index is a composition of Result Index and Cause Index. This distinction aids in examining the result index to measure the current level of rural development and cause index to evaluate the process of rural development for policy makers in identifying the areas of improvement in the overall development of the rural area The study identifies and compares structurally weak regions in both countries, considering the challenges they face (39). Bangladesh is predominantly an agro-based economy where the rural economy is the linchpin of her development. An indicator RDI based assessment technique developed to elucidate the connection between the growth centres and rural development. Furthermore, a Priority Index (PI) also utilized to rank the need for further investment in growth centres. The fndings unveil that storage, loading/unloading facilities, and a women's toilet arrangement were essentially non-existent in the studied regions. Further more, the state of the connecting roadways from the farm to the market is unsuitable for market vendors. Finally, indicator-based assessment signifes that rural development elements are profoundly impacted by the growth centre. The policy implication is that, after acknowledging the real scenario of growth centres, we should rethink and rearrange investment policies from the standpoint of rural development (40). The context for this study is Hajij Village in Iran, and the approach adopted differed from that undertaken in Italy with regards to the main target, time and procedures of implementation. The study proposes the novel index based on the weighted averages of 20 variables as used with a sample of 87 members of the Hajij Community. The study explores the possibility of quantitative measurements between the weaknesses, strengths, threats, and opportunities associated with development plans.(41) The results study RDI in Indonesia indicate that areas with IDM that fall into the category of "independent" and "advanced" villages have the potential to reduce the depth of poverty and the severity of poverty in their areas and increase economic growth. In contrast, areas that fall into the category of underdeveloped and very underdeveloped IDM experience a more significant gap in the depth and severity of poverty. (42)

The results of the study may differ if conducted on different data scales, data aggregation, and zoning or analysis. A large amount of secondary data on village IDM in Wonogiri district is available periodically from 2018 to 2023, so further research can ensure the availability of data at https://idm.kemendesa.go.id . Figure 3. Map of Wonogiri Regency

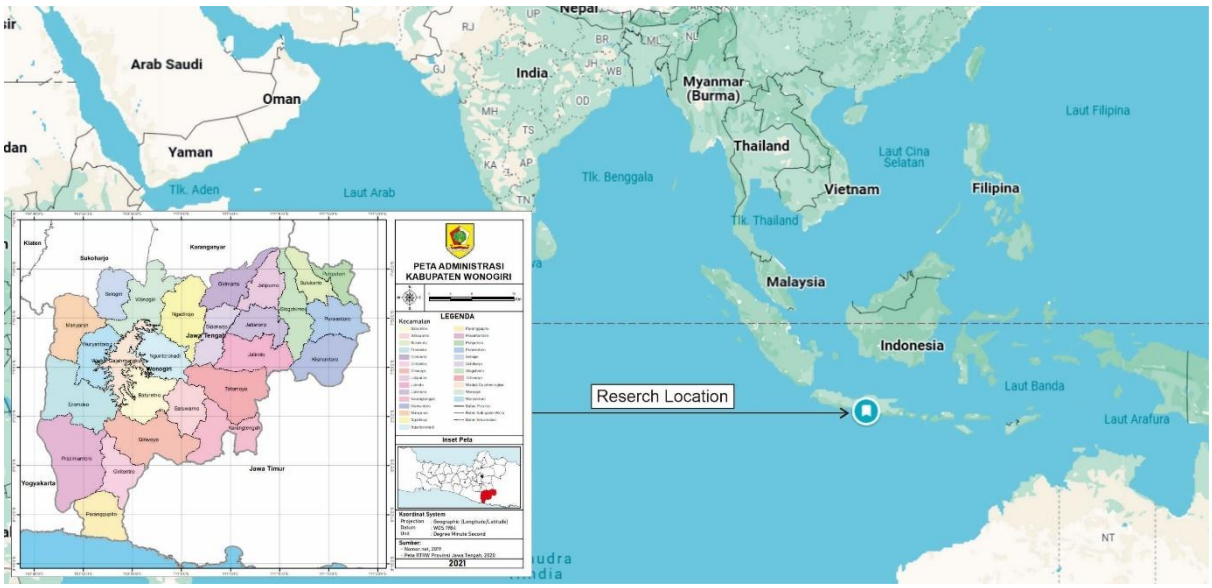


Figure 3. Map of Wonogiri district area
Source: https://idm.kemendesa.go.id

Population density in Wonogiri Regency in 2022 reached 555 people/km2. (BPS Wonogiri, 2023). The topography of some areas of Wonogiri Regency is lowlands and highlands with an altitude of ≥500 meters above sea level with a fairly undulating relief, which is around 52% of the entire area is land with a slope of <15%. While the slightly undulating area has a slope of between 15-40% or around 26% of the area and the remaining 22% is an area with a land slope of more than 40%. With this morphology, it is characterized by rather steep, narrow valleys and hills, with rather rough relief, the slope generally ranges from 15-30 (Profil Wonogiri, 2020). . The air temperature in the dry season and in the rainy season is a maximum of 35°C and a minimum of 19°C. The number of rainy days in the dry season is 26 rainy days and in the rainy season 117 rainy days , with monthly rainfall of more than 320 mm per month. Annual rainfall in Wonogiri ranges between 1,700–2,100 mm per year.(BMKG, 2023)

Spatial data analysis of mapping results of the classification of the achievement status of the Village Development Index (IDM) of villages in Wonogiri Regency from 2019 to 2023 is mapped in the status of village progress and independence according to Article 19 (1) of the Regulation of the Minister of Villages, Disadvantaged Regions and Transmigration Number 2 of 2016; 1) Independent Village, 2) Advanced Village, 3) Developing Village, 4) Underdeveloped Village, and 6) Very Underdeveloped Village. By using a green line gradation for independent villages, light blue for advanced villages, light yellow for developing villages, gray for underdeveloped villages and red for very underdeveloped villages.

Figure 4. Describes in detail the achievement of independent village status and advanced village status in Wonogiri Regency which has increased, while the status of developing villages tends to decrease, and there is no status of underdeveloped and very underdeveloped villages, as shown in the graph;

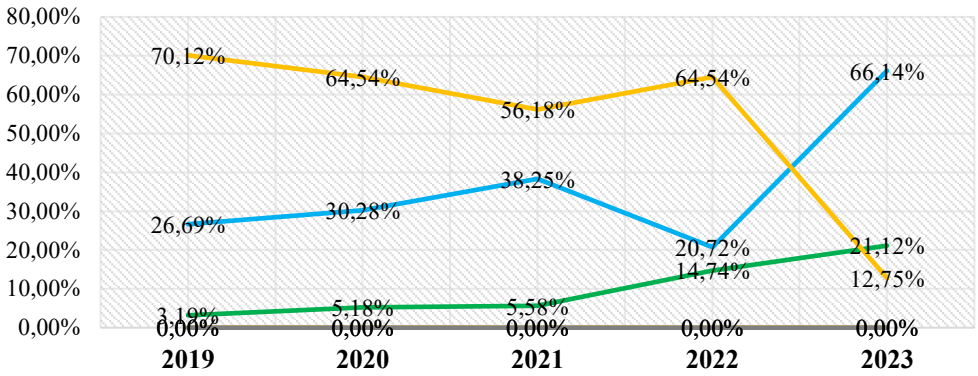
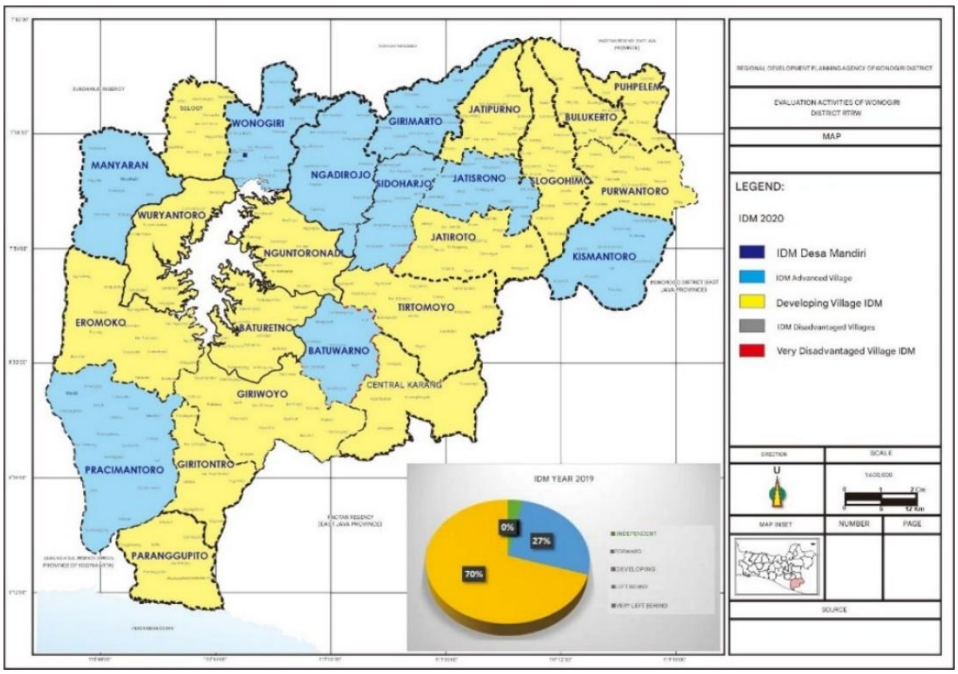


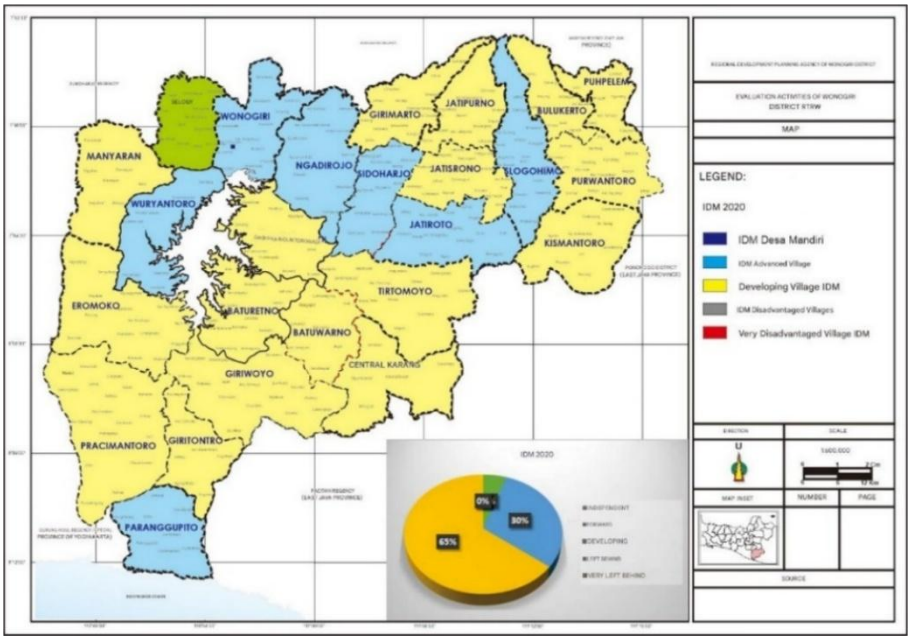
Figure 4. Development of IDM on a National Scale in 2019-2022 Source: https://idm.kemendesa.go.id

In 2019, the IDM achievement status in Wonogiri Regency was dominated by developing villages, namely 176 or 70.12% and advanced villages 67 villages or 26.69% while the achievement status of independent villages was very low, namely 8 villages or only 3.19% and there were no more underdeveloped or very underdeveloped villages. The achievement status of advanced villages in 2023 increased significantly to 66.14% or 166 villages and independent villages by 21.12% or 53 villages, while the status of developing villages decreased significantly by 32 villages or to 12.75%.

Grouping data using *natural breaks* on data from 2022 and 2023 shows that the dominance of village status classification is in developing villages towards advanced villages while the difference towards independent villages has increased slightly. This is achieved by maximizing the variance between statuses and at the same time, namely from 2022 to 2023, minimizing the variance in classification. (43) Figure 5. Village Status Map in Wonogiri Regency based on IDM 2019 and 2020;



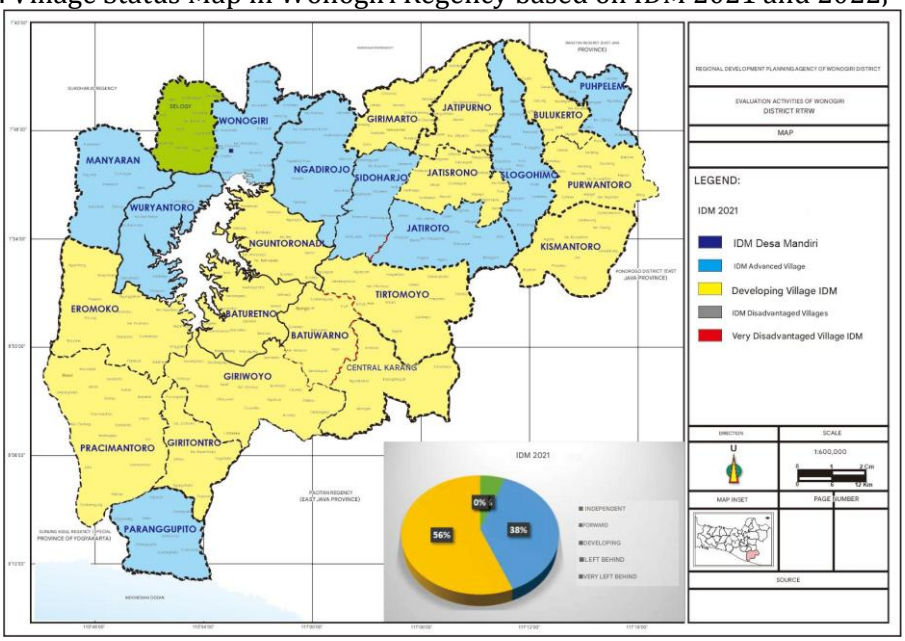
(A)



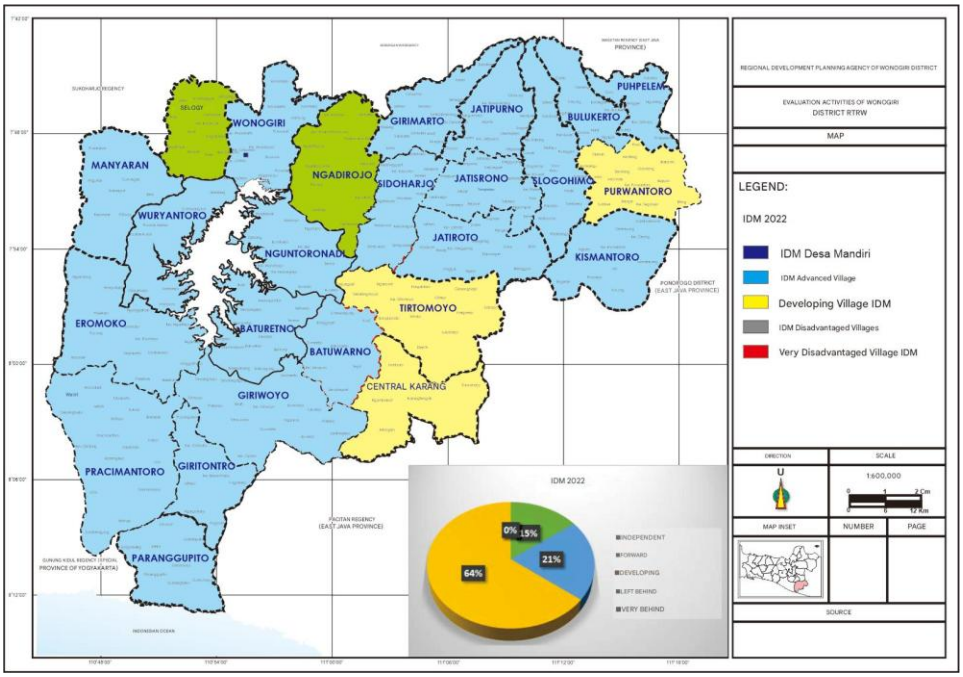
(B)

Figure 5. Village Status Map in Wonogiri Regency based on (A) IDM 2019 and (B) IDM 2020

The depiction of spatial data groups per sub-district of the IDM status of villages in Wonogiri Regency from 2019 to 2023 is mapped with a green color gradation for independent villages, blue for advanced villages, and yellow for developing villages. In 2019, the spatial mapping in the image above shows that information is still dominated by developing villages in 16 sub-districts and advanced villages in 9 sub-districts, and there are no independent villages, while in 2020 there were a number of villages with independent status in Selogiri sub-district and a decrease in advanced villages in 8 sub-districts and a decrease in the status of several villages to developing villages in 17 sub-districts due to *the refocusing of* village activities to handle the impact of Covid 19. Figure 6. Village Status Map in Wonogiri Regency based on IDM 2021 and 2022;



(A)



(B)

Figure 6. Village Status Map in Wonogiri Regency based on (A) IDM 2021 and (B) IDM 2022

In 2021 until now, it has shown an increase in status that is almost the same as in 2020, but in 2022 there was a recovery in village fund absorption activities which had an impact on increasing the independent village status group in Selogiri District and Wonogiri District, as well as increasing the advanced village group in 22 districts and there was a decrease in the developing village group dominated in 3 districts, namely; Purwantoro District, Karangtengah District and Tirtomoyo District. Figure 7. Village Status Map in Wonogiri Regency based on IDM 2023;

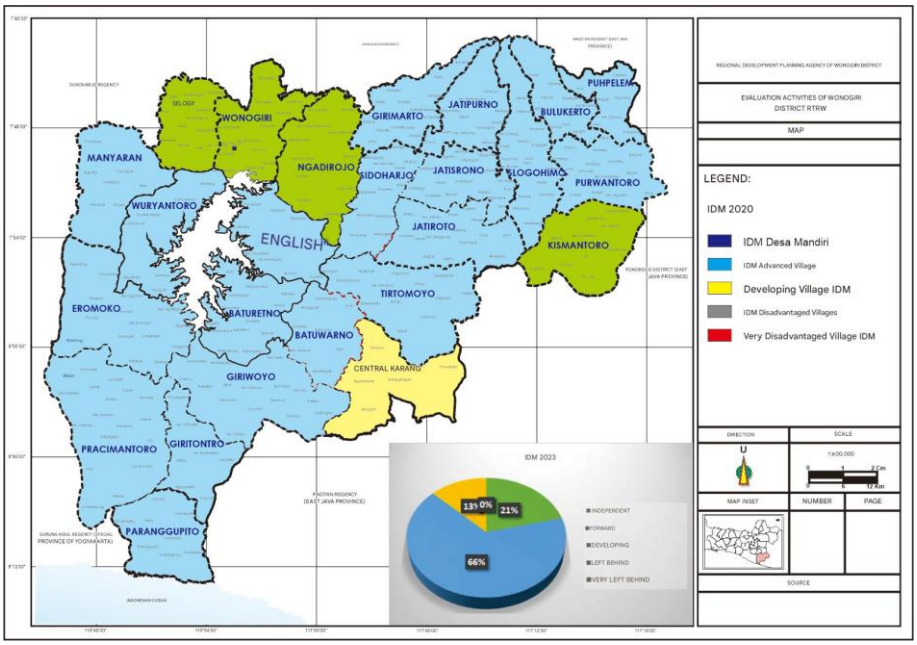


Figure 7. Village Status Map in Wonogiri Regency based on IDM 2023

Along with the recovery of development activities in the village, the results of the IDM status assessment of villages in Wonogiri Regency in 2023 showed an increase in the independent village status group in Selogiri District, Wonogiri District, Ngadirojo District and Purwantoro District. The 2023 IDM results also showed a relatively converging pattern for the independent village status classification of 21.12%, namely in the center of government and there was an increase that tended to spread for the advanced village classification or 66.14% in almost all 20 sub-districts in Wonogiri Regency, and there was still a developing village classification decreasing to 12.75% from 70.12% in 2019 which was dominated by Karangtengah District.
Statistical data analysis to integrate spatial and temporal aspects in exploring the variables of increasing village IDM status groups in Wonogiri Regency. The results of the weighting and assessment of Village IDM use three assessment aspects, namely; assessment of the Social Resilience Index (IKS), Economic Resilience Index (IKE) and Environmental Resilience Index (IKL). Table 2. Improvement in the development of village IDM status in Wonogiri Regency from 2019 to 2023;

Table 2. Village Development Index (IDM) Data for Wonogiri Regency 2020-2023

No	Subdistrict	2020	2021	2022	2023
1	Selogiri	0.8482	0.8620	0.8892	0.9023
2	Wonogiri	0.7413	0.7441	0.8101	0.8175
3	Ngadirojo	0.7466	0.7531	0.8202	0.8182
4	Kismantoro	0.6987	0.6968	0.7510	0.8678
5	Pracimantoro	0.6948	0.7194	0.7277	0.7520
6	Giritontro	0.7037	0.7063	0.7661	0.7659
7	Giriwoyo	0.6972	0.6993	0.7222	0.7377
8	Batuwarno	0.6862	0.6833	0.7104	0.7600
9	Baturetno	0.6775	0.6782	0.7933	0.8019
10	Eromoko	0.7002	0.7031	0.7380	0.7594
11	Wuryantoro	0.7188	0.7195	0.7610	0.7690
12	Manyaran	0.7000	0.7119	0.7319	0.7484
13	Sidoharjo	0.7320	0.7626	0.7918	0.8040
14	Jatiroto	0.7119	0.7304	0.7468	0.7617
15	Slogohimo	0.7050	0.7064	0.7336	0.7583
16	Jatisrono	0.7255	0.7265	0.7678	0.8095
17	Jatipurno	0.6979	0.6989	0.7279	0.7408
18	Girimarto	0.6793	0.6804	0.7684	0.7887
19	Paranggupito	0.7411	0.7391	0.7492	0.7679
20	Puhpelem	0.7014	0.7102	0.7715	0.7670
21	Tirtomoyo	0.6421	0.6696	0.6753	0.7123
22	Nguntoronadi	0.6710	0.6795	0.7276	0.7354
23	Purwantoro	0.6690	0.6748	0.6888	0.7078
24	Bulukerto	0.6517	0.6792	0.7224	0.7260
25	Karangtengah	0.6569	0.6647	0.6965	0.6828
	Average	**0.7039**	**0.7120**	**0.7516**	**0.7705**
	Status	Develop	Proceed	Proceed	Proceed

Figure 8. Scatter-plot results of IDM Data for Wonogiri Regency 2019-2023 from the results of processing sustainable rural development growth data.

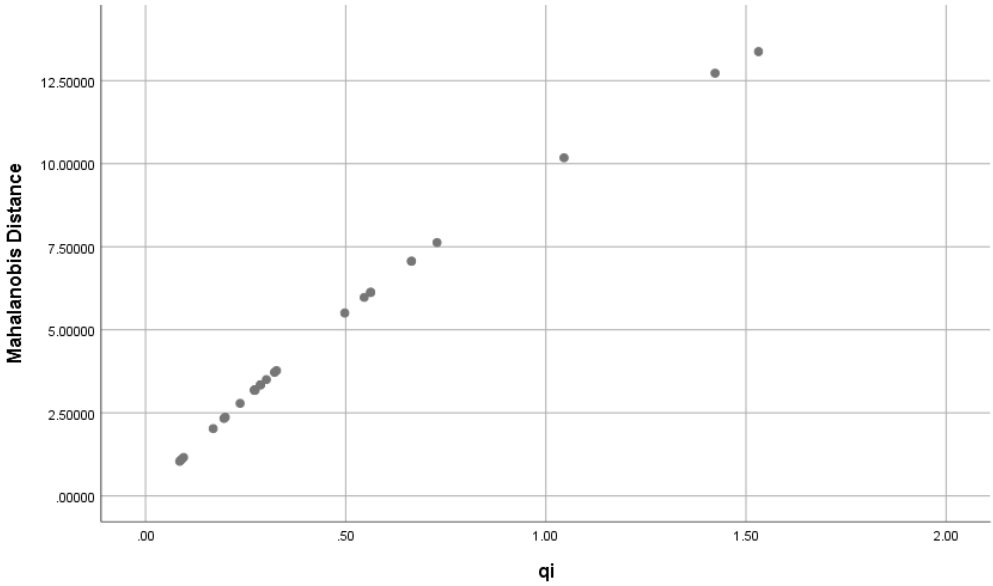


Figure 8. *Scatter-plot* IDM Data for Wonogiri Regency 2019-2023
Source: Data Processing, 2024

The assessment status of the Village IDM uses three assessment aspects, namely; assessment of the Social Resilience Index (IKS), Economic Resilience Index (IKE) and Environmental Resilience Index (IKL), which on a national scale is still dominated by the status with the IDM **village status group. developing** , as seen in the table above, the village IDM in Wonogiri district in 2019-2022 is also dominated by the **village status group developing** , and experiencing a significant increase in the **advanced village status group** in 2023.

Figure 9. *Graph* IDM data for Wonogiri Regency in 2019-202 illustrates the increase in village status in Wonogiri Regency towards the National IDM depicted from the transformation of linear growth of data groups of each village status into a straight line by considering *scatter-plot statistical data* , to be able to draw conclusions from the correlation value.

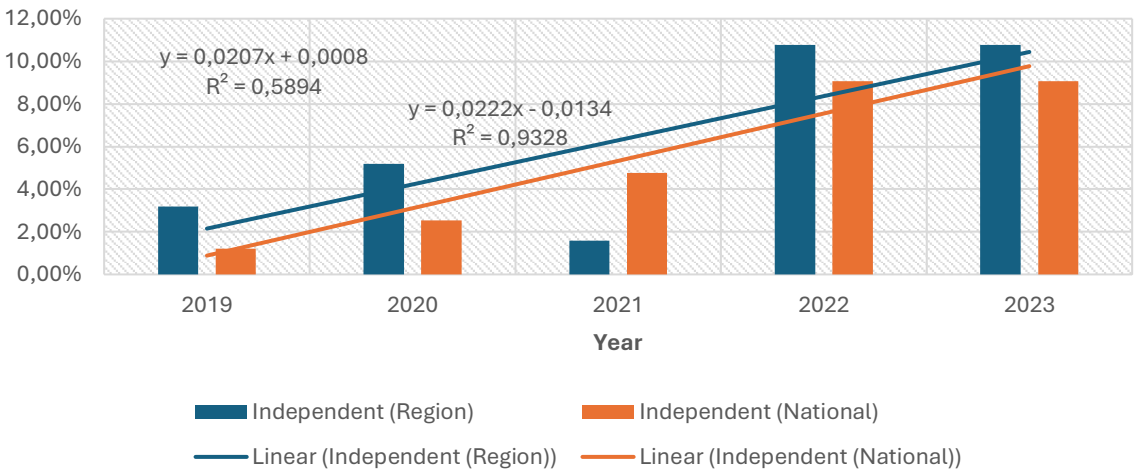


Figure 9. *Scatter-plot* IDM Data Independent Village for Wonogiri Regency 2019-2023

Figure 10. *The graph of* IDM data for Wonogiri Regency in 2019-2023 illustrates the growth of the classification of **independent village status groups** in 2019-2023. The IDM of villages in Wonogiri Regency showed a slightly higher level than the IDM on a national scale, (R^2=0.8967>0.8769). Meanwhile, the **advanced village** status group in 2019-2023, the IDM of villages in Wonogiri Regency showed a significant increase from the IDM on a national scale, (R^2=0.9918>0.8769). 0.3798).

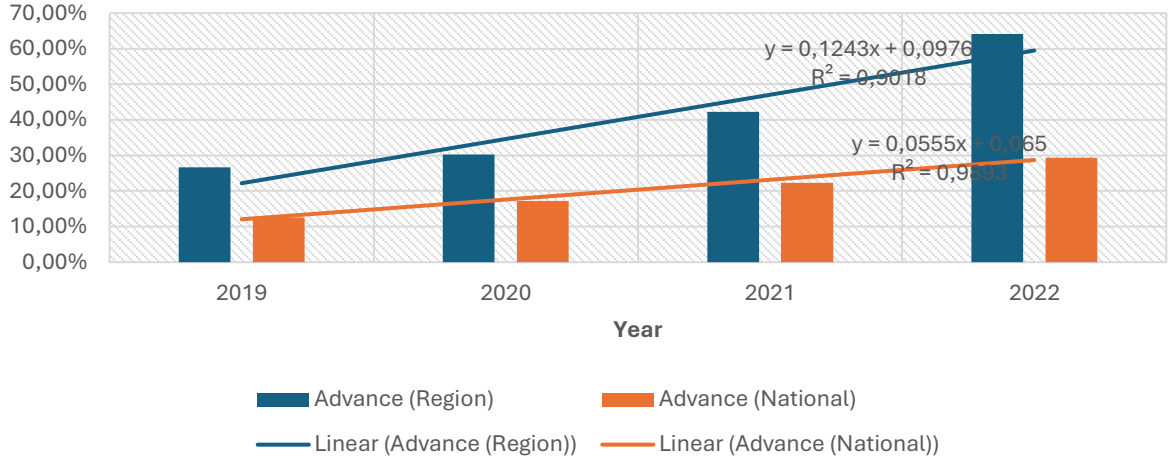


Figure 10. *Scatter-plot* IDM Data Advance Village for Wonogiri Regency 2019-2023

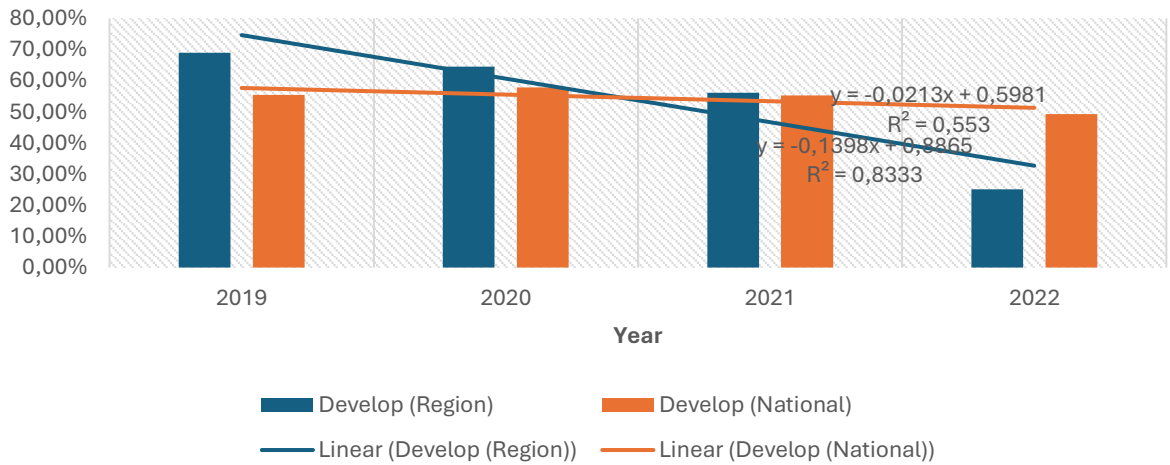


Figure 11. *Scatter-plot* IDM Data Developing Village for Wonogiri Regency 2019-2023

developing village status groups in 2019-2023, the village IDM in Wonogiri Regency showed a decrease that was less than the National scale IDM, (R^2=0.3798<0.8848). Meanwhile, the status assessment in 2019-2023, the village IDM in Wonogiri Regency showed that there were no groups of **underdeveloped villages** , while the National scale IDM experienced a significant decrease, (R^2=0.989).

4. Results and Discussions

The assessment status of the Village IDM uses three assessment aspects, namely; assessment of the Social Resilience Index (IKS), Economic Resilience Index (IKE) and Environmental Resilience Index (IKL), which on a national scale is still dominated by the status with the IDM **village status**

group developing, also dominated by the **village status group developing**, and experiencing a significant increase in the **advanced village status group** in 2023. While the status of the IDM assessment of villages in Wonogiri Regency throughout 2019-2023 did not include any underdeveloped or very underdeveloped village groups, but was dominated by groups of **village status developing** , while for the **advanced village and independent village groups** there was little growth in relation to the national scale IDM.

References

[1] Li H, He H, Zhang J. Study on Rural Development Evaluation and Drivers of Sustainable Development: Evidence from the Beijing-Tianjin-Hebei Region of China. Sustain. 2022;14(15).
[2] López-Penabad MC, Iglesias-Casal A, Rey-Ares L. Proposal for a sustainable development index for rural municipalities. J Clean Prod. 2022;357(June 2021).
[3] Martyka A, Jopek D, Skrzypczak I. Analysis of the Sustainable Development Index in the Communes of the Podkarpackie Voivodeship: A Polish Case Study. Sustain. 2022;14(16).
[4] Setyowati E. Tata kelola pemerintahan desa pada perbedaan indeks desa membangun (idm): studi tiga desa di kabupaten malang. JISPO J Ilmu Sos dan Ilmu Polit. 2019;9(2):170–88.
[5] Naufal HA, Maret US. The Effect of Social Infrastructure on Rural Poverty in Indonesia with The Village Development Index As Moderation Variable. EKO-REGIONAL J Pembang Ekon Wil. 2023;18(1):87–98.
[6] Nelson KS, Nguyen TD. Community assets and relative rurality index: A multi-dimensional measure of rurality. J Rural Stud [Internet]. 2023;97(December 2022):322–33. Available from: https://doi.org/10.1016/j.jrurstud.2022.12.025
[7] Liu B, Zhang X, Tian J, Cao R, Sun X, Xue B. Rural sustainable development: A case study of the Zaozhuang Innovation Demonstration Zone in China. Reg Sustain. 2023 Dec 1;4(4):390–404.
[8] Yang W, Li W, Wang L. How should rural development be chosen? The mechanism narration of rural regional function: A case study of Gansu Province, China. Heliyon [Internet]. 2023;9(10):e20485. Available from: https://doi.org/10.1016/j.heliyon.2023.e20485
[9] Situmeang M, Zulfida I. Analysis of Achievement of The Village Development Index 2018-2019 Kecamatan Percut Sei Tuan District Deli Serdang. 2021;18(9):1823–84.
[10] Ren YS, Kuang X, Klein T. Does the urban–rural income gap matter for rural energy poverty? Energy Policy [Internet]. 2024;186(December 2023):113977. Available from: https://doi.org/10.1016/j.enpol.2023.113977
[11] ABEDULLAH, FAROOQ S, NAZ F. Developing strategy for rural transformation to alleviate poverty in Pakistan: Stylized facts from panel analysis. J Integr Agric [Internet]. 2023;22(12):3610–23. Available from: http://dx.doi.org/10.1016/j.jia.2023.11.028
[12] Mishra A. Correlates of rural development: A case study of Sadar development block of Pratapgarh District in Uttar Pradesh, India. Environ Socio-Economic Stud. 2018;6(3):19–23.
[13] Apud A, Faggian R, Sposito V, Martino D. Suitability Analysis and Planning of Green Infrastructure in Montevideo , Uruguay. 2020;
[14] Hennebry B, Stryjakiewicz T. Classification of Structurally Weak Rural Regions: Application of a Rural Development Index for Austria and Portugal. Quaest Geogr. 2020;39(2):5–14.
[15] Masot AN, Alonso GC, Moriche ÁE. Design of a development index for spanish municipalities. Sustain. 2020;12(21):1–22.
[16] Bedi JS, Ramachandran H. Human Development Index for Rural Andhra Pradesh. Natl Counc Appl Econ Res [Internet]. 2008;(99). Available from: http://www.ncaer.org/Downloads/WorkingPapers/WP99.pdf
[17] Linderhof V, Reinhard S. Do rural development program measures for the encouragement of rural tourism work? A spatial econometric analysis. Res Pap Econ [Internet]. 2012; Available from: https://econpapers.repec.org/RePEc:wiw:wiwrsa:ersa12p932%0Ahttps://lens.org/033-828-745-381-918
[18] Burke A, Jones A. The development of an index of rural deprivation: A case study of Norfolk, England. Soc Sci Med [Internet]. 2019;227(January 2018):93–103. Available from: https://doi.org/10.1016/j.socscimed.2018.09.019
[19] Zhao Q, Bao HXH, Yao S. Unpacking the effects of rural homestead development rights reform on rural revitalization in China. J Rural Stud [Internet]. 2024;108(April):103265. Available from: https://doi.org/10.1016/j.jrurstud.2024.103265
[20] Muti'ah R, Ritonga M, Bangun B. Increasing the Human Development Index Through the Rural Community Literacy Improvement Program. J Soc Polit Sci. 2022;5(4):44–54.
[21] Meyer DF, Meyer N. INDEX. 2016;8(1):100–16.
[22] Luo Y, Liu C, Li Y, Jin X, He Z, Chen Q. Evaluation of rural vitality and development types in mountainous areas of southwestern China: A case study of Wuxi County, Chongqing. Heliyon [Internet]. 2024;10(5):e27660. Available from: https://doi.org/10.1016/j.heliyon.2024.e27660

[23] Sha A, Madhan S, Karthikeya M, R M, Swain D, Gopakumar G. Data-Driven Clustering and Insights for Rural Development in India. Procedia Comput Sci [Internet]. 2024;233:336–42. Available from: https://doi.org/10.1016/j.procs.2024.03.223
[24] Kovshov V, Lukyanova M, Zalilova Z, Frolova O, Galin Z. International regional competitiveness of rural territories as a factor of their socio-economic development: Methodological aspects. Heliyon [Internet]. 2024;10(1):e23795. Available from: https://doi.org/10.1016/j.heliyon.2023.e23795
[25] Sun F, Zheng Q, Ye C, Lin J. A rural resilience development indicator system oriented to common prosperity: The case of a coastal village in Zhejiang Province. Ecol Indic [Internet]. 2023;156(September):111126. Available from: https://doi.org/10.1016/j.ecolind.2023.111126
[26] Xiong Z, Huang Y, Yang L. Rural revitalization in China: Measurement indicators, regional differences and dynamic evolution. Heliyon [Internet]. 2024;10(8):e29880. Available from: https://doi.org/10.1016/j.heliyon.2024.e29880
[27] Wali SB, Hannan MA, Ker PJ, Rahman MSA, Tiong SK, Begum RA, et al. Techno-economic assessment of a hybrid renewable energy storage system for rural community towards achieving sustainable development goals. Energy Strateg Rev. 2023 Nov 1;50.
[28] Fajar KID, Rijanta R, Kurniawan A. Eksplorasi Variabel Pembangunan Berkelanjutan untuk Indeks Desa Membangun Pulau Jawa. Maj Geogr Indones. 2022 Dec 21;37(1):68.
[29] Sari N, Oktavianor T. INDEKS DESA MEMBANGUN (IDM) DI KABUPATEN BARITO KUALA. Vol. 2, JPP: Jurnal Administrasi Publik dan Pembangunan. 2020.
[30] Purnamasari R, Hasanudin AI, Zulfikar R, Yazid H. Do internal control and information systems drive sustainable rural development in Indonesia? J Open Innov Technol Mark Complex [Internet]. 2024;10(1):100242. Available from: https://doi.org/10.1016/j.joitmc.2024.100242
[31] Hidayat H, Sulastri S, Christianingsih E. IMPLEMENTATION OF VILLAGE INDEX DEVELOPMENT POLICY (A Study in Kutawaringin District, Bandung Regency) [Internet]. Jurnal Sosial Humaniora. 2021. Available from: https://ojs.unida.ac.id/index.php/JSH/article/view/4033
[32] Abreu I, Mesías FJ, Ramajo J. Design and validation of an index to measure development in rural areas through stakeholder participation. J Rural Stud. 2022;95:232–40.
[33] Sobczyk W. Sustainable development of rural areas Zrównoważony rozwój obszarów wiejskich Wiktoria Sobczyk Department of Environmental Engineering and Mineral Processing ,. Probl Sustain Dev. 2014;9(1):119–26.
[34] Sosial JI, Humaniora D, Pembangunan E, Berdasarkan D, Nyoman Astika A, Subawa NS. Evaluasi Pembangunan Desa Berdasarkan Indeks Desa Membangun. Nyoman Sri Subawa) [Internet]. 2021;5. Available from: http://jurnal.um-tapsel.ac.id/index.php/muqoddimah
[35] Isakh IH, Muhafidin D, Halimah M. Organizational Development of Desa Rancaekek Wetan in. JANE (Jurnal Adm Negara). 2022;13(2):384–90.
[36] Moan Bura FX. Perkembangan Desa Berdasarkan Indeks Desa Membangun Di Kabupaten Mempawah. J Borneo Akcaya. 2021;7(1):10–20.
[37] Natalia D. European Journal of Physical Education and Sport Science THE OPEN SPACE , HUMAN RESOURCE AND PUBLIC PARTICIPATION - PART OF SPORT DEVELOPMENT IN WONOGIRI REGENCY , INDONESIA. 2017;58–68.
[38] Ristanto I, Widodo S, Nayono SE. A Green Infrastructure SDGS Num 11 : Approach Planning Design Model Reliability of Permeability and Concrete Quality Rural Roads P3MD Program in Wonogiri. 2024;03042(6).
[39] Banakar V, Patil DSV. A Conceptual Model of Rural Development Index. Int J Rural Dev Environ Heal Res. 2018;2(4):29–38.
[40] Arif KM, Islam SR, Islam A. Challenges and opportunities of growth centres in Bangladesh: rural development perspective. Front Urban Rural Plan [Internet]. 2024;2(1):1–15. Available from: https://doi.org/10.1007/s44243-023-00026-7
[41] Hashemi N, Ghaffary G. A Proposed Sustainable Rural Development Index (SRDI): Lessons from Hajij village, Iran. Tour Manag. 2017;59:130–8.
[42] Handoyo F, Hidayatina A, Purwanto P. The Effect of Rural Development on Poverty Gap, Poverty Severity and Local Economic Growth in Indonesia. J Bina Praja. 2021;13(3):369–81.
[43] Clegg SR, Cunha MP e, López A, Sirage E, Rego A. Tackling sustainable development goals through new space. Proj Leadersh Soc [Internet]. 2024 Dec;5:100107. Available from: https://linkinghub.elsevier.com/retrieve/pii/S2666721523000285