Village Development Index Behavior: A Review of Regional Attractiveness

Anthonia Karolina Rejo Lobwaer [1] and Nursini [2] , Anas Iswanto Anwar [3] , Sultan Suhab [4]

[1] Economics Doctoral Program Student, Postgraduate Faculty Economics and Business Hasanuddin University Makassar, Indonesia
[2,3,4] Faculty of Economics and Business Hasanuddin University Makassar, Indonesia

Lobwaer_feb@unmus.ac.id

Abstract. The government released the Developing Village Index (IDM) by categorizing villages into five levels: Independent, Developed, Developing, Disadvantaged, and Very Disadvantaged, on the other hand, the regulations accompany the administrative center as the center of growth. Various scientific opinions suggest that the attractiveness of growth centers will have an impact on the growth of areas around the growth area. Is the attractiveness variable able to encourage an increase in IDM? This paper, which is a review of regional attractiveness in influencing IDM behavior, is a regression analysis of three determinants of attractiveness consisting of six independent variables and one dependent variable where the test results show that the variable distance to the center of growth hurts IDM. In contrast, population, health facilities, and trade facilities have a positive effect, whereas banking facilities and education facilities have no effect. The lack of effect of these two facilities is indicated because other conditions in Papua are different from conditions in general in Indonesia. The level of IDM in areas around the growth area is very dependent on the distance, population, health facilities, and trade facilities, and the variable with the greatest attraction is trade facilities.

Keywords: Developing Village Index, Population, Facilities.

1. Introduction

The Indonesian government pays attention to development that moves from the lowest administrative areas (Villages). The Indonesian government itself divides government areas into 3 levels, namely Province, Regency, and Village. In 2016 the Government released the Developing Village Index (IDM) by categorizing villages into independent, advanced, developing, underdeveloped, and very underdeveloped. The classification is based on the Village's capabilities in terms of Social, Economic, and Environmental aspects. Social includes the community's ability to access health facilities, education, technology, and basic needs related to housing. The economy includes society's

A. Patunru et al. (eds.), *Proceedings of the 8th International Conference on Accounting, Management, and Economics (ICAME 2023)*, Advances in Economics, Business and Management Research 279,
https://doi.org/10.2991/978-94-6463-400-6_26

ability to create products, access markets, and economic institutions, and the availability of transportation facilities. Environment is the third composite index in IDM which assesses villages based on their ability to protect their environment, namely environmental quality, disaster risk, and disaster facilities [1]. When examining backwardness based on IDM, it is realized that its dependence on the availability of public facilities is very large.

On the other hand, regulations regarding the provision of public service facilities related to health and education are a comparison of population and administrative areas [2] [3] [4] [5]. If we link this, the central administrative regions and regions with the largest populations will have advantages over other regions, and the central administrative regions are designated as growth centers. Growth centers can be interpreted functionally and geographically. Functionally, a growth center is a concentration of business groups or industrial branches that, due to their nature, have dynamic elements that can stimulate the economy both internally in the region and the regions behind it. Geographically, a growth center is a location that has facilities and convenience so that it becomes a center of attraction. [6].

The attractiveness of the area is influenced by the distance to the center of growth, population, and facilities, as stated by Stewart [7], namely $F= GN_1 N_2 /d^2$ where F is attractiveness; G is the attraction constant; N_1 and N_2 is the population of two regions and d^2 is the distance. According to him, this model was adopted from Newton's law of gravity. This opinion also becomes a reference and review of attractiveness as measured by the level of accessibility found in Tarigan [6] Where: Tij is the level of accessibility from area i to area j; P_i is the population of area i (analyzed area); P_j is the population of area j; dij is the distance from area i to area j; b is the power of d (in most cases b = 2); and F(Zi) is the attraction of city i, and according to Tarigan, this attraction can use the large number of job opportunities, shops or other things that become attractions.

Since the IDM was released, the only province that has not experienced a change in status, namely being very behind, is the province of Papua. Does the attractiveness variable have an impact on IDM behavior in Papua as stated that the attractiveness variable creates growth in the growth center and surrounding areas? This paper is divided into three discussion sub-sections, namely: 1. Distance and IDM, 2. Population and IDM and 3. Facilities and IDM where the discussion is a review of IDM behavior in Papua in terms of the attractiveness variable.

2. Method

This paper review refers to a regression analysis carried out on six exogenous variables and one endogenous variable, with the locus studied being Papua Province and a total sample

of 231 villages where the sampling criteria refer to the Slovin formula and the availability of the required data, the data used is secondary data.

3. Results

Table 1 provides an overview of the variables tested to analyze the village development index in 231 villages.

Table 1. Descriptive Statistics

Variables	Mean	Std. Deviation	N
IDM	.5716	.0996	231
Distance	2.4325	1.4292	231
Population	6.3827	.7559	231
Educational Facilities	1.8732	.8061	231
Medical Facilities	1.3165	.7012	231
Trading Facilities	.0299	1.0254	231
Banking Facilities	.2753	.6829	231

Figure 1 shows that the residuals from the model are normally distributed where the distribution is around a straight line so that the regression model meets the normality assumption.

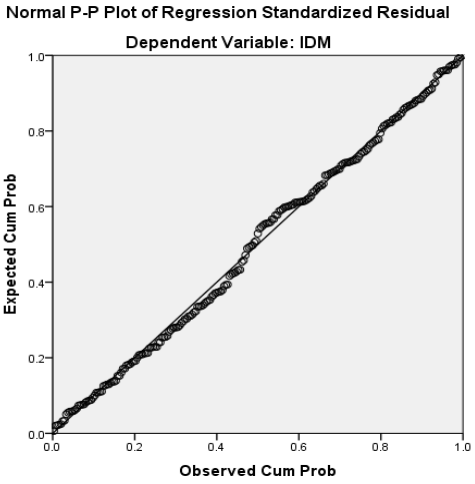

Fig 1. Normality test

The coefficient of determination shown in Table 2 shows that changes in IDM can only be explained by the independent variables tested at 54.1 percent while the rest is determined by other variables.

Table 2. Coefficient of determination

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,744 [a]	,553	,541	.0675

a. Predictors: (Constant), Banking Facilities, Medical Facilities, Distance, Educational Facilities, Trading Facilities, Population
b. Dependent Variable: IDM

The F test is at a significant level of 0.000, smaller than 0.05, this shows that the regression model can predict the Village Development Index.

Table 3. F test

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1,263	6	.211	46,198	,000 [b]
	Residual	1,021	224	,005		
	Total	2,284	230			

a. Dependent Variable: IDM

b. Predictors: (Constant), Banking Facilities, Medical Facilities, Distance, Educational Facilities, Trading Facilities, Population

Based on the regression analysis in Table 4, the regression equation appears as follows:

$$Y = 0.327 - 0.010X_1 + 0.036X_{2+} \_ 0.000X_3 + 0.028X_4 + 0.043X_5 + 0.007X_6 + e$$

Table 4 based on the level of significance shows that the variables Distance, Population, Health Facilities, and Trade Facilities affect IDM, whereas Education and Banking Facilities have no effect, where of the 4 variables that have an effect there is 1 variable that has a negative effect.

Table 4. Regression Coefficient

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	,327	,050		6,509	,000
	Distance	-.010	,003	-.143	-2,991	,003
	Population	,036	,008	,273	4,596	,000
	Educational Facilities	,000	,006	-.002	-.045	,964
	Medical Facilities	.028	,007	,196	4,272	,000
	Trading Facilities	,043	,005	,442	7,808	,000
	Banking Facilities	,007	,007	,046	,905	,366

a. Dependent Variable: IDM

4. Discussion

4.1 Distance and Development Village Index (IDM)

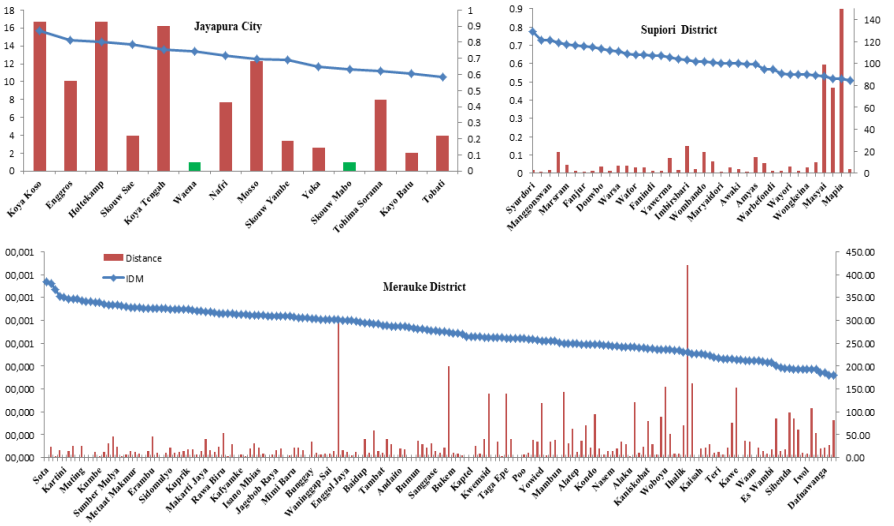

Fig 2. Distance to district and IDM

The results of statistical tests indicate that the further the distance from the administrative area or growth center, the higher the IDM, whereas the closer the IDM is, the lower the IDM is. This finding leads to Frank's opinion, namely that areas with the weakest ties have the greatest development, whereas underdeveloped areas have the closest ties. with growth regions [8]

IDM behavior in terms of distance as seen in Figure 3 based on region has different behavior. For the Jayapura city area which consists of 5 districts, 25 sub-districts, and 14 villages, of the 14 villages, villages indexed by Mandiri have a long distance from the sub-district city and district city (Koya Kaso) and villages in the disadvantaged category are villages with good distance to the city. The sub-district and district city are quite close, apart from that, the two villages which are the capitals of the two sub-districts are in the IDM with advanced and developing status. Supiori Regency consists of 5 sub-districts and 38 villages, 5 villages as the sub-district capital are in the IDM with the status: 1 developed village, 2 developing villages, and 2 underdeveloped villages. Although there are three underdeveloped villages with a long distance from the sub-district city (99km, 120 km, and 419 km) there is one village that has underdeveloped status and has an IDM in that the three villages are a short distance (4km) from the sub-district city. According to BPS data, the three villages whose IDM behavior in terms of distance is different from the general findings can only be reached by sea transportation.

Merauke Regency has 179 villages divided into 20 districts where 19 villages are sub-district cities. In this region, 1 village has developed status, 8 are developing, 7 are underdeveloped and 3 are very underdeveloped. The three villages in the sub-district capital with very underdeveloped status are 120 km apart. 170 km and 165 nautical miles where the shortest distance from the district city is 32km, however, in terms of transportation, these three villages are areas that cannot be traversed at all times due to natural conditions and the roads are still dirt roads and the three villages do not have public routes, apart from Likewise, of the 4 villages in Merauke sub-district, where Merauke is the district capital, only one village has developing status, 2 are underdeveloped and the other 2 villages are very underdeveloped. It cannot be denied that the role of transportation is very important, in 1973 Taaffe, Morrill, and Gould released an article on transportation expansion in underdeveloped areas, this study was based on a combination of their findings in 1960, they argued that the most important factor in underdeveloped areas was increasing internal accessibility through expansion of transportation networks [9], From a temporal perspective, developed countries were the first to enter a stable stage in rural road mileage [10]

4.2 Population and Developing Village Index (IDM)

Mankiw stated that population growth is a determinant of a country's standard of living [11]. Population growth is the key to progress in economic prosperity, more people will encourage progress [12]. Population growth is a scapegoat for the backwardness of a region, in fact for underdeveloped regions population growth is needed, the consequences of the

birth of one child in a developed region are equivalent to many times more children born in an underdeveloped region when viewed from the perspective of depletion of natural resources and consumption patterns. The problem lies not in growth but in the distribution of population.

The implications of the regression of population and IDM are positive, where the higher the population, the higher the IDM. Of the 231 sample data, 26 villages are administrative centers (sub-districts) which on average have advantages in terms of population where 3 villages are categorized as developed with an average population of 9395; 11 developing villages with an average of 1153 people; 9 villages are categorized as underdeveloped with an average population of 581 people and 3 villages have very underdeveloped status with an average population of 471 people. Of the 231 villages, there is only 1 Mandiri village with a population of 6418 and of the 51 very underdeveloped villages there is 1 village with the lowest index in very underdeveloped status with the smallest population, namely 64 people. Other facts about IDM and population are also seen in Table 5:

Table 5. IDM and Population

IDM Status	Number of Villages	Average Population
Proceed	13	3102
Develop	94	1090
Left behind	72	455
Very Left Behind	51	428

4.3 IDM and Facilities

Todaro stated that underdevelopment is reduced with strategies that produce a better life, namely increasing the ability to access health, education, and economic facilities [13]. The regression test explicitly states that there is no effect of educational facilities on IDM, this is very contradictory but the condition of Papua is related to education much influenced by the quality of education, lack of teaching staff, security of teaching staff, and local culture as found by [14][15][16]. These other factors mean that the existence of educational facilities has no impact on village development in Papua. Banking is also explicitly not an attraction for IDM Papua, on the contrary, trade has a positive influence and this cannot be denied considering the consumption patterns of the Papuan people. Another factor that has

a big impact on people's savings is the abundance of natural resources so that Papuan people are sufficient to meet their food needs even though they have no income. Apart from that, low income makes people more inclined to consume directly compared to saving [17 [17]. Table 6 shows the availability of health and trade facilities in 231 villages.

Table 6. Number of Villages according to Availability of Health and Trade Facilities

Facility	Availability of Facilities									Number of Villages
	There isn't any	There is								
		1	2	3	4	5	6	10	>10	
Public health center	190	41	0	0	0	0	0	0	0	231
Auxiliary Health Center	84	146	1	0	0	0	0	0	0	231
Shop	227	3	0	1	0	0	0	0	0	231
Permanent Building Market	227	4	0	0	0	0	0	0	0	231
Semi-Permanent Building Market	209	18	3	1	0	0	0	0	0	231
Buildingless Market	227	4	0	0	0	0	0	0	0	231
Mini Market/ Supermarket/ Supermarket	220	3	2	3	1	2	0	0	0	231
Restaurant/Eating House	221	3	2	3	1	2	0	0	0	232
Stall/Food Shop	158	19	16	13	7	3	2	1	12	231
Shop/Grocery Stall	76	19	8	16	13	9	10	6	74	231

Wagambi Village is the village with the lowest IDM (0.36033) with a very underdeveloped status, in this village there are no educational facilities or trade facilities. Figure 3 shows the development of IDM in the central administrative area where Holtekamp Village has advantages in terms of distance, population, and trade, Koyo Tengah and Moso villages, although located at a distance that is not much different from Holtekamp Village, are still inferior in terms of trade.

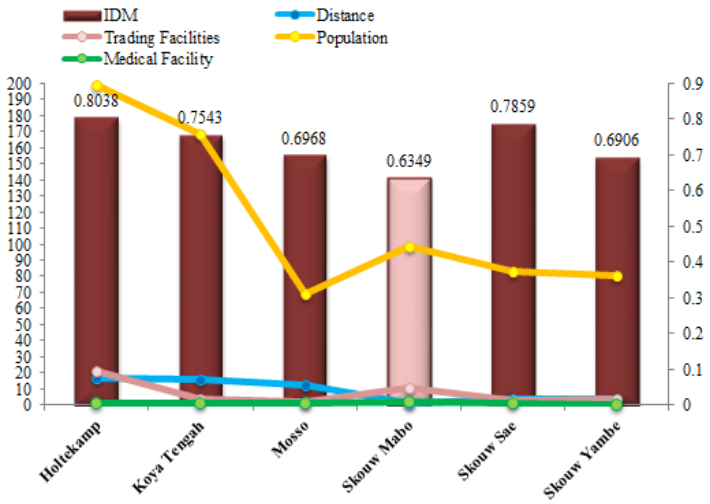

Fig 3. IDM and Attraction

It cannot be denied that these findings recommend trade as a variable of attraction for increasing IDM as stated by other opinions that the administrative area is not a determinant of competitiveness but rather a variety of business collaborations [18]. Development should not only focus on agricultural products because it will create dependence on the decisions of large distributors and other things. this can only be balanced with marketing power that is centralized and develops from within the village [19] economic restructuring plays a major role in the process of rural restructuring [20] The attractiveness of the economy moves faster than the attractiveness of the population [21].

Rural socio-economic development is positively related to population and will be negatively related to an aging population [22]. Rural revitalization is hampered by depopulation and an aging population [23] [24]. Differences between regions are not caused by economic conditions but by population potential and infrastructure, many public services are available in administrative areas due to greater population concentration [25] [26].

5. Conclusion

IDM behavior cannot be separated from the regional attractiveness variable. Villages that are far from the administrative center or growth center have a high IDM, except for villages that are far away and have low transportation access. Villages that are close to the growth center have a lower IDM. Administrative centers, on average, have a high IDM due to their superiority in terms of population. Villages that are far away and have lots of trading facilities have a higher IDM than villages that are far away but have fewer trading facilities.

IDM behavior in areas around growth in general. If the village is at a long distance, with trade and health facilities that are higher than the administrative center of growth, the IDM will be higher than the IDM at the center of growth. On the other hand, if the village is close to trade facilities. If health is smaller than the growth center, the village IDM will be smaller than the growth center IDM.

6. Acknowledgments

Apart from adding scientific references, this paper is also a dedication of the author as a thank you to the Education Fund Management Institute (LPDP) for the study opportunity provided.

References

1. Kementrian Desa, *Peraturan Nomor 2 Tahun 2016 Tentang Indeks Desa Membangun*. 2016.
2. Kementerian Pendidikan Nasional, *Peraturan Nomor 24 Tahun 2007 Tentang Standar Sarana dan Prasarana untuk Sekolah Dasar/ Madrasah Ibtidaiyah (SD/MI), Sekolah Menengah Pertama/Madrasah Tsanawiyah (SMP/MTs) dan Sekolah Menengah Atas/Madrasah Aliyah (SMA/MA)*. 2007.
3. Kementerian Hukum dan Hak Asasi Manusia, *Peraturan Nomor 34 Tahun 2016 tentang Kriteria Daerah Kabupaten/Kota Peduli Hak Asasi Manusia*. 2016.
4. Kementerian Kesehatan, *Peraturan Nomor 33 Tahun 2015 Tentang Pedoman Penyusunan Perencanaan Kebutuhan Sumber Daya Manusia Kesehatan*. 2015.
5. Kementerian Kesehatan, "Peraturan Menteri Kesehatan RI No 43 tahun 2019 tentang Puskesmas," *Kementerian Kesehatan*, vol. Nomor 65, no. 879. pp. 2004–2006, 2019.
6. R. Tarigan, *Perencanaan Pembangunan Wilayah*. Jakarta: Bumi Aksara, 2005.
7. J. Q. Stewart, "Demographic gravitation: evidence and applications," *Sociometry*, vol. 11, no. 1/2, pp. 31–58, 1948.No
8. A. G. Frank, "The development of underdevelopment," in *Promise of development*, Routledge, 1966, pp. 111–123.
9. E. J. Taaffe, R. L. Morrill, and P. R. Gould, "Transport expansion in underdeveloped countries: a comparative analysis," in *Transport and development*, Springer, 1973, pp. 32–49.
10. M. Liu, N. Li, Y. Liu, and W. Chen, "Development and Application of a Coupled Model for Rural-Transportation Coordination in China Based on an International Perspective," vol. 1, pp. 22–29, 2023.
11. N. G. Mankiw, *Makroekonomi edisi Keenam*. Jakarta: Erlangga, 2006.
12. M. Kremer, "Population growth and technological change: One million BC to 1990," *Q. J. Econ.*, vol. 108, no. 3, pp. 681–716, 1993.
13. M. P. Todaro and S. P. Robbins, *Pembangunan Ekonomi edisi 11 jilid 2*. Jakarta: Erlangga, 2011.
14. Z. B. Gani, "Analisis Hukum Terhadap Kebijakan Pemerintah Dalam Mewujudkan Kemajuan Literasi Digital Dunia Pendidikan Di Papua," *J. Law Nation*, vol. 2, no. 2, pp. 113–121, 2023.
15. A. O. Safitri, V. D. Yunianti, and D. Rostika, "Upaya Peningkatan Pendidikan Berkualitas di Indonesia: Analisis Pencapaian Sustainable Development Goals (SDGs)," *J. Basicedu*, vol. 6, no. 4, pp. 7096–7106, 2022.

16. Y. Mataputun, “Analisis pemenuhan standar nasional pendidikan dan permasalahannya,” *J. Konseling dan Pendidik.*, vol. 8, no. 3, pp. 224–233, 2020.
17. D. Yapsenang, D. P. Utami, and Y. Irawan, “Klayas Village Community Empowerment Strategy Based on Sustainable Livelihood Approach,” vol. 1, no. 1, pp. 23–28, 2022.
18. J. M. Garcia-Alvarez-Coque, N. Roig-Tierno, M. Sanchez-Garcia, and F. Mas-Verdu, “Knowledge Drivers, Business Collaboration and Competitiveness in Rural and Urban Regions,” *Soc. Indic. Res.*, vol. 157, no. 1, pp. 9–27, 2021.
19. K. de Roest, P. Ferrari, and K. Knickel, “Specialisation and economies of scale or diversification and economies of scope? Assessing different agricultural development pathways,” *J. Rural Stud.*, vol. 59, pp. 222–231, 2018.
20. S. Tu, H. Long, Y. Zhang, D. Ge, and Y. Qu, “Rural restructuring at village level under rapid urbanization in metropolitan suburbs of China and its implications for innovations in land use policy,” *Habitat Int.*, vol. 77, no. August, pp. 143–152, 2018.
21. C. Yuan and C. Yuan, "GIS-Based Research on the Spatial Trajectory Migration of Shaanxi Province's Demographic, Economic, and Industrial Centers of Gravity," *Proc. Int. Sci. Conf. Hradec Econ. Days 2023*, vol. 13, pp. 835–847, 2023.
22. B. Mitrică, I. Mocanu, M. Dumitraşcu, and I. Grigorescu, “Socio-economic disparities in the development of Romania's border areas,” *Soc. Indic. Res.*, vol. 134, no. 3, pp. 899–916, 2017.
23. S. K. Wegren, “The quest for rural sustainability in Russia,” *Sustainability*, vol. 8, no. 7, p. 602, 2016.
24. F.-C. Mihai and C. Iatu, “Sustainable rural development under Agenda 2030,” *Sustain. Assess. 21st century*, pp. 9–18, 2020.
25. F. Boncinelli, G. Pagnotta, F. Riccioli, and L. Casini, “The determinants of quality of life in rural areas from a geographic perspective: The case of Tuscany,” *Rev. Urban Reg. Dev. Stud.*, vol. 27, no. 2, pp. 104–117, 2015.
26. J. Straka and M. Tuzová, "Factors affecting the development of rural areas in the Czech Republic: A literature review," *Procedia-Social Behav. Sci.*, vol. 220, pp. 496–505, 2016.