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Segmentation of Village Accessibility of Education Service Facilities in Ogan Komering Ulu Selatan Regency

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Abstract

Education is one of the most important aspects in the development and every citizen has the right to education, and the government is obliged to finance as mandated in the 1945 Constitution. However, the disparity in education access and equity is a problem faced by education in various regions in Indonesia, especially in rural areas. One of the efforts to solve the disparity in educational facilities in rural areas is to carry out village development by increasing the availability and accessibility of educational facilities through the village fund policy. Problem structuring is needed to formulate problems and produce knowledge about what problems must be solved, so that the use of village funds in increasing the accessibility of educational facilities is effective and efficient. In policy analysis, problem formulation is very important, so that the implemented policy resolves the right problems and avoids type III errors. One of the methods used in problem structuring is the classification method. Classification/segmentation of educational facilities accessibility is conducted using the Self Organizing Map algorithm approach. The results of the classification will map the problems and conditions of accessibility of village education facilities in Ogan Komering Ulu Selatan regency into several segments or clusters. This information can be used as a guide for the government in planning or determining development priorities, so that type III errors do not occur, particularly in the development of accessibility of educational facilities in villages. Thus, the use of village funds or other public policies resolves the right problems.

Keywords: *accessibility; classification; education; public policy; self-organizing map*

INTRODUCTION

Education is one of the most important aspects of development and is mandated by the 1945 Constitution Article 31 paragraphs 1 and 2. Various efforts have been made by the government to improve education through various policies. All these policies are implemented by the government with the hope of improving the quality and accessibility of education services.

Ogan Komering Ulu Selatan is one of the regencies with very low availability and accessibility of education services in South Sumatra province. This can be seen from the regency's basic service dimensions of the Village Development Index of 48.73, which is below the average and lowest in South Sumatra. The disparity in the availability and accessibility of educational facilities in the village has caused difficulty for the villagers in getting access to education services which has resulted in low-quality of human resources and the low welfare of the public.

The disparity in education accessibility and equality is a problem faced by education in various regions in Indonesia, especially in rural areas. Rural villagers tend to have more difficult access to educational facilities. Meanwhile, urban citizens tend to have adequate means of transportation that can help them reach educational facilities very easily (Vito & Krisnani, 2015). Junita, Juniardi, and Azwansyah (2017) explained that accessibility is a level of difficulty or ease in accessing service in particular places to meet the needs of the public. Andrianto & Iskandar (2020) also added that, one way to reduce the disparity between regions is by building infrastructure that can improve connectivity between regions. Increasing connectivity between regions can increase the accessibility of education services.

Apart from the problem of village connectivity and transportation facilities, the location or availability of educational facilities also affects the accessibility of the public in accessing these facilities. In research conducted by Budiman & Cahyono (2017), the location of the facility in the middle of the settlement can be accessed easily by people who are in the radius of the facility's reach. Moreover, Andrianto & Iskandar (2020) added that good accessibility can open the isolated area and make the opportunities for an area to develop bigger. Good accessibility can make it easier for villagers to access educational facilities and various other public facilities.

One of the government's efforts to overcome the limited availability and access of educational facilities in the rural areas is through village funds. The village funds can be used for infrastructure development that can improve the village connectivity (Aziz, 2016). In addition to improving connectivity, the village funds also aim to bring government services such as educational facilities closer to the villagers (Jamaluddin et al., 2018). Village funds have a positive impact on village development activities (Oktavia, 2020). Moreover, decentralization provides opportunities for local governments to make decisions according to the conditions and potentials of a region (Arif & Maksum, 2017). However, in its implementation, information is needed regarding the availability and accessibility of educational facilities so that the impact of using village funds in increasing accessibility is effective and efficient.

One way to obtain this information is by conducting policy analysis through problem structuring. Problem structuring is used to identify or generate knowledge about what problems to solve. The function of problem structuring is to provide policy-relevant knowledge to those who wish to examine the assumptions underlying the definition of problems on the public agenda. In policy analysis, the formulation of the problem becomes very important so that the implemented policies solve the right problems. Errors during the problem formulation phase can cause type III errors, that is the policies taken by the government to solve the wrong problem or get the wrong solution for the right problem (Dunn, 2018). This type III error can cause development that does not solve problems that occur in the village. In other words, development becomes ineffective and inefficient. Therefore, good planning is needed so that the use of village funds is effective and right on target in increasing the accessibility of education facilities in the village.

The purpose of this research is to map the accessibility of educational facilities in

Table 1. Scoring of Road Quality Conditions and Road Accessibility

No	Indicator	Scores
1	Road quality conditions	Score 0 represents the village traffic to and from the village only via water. Score 1 is the village with traffic from and to the village by land, as well as the widest type of road surface other than asphalt/concrete, paved, or soil. Score 2 is the village with traffic from and to the village by land, and the widest type of road surface is land. Score 3 is the village with traffic to and from the village by land, and the widest type of road surface is paved (stone, gravel, etc.). Score 4 is the village with traffic from and to the village by land, and the widest type of road surface is asphalt/concrete.
2	Road accessibility	Score 0 represents the village traffic to and from the village only via water. Score 1 is a village with traffic from and to the village by land, or land and water, but the road cannot be passed by motorized vehicles 4 or more throughout the year. Score 2 is a village with traffic from and to the village by land, or land and water, and the road is accessible to motorized vehicles with 4 or more wheels throughout the year except during the rainy season. Score 3 is a village with traffic from and to the village by land, or land and water, and the road is accessible to motorized vehicles of 4 or more wheels throughout the year except for certain times (when it rains, high tides, etc.).

Source: BPS PODES Survey, 2018

Ogan Komering Ulu Selatan Regency. Information resulting from problem structuring is the result of observed policies, policy problems, which policies will be chosen, the extent to which policy performance has been achieved, and the expected results of the policies designed (Dunn, 2018). This information is expected to become a guideline or reference for local and village governments in conducting policy interventions, particularly in terms of improving education accessibility.

METHOD

The method used in the problem structuring is through classification or segmentation. Therefore, the analysis method used for this study is quantitative method. The unit of analysis in this study is the definitive village in Ogan Komering Ulu Selatan regency. The analysis was carried out in three stages. The first stage is the analysis of village connectivity in Ogan Komering Ulu Selatan Regency using the social network analysis (SNA) approach to obtain the centrality of degree and betweenness. SNA is very important to see the role of a node in a network (Park & Yilmaz, 2010). SNA is also very relevant in understanding and improving the process of implementing a program (Valente et al., 2015). The centrality degree provides information on the number of nodes connected to a node. While the centrality betweenness provides information on the most frequently passed nodes in a network. The village network structure matrix was obtained by processing the village map of Ogan Komering Ulu Selatan Regency using the QGIS application and the help of google satellite.

The second stage is the analysis of village areas that are not covered or are outside the radius reach of educational facilities in accordance with SNI No. 03-1733-2004 concerning Environmental Planning Procedures and Decree of the Minister of Settlements and Regional Infrastructure No.534/KPTS/M/2001. This analysis uses buffer spatial

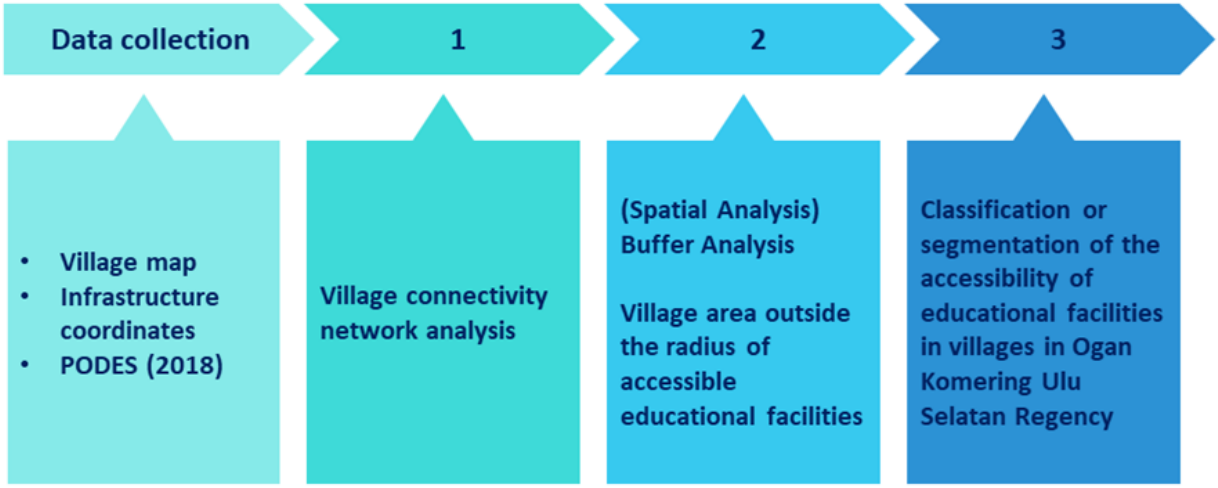

Figure 1. Research Design

analysis. Buffer analysis serves to identify whether a geographic feature is outside or inside the buffer boundary (Sunardi et al., 2005). The data sources used to carry out the buffer analysis are the coordinates of the educational facilities as a result of the 2019 BPS statistical area mapping of Ogan Komering Ulu Selatan Regency and the village map of Ogan Komering Ulu Selatan Regency. The result of this stage is the percentage of village areas that are outside the radius of kindergarten, elementary, junior high and high school education facilities.

The final stage is to classify or segment with the variables produced in the first, second, and transportation facilities variables, that is the quality and accessibility of roads obtained from Village Potential data (PODES 2018). The road quality and road accessibility are scored according to Table 1.

The analysis in the third stage uses the Self-Organizing Map (SOM) approach using the RStudio application. SOM is an unsupervised clustering algorithm as well as a good visualization tool. It is widely used in many application domains, such as economics, industry, management, sociology, geography, text mining, etc. (Cottrell et al., 2018). SOM is a technique in Neural Networks that aims to visualize data by reducing data dimensions through the use of self-organizing neural networks so that humans can understand high-dimensional data mapped in low-dimensional data. The learning method used by SOM is unsupervised learning which assumes a structured topology to become class units/clusters (Fausett, 2017).

In cluster analysis, data standardization was carried out. Data standardization is one of the requirements for clustering. The standardization process is carried out if there is a large difference in unit size between the variables studied. Unit differences can cause calculations using cluster analysis to be invalid. Therefore, data standardization needs to be done before further analysis (Silvi, 2018). The next step is to segment or classify and visualize the accessibility conditions of education facilities in villages in Ogan Komering Ulu Selatan Regency using the SOM approach. The final stage of this analysis, then, is to conduct the profiling of the formed segmentation results. The research design of this study is shown in Figure 1.

FINDINGS AND DISCUSSION

Village accessibility to educational facilities can be seen from the value of village centrality in the village connectivity network in Ogan Komering Ulu Selatan Regency. The value of centrality degree shows the relationship of a village with other villages in a network. There are 44 villages or 17% of the villages that have a degree totaling 1, in other words 17% of the villages in Ogan Komering Ulu Selatan regency only have one access road leading to the village

Table 2. Number of Villages Based on Degree Centrality Value

No	Degree Centrality	Number of Villages
1	1	44
2	2	115
3	3	71
4	4	16
5	5	5
6	6	1

Source: Data analysis

and tend to be isolated in getting access to educational facilities. Meanwhile, most of the villages or 72% of the villages in Ogan Komering Ulu Selatan have a degree with a value of 2, indicating that the villages have at least two accesses in and out of the village and act as a chain link in the village connectivity network. The greater the degree value, the greater a village has access to educational facilities in other villages, and vice versa. Table 2 shows the number of villages based on their centrality value.

In addition to degree centrality, the betweenness centrality can also help in providing information on nodes or villages that are bridges or connectors in a network. The villages with the highest centrality degree and betweenness values in the network were Gunung Terang village in Buay Sandang district, Gunung Tiga village in Muaradua district, and Rantau Panjang village in Buay Rawan district. The villages with the highest centrality value are the most often traversed in the network and acts as a bridge in the network. The condition or quality of roads and the availability of educational facilities in the village have an important role for other villages in accessing the educational facilities that are located in or through the village.

The location of educational facilities can also affect villagers accessing educational facilities. According to SNI No. 03-1733-2004, the radius of reach for kindergarten (TK) education facilities is 500 meters, elementary school (SD) and junior high school (SMP) are 1 km, while for senior high school (SMA) and equivalent is 3 km. There are still many villages with an area percentage of 100% outside the radius reach, in other words, these villages do not have any educational facilities and are located outside the radius of educational facilities in the nearest village (Table 3). This resulted in the villagers having difficulty getting access to education because there were no educational facilities in their village or the villagers had to travel a distance outside the SNI regulations to get educational facilities that were not available in their village.

As an illustration, Figure 2 shows the spatial conditions and connectivity of Pematang Obar Village. The areas that are not covered by the radius reach of educational facilities in Pematang Obar Village are settlement areas, forests, and plantations. The entire village area is not covered by the radius of the kindergarten, elementary, and junior high school education facilities. Meanwhile, the village area is only covered by high school education facilities in Kemu Village, but in terms of connectivity, the value of the centrality degree of Pematang Obar Village is 1 and is only connected to Gunung Batu Village. As a result, the Pematang Obar villagers have to travel approximately 9 km to access SD and SMP facilities in the nearest village, that is Gunung Batu. Meanwhile, to access high school education facilities, the community must go through 3 villages with a distance of approximately 18 km from Pematang Obar Village to Pulau Beringin Village

The radius reach of educational facili-

Table 3. Number of Villages Based on Percentage of Areas Outside the Radius Reach of Educational Facilities

No	Percentage of Areas	Number of Villages			
		TK	SD	SMP	SMA
1	0%	0	10	5	43
2	1-25%	1	23	2	37
3	26-50%	3	42	8	30
4	51-75%	6	91	36	40
5	76-99%	101	84	128	58
6	100%	141	2	73	44

Source: Data analysis

ties in the Ogan Komering Ulu Selatan regency is shown in Figure 3. From Figure 3, it can be seen that most of the areas outside the radius are forest and plantation areas. Meanwhile, the majority of the population in Ogan Komering Ulu Selatan regency also works in the agricultural sector and tends to live or settle around agricultural or plantation areas. However, there are still many people who live in areas around other public infrastructure that are not within the radius of the educational facilities. To reach or access these facilities, villagers who live in areas outside the radius of educational facilities require more effort than villagers that live around educational facilities.

One method in problem structuring is through classification or segmentation to map the accessibility conditions of educational facilities. The classification or segmentation of the accessibility of educational facilities in villages in Ogan Komering Ulu Selatan Regency is divided into 3 clusters.

The first cluster consists of the first and second segments. The first segment is villages with a low degree of centrality and betweenness centrality. In terms of the radius reach, the first segment is villages with a high percentage of the area outside the radius reach of educational facilities. Meanwhile, the quality and road access conditions in the first segment are also very low. The road quality of the majority of villages in the first segment are roads with the narrowest surface of land and village road access is mostly impassable by vehicles with 4 or more wheels. There are villages that can be passed by 4-wheeled vehicles or more but cannot be passed through the rainy season. Meanwhile, the condition of the second segment is not much different from the first class. However, the village road access in the second class is better than in the first segment. The majority of road access in the second segment can be accessed by 4-wheeled vehicles or more except at certain times, and several villages are accessible by 4-wheeled vehicles all year round. Judging from these conditions, the villages in the first cluster are villages that have a very low chance of getting access to educational facilities.

The second cluster consists of the third segment. The third segment is villages with the dominant characteristics of good road quality and accessibility. Moreover, this segment also has a low percentage of areas outside educational facilities and has a good enough degree centrality with 2 or more degrees. The second cluster is villages with adequate educational facilities accessibility because it is supported by the location of educational facilities in or around the village and is supported by good road conditions that can be passed by 4-wheeled vehicles or more throughout the year.

Lastly, is the third cluster. The third cluster consists of segments 4,5,6,7,8, and 9.

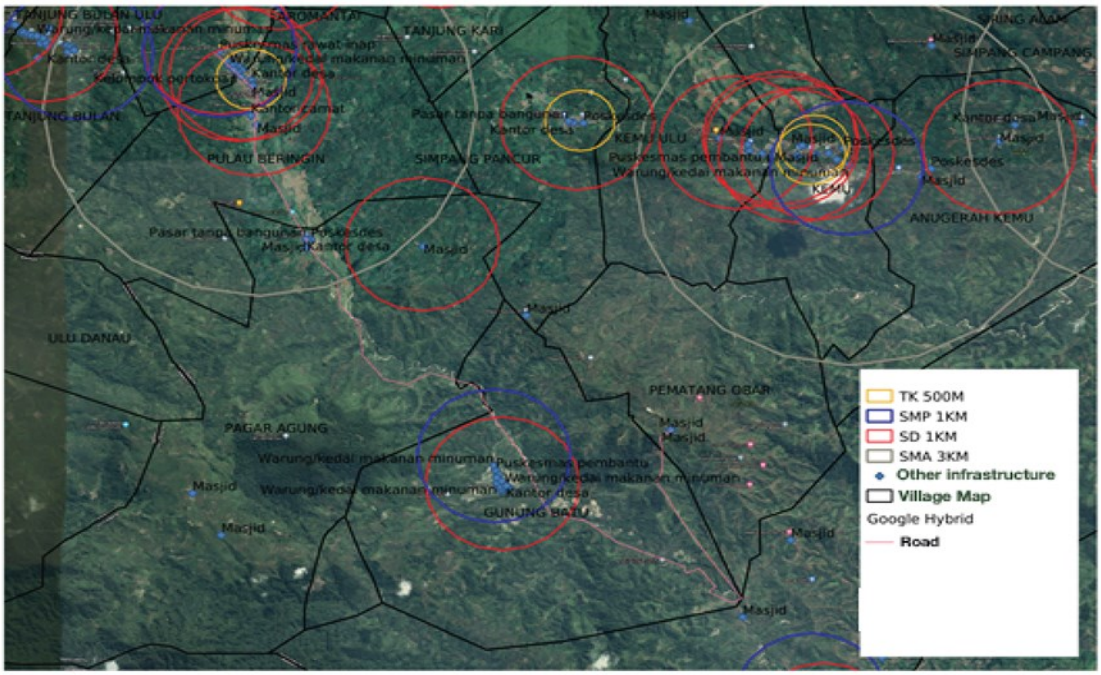

Figure 2. Spatial Condition and Connectivity of Pematang Obar Village
Source: Data analysis

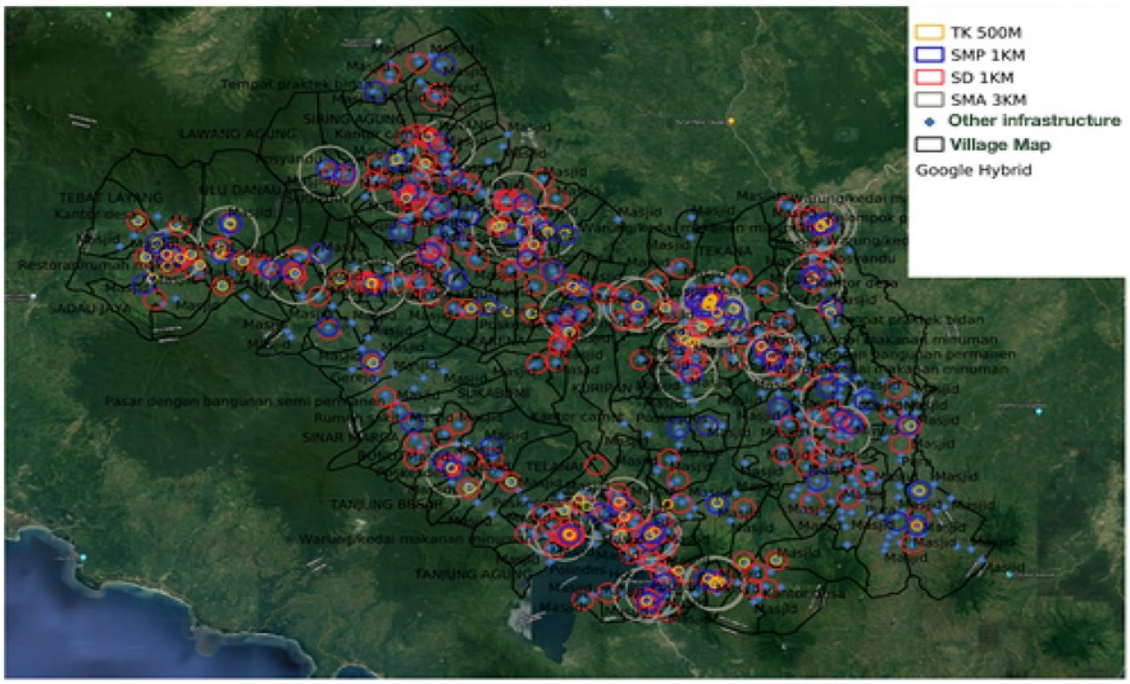

Figure 3. Radius Reach of Educational Facilities in Ogan Komering Ulu Selatan Regency
Source: Data analysis

The majority of villages in the third cluster have a high enough percentage of areas outside the coverage of educational facilities at certain levels of education as illustrated in Figure 4. However, the quality and accessibility of the roads in the third cluster are

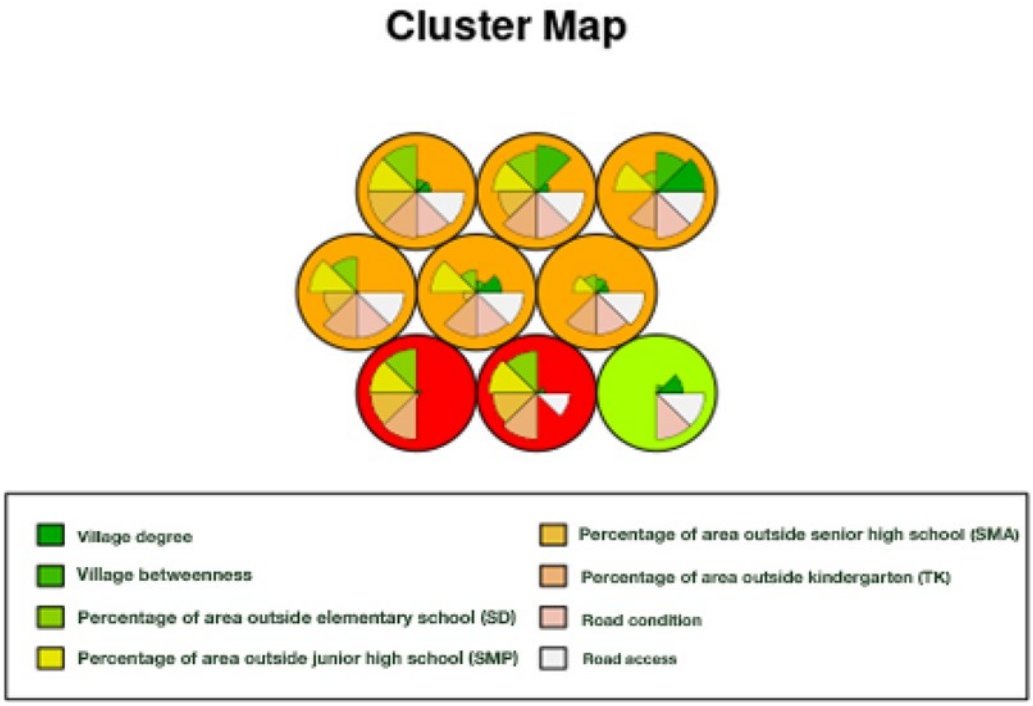

Figure 4. Segment Characteristics
Source: Data analysis

quite good. On the other hand, the degree centrality and betweenness centrality in the third cluster are also better compared to the first cluster. Although most of the villages are located outside the radius of educational facilities, with good enough conditions of transportation and connectivity, the villages in the third cluster still have a great opportunity in the accessibility of educational facilities both inside the village and facilities outside the village. Although more effort is required to access education facilities that are not in the village or outside the reach of the villagers. The characteristics between segments are depicted in Figure 4.

The cluster with good educational facilities and accessibility conditions is in the second cluster. However, the number of villages in the cluster is only 7 of 252 villages in Ogan Komering Ulu Selatan regency. On the other hand, the worst condition for the accessibility of education facilities is the villages that are in the first cluster. The number of villages in the first cluster was 41 villages. Meanwhile, almost 81% of villages in Ogan Komering Ulu Selatan Regency are in the third cluster with different conditions of access to education facilities at each level but having better conditions of transportation facilities and centrality compared to the first cluster. The distribution of villages in each segment and cluster is depicted in Figure 5.

Each segment or cluster formed has dominant characteristics or indicators relating to the accessibility of educational facilities. This information can assist in finding and classifying villages based on problems or characteristics in the segment, so that it can serve as a guide for the government in making development priorities and implementing village development policies through village funds. Table 4 list the villages in Ogan Komering Ulu Selatan based on the segment's classification.

The result of the classification or segmentation shows that there are only 7 villages with good education facility accessibility categories, 41 villages with conditions that require urgent attention, and 204 villages with the urgent need to increase village development in supporting the accessibility of educational facilities at a certain level of education. This condition illustrates that the educational facilities in the village in Ogan Komering Ulu Selatan regency are still far

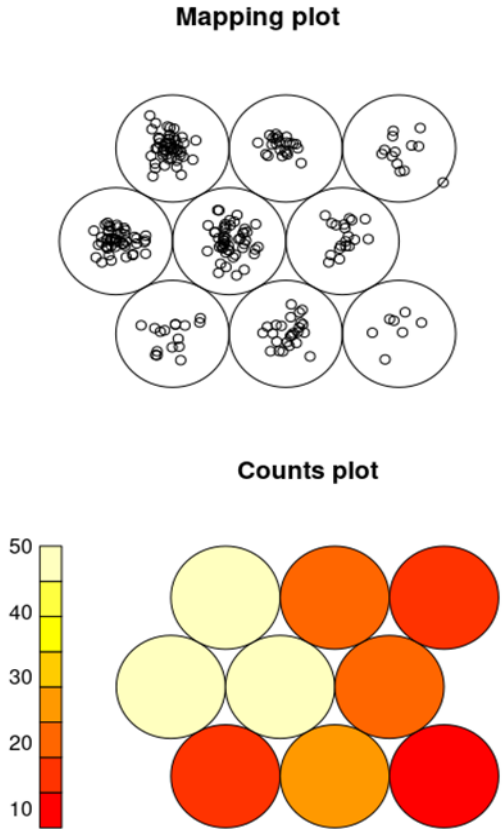

Figure 5. Distribution of Villages Based on Segments
Source: Data analysis

from adequate and there are still many isolated areas in getting access to educational facilities.

The classification results map the problems in the accessibility of educational facilities. The most dominant transportation problems occur in the first and second segments. The worst road quality conditions are in the first and second segments. Moreover, the worst road accessibility conditions are found in villages in the first segment. In general, the condition of village transportation facilities in other segments, most segments have good enough road quality. With this condition, the priority focus of the use of village funds in the first and second segments can be used in road construction or improving the road quality into and out of the village.

Furthermore, regarding the issue of village connectivity, the most dominant problems are also found in the first and second segments. The role of the government, in this case, is to make efforts or policy interventions by prioritizing road construction that can improve village accessibility. Furthermore, the government can also prioritize improving the quality and accessibility of roads in villages with high centrality values in order to make it easier for other villages to access educational facilities that are located in or through the villages with high centrality values of degree and betweenness in segments 8 and 9.

Considering the radius reach of educational facilities, with the exception of villages in segments 3 and 9, almost all villages suffer from the problems of availability and coverage for kindergarten education. In general, problems with the availability and reach of educational facilities are most dominant in villages in the first and second seg-

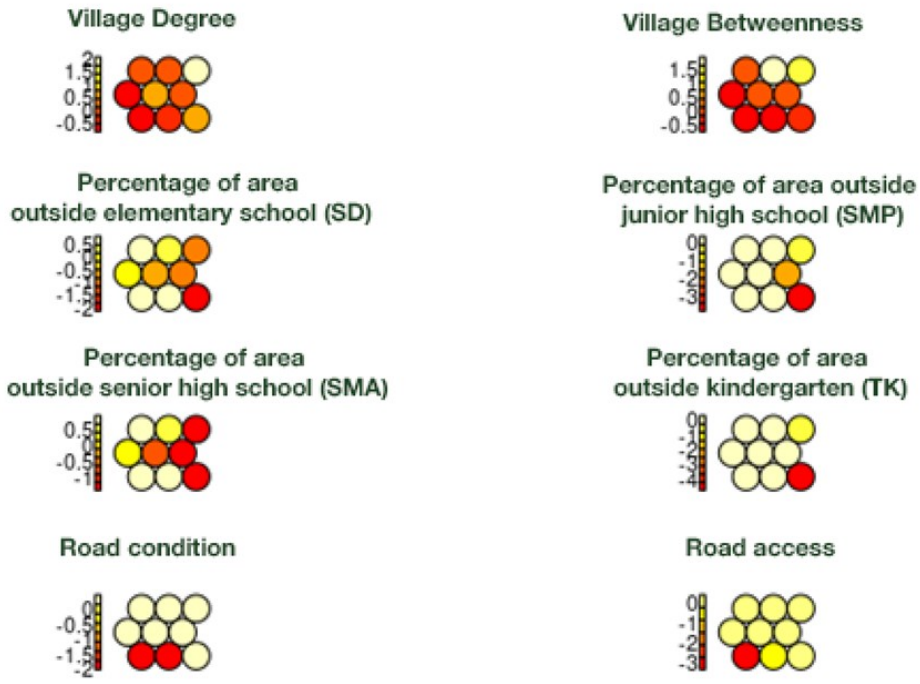

Figure 6. Heatmap Indicators of Accessibility of Educational Facilities
Source: Data Analysis

ments. Therefore, through policy intervention, the government must focus more on building new educational facilities or improving the quality and accessibility of roads in village areas that are outside the radius of educational facilities. Meanwhile, for other segments, the government can make policies according to the needs or problems that are dominant in that segment. The government can also focus on using village funds to develop other sectors, such as economy, health, and developing village businesses in villages that as a whole already have transportation, connectivity, and availability of adequate educational facilities, that is the villages in the third segment.

CONCLUSION

The classification process provides a visualization of the accessibility of education facilities in Ogan Komering Ulu Selatan regency. This visualization provides information about the accessibility characteristics of the village which are divided into three clusters:

1. The first cluster

   The problem in the first cluster in the accessibility of education facilities is the isolation of villages as a result of poor road quality and access, and also low village connectivity. In addition, the problem of access to education is also caused by the lack of educational facilities in the village or that the education facilities are outside the reach of the village. Considering the inadequate condition of transportation facilities and connectivity as well as the lack of educational facilities, villagers in this cluster have difficulties in obtaining adequate and proper education. Such low accessibility to education can affect the quality of life and the welfare of the villagers, and others.

2. The second cluster

   The second cluster is the villages that have adequate accessibility to educational facilities. This is because most of the villages have good connectivity and good transportation facilities. Moreover, the villages also have adequate educational facilities and it covers most of the village area.

Table 4. List of Villages by Segment

Segment	List of Villages	Number of Villages
1	Sidodadi, Gedung Ranau, Sumber Mulia, Simpang Sender Timur, Sumber Jaya, Tunas Jaya, Gemiung, Simpang Empat, Simpang Tiga, Singa Laga, Air Alun, Gunung Gare, Pematang Obar,	16
2	Kemang Bandung, Selabung Belimbing Jaya, Perean, Tanjung Agung, Sipatuhu Dua, Sumber Makmur, Remanam Jaya, Way Wangi Seminung, Bumi Agung, Sigigok Raya, Simpang Sender Tengah, Serumpun Jaya, Danau Jaya, Sido Rahayu, Sidodadi, Sumber Raya, Sinar Napalan, Sinar Baru, Mekar Jaya, Tanjung Baru, Pekuwolan, Nagar Agung, Bandar Alam Lama, Pulau Kemuning, Tanah Pilih	25
3	Sipatuhu, Tanjung Jati, Tanjung Baru Ranau, Simpangan, Simpang Agung, Muaradua Kisam, Simpang Luas	7
4	Pulau Duku, Air Rupik, Merbau, Surabaya Timur, Sukajaya, Gunung Raya, Tanjung Baru, Bedeng Tiga, Tanjung Kemala, Subik, Padang Ratu, Air Kelian, Tanjung Menang, Tanjung Sari, Lubar, Bungin Campang, Jagaraga, Sukabanjar, Sukaraja Ii, Batu Belang 2, Datar, Banjar Agung, Majar, Bunga Mas, Lubuk Liku, Sukabumi, Kota Agung, Surabaya, Kuripan, Padang Bindu, Kota Aman, Kagelang Blambangan, Tanjung Kurung, Bumi Genap, Balaian, Tebat Gabus, Padang Lay, Kota Padang, Tanjung Beringin, Ulak Agung Ulu, Penyandingan, Sukananti, Lawang Agung, Bayur Tengah, Keban Agung, Pematang Danau, Ulu Danau, Sebaja, Sadau Jaya	49
5	Kepayang, Surabaya, Rantau Nipis, Karang Indah, Kota Batu, Pagar Dewa, Sukamarga, Jepara, Hangkusa, Tanjung Sari, Way Relai, Pakhda Suka, Tanjung Durian, Kota Way, Serakat Jaya, Durian Sembilan, Sumber Ringin, Tanjung Jaya, Tanjung Sari, Sinar Mulyo, Damarpura, Sinar Danau, Pelangki, Bumi Jaya, Tanjung Raya, Tanjung Menang Ilir, Talang Baru, Saung Naga, Negeri Batin Baru, Sukajadi Blambangan, Gedung Nyawa, Gedung Wani, Sura, Karang Endah, Danau Rata, Tenang, Padang Bindu, Pajar Bulan, Bandar Alam Baru, Ulak Agung Ilir, Alundua, Dusun Tengah, Penantian, Sukaraja, Pagar Dewa, Siring Alam, Tanjung Jati, Campang Jaya, Pulau Beringin, Cukoh Nau	50
6	Way Timah, Sugih Waras, Penantian, Tangsi Agung, Terap Mulia, Gunung Aji, Pilla, Mekar Sari, Sukarami, Sri Menanti, Sukajaya, Peninggiran, Kuripan 2, Bedeng Blambangan, Pulau Panggung, Tanjung Tebat, Pulau Kemiling, Muara Sindang Tengah, Pecah Pinggan	19
7	Kota Dalam, Tanjung Besar, Sinar Marga, Kota Baru, Galang Tinggi, Sukaraja, Srimenanti, Air Baru, Bunut, Suka Negeri, Telanai, Tanjung Harapan, Kiwis Raya, Sipin, Karet Jaya, Kembang Tinggi, Karang Agung, Tanjung Beringin, Bandar, Tekana, Pendagan, Mehanggin, Tanjung Menang Ulu, Kenali, Negeri Cahya, Sukaraja I, Tanjung Iman, Karang Pendeta, Sukarena, Sugih Waras, Padang Sari, Penanggungan, Merpang, Air Baru,	50

	Gunung Megang, Muara Payang, Siring Agung, Sugihan, Pangandonan, Pius, Muara Sindang, Gunung Batu, Pagar Agung, Tanjung Bulan, Tanjung Bulan Ulu, Muara Sindang Ilir, Watas, Ujan Mas	
8	Simpang Sender Utara, Gunung Tiga, Gedung Lepihan, Pelawi, Bendi, Gunung Cahya, Ruos, Sukarami, Negeri Agung, Madura, Negeri Batin, Kota Karang, Simpang Saga, Perupus Blambangan, Simpang Lubuk Dalam, Simpang Campang, Kemu, Simpang Pancur, Tanjung Kari, Aromantai, Anugerah Kemu, Kemu Ulu, Pulau Beringin Utara	23
9	Teluk Agung, Banding Agung, Sukamaju, Tanjung Setia, Gedung Baru, Sukabumi, Simpang Sender Selatan, Talang Padang, Rantau Panjang, Bumi Agung Jaya, Gunung Terang, Peninjauan, Blambangan	13

Source: Data analysis

3. The third cluster

   Most of the villages in Ogan Komering Ulu Selatan regency are in the third cluster. The villages in the third cluster have a condition of the availability of educational facilities at levels that are inadequate or outside the radius. When compared to the first cluster, with these conditions, the villagers in the third cluster still have a good chance to get educational services because it is supported by transportation and connectivity facilities that are good enough even though it must take some efforts to access these facilities.

Classification results map the villages and indicators into segments based on the accessibility conditions of education facilities in Ogan Komering Ulu Selatan regency. The information in each cluster formed can be a guideline or reference for the government in finding policy problems, providing an overview of policy results, providing information on expected results, policy performance, and what policies should be taken. It is hoped that the type III error will not occur and the government can intervene or make development plans according to the conditions and problems that occur in the village so that government policies are right on target and solve the right problems.

The weakness of this research is that it only uses villages map and does not use forests maps or maps of non-settlement areas. The assumption used in this research is that the population spreads out in the village area and around other public facilities. Future research is expected to use maps or areas of non-settlement areas to improve accuracy in calculating the percentage of areas outside the radius of achievement of educational facilities and other public facilities. Another drawback of this research is that it does not use the variable of distance between the village center and the closest educational facilities due to a lack of resources and time to create and identify the road network. It is hoped that further research can use and create a road network with GIS to obtain the variable of the closest distance between the village center and the closest educational facilities with the Dijkstra algorithm so that it can be used for other policy research such as educational zoning policies.

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