Analysis of Elementary, Middle and High School Gross Enrollment Rates (APK) in the Villages and Sub-Districts Surrounding the Dramaga IPB Campus

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Abstract – One of the important roles of tertiary institutions is to contribute to the surrounding environment through community service. IPB University as a State Educational Institution is expected to be able to contribute to the surrounding environment, especially the 12 villages around the IPB campus. The research objective was to determine the level of gross enrollment rate (APK) both at the elementary, junior high and high school levels in the villages around the IPB campus. GER is the simplest indicator to measure the absorption of the school-age population at each level. The benchmark for the success of education lies in its implementation. The population of this study were all residents aged 7-18 years who live in 12 villages around the IPB campus. This research was conducted using quantitative methods using descriptive analysis of percentages. The research data collection method was carried out by means of village data collection which synthesized census, spatial and community participation approaches through the precision village data method. This method places the unit of analysis for families and individuals in the Rukun Warga-RW as the smallest regional unit in the village. The gross enrollment rate (APK) in the 12 villages/sub-districts surrounding the IPB campus in general, the highest gross enrollment rate is at the junior high school level. Of the 12 villages/sub-districts surrounding the IPB campus, there are 6 villages whose APK grades for elementary school education levels are still below 75%, namely Benteng Village, Cihideung Ilir Village, Bantarjaya Village, West Semplak Village, Balumbang Jaya Village and Situ Gede Village. At the junior high school level, only one village had an APK score of less than 75%, namely Neglasari Village, while at the senior high school level there were 4 villages namely Neglasari Village, Sinarsari Village, Cibanteng Village and Balumbang Jaya Village. By using the Village Clusterization analysis around the IPB campus based on the gross enrollment rate similarity in GER levels of 12 villages, it is known that cluster 1 with GER SD and GER SMP is lower than the average and GER SMP scores are higher than the average. In cluster 2, the average GER for SD is higher than the average, while the GER for SMP and SMA is lower than the average, while in cluster 3, the average GER for SD is lower than the average and the GER for SMP and SMA is higher. higher than the average consists of 6 Villages. By carrying out a clustering analysis of villages around the IPB campus based on GER, it will be able to help understand the different characteristics of GER in these villages according to each cluster. So that it can assist in planning programs and policies aimed at increasing educational participation in the ring villages

Keywords – Gross Enrollment Rate, Village, Campus, Education, Community Service.

I. INTRODUCTION

Poverty is still an unsolved problem in Indonesia. The living conditions of people living in poverty tend to face many obstacles, including a low level of education which causes a limited level of knowledge and skills. The problem of poverty causes many school-age children to be unable to get an education. Poverty continues to be one of the barriers to accessing education, even though the government has created various educational opportunities (Jonaidi 2012). Education is a very important sector

and must be prioritized in order to achieve the national goal of educating the nation's life, which of course will be followed by an increase in quality human resources towards sustainable national developmentHasbullah 2009). Education plays an important role in improving the quality of human resources to learn and master a competency, as well as developing knowledge to achieve a better standard of living (Agustin Y and Aziz 2021.

Poverty occurs because one of them is the low level of public education. The most decisive factor in improving the welfare of the poor is not objects, nor land for agriculture, but human capital improvement is done through investment in human resources through education (Schultz T 1981). Education plays a key role in the ability of developing countries to absorb modern technology and develop the capacity to sustain growth and development (Tinto V 1975).

Many academics and practitioners in the field of education have criticized the quality of education in Indonesia, one of which is the main issue that has not created equal educational equity in Indonesia. The education system in Indonesia must meet the needs of a large, growing, and diverse population with differences in enrollment rates between regions (Wibowo 2018).

Public relations for tertiary institutions is a two-way relationship between tertiary institutions and the community to discuss certain ideas and information that are useful for improving education. Relations with the community are based on the fact that (1) the community is one of the sponsors of the school, (2) the teaching and learning environment also takes place and is in the community and (3) the community maintains it for the benefit of the school's education of their children.

Thus, education has a very important role, especially in the development of human resources for the realization of sustainable development. Education is important because it can direct students to be able to think, prioritize experience, and demand active involvement of students in the learning process (Agustun Y and Jamna J 2021).

In increasing village prosperity, a strategy is needed in village development, especially in increasing the education of its citizens. Conventional patterns (old traditions) in carrying out village development must be abandoned. This is the importance of inclusive innovation in helping villages to be able to promote community welfare (Sjaf et al. 2020).

Village development must go through two ways, namely first, village development is carried out using appropriate, accurate, and actual data based on the results of research and studies conducted by government agencies, educational institutions, and Civil Society Organizations (Sampean et al. 2019).

Based on the background above, we consider it important to analyze the Gross Enrollment Rate in the IPB Campus Circle as part of formulating University policies as part of educating the nation's life.

Objective

The aim of the study was to analyze the gross enrollment rate (APK) at both the elementary school (SD), junior high school (SMP) and senior high school (SMA) levels in the villages around the IPB Campus and cluster the villages based on similarity in the APK level of 12 villages around the IPB campus.

II. RESEARCH METHODS

This research was conducted using quantitative methods using descriptive analysis of percentages. The research data collection method was carried out by means of village data collection which synthesized census, spatial and community. This method places the family and individual analysis units of the Rukun Warga-RW as the smallest regional unit in rural areas (Sjaf et al. 2022). The data analysis used is with the APK Criteria table to measure community education participation based on Precision Village Data. Age categories are used to analyze APKs of different age groups, this is done to obtain a more complete picture of educational participation in a region. By paying attention to the age categories in the APK, it can be known the age group and facilitate the analysis of educational gaps between certain age groups. And in this study also uses cluster analysis which is useful in concluding a complex data by grouping objects that have similar characteristics. A good cluster has the following characteristics: (1) Has high homogeneity between objects in one cluster (within cluster), (2) Has high heterogeneity between one cluster and another (between clusters). Based on these characteristics, it can be stated that an effective cluster is a cluster consisting of several objects that have similarities between one cluster and another, but are very different from other clusters. In this case, similar words can also be interpreted with the level of similarity of characteristics between two objects (Santoso and Singgih. 2015).

In calculating the Gross Participation Rate (APK) using the following method:

$$\text{APK SD} = \frac{\text{Number of primary school students or equivalent}}{\text{Total population aged 7-12 years}} \times 100\%$$

$$\text{APK SMP} = \frac{\text{Number of Junior high chool students or equivalent}}{\text{Total population aged 13 - 15 years}} \times 100\%$$

$$\text{APK SMA} = \frac{\text{Number of primary school students or equivalent}}{\text{Total population aged 16 -18 years}} \times 100\%$$

Completeness of compulsory education is divided into four categories (Ministry of National Education 2006).

(1) Complete Primary when APK reaches 80% - 84%

(2) Complete Madya when the APK reaches 85% - 89%

(3) Main Complete when APK reaches 90% - 94%

(4) Complete Plenary if Minimun APK reach 95%

III. RESULTS AND DISCUSSION

Elementary school gross enrollment rates in the Villages of the Dramaga IPB Campus Circle

Based on the results of the census of precision village data, it is known that the population aged 7-12 years in 12 villages around the Dramaga IPB Campus in 2020 totaled 10,738 people, with the highest number in Cibanteng Village of 1,556 people (Sjaf et al. 2020), followed by Bantar Village Jaya there are 1,153 (Sjaf et al. 2020), in Neglasari Village there are 1,171 (Sjaf et al. 2020) and at least in Margajaya Village there are 288 people (Sjaf et al. 2020) (Table 1).

Table 1 Residents Aged 7-12 Years in the Village Circle of IPB Dramaga Campus

Village	Total Population Aged 7 – 12 Years
Balumbang Jaya	665
Bantar Jaya	1.153
Benteng	817
Cibanteng	1.556
Cihideung Ilir	895
Cikarawang	917
Dramaga	651
Margajaya	288
Neglasari	1.171
Semplak Barat	742
Sinar Sari	1.026
Situ Gede	857
Total	**10.738**

In general, the primary school enrollment rate in 12 villages around the IPB campus is included in the Complete Primary category with a percentage of 84.2% with various patterns. If viewed per village, it is known that there are two villages that fall into the Complete Complete Plenary category, namely Cibanteng Village (115.5%) and Neglasari Village (107.3%), while those included in the Complete Middle Complete category are Cikarawang Village (87%) and Village Dramaga (86.6%), and the Complete Primary category is Sinar Sari Village (84.9%), there are even seven villages that fall into the incomplete category (the percentage gross enrollment rate is <80%), namely Balumbang Jaya Village, Bantar Jaya Village, Benteng Village, Cihideung Ilir Village, Margajaya, West Semplak Village and Situ Gede Village (Table 2). There are still many villages that fall into this incomplete category that need attention due to several factors. These factors include (1) late entry to elementary school, weak socioeconomic factors, and (3) cultural factors of people who have not prioritized education.

Table 2 Gross Participation Figures of Elementary Schools in the Village of IPB Dramaga Campus Circle

Village	Residence aged 7 – 12 years old	Number of student SD	APK SD (%)	information
Balumbang Jaya	665	489	73.5	incomplete
Bantar Jaya	1.153	840	72.8	Incomplete
Benteng	817	581	71.2	incomplete
Cibanteng	1.556	1.798	115.5	Complete plenary
Cihideung Ilir	895	521	58.2	incomplete
Cikarawang	917	798	87.0	Complete intermediate
Dramaga	651	564	86.6	Complete intermedite
Margajaya	288	223	77.4	incomplete
Neglasari	1.171	1256	107.3	Complete plenary
Semplak Barat	742	508	68.5	incomplete
Sinar Sari	1.026	871	84.9	Complete intermdiate
Situ Gede	857	589	68.7	Incomplete
Total	**10.738**	**9.038**	**84.2**	

Middle school gross enrollment rates in the Villages Surrounding the Dramaga Campus of IPB

After completing elementary school education for children aged 13-15 years, they are required to continue and attend education at a higher level, namely junior high school (SMP). Furthermore, it can be seen the number of residents aged 13-15 years in the villages around the IPB campus who should be attending junior high school (Table 3). From these data it can be seen that the number of residents in the 12 villages around the Dramaga IPB Campus who are 13-15 years old in 2021 is 5,182 people who are children who should be attending junior high school level education. The largest population aged 13-15 years among the villages in the Dramaga Campus Circle of IPB is Cibanteng as many as 707 people, followed by Bantar Jaya Village with 572 people and Neglasari Village with 557 people, while the least is Margajaya Village with 159 people.

Table 3 Residents Aged 13 – 15 Years in the Village Circle of IPB Dramaga Campus

Village	Total Population Aged 13 – 15 Years
Balumbang Jaya	340
Bantar Jaya	572
Benteng	403
Cibanteng	707
Cihideung Ilir	406
Cikarawang	444
Dramaga	368
Margajaya	159
Neglasari	557
Semplak Barat	354
Sinar Sari	492
Situ Gede	380
Total	**5.182**

The population aged 13-15 years in the Village of IPB Campus Ring is generally less than the number of junior high school students, in other words the number of junior high school students exceeds the population aged 13-15 years so that a surplus of 7.4% (382 people surplus) is included in the complete category. plenary, but there are villages that do not have the opportunity to attend junior high school level education, namely in Cibanteng Village and Neglasari Village. This is caused by several factors, namely (1) late completion of SD/MI, (2) weak socioeconomic status, and (3) cultural attitudes that do not yet support the importance of education.

The indicator of the junior high school gross enrollment rate on the success of the 9-year in the circle Village of the IPB Dramaga Campus, it is generally good to be shown with 10 villages that are included in the Paripirna Complete category, while there is 1 village that is included in the Tuntas Pratama category, namely Cibanteng Village, and 1 more village that is included in the incomplete category with an APK value of 53%, namely in Neglasari Village (Table 4).

Table 4. Junior high school gross enrollment rates in the Villages Surrounding the Dramaga IPB Campus Dramaga

Village	Population Aged 13 – 15 Years	Number of Junior High School Students	APK SMP (%)	information
Balumbang Jaya	340	395	116.2	Complete Plenary
Bantar Jaya	572	726	126.9	Complete Plenary
Benteng	403	531	131.8	Complete Plenary
Cibanteng	707	578	81.8	Complete Primary
Cihideung Ilir	406	528	130.0	Complete Plenary
Cikarawang	444	467	105.2	Complete Plenary

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Dramaga	368	386	104.9	Complete Plenary
Margajaya	159	172	108.2	Complete Plenary
Neglasari	557	295	53.0	Incomplete
Semplak Barat	354	416	117.5	Complete Plenary
Sinar Sari	492	551	112.0	Complete Plenary
Situ Gede	380	519	136.6	Complete Plenary
Total	**5.182**	**5.564**	**107.4**	

High School Gross Enrollment Rate in the Village of Dramaga IPB Campus Circle

Senior High School is the level of education that must be taken after completing Junior High School education for children aged 16-18 years. Based on the data obtained, it is known that the number of residents aged 16-18 years in the villages around the IPB campus who should have attended high school level schools was 5,304, who were children who should have received high school level education. The population aged 16-18 years, the largest village in the IPB Campus Circle is Cibanteng Village with 708 people, followed by Neglasari Village with 564 people and Bantar Jaya Village as many as 542 people, while the least is Margajaya Village with 164 people (Table 5).

Table 5 Population Age 16-18 Years in the Village Circle of Dramaga IPB Campus

Village	Total Population Aged 18 – 24 Years
Balumbang Jaya	366
Bantar Jaya	542
Benteng	414
Cibanteng	708
Cihideung Ilir	504
Cikarawang	474
Dramaga	335
Margajaya	164
Neglasari	564
Semplak Barat	350
Sinar Sari	476
Situ Gede	407
Total	**5.304**

Residents aged 16-18 years in the IPB Campus Circle Village who had the opportunity to attend high school level education reached 4,092 people or 77% of the total population aged 16-18 years (5,304 people). The results of the analysis of high school/equivalent APKs show that there are 6 villages that fall into the incomplete category with APK scores below 80%, namely Balumbang Jaya Village (69.1%), Bantar Jaya Village (79.3%), Cibanteng Village (56.9%), Cihideung Village Ilir (77.2%), Neglasari Village (62.6%), and Sinar Sari Village (74.6%). And those who fall into the Completed Primary category are 2 villages, namely Benteng Village (84.1%) and Cikarawang Village (84.6%), The camplete intermadiate category has 1 village, namely Margajaya Village (89.6%), the Main Complete category there are 2 villages, namely Dramaga Village (90.7%) and Situ

Gede Village (92.4%). Meanwhile, those who are included in the Complete Plenary category with a minimum APK value of 95% are found in West Semplak Village (95.1%).

Table 6 High School Gross Enrollment Rates in the Villages Surrounding the Dramaga IPB Campus

village	Population Aged 16 – 18 Years	Total student SMA	APK SMA (%)	Information
Balumbang Jaya	366	253	69.1	Incomplete
Bantar Jaya	542	430	79.3	Incomplete
Benteng	414	348	84.1	Complete primary
Cibanteng	708	403	56.9	Incomplete
Cihideung Ilir	504	389	77.2	Incomplete
Cikarawang	474	401	84.6	Complete intermadiate
Dramaga	335	304	90.7	MainCompletion
Margajaya	164	147	89.6	Main Completion
Neglasari	564	353	62.6	Incomplete
Semplak Barat	350	333	95.1	completePlenary
Sinar Sari	476	355	74.6	incomplate
Situ Gede	407	376	92.4	Main Completion
Total	**5.304**	**4.092**		

Grouping of Villages around the IPB Campus Based on Gross Participation Rates

Based on an analysis of the gross enrollment rates of three levels of education, namely elementary, junior high and high school in 12 villages around the IPB Campus, it was found that the lowest achievement was the elementary level gross enrollment, which was 84%. which were dominated by villages in the incomplete category (participation rate <80%) as many as 7 seven villages, then the high school level with 92% achievement but there were still many villages included in the incomplete category. Only the level of junior high school education exceeds 95% and is dominated by the Complete Plenary category (fig. 1).
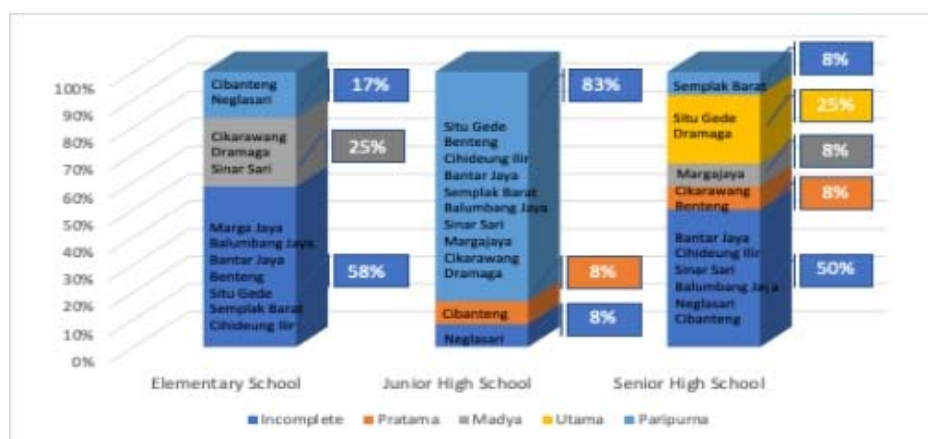

Fig. 1. Persentase Desa Berdasarkan Kategori Ketuntasan

One of the Government's important policies in improving education services is completing the implementation of 9-year Basic Education. Completion of 9 years of basic education shows satisfactory results, especially at the junior high school level, in reality the gross enrollment rate for junior high schools has reached 107.4%. If you follow the standards of the Ministry of National Education, the category of completing 9 years of basic education in 12 Campus Circle Villages is in the plenary complete category (minimum APK 95%). Meanwhile, at the SD level, the achievement of SD APK reached 84.2%. When viewed from the standard category of the Ministry of National Education, the complete category for the elementary level is the primary complete category (APK between 80% - 84.9%). At the high school level, the realization of APK achievement reaches 92%. When viewed from the category for the high school level, it is included in the main complete category (APK between 90% - 94%).

The results of the clustering analysis calculations form 3 clusters for each variable. The variable in table 7 is the final cluster centers which are the results for standardized values. Negative numbers indicate that the data is below the total average and positive numbers mean that the data are above the total average.

Tabel 7 Final cluster centers

APK	Cluster		
	1	2	3
Zscore: APK SD	-.51803	183.570	-.26655
Zscore: APK SMP	.46573	-182.919	.29924
Zscore: APK SMA	-.38205	-164.364	.80258
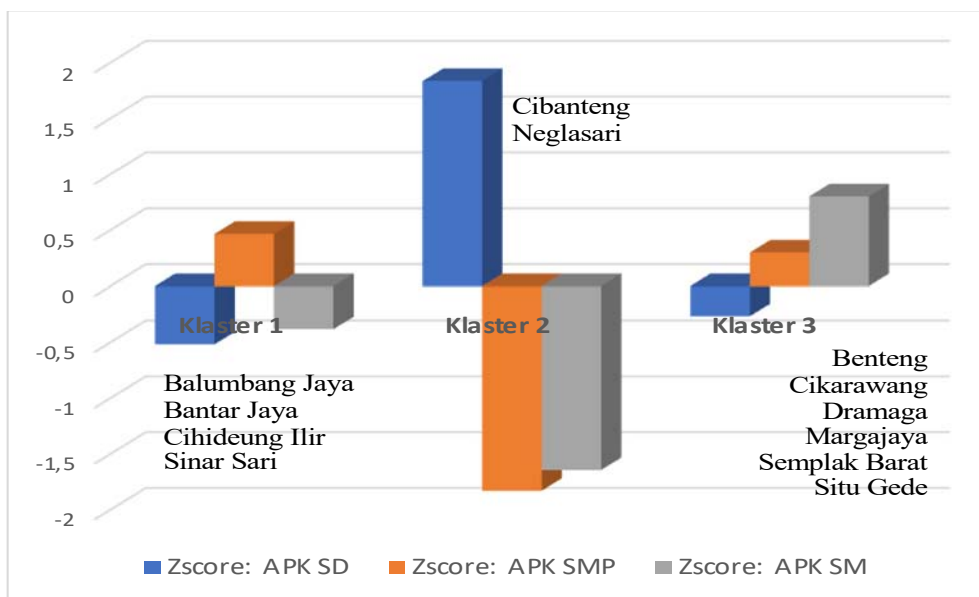
Gambar 2 Clustering based on gross enrollment rates

Based on the calculations generated from each variable, namely GER SD, SMP and SMA, the characteristics of each cluster are obtained. The following is an explanation for each cluster:

a. Cluster 1 contains GER SD and GER SM with lower than average scores and SMP GER scores higher than average

b. Cluster 2 contains GER SD with a value higher than the average, while GER for SMP and SMP is lower than the average

c. Cluster 3 contains SD APK with lower than average values and SMP and SM APKs higher than average

Based on the similarity in the APK level of the 12 villages, it is known that cluster 1 consists of 4 villages consisting of Balumbang Jaya Village, Bantar Jaya Village, Cihideung Ilir Village and Sinar Sari Village, cluster 2 consists of 2 villages namely Cibanteng Village and Neglasari Village, while cluster 3 consists of 6 villages namely Benteng Village, Cikarawang Village, Dramaga Village, Margajaya Village, West Semplak Village and Situ Gede Village. More clearly can be seen in Table 8 below.

Table 8 Grouping of villages based on gross enrollment rate

Village	Cluster
Balumbang Jaya	1
Bantar Jaya	1
Benteng	3
Cibanteng	2
Cihideung Ilir	1
Cikarawang	3
Dramaga	3
Margajaya	3
Neglasari	2
Semplak Barat	3
Sinar Sari	1
Situ Gede	3

The results of this grouping can be a proxy for a policy approach in increasing gross enrollment rates. Through the concept of community development as social planning (Ife 1995), IPB can help open citizens' access to professional, technical, facilities and other incentives to increase citizen participation by collaborating with local governments, both cities and districts, to provide packages and scholarships, especially for children who drop out of school or do not attend school at the SD and SMP levels. Furthermore, it can change professional behavior to be more sensitive to the needs, concerns, and ideas of community members by organizing job training for school dropouts at the upper secondary level. By collaborating with all faculties and study programs at IPB, IPB always provides technical skills provision for the community in improving work skills so that they can be accepted in the world of work and can increase family income.

IV. CONCLUSION

The gross enrollment rate (APK) in the 12 villages/sub-districts surrounding the IPB campus in general, the highest gross enrollment rate is at the junior high school level. Of the 12 villages/sub-districts surrounding the IPB campus, there are 6 villages whose APK grades for elementary school education levels are still below 75%, namely Benteng Village, Cihideung Ilir Village, Bantarjaya Village, West Semplak Village, Balumbang Jaya Village and Situ Gede Village. At the junior high school level, only one village had an APK score of less than 75%, namely Neglasari Village, while at the senior high school level there were 4 villages namely Neglasari Village, Sinarsari Village, Cibanteng Village and Balumbang Jaya Village.

Clustering of villages around the IPB campus based on the similar gross enrollment rate of the GER level of 12 villages, it is known that cluster 1 with SD GER and SM GER values are lower than the average and SMP GER values are higher than the average consisting of 4 villages consisting of The villages of Balumbang Jaya, Bantar Jaya, Cihideung Ilir and Sinar Sari, cluster 2 with an average GER SD higher than the average while GER SMP and SMA are lower than the average consist of 2 villages, namely Cibanteng and Neglasari, while the cluster 3 with an average GER for elementary school is lower than the average and

GER for junior high school and senior high school is higher than the average consisting of 6 villages namely Benteng, Cikarawang, Dramaga, Margajaya, Semplak Barat and Situ Gede. By carrying out a clustering analysis of villages around the IPB campus based on GER, it will be able to help understand the different characteristics of GER in these villages according to each cluster. So that it can assist in planning programs and policies aimed at increasing educational participation in villages around the IPB campus.

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