Analysis of Elementary School Teachers Needs Based on Projection of Growth of School-Age Population in Sukabumi District in 2026

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Abstract—**This study aims to analyze the needs of teachers in Sukabumi Regency in 2026. The method used in this study is descriptive and projection methods. While the analysis of technical data carried out is by calculating the total population growth, projections of the school-age population, projections of study group needs, analysis of the condition of available teachers, and analysis of teacher needs. This study is an implementation of social demands on educational planning. Therefore, the results of this study will show the conditions and projections of residents in Sukabumi Regency as well as the condition of available teachers and projections of teacher needs in the future. Population growth in Sukabumi Regency is included in the slow category with a growth rate of 0.013%. Growth rates naturally affect educator projections. Based on the projection results, in 2026 the population in Sukabumi Regency will be 2,948,902 people, with a school-age population of 87,458 people. The number of school-age population will certainly affect the need for the number of study groups in Sukabumi Regency. In 2026, the total study group based on projected results is 10,727. This condition will certainly affect the number of teachers needed. At the end of 2026 the number of available teachers is 7,178 people. This condition indicates an increase in the need for teachers in Sukabumi Regency. Therefore, Sukabumi Regency requires the procurement of teachers who are in accordance with academic qualifications.**

Keywords— teacher needs, educational planning, social demand

INTRODUCTION

The teacher is one of the important elements, the spearhead in education [1] [2]. Therefore, teachers at any level of education need to plan carefully to fulfill this. In the context of school basic education planning, teacher needs planning is carried out using a social demands approach or a social needs approach. The social demand approach or social needs approach is an effort to approach educational development, namely by providing institutions and facilities to meet school needs and meet community needs for education [3]. This is because education is a form of public service that must be provided to everyone without exception, where the results of this education will have an impact both personally and for the state [4] [5]. Therefore, one form of service that needs to be improved in education is an increase in the number of qualified teachers.

Based on Government Regulation Number 13 of 2015 concerning National Education Standards, ideally at every level of education there should be a teacher available with a ratio of 1:28 meaning 1 teacher for 28 students. In addition, in each education unit there must be a minimum of 6 teachers, while regional education units must have a minimum of 4 teachers. Of course, this number does not include teacher subjects such as PJOK teachers and PAI teachers. The criterion for the number of teachers is one of the National Education Standards, of course, each education unit must fulfill it. Therefore, each internal education unit at SD Negeri Pendidikan must have a number of class teachers that fit the large study group.

One of the methods to find out the needs of class teachers according to the National Education Standards is to carry out an analysis of educational planning through a social demand approach. This approach to social needs is of course adapted to demographic and territorial aspects. The area to be identified for carrying out this education plan is Sukabumi District in West Java Province. This was done because Sukabumi Regency is one of the regencies with the largest population and has a very large area in West Java (BPS, 2021).

Population density and area will certainly have an impact on needs, especially the needs for educational facilities and infrastructure for educators, namely teachers. While the increase in population is caused by several

factors, one of which is height, number of births. Based on data from the Central Statistics Agency, the population of Sukabumi Regency in 2021 is 2,761,480 people. From these data, the total school-age population is 270,211 people, while the number of students who are in both SD and Madrasah Ibtidaiyah schools is 290,660 people. This proves that the gross enrollment rate at the elementary school level is 107.56%. Therefore, if the allocated needs for class groups and teachers are as many as 10,312 study groups.

Data from the National Education Planning Indicator (NIEP) states that the number of classrooms in Sukabumi Regency is 8,607 units. This number certainly does not meet the National Education Standards which require a study group to student ratio of 1:28. This is due to the fact that there are still many schools that carry out the teaching and learning process in two hours, namely morning and afternoon, especially for grades 1 and 2. The minimal number of study groups is also proportional to the shortage of class teachers.

Based on data from the Sukabumi Regency Education Office Staffing, the number of PNS Elementary School teachers in Sukabumi Regency is 3,434 people. Based on these data, of course it can be concluded that Sukabumi Regency is experiencing a shortage of teachers. This causes the number of teachers present is not proportional to the number of study groups. In fact, these conditions are still very far from the ideal National Education Standards.

Therefore, meeting the needs of teachers needs to be done carefully and precisely planning so that deficiencies in the future can be anticipated immediately. If teacher planning is carried out optimally, the quality of education services will also increase. This is what the author pays attention to in conducting a study on Elementary School Teacher Needs Analysis based on projected growth of the school-age population in Sukabumi Regency in 2026.

METHODS

The method used in this research is descriptive method and projection method. The descriptive method is an explanatory research method that studies current and future phenomena using descriptions and estimates of natural conditions [6] [7]. While the projection method is used to estimate a situation or trend that will come through numerical results [8] [9]. Then, the research approach used is a qualitative approach. Where in this study, researchers explored and understood the meaning of a number of participants with specific strategies that were interactive

and flexible, which aimed to understand social problems [10] [11].

The focus of this study is on the projected need for teachers in Sukabumi Regency in the future, in 2026 to be precise. The data sources used in this study are primary data and secondary data. Primary data was obtained through interviews with relevant stakeholders in Sukabumi Regency, namely the Head of Data and Information Planning for Employment Planning at the Human Resources and Development Agency for Sukabumi Regency, Head of Data Processing and Statistics Section at the Population and Civil Registry Office for Sukabumi Regency and Information Management Officers and Documentation of the Education Office of Sukabumi Regency. While secondary data consists of two data, namely school statistics and population data. Statistical data for schools in the Sukabumi district were taken from the Basic Education Data (Dapodik) at the Sukabumi District Education Office operator. Meanwhile, population data was obtained from the Sukabumi Regency population and civil registration service and the Central Statistics Agency website.

Data collection techniques used in this research are documentation study techniques and interviews. Documentation studies are used to obtain an overview and findings about information in the field [12], of course the information used is information that is relevant to research [13]. Furthermore, to answer the research questions used data analysis techniques in accordance with the method used is the projection method.

RESULTS AND DISCUSSION

A. Educational Planning

Planning is very important in making a program without exception in the field of education. According to Udin Syaefuddin Saud and Abin Syamsudin Makmun [14] explained that educational planning is an intellectual process for analyzing, formulating and making decisions that have internal consistency and relate systematically to other decisions in one field or another, so that this planning does not have time limit for one type of activity. Furthermore [15] explains that in a plan there are methods for conducting learning starting from mapping goals, acting until they are right.

In making plans, especially educational planning, of course, one must apply rational principles, systematic analysis of the educational development process with the aim that education can be carried out more effectively and efficiently [16]. Therefore, in making educational

planning there are many possible approaches to be used so that this planning can be carried out in a systematic and organized manner. The main types of approaches to educational planning are cost-benefit analysis, workforce planning and social demand [17].

B. The Social Demands Approach

The social demands approach or the social needs approach is one of the educational planning approaches. In this approach, education is seen as a public service that must be provided to all citizens as a social need and right of every citizen. It was further explained that in planning education with this social demand approach we must pay attention to individual needs in education such as paying attention to the place and time where this must become a national development plan.

Therefore, the relevant educational planning is to use the social demands approach we have to project the data. Our data projects span population growth, community participation, student flow, to dream communities. Where in planning we can use projections of educational participation targets for a plan based on mechanistic trend analysis, which is then interpolated [20]. So that in this study researchers will process data that will be projected, including population growth in Sukabumi Regency, the age of the school population, to the need for teachers in Sukabumi Regency.

C. Teacher Needs

The teacher is one of the supporting factors for the implementation of education at every level of education, so that their role is very important, especially for the survival of the nation. Therefore, the needs of teachers must be adjusted to the qualifications and needs of each level. This is in line with Mari's opinion that the need for teachers refers to the need for educators to fill very important positions that cannot be replaced by others, in other words they must be adapted to the needs and characteristics of students.

Based on teacher and lecturer law number 14 of 2005 and Government Regulation Number 74 of 2008 it is stated that teachers are required to have academic qualifications S1/D IV, educator certificates, competence, physically and mentally healthy and have the ability to realize the goals of National Education. Therefore, the procurement of teaching staff, in this case teachers, must be carefully prepared through the projection method.

D. Projection of Teacher Needs

Teacher projection is important in educational planning. This is in line with [23] opinion which states that the teacher is a central activity center in schools, where schools may not necessarily be able to organize education effectively and efficiently, if the fulfillment of teacher needs is not properly planned [23]. This is because the quantity of teachers, which is always growing, is influenced by new admissions, incoming transfers, outgoing transfers, promotions and retirement [24].

The importance of future teacher needs must be projected from now on, so that there is no gap between the number of existing teachers and the number of teachers needed in the future. If the number of teachers available is small, while educational institutions need many teachers, there will be a decrease in the quality of education. Conversely, if the number of teachers is abundant, while educational institutions need a few teachers, there will be a buildup in the number of employees and even unemployment. In determining the projected need for teachers based on the total population in an area, the total school-age population, the gross enrollment rate, the number of teachers available and the ratio of teachers based on existing national education standards. The calculation of the projected need for teachers in elementary schools is based on the number of existing study groups.

E. Population Projection

Determining the projected population is the first step in determining the projection of teacher needs. Population projection is an effort made to estimate the future population, based on current or past population data, especially those related to growth trends [25]. In this project population is based on the state of fertility, mortality and migration [26]. As for the population projection method, there are 2 methods that can be used, namely the mathematical method and the component method. As for this study, researchers used the mathematical projection method. The mathematical method is a projection method that is calculated based on population data. This is done if population components such as fertility, mortality, and migration cannot be known [27].

F. Population Projection and Teacher Needs in Sukabumi Regency

In determine teacher needs in the district Sukabumi, there are steps that must be taken conducted namely:

1) Projection of the Total Population of Sukabumi Regency in 2022-2027

In count amount population Regency Sukabumi years 2022-2027, researcher use approach mathematical with method count number rate growth resident . This means that the initial data needed is the previous population of Sukabumi Regency, namely from 2015 to 2021, sourced from the Central Bureau of Statistics for Sukabumi Regency, shown in the following table:

TABLE I.   TOTAL POPULATION OF SUKABUMI REGENCY

Year	201 7	201 8	201 9	20 20	20 21
Population	2 . 453.50 0	2 . 460.69 0	2 . 466.27 0	2 . 725.45 0	2,761 . 48 0

Based on the data table 1, then could counted projection amount population as following :

Known:
Amount Population in 2020 (Po) = 2,725,450
Amount Population in 2021 (Pn) = 2,761,480
Period time (t) = 2021-2020 = 1,
Number exponential (e) = 2.718281828
asked: Rate Growth Population (r)
Equality $P_t = P_o(1 + r)^t$
Answer   :

$$r = \left(\frac{Pt}{Po}\right)^{1/1} - 1 \qquad r = \left(\frac{2.761.480}{2.725.450}\right)^{1/1} - 1$$
$$r = 1,013219835 - 1$$
$$r = 0,013219835$$

So, speed growth Regency Sukabumi is 0.013 per year . So projection amount population counted use equation (2.1), when Po is population year beginning projection, that is of 2,761,480 then could counted until six year projection. Projection amount population could detailed from 2022 to _ year 2027, through table following:

TABLE II.   POPULATION PROJECTION FOR 2022-2027 SUKABUMI REGENCY

Year	Σ population	Score (1 +r)	Σ projection
2022	2,761,480	1.01322	2,797,986
2023	2,797,986	1.01322	2,834,975
2024	2,834,975	1.01322	2,872,453
2025	2,872,453	1.01322	2,910,426
2026	2,910,426	1.01322	2,948,902
2027	2,948,902	1.01322	2,987,886

Based on the data above, it can be concluded that the projection for 2022 is the population of Sukabumi Regency of 2,797,986 people, the projection for 2023 is the population of Sukabumi Regency of 2,834,975 people, the projection for 2024 is the population of Sukabumi Regency is 2,872,453 people, the projection for 2025 is the population of Sukabumi Regency of 2,910,426 people, the projection for 2026 is the population of Sukabumi Regency of 2,948,902 people, and the projection for 2027 is the population of Sukabumi Regency of 2,987,886 people. The population growth of Sukabumi Regency looks large, this is because the population growth rate reaches 1.3% per year. In addition, the location of Sukabumi Regency, which is a developing city with a strategic position in the industrial and tourism sectors, causes a large number of migrations and requests that make the population figure even higher.

This change in population is the basis for calculating the projected needs of elementary school teachers on the basis of achievement standards national education (SNP).

2) Projection of Elementary School Age Population (PUS 7-12 years) in Sukabumi Regency in 2022-2027

Remember needs study this is for knowing the number of teachers in 2022-2026, then the data needed is secondary data in the form of population data in 2020 and in 2021 consisting from age five year resident. The data used for count projection population age school basic. As for the calculation process through breakdown of population data, five year age data Becomes age one annual.

In count district EFA projections Sukabumi from 2022 to 2027, that is use equation 2.1, where Po as year beginning is in 2022, that is of 270.221. For more he explained so could presented in the table following :

TABLE III.   PROJECTION OF NUMBER OF AFA 7-12 FROM 2022-2027

Year	Σ population	Score (1 +r)	Σ projection
2022	270,221	0.993351	268,424

2023	268,424	0.993351	266,639
2024	266,639	0.993351	264,867
2025	264,867	0.993351	263,106
2026	263,106	0.993351	261,356
2027	261,356	0.993351	259,619

From the table above, it can be seen that the projected number of school age residents who will be absorbed by basic education, public elementary schools, private elementary schools, and elementary schools in Sukabumi Regency in 2022 is 268,424 people, in 2023 there are 266,639 people, in 2024 there are 264,867 people, in 2025 there were 263,106 people, in 2026 there were 261,356 people, in 2027 there were 259,619 people.

3) Number of School Age Population Projections 6-7 years in Sukabumi Regency in 2022-2027

Based on secondary data on the number of residents of school entry age (PUMS) or ages 6-7 years from 2017-2021 in Sukabumi Regency, the fact is that the number of PUMS in Sukabumi Regency fluctuates every year as well as the projected results of PUMS for five years will experience decline. The projected analysis of the population of primary school entry age or population aged 6-7 years and over is based on calculations using the Sprague Multiplier method, by dividing the five-year age group available in secondary data into one year of age using a predetermined formula. Then it is calculated using population projections with a mathematical approach using the population growth rate.

TABLE IV. PROJECTION OF POPULATION OF SCHOOL ENTRY AGE (PUMS) 6-7 YEARS OLD IN SUKABUMI REGENCY IN 2022-2027

Year	∑PUMS	Value (1+r)	∑ Projection
2022	88,318	0.998045	88146
2023	88146	0.998045	87,973
2024	87,973	0.998045	87,801
2025	87,801	0.998045	87,630
2026	87,630	0.998045	87,458
2027	87,458	0.998045	87,287

a. So , projection population ages 6 and 7 years in 2022 by _ 88,146 , in 2023 it will be 87,973 , in 2024 it will be 87,801 , in 2025 it will be 87,630 , in 2026 it will be 87,458 , and in 2027 it will be 87,287 people .

b. The change (decrease) in the school-age population basically occurs from 2022 to 2017, based on the growth rate of the school-age population which increases every year, which is around (-2%), besides that Sukabumi Regency is a developing city with a location strategic geographic location that causes permanent population movement (migration). occurs every year, because the Sukabumi Regency area is surrounded by many of these industrial companies.

4) Projection of Elementary School Teacher Needs in 20122-2027

Based on data from the Sukabumi Regency Education Office, the condition of teachers for the end of elementary school classes in 2021 is 7,955 teachers, with details of 3,434 PNS teachers, 4,381 state honorary teachers and 140 private honorary teachers. Then it is estimated that every year the number of teachers entering retirement age is 5%. So based on these data it can be projected that the needs of school teachers, especially class teachers in Sukabumi Regency from 2022 to 2027 are as follows:

TABLE V. NEED FOR ELEMENTARY SCHOOL CLASS TEACHERS IN 2022 - 2027

YEAR	Projection Student	NUMBER OF ROOMS	CONDITIONS OF PNS TEACHERS	RETIREMENT TEACHER	NON PNS TEACHERS	END OF THE YEAR TEACHER	TEACHER NEEDS
2022/2023	288,717	10.312	3434	172	4,521	7,783	2,529
2023/2024	291,704	10,418	3,262	163	4,521	7,620	2,798
2024/2025	294,638	10,523	3,099	155	4,521	7,465	3,058

2025 /2026	297,520	10,626	2,944	147	4,521	7,318	3.308
2026 /2027	300,351	10,727	2,797	140	4,521	7,178	3,549
2027 /2028	303,131	10,827	2,657	133	4,521	7,045	3,782

So based table 20 , can _ projected that classroom teacher needs school base on year teachings 2022/2023 is 2,529 people, in yr teachings 2023/2024 is 2,798 people , in year teachings 2024/2025 is 3,058 people , in year teachings 2025/2026 is 3,308 people , in year teachings 2026/2027 is 3,549 people , and in teachings 2027/2028 is 3,782 people .

CONCLUSION

An increase in population certainly has an impact on an increase in the need for education. Where more and more school-age residents have an effect on increasing the need for study groups. So that with the increase in study groups, the need for teachers will also increase. Therefore, planning related to teacher needs must be done. This is because the teacher is the main factor in education who plays an important role in the classroom. Population growth in Sukabumi Regency is included in the slow category with a growth rate of 0.013%. Growth rates naturally affect educator projections. Based on the projection results, in 2026 the population in Sukabumi Regency will be 2,948,902 people, with a school-age population of 87,458 people. The number of school-age population will certainly affect the need for the number of study groups in Sukabumi Regency. In 2026, the total existing learning groups based on projected results will be 10,727. This condition will certainly affect the number of teachers needed. At the end of 2026 the number of available teachers is 7,178 people. This condition indicates an increase in the need for teachers in Sukabumi Regency. Therefore, Sukabumi District requires appropriate teacher procurement.

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