

EDUCATIONAL FACILITY NEEDS BASED ON SCHOOL-AGE POPULATION GROWTH: EVIDENCE FROM POSO REGENCY, INDONESIA

Prilly Prichila Lagonda ^{a*)}, Jawoto Sih Setyono ^{a)}

^{a)} *Diponegoro University, Semarang, Indonesia*

^{*)} *Corresponding Author: prilagonda@gmail.com*

Article history: received 18 February 2026; revised 25 February 2026; accepted 11 March 2026

DOI: <https://doi.org/10.33751/jhss.v10i1.181>

Abstract. This study aims to analyze the availability and distribution of educational facilities in Poso Regency in 2026. A quantitative descriptive approach was employed using secondary data collected through document analysis from official sources. The analysis was conducted based on the SNI 03-1733-2004 standard to compare the required number of educational facilities with existing availability across all subdistricts in Poso Regency. Population projection using the geometric method estimates that the school-age population will reach 223,190 in 2026, which serves as the basis for calculating facility needs. The results indicate that, overall, the availability of educational facilities in Poso Regency is relatively sufficient at the kindergarten, primary school, and junior high school levels, where the number of available facilities exceeds the calculated requirements. However, at the senior high school level, a deficit of 27 units was identified. In addition, the distribution of educational facilities remains uneven across subdistricts, as several areas still lack any senior high school facilities. This study contributes to educational planning by providing a data-driven assessment of facility adequacy based on school-age population needs. From a policy perspective, the findings highlight the need to prioritize the development and equitable provision of senior high school facilities, particularly in underserved subdistricts. Strategic efforts should focus on increasing the number of schools and improving the distribution of facilities to ensure more equitable access to education.

Keywords: Educational facilities, facility needs analysis, education facility planning

I. INTRODUCTION

The provision of public service facilities in appropriate locations based on community needs is essential for improving quality of life, promoting equitable distribution of benefits, and fostering social justice [1]. Among these facilities, education plays a particularly critical role; therefore, the equitable distribution of educational facilities is of paramount importance. Education serves as a fundamental driver in the development of human resources and the enhancement of societal well-being. Through education, individuals acquire the knowledge, skills, and values necessary to actively participate in social, economic, and cultural life. Consequently, the provision of adequate educational facilities constitutes a key component in supporting effective and equitable learning processes.

Achieving educational equity has become a global priority, as it contributes to breaking the cycle of intergenerational poverty, fostering inclusive growth, and advancing sustainable development [1]. Within the framework of the Sustainable Development Goals (SDGs), education is explicitly addressed in Goal 4, which aims to ensure inclusive, equitable, and quality education, as well as to promote lifelong learning opportunities for all. In particular, Target 4.7 emphasizes that by 2030, all learners should acquire the knowledge and skills needed to promote sustainable development, including education for human rights, gender equality, sustainable lifestyles, and global citizenship [2].

Education constitutes the foundation for both individual development and broader societal progress. It enhances intellectual capacity, strengthens skills, and fosters critical and creative thinking, enabling individuals to understand, adapt to, and transform their environment effectively. The success of the educational process is highly dependent on the availability of adequate educational facilities. High-quality facilities not only improve individual learning outcomes but also promote equal opportunities, support socio-economic development, reduce disparities, and strengthen social inclusion [3], [4], [5]. In this context, the availability of well-maintained and properly distributed educational facilities is crucial for creating a conducive learning environment for both students and educators [6]. Therefore, ensuring the adequacy of educational facilities is a strategic priority in improving the overall quality of education.

In Indonesia, the importance of education is constitutionally guaranteed. Article 31 paragraph (1) of the 1945 Constitution of the Republic of Indonesia states that every citizen has the right to education, while paragraph (3) mandates the government to organize a national education system aimed at enhancing the intellectual life of the nation [7]. This constitutional mandate underscores the state's responsibility to ensure the adequate provision of educational facilities for all citizens. Furthermore, in realizing the vision of Golden Indonesia 2045, human resource development is positioned as a central pillar in achieving a developed nation by 2045. Efforts

to improve quality of life include expanding equitable access to education, strengthening cultural values, enhancing health services, and advancing science and technology competencies. Education is therefore recognized as a key instrument in shaping competitive, dignified, and resilient citizens.

Improving educational quality must also involve expanding access to educational services across all regions, including rural, remote, and archipelagic areas. This effort aims to ensure that all individuals can obtain quality education regardless of geographic or economic constraints. Despite various policies implemented to enhance educational quality, disparities in the distribution of educational facilities across regions remain a significant challenge. Educational equity, as a fundamental concept in educational studies, emphasizes equal access, opportunity, and quality for all individuals. Rooted in the principle of social justice, it requires that all citizens, regardless of socio-economic or geographic background, have equal opportunities to access quality education [8], [9].

Significant disparities persist in educational development between Java and other regions of Indonesia. While regions outside Java continue to face limitations in access to quality education, Java has emerged as the primary educational hub, characterized by greater accessibility and higher standards. As the political, economic, and social center of the country, Java hosts numerous prestigious schools and leading universities [10]. This condition aligns with previous findings indicating that uneven regional development contributes to disparities in educational progress, particularly between developed and less-developed areas [3], [11], [12]. Therefore, efforts to decentralize educational development are essential to reduce disparities in access and quality across regions.

One region outside Java that requires particular attention in terms of educational facility provision is Poso Regency in Central Sulawesi Province. Covering an area of approximately 755,423 hectares, Poso Regency exhibits diverse geographical characteristics, ranging from coastal zones to mountainous areas. These geographical conditions significantly influence community access to public services, including education. In several areas, the distance between residential settlements and educational facilities remains considerable, thereby limiting access for school-age populations. This condition highlights the need for a more spatially responsive and needs-based approach to educational facility distribution.

A systematic analysis of educational facility requirements based on the school-age population is therefore essential to assess the adequacy of existing infrastructure. Such an approach ensures that the provision of educational facilities is aligned with actual community needs rather than based on general assumptions. Consequently, educational development planning can be conducted in a more measurable, targeted, and evidence-based manner [13]. As the school-age population continues to grow, the demand for educational facilities is determined not only by quantity but also by the appropriateness of distribution and service capacity in relation to demographic dynamics. A needs-based approach is thus critical to ensuring proportional access to educational services and minimizing imbalances between student populations and available facilities [14].

Analyzing the demand for educational facilities represents a crucial step in understanding current availability and

identifying existing gaps. Such analysis provides a comprehensive overview of facility adequacy and shortages in Poso Regency by 2026. The findings can support government decision-making by offering precise and location-specific information regarding educational infrastructure needs. This enables more effective, targeted, and efficient allocation of resources. Moreover, needs-based studies contribute significantly to promoting equitable educational development, particularly in rural and underserved areas. By accurately capturing real conditions, local governments can formulate more responsive policies aimed at improving educational service quality and reducing regional disparities.

However, studies that specifically measure the adequacy of educational facilities based on standardized and quantifiable needs remain relatively limited, both in terms of methodological rigor and analytical depth. Most previous research has tended to focus on the general availability of educational facilities, such as the number and distribution of schools, without directly linking these aspects to the dynamic and evolving needs of the school-age population. Meanwhile, empirical evidence indicates that the distribution of educational facilities often fails to reflect principles of equity and actual community needs, thereby generating disparities across regions [15]. Various approaches, including spatial analysis and location optimization models, have been developed to improve allocation efficiency by incorporating population distribution and service capacity [16]. extending even to more advanced frameworks such as the Maximal Accessibility Equality Problem (MEAP), which integrates demand, capacity, and spatial accessibility [17].

Nevertheless, several important research gaps remain. First, existing approaches tend to be polarized between simple descriptive analyses, which are insufficient to capture actual needs, and complex mathematical models that are difficult to implement in practical regional contexts. Second, most studies have not systematically integrated standardized service requirements with up-to-date demographic data as a basis for measuring facility adequacy. Third, discussions of equity remain largely confined to the distribution dimension and have not fully accounted for the proportionality of needs based on the size of the school-age population [18]. In addition, non-technical factors, such as policy decisions and vested interests, continue to influence the distribution of facilities, ultimately affecting the effectiveness of educational service delivery [19]. The absence of a needs-based approach may also result in overutilization or underutilization of facilities, thereby reducing overall service efficiency.

Based on these gaps, this study offers a novel contribution by developing a more operational and applicable quantitative approach to measuring the adequacy of educational facilities based on actual community needs. This approach integrates up-to-date data on the school-age population with standardized service requirements at each level of education, thereby enabling a more precise assessment of the balance between service capacity and the population served. Accordingly, the primary contribution of this study lies not only in refining the methodology for assessing the adequacy of educational facilities, but also in providing an analytical framework that is relatively simple yet comprehensive to support decision-making processes. The findings of this study are expected to

serve as a robust empirical foundation for formulating more targeted, efficient, and sustainable educational development policies, while also adhering to the principle of equity.

Based on this framework, the research hypothesizes that the availability of educational facilities in Poso Regency has not yet been fully aligned with community needs, particularly in terms of distribution. This imbalance suggests that certain areas still face limited access to quality educational services. Therefore, more focused and needs-based planning is required to improve the distribution of educational facilities. Such planning is expected to enhance equitable access to education, expand opportunities for communities, and ultimately contribute to the improvement of human resource quality in Indonesia, in line with the vision of Golden Indonesia 2045.

II. RESEARCH METHODS

Research methodology explains the procedures and stages employed to conduct the study. This research adopts a quantitative approach with a descriptive method. The quantitative approach is appropriate because the study analyzes numerical data, particularly data related to the number of educational facilities and the size of the school-age population. The descriptive method is used to systematically and factually describe the availability and distribution of educational facilities in Poso Regency, enabling an assessment of whether existing facilities meet community needs. Through this approach, the study aims to provide a clear and comprehensive picture of the current condition of educational facilities in the study area.

This study focuses on analyzing the need for educational facilities in Poso Regency in 2026. The objectives are to assess the level of availability of educational facilities and to examine their distribution across different areas. In addition, the study compares the number of available educational facilities with the number of school-age residents in each area. This comparison is intended to determine whether the existing facilities adequately meet community needs or whether deficits remain. Accordingly, the scope of this research is directed toward providing an overview of the extent to which they satisfy community demand and the distribution of educational facilities in Poso Regency in 2026. The findings are expected to provide useful information for planning future educational infrastructure development.

To ensure conceptual clarity and analytical precision, this study employs several operational definitions. The variables include educational facilities, educational facility needs, school-age population, and the distribution of educational facilities. The operational definitions of these variables are presented in the following table 1.

In this study, educational facilities refer to the infrastructure used in the provision of formal education. These facilities play a crucial role in supporting the learning process and ensuring the continuity of education within a region. Educational facility needs refer to the number of facilities required to meet community demand based on the size of the school-age population. The estimation of facility needs is conducted through calculations using data on the number of existing facilities and the number of school-age residents. The school-

age population serves as the primary basis for determining facility requirements. Meanwhile, the distribution of educational facilities refers to the availability of educational facilities across sub-districts in Poso Regency, reflecting the level of equity in access to education. A balanced distribution indicates that facilities are evenly dispersed, enabling communities in different areas to access educational services more equitably.

Table 1. Definition of Operational Research Variables

Variables	Operational Definition	Indicator
Educational Facilities	The educational facilities used to carry out formal education in a particular area	Number of education facilities available
Educational Facility Needs	The number of educational facilities that should be available to meet the needs of the community	Educational facility needs
School-Age Population	A group of people who are in the age range for formal education	Number of school-age population in each area
Distribution of Educational Facilities	The distribution of educational facilities across each area	The distribution of education facilities in each area.

Source: Researcher, 2026

This research was conducted in Poso Regency. The study area was selected based on the research objective of analyzing the need for and distribution of educational facilities. Poso Regency covers an area of 755,423 hectares and is located between 1°06'44.892" – 2°12'53.172" South Latitude and 120°05'96" – 120°52'4.8" East Longitude, with the following boundaries: to the north, it borders the Tomini Bay and Parigi Moutong Regency, to the east is bordered by Parakan District, to the south, it borders South Sulawesi, and to the west, it borders Sigi Regency.



Source: Spatial Planning of Poso Regency, 2024– 2043

Figure 1. Administrative Map of Poso Regency in 2026

Poso Regency was selected as the study area because it is one of the regions outside Java, making it relevant for examining disparities in the availability and distribution of educational facilities [20], this study is expected to provide a clearer understanding of the condition of educational facility availability and its alignment with the school-age population.

The population of this study comprises all educational facilities and the entire school-age population in Poso Regency. These two elements serve as the basis for analyzing the need for educational facilities in order to assess their availability and compare it with existing demand.

The data used in this study are secondary data obtained from official documents and relevant institutions. These data include information on the number of educational facilities and the size of the school-age population in Poso Regency. The use of secondary data ensures accuracy, reliability, and relevance to the research objectives. Data processing tools are employed to facilitate analysis, calculation, and presentation, ensuring that results are systematically organized.

Data collection is conducted using a documentation study technique. This involves gathering data and information related to educational facilities and the school-age population from official reports and statistical documents issued by authorized institutions. This technique is appropriate given the reliance on existing data sources, making the process efficient and reliable.

The data analysis technique applied in this study is quantitative descriptive analysis. This approach involves processing the collected data to systematically and quantitatively assess the availability and needs of educational facilities in Poso Regency in 2026.

The first stage of analysis involves population projection. This step aims to estimate the population in 2026, particularly the school-age population, which serves as the basis for calculating educational facility needs. Three aggregate projection methods are employed: arithmetic, geometric, and exponential. The formulas used are as follows:

Table 2. Aggregate Population Projection Formula

Metode agregat aritmatik:	Metode agregat geometrik	Metode agregat eksponensial
---------------------------	--------------------------	-----------------------------

$$P_t = P_0 (1+r)^t \quad r = (1/t) (P_t/P_0 - 1)$$

$$P_t = P_0 (1+r)^t \quad r = (P_t/P_0)^{1/t} - 1$$

$$P_t = P_0 e^{rt} \quad r = (1/t) \ln (P_t/P_0)$$

Keterangan:

P_t = population in year t

P = population in the base year

r = population growth rate

t = the time period between the base year and year t (in years)

e = the base of the natural logarithm (ln), which is 2.7182818.

Source: Adioetomo and Samosir, 2010

The projection results from the three methods are evaluated using two key indicators: standard deviation and correlation coefficient. Standard deviation measures the deviation between projected and actual data; thus, a smaller value indicates lower projection error. The correlation coefficient measures the strength of the relationship between projected and actual data, where values closer to 1 indicate a stronger relationship. The method with the smallest standard deviation and the correlation coefficient closest to 1 is selected as the most appropriate [21].

The resulting projection is then used as the basis for estimating the population, particularly the school-age group, which serves as the primary input for analyzing educational facility needs.

The next stage involves analyzing educational facility needs using the national standard SNI 03-1733-2004. This standard is applied to calculate the required number of facilities based on school-age population. The calculation is performed using the following formula [22].

Table 3. Educational Facility Requirements Calculation Formula

Formula	
$S(n) = \frac{Pn}{Sm}$	
Explanation:	
$S(n)$	= Type/number of infrastructure facilities based on the standard
Pn	= Total population in year – n
Sm	= Minimum standard

Source: SNI 03-1733-2004

The results of all analytical stages are presented in tabular and descriptive forms to comprehensively explain the availability, needs, and distribution of educational facilities in Poso Regency. This approach provides an empirical and systematic basis for planning more effective and equitable educational infrastructure development in the future.

III. RESULT AND DISCUSSION

This study presents the results of an analysis of educational facility needs in Poso Regency for the year 2026. The analysis aims to assess the extent to which the availability of educational facilities aligns with the needs of the school-age population. Population projections are employed as the analytical basis to provide a comprehensive overview of the availability and distribution of educational facilities in the region. The findings are presented in the form of tables accompanied by analytical narratives to clearly describe the existing conditions of educational infrastructure.

Population Projection

The initial stage of this study involves projecting the population of Poso Regency. The projection is conducted using three methods: the arithmetic, geometric, and aggregate methods. These approaches are compared to identify the method that most accurately reflects real conditions based on their respective error levels.

Table 4. Population Projection of Poso Regency in 2026

Year	School-Age Population	Arithmetic Method		Geometric Method		Aggregate Method	
		r	Pt	r	Pt	r	Pt
2015	199177		199177		199177		417464 7
2016	203615		201337		201249		437589 6
2017	207993	1,08%	203497	1,04%	203342	1,03%	457714 5
2018	212432		205657		205457		477839 4
2019	216856		207817		207594		497964 3

Year	School-Age Population	Arithmetic Method		Geometric Method		Aggregate Method	
		r	Pt	r	Pt	r	Pt
2020	208685		209978		209754		518089
							1
2021	211278		212138		211935		538214
							0
2022	214490		214298		214140		558338
							9
2023	213204		216458		216367		578463
							8
2024	218618		218618		218618		598588
							7
Standar Devisiasi			6540,06		6539,96		609310,95
Koefisien Korelasi			0,8		0,8		0,8
Proyeksi							
	2025		220989		220892		220880
	2026		223386		223190		223166

Source: Researcher, 2026

The comparison indicates that the geometric method is the most appropriate for this study. This method is selected because it yields the smallest standard deviation and a correlation coefficient closest to 1 compared to the other methods. Based on the geometric approach, the population of Poso Regency in 2026 is projected to reach 223,190 people. This projection suggests a consistent increase in population over time, which in turn implies a growing demand for public services, including educational facilities.

Educational Facility Needs

Based on the population projections for 2026, the next stage is to analyze the demand for educational facilities. This analysis aims to assess whether the existing facilities are adequate to meet community needs, taking into account the school-age population served at each educational level. The results reveal variations in facility availability across different educational levels.

Table 5. Educational Facility Needs in Poso Regency in 2026

Education	Supporting Population Standard	Existing Condition	School-Age Population	Required	Gap
Kindergarten	1.250	220	223.190	179	-41
Primary School	1.600	233	223.190	139	-94
Junior High School	4.800	73	223.190	46	-27
Senior High School	4.800	19	223.190	46	27

Source: Researcher, 2026

At the kindergarten level, the required number of facilities is 179 units, while the current availability is 220 units. This indicates a surplus of 41 units, suggesting that the demand at this level has been adequately met. At the primary school level, the required number is 139 units, whereas 233 units are

available, resulting in a surplus of 94 units and indicating sufficient provision.

At the junior secondary level, the required number of facilities is 46 units, while 73 units are available. This results in a surplus of 27 units, indicating that the demand at this level has also been fulfilled. In contrast, a different condition is observed at the senior secondary level. The required number of facilities is 46 units, while only 19 units are available. This results in a deficit of 27 units, indicating that the existing facilities are insufficient to meet the needs of the school-age population.

Table 6. Distribution of Educational Facilities in Poso Regency in 2025

Sub-district	Kindergarten	Primary School	Junior High School	Senior High School
South Pamona	20	23	5	2
West Pamona	9	10	2	1
Southeast Pamona	10	11	3	-
South Lore	9	9	3	1
West Lore	6	6	2	-
Pamona Pusalemba	18	15	7	2
East Pamona	11	14	6	1
North Pamona	15	16	5	2
North Lore	8	10	3	1
Central Lore	8	8	3	-
East Lore	5	5	2	-
Lore Peore	4	6	2	-
Poso Coastal	20	20	5	-
South Poso Coastal	11	10	3	1
North Poso Coastal	17	12	4	1
Lage	19	22	7	2
Poso City	11	16	3	2
North Poso City	12	11	6	2
South Poso City	7	9	2	1
Total	220	233	73	19

Source: Poso Regency in Figures, 2025

The distribution of educational facilities shows considerable variation across districts [23]. At the kindergarten level, the highest number of facilities is found in Pamona Selatan and Poso Pesisir Districts, each with 20 units, while the lowest is in Lore Peore District with 4 units. At the primary school level, Pamona Selatan has the highest number of facilities with 23 units, followed by Lage with 22 units, whereas the lowest is in Lore Timur with 5 units.

At the junior secondary level, the highest number of facilities is found in Pamona Pusalemba and Lage, each with 7 units. Meanwhile, districts such as Lore Barat, Lore Timur, and Lore Peore have relatively limited facilities, with

approximately 2 units each. At the senior secondary level, the number of facilities is relatively limited compared to other levels. Several districts lack senior secondary schools entirely, including Pamona Tenggara, Lore Barat, Lore Tengah, Lore Timur, Lore Peore, and Poso Pesisir. This indicates that the distribution of senior secondary educational facilities remains uneven.

Research results

The findings indicate that the availability of educational facilities in Poso Regency varies across educational levels. At the basic education level, including kindergarten and primary school, the number of available facilities generally exceeds the estimated demand. This suggests that access to basic education is relatively well accommodated.

These findings are consistent with prior studies in educational planning, which emphasize the importance of adequate basic education facilities in enhancing access and participation from an early age. Basic education constitutes the foundation of the education system, as it develops essential competencies that influence success at higher levels of education [1], [24]. Furthermore, the provision of sufficient facilities at this level represents a strategic step toward fostering an inclusive and equitable education system. Adequate infrastructure expands access opportunities and contributes to the long-term improvement of human resource quality. Accordingly, these findings reinforce previous research demonstrating that sufficient basic education facilities play a significant role in promoting equitable access and increasing participation in formal education.

At the junior secondary level, the availability of facilities also exceeds demand, indicating that access at this level is relatively adequate. The presence of sufficient facilities plays a strategic role in sustaining educational progression beyond the basic level. Educational infrastructure functions not only as a physical resource but also as a driver of student motivation and a facilitator of continued education. This finding is consistent with research [25], which demonstrates that students' motivation to pursue higher levels of education is influenced by supportive learning environments, including the availability of facilities and the role of educational institutions. Thus, adequate provision at the junior secondary level contributes not only to meeting quantitative needs but also to strengthening students' educational aspirations.

In contrast, at the senior secondary level, the availability of facilities remains significantly below the required level. This shortfall reflects limited access to upper secondary education and is further exacerbated by uneven distribution. Several districts do not have senior secondary schools, requiring students to travel to other areas. This situation increases travel distances and creates accessibility challenges.

These findings are consistent with the study, which identifies limited access to advanced education, particularly due to inadequate facilities, as a key factor contributing to low continuation rates [26]. Areas without senior secondary schools tend to face substantial access barriers, especially in terms of distance and transportation constraints. Moreover, prior studies have demonstrated a significant relationship between the availability of educational facilities and students' motivation

and participation [27]. Inequities in the distribution of these facilities can diminish overall community participation in education.

If this condition persists, it may lead to lower participation in upper levels of education. Numerous studies indicate that physical accessibility factors, such as distance and travel time, significantly influence students' educational continuity [26], [27]. Therefore, the development of senior secondary educational facilities should be prioritized in educational planning in Poso Regency to reduce regional disparities.

The equitable distribution of educational facilities not only improves access but also contributes to the enhancement of human capital and supports sustainable social and economic development [28]. Furthermore, research findings indicate that the availability of educational facilities is a critical component of regional development and plays a significant role in strengthening regional competitiveness.

Moreover, educational facility planning should consider not only the number of facilities but also their location and accessibility to ensure equitable service coverage [29]. Uneven distribution may lead to regional disparities, particularly between more developed areas and those with limited access.

Overall, this study demonstrates that analyzing educational facility needs provides a clear and systematic understanding of the availability and distribution of facilities within a region. This information serves as a crucial foundation for developing more targeted, effective, and needs-based educational policies. The findings underscore the importance of data-driven planning in addressing disparities in educational access.

Accordingly, the development of educational facilities in Poso Regency should be carried out systematically, with careful attention to equitable distribution and accessibility across districts. This approach is essential to reducing disparities and ensuring equal opportunities for all communities to access education.

In addition, the availability of adequate educational facilities supports more effective learning processes. In the long term, improving both the distribution and quality of educational infrastructure is expected to enhance human resource capacity. This is consistent with the strategic role of educational facilities in regional development. Therefore, efforts to improve educational infrastructure not only impact the education sector but also provide a foundation for sustainable regional and national development, in line with the Indonesia Emas 2045 vision, which emphasizes the development of high-quality, competitive, and adaptive human resources in response to advancements in science and technology.

IV. CONCLUSIONS

Based on the findings, the analysis of educational facility needs in Poso Regency reveals significant variation in availability across different levels of education. Population projection results indicate that the geometric method is the most appropriate approach, as it produces the lowest deviation and the strongest correlation with observed data. Using this method, the school-age population is projected to reach 223,190 by 2026. This projection provides a strong empirical basis for estimating the required number of educational facilities.

The results show that at the kindergarten, primary school, and junior high school levels, the number of available facilities generally exceeds the calculated needs, indicating that educational provision at these levels is relatively sufficient. In contrast, at the senior high school level, there remains a considerable shortfall, with a deficit of 27 units compared to the projected demand. In addition, the distribution of educational facilities is still uneven across sub-districts, with some areas having a higher concentration of facilities than others.

This study makes an important contribution to the field of educational planning by offering a more operational quantitative approach to measuring the adequacy of educational facilities based on actual community needs. By integrating population projections with standardized service requirements, the study provides a more precise and applicable analytical framework for assessing the balance between service capacity and the population served. Furthermore, the study contributes to the empirical literature on disparities in educational infrastructure in regions outside Java, particularly in areas with diverse geographical characteristics such as Poso Regency.

From a policy perspective, the findings highlight the need to prioritize the development of senior high school facilities, particularly in sub-districts that currently lack sufficient provision. In addition to increasing the number of facilities, policymakers should focus on ensuring a more equitable distribution of educational infrastructure. Strategic actions may include the construction of new schools in underserved areas and the optimization of existing facilities. A needs-based and data-driven planning approach is essential to ensure that resource allocation is efficient, targeted, and aligned with demographic conditions.

Despite its contributions, this study has several limitations. First, the analysis relies on secondary data, which may not fully reflect current conditions in the field. Second, the study focuses primarily on the quantitative aspect of facility availability and does not consider qualitative factors such as infrastructure conditions, teacher availability, and the quality of educational services. Third, the analytical approach remains relatively simple and may not fully capture the complexity of real-world conditions.

Therefore, future research is recommended to adopt a more comprehensive approach by incorporating additional variables, including the quality of educational facilities and socio-economic factors influencing educational participation. Further studies may also apply more advanced analytical methods to produce more accurate and in-depth findings. In addition, the use of primary data through field surveys would improve the accuracy and robustness of the analysis. These improvements are expected to provide a more holistic understanding of educational facility needs and support more effective and sustainable educational planning.

REFERENCES

- [1] Y. Yang, Q. Wang, X. Dai, S. Wang, S. Fang, and Y. Zhu, "Evaluating the accessibility and equity of basic educational facilities in China during the poverty alleviation and elimination campaign (2015–2021)," *Geogr. Sustain.*, vol. 7, no. 2, p. 100422, Apr. 2026, doi: 10.1016/j.geosus.2026.100422.
- [2] K. Shulla, W. L. Filho, S. Lardjane, J. H. Sommer, and C. Borgemeister, "Sustainable development education in the context of the 2030 Agenda for sustainable development," *Int. J. Sustain. Dev. World Ecol.*, vol. 27, no. 5, pp. 458–468, Jul. 2020, doi: 10.1080/13504509.2020.1721378.
- [3] Y. Guo and X. Li, "Regional inequality in China's educational development: An urban-rural comparison," *Heliyon*, vol. 10, no. 4, p. e26249, Feb. 2024, doi: 10.1016/j.heliyon.2024.e26249.
- [4] E. Hannum and C. Buchmann, "Global Educational Expansion and Socio-Economic Development: An Assessment of Findings from the Social Sciences," *World Dev.*, vol. 33, no. 3, pp. 333–354, Mar. 2005, doi: 10.1016/j.worlddev.2004.10.001.
- [5] S. Klasen, "Low Schooling for Girls, Slower Growth for All? Cross-Country Evidence on the Effect of Gender Inequality in Education on Economic Development," *World Bank Econ. Rev.*, vol. 16, no. 3, pp. 345–373, Dec. 2002, doi: 10.1093/wber/lhf004.
- [6] P. A. Adigeb, P. M. Anake, and A. U. Akomaye, "The Impact Of Educational Facilities On Students' Teaching/Learning Process In Abeokuta, Ogun State, Nigeria: Need For Counselling Approaches," *Eur. J. Educ. Stud.*, vol. 3, no. 9, pp. 1–13, 2017, doi: 10.5281/zenodo.998534.
- [7] Pemerintah Republik Indonesia, "Undang-Undang Dasar Negara Republik Indonesia," 1945. [Online]. Available: <https://webcache.googleusercontent.com/search?q=cache:BDsuQOHoCi4J:https://media.neliti.com/media/publications/9138-ID-perlindungan-hukum-terhadap-anak-dari-konten-berbahaya-dalam-media-cetak-dan-ele.pdf+&cd=3&hl=id&ct=clnk&gl=id>
- [8] P. Kowal, A. R. Hosseinpoor, and S. Chatterji, "Letters," *MEDICC Rev.*, vol. 13, no. 4, p. 5, Oct. 2011, doi: 10.37757/MR2011V13.N4.2.
- [9] G. Anderson, M. G. Pittau, and R. Zelli, "Measuring the progress of equality of educational opportunity in absence of cardinal comparability," *METRON*, vol. 78, no. 2, pp. 155–174, Aug. 2020, doi: 10.1007/s40300-020-00172-8.
- [10] S. A. Putri, Komariyah, and T. Dianawanti, "Pro & Kontra," in *Agrarzeitung*, vol. 77, no. 22, 2022, pp. 3–3. doi: 10.51202/1869-9707-2022-22-003-1.
- [11] J. Golley and S. T. Kong, "Inequality of opportunity in China's educational outcomes," *China Econ. Rev.*, vol. 51, pp. 116–128, Oct. 2018, doi: 10.1016/j.chieco.2016.07.002.
- [12] J. Yang, X. Huang, and X. Liu, "An analysis of education inequality in China," *Int. J. Educ. Dev.*, vol. 37, pp. 2–10, Jul. 2014, doi: 10.1016/j.ijedudev.2014.03.002.
- [13] Q. Huang, X. Cui, and L. Ma, "The Equity of Basic Educational Facilities from the Perspective of Space," *Sustainability*, vol. 15, no. 15, p. 12031, Aug. 2023, doi: 10.3390/su151512031.
- [14] A. Abidah, H. N. Hidayatullaah, R. M. Simamora, D. Fehabutar, and L. Mutakinati, "The Impact of Covid-

- 19 to Indonesian Education and Its Relation to the Philosophy of 'Merdeka Belajar,'" *Stud. Philos. Sci. Educ.*, vol. 1, no. 1, pp. 38–49, Apr. 2020, doi: 10.46627/sipose.v1i1.9.
- [15] L. Nurhayati, "Policy Effectiveness Program for Improving Education Equality through the Development of Education Facilities and Infrastructure," *J. Educ. Rev. Provis.*, vol. 1, no. 1, pp. 6–11, Mar. 2021, doi: 10.55885/jerp.v1i1.31.
- [16] Y. Chen, Z. Lai, and C. Huang, "Optimizing Spatial Location and Service Capacity of New Schools Toward Maximum Equity in the Distribution of Educational Resources," *J. Urban Plan. Dev.*, vol. 149, no. 3, pp. 1–8, Sep. 2023, doi: 10.1061/JUPDDM.UPENG-4346.
- [17] Q. Ni, X. Wu, and P. Cui, "Research on the Equity of Educational Facilities in Counties of the Loess Plateau Gully Area: Chengcheng County, Shaanxi Province as an Example," *Sustainability*, vol. 14, no. 20, p. 13106, Oct. 2022, doi: 10.3390/su142013106.
- [18] B. I. Ojiri, "Equitable Distribution of School Facilities in Secondary Schools," *Int. J. Institutional Leadership, Policy Manag.*, vol. 4, no. 2, pp. 348–363, 2022, [Online]. Available: www.ijilpm.com.ng
- [19] O. Madu and O. Adebisi, "Equitable Distribution of School Facilities for Effective Teaching and Learning in Secondary Schools in Imo State, Nigeria," *Int. J. Educ. Manag.*, vol. 19, no. 1, pp. 1–12, 2021, [Online]. Available: https://www.researchgate.net/profile/Onyewuchi-Madu-2/publication/379403252_Equitable_distribution_of_school_facilities_for_effective_teaching_and_learning_in_secondary_schools_in_Imo_State_Nigeria/links/606e3fdb839e05a20a94193/Equitable-distribution-of-school-facilities-for-effective-teaching-and-learning-in-secondary-schools-in-Imo-State-Nigeria.pdf
- [20] Pemerintah Kabupaten Poso, "Rencana Tata Ruang Wilayah Kabupaten Poso," 2024.
- [21] S. M. Adioetomo and O. B. Samosir, *Dasar-Dasar Demografi*. Jakarta: Salemba Empat, 2010. [Online]. Available: https://psb.feb.ui.ac.id/index.php?p=show_detail&id=1375
- [22] Badan Standarisasi Nasional, "Standar Nasional Indonesia SNI 03:1733:2004 Tentang Tata Cara Perencanaan Lingkungan Perumahan di Perkotaan," 2004. [Online]. Available: http://johannes.lecture.ub.ac.id/files/2012/10/Tata-Cara-Perencanaan-Lingkungan-Perumahan-di-Perkotaan-_SNI-03-1733-2004.pdf
- [23] BPS Kabupaten Poso, "Kabupaten Poso Dalam Angka," 2025. [Online]. Available: <https://posokab.bps.go.id/id/publication>
- [24] L. la Velle, "The role of initial and continuing professional education in recruitment and retention of teachers: the importance of a basis of social justice," *J. Educ. Teach.*, vol. 49, no. 2, pp. 177–179, Mar. 2023, doi: 10.1080/02607476.2023.2191470.
- [25] M. Thoharudin, Y. Suryanti, and A. D. Sore, "Sosialisasi Pentingnya Pendidikan Lebih Tinggi Di Desa Sungai Mali Kecamatan Ketungau Hilir," *J. Pengabd. Masy. Khatulistiwa*, vol. 2, no. 1, pp. 1–9, May 2019, doi: 10.31932/jpmk.v2i1.423.
- [26] I. Marić and K. Kinoti, "Spatial accessibility analysis of educational facilities in Kenya - Detection of education deserts," *Cities*, vol. 172, p. 106876, May 2026, doi: 10.1016/j.cities.2026.106876.
- [27] C. O. Akomolafe and V. O. Adesua, "The Impact of Physical Facilities on Students' Level of Motivation and Academic Performance in Senior Secondary Schools in South West Nigeria," *J. Educ. Pract.*, vol. 7, no. 4, pp. 38–42, 2016, [Online]. Available: www.iiste.org
- [28] R. A. Madani, "Analysis of Educational Quality, a Goal of Education for All Policy," *High. Educ. Stud.*, vol. 9, no. 1, p. 100, Jan. 2019, doi: 10.5539/hes.v9n1p100.
- [29] L. Ramandei, R. E. Binur, and E. K. Raunsay, "Education Facility Needs Analysis in Abepura District Jayapura City," *East African Sch. J. Educ. Humanit. Lit.*, vol. 5, no. 3, pp. 93–103, Mar. 2022, doi: 10.36349/easjehl.2022.v05i03.005.