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# Drinking Water Supply System (SPAM) and Reservoir Planning in Dusun Lebaho Lais

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***Abstract***

*Clean water availability is a fundamental requirement for human life and socio-economic development, particularly in rural areas that have not been adequately served by drinking water supply systems. Dusun Lebaho Lais, located in Jembayan Dalam Village, Loa Kulu District, faces challenges in accessing sufficient and sustainable clean water due to population growth and limited infrastructure. This study aims to analyze population growth, estimate future clean water demand, and determine the required reservoir capacity to support the planning of a Drinking Water Supply System (SPAM) in the area. The research applied a quantitative descriptive method using both primary and secondary data. Primary data were obtained through direct field observations, while secondary data were collected from village records, government agencies, statistical reports, and relevant literature. Population projection was conducted using the Arithmetic Method based on population data from 2015 to 2024, with projections extended to 2035. The suitability of the projection method was evaluated using standard deviation and correlation coefficient analysis. The results show that the Arithmetic Method produced a standard deviation value of 81.747 and a correlation coefficient of 1, indicating a perfect positive correlation and high reliability. The population of Dusun Lebaho Lais was recorded at 4,544 persons in 2024 and is projected to increase to 4,858 persons by 2035, with an average annual growth rate of 1%. Based on rural water consumption standards, the projected clean water demand in 2035 is estimated at 242,889 liters per day or 242.889 m³/day. The reservoir capacity analysis indicates that a reservoir with a volume of 84.86 m³, a diameter of 6 meters, and a height of 3 meters, requiring only three reservoir units, are sufficient to support the projected water demand. These findings confirm that the planned reservoir design can adequately meet future clean water needs and support sustainable water supply development in Dusun Lebaho Lais.*

***Keywords: Drinking Water Supply System (SPAM), Reservoir Planning, Clean Water Demand, Population Projection, Rural Area***

## INTRODUCTION

Water is one of the most essential resources in fulfilling basic human needs and plays a critical role in sustaining life and supporting socio-economic development (Desti & Ula, 2023). The availability of water on Earth is abundant, originating from various natural sources such as rivers, springs, lakes, reservoirs, seas, and oceans . However, not all available water resources can be directly utilized to meet daily human needs, particularly for clean water and drinking water purposes. This limitation arises due to factors such as water quality degradation, uneven spatial distribution, seasonal variability, and inadequate water infrastructure (Bhaskoro & Ramadhan, 2018).

In many regions, especially in developing and rural areas, an imbalance frequently occurs between water demand and water availability (Damayanti et al., 2022). This condition necessitates comprehensive studies on water demand components and the efficiency of water use to achieve a sustainable balance between supply and demand. (Sari et al., 2011) emphasize that water resource planning must consider population growth, consumption patterns, and water loss to ensure long-term adequacy. Without proper planning and management, water scarcity may intensify, particularly during dry seasons, leading to reduced access to safe and sufficient water for communities.

In Indonesia, the provision of clean water must comply with regulatory standards as stipulated in Government Regulation of the Republic of Indonesia Number 122 of 2015 concerning Drinking Water Supply Systems. This regulation mandates that water supply systems must meet minimum requirements in terms of quantity, quality, and continuity (Nurbaya & Sari, 2023). The produced water must be sufficient to meet daily basic needs, fulfill health-related quality standards, and be continuously available within a specified service period (Peraturan Pemerintah (PP) Nomor 122 Tahun 2015 Tentang Sistem Penyediaan Air Minum, 2015). These standards serve as a crucial framework for designing and evaluating clean water infrastructure, including reservoirs (Badrun et al., 2023).

Reservoirs constitute a vital component in the development of clean water supply systems (Safitri et al., 2025). They function as storage units that balance fluctuations between water production and consumption while ensuring stable pressure within the distribution network (Wiradnyana, 2023). According to (Prasetya et al., 2021) reservoirs should be located as close as possible to the center of water demand to enable efficient gravity-based distribution with adequate pressure. Proper reservoir planning significantly contributes to system reliability, operational efficiency, and service sustainability. In general, reservoir planning is conducted for a medium- to long-term horizon, commonly spanning a 10-year planning period, to accommodate population growth and future water demand (Simanjuntak, 2025). Based on the aforementioned conditions, the planning of a clean water reservoir is particularly necessary in Dusun Lebaho Lais, Jembayan Dalam Village, Loa Kulu District, an area that faces challenges in accessing adequate drinking water services. Many settlements in similar rural areas rely heavily on rainwater harvesting, river water, or shallow wells, which are highly vulnerable to seasonal droughts, environmental pollution, and increasing population pressure. These limitations pose serious risks to water security and public health.

Several previous studies indicate the importance of integrated clean water supply system planning. (Prasetya et al., 2021) explain that reservoir planning is carried out based on clean water demand and the technical standards of the drinking water supply distribution network. (Sari et al., 2011) also emphasize that well-structured water demand planning and efficient use of water resources are key factors in addressing the imbalance between water availability and demand. Meanwhile, (Bhaskoro & Ramadhan, 2018) states that clean water supply system planning must consider aspects of quantity, quality, and service continuity in order to meet the minimum service standards established by the government. Based on these previous studies, planning a clean water reservoir in Dusun Lebaho Lais is highly important to ensure sustainable clean water availability in accordance with the established service standards. Therefore, the planning and development of a clean water supply system that fulfills both quality and quantity requirements are urgently needed to meet the community's present and future water demands (Kuhunuz et al., 2024). Population growth, along with the development of housing areas and supporting facilities aimed at stimulating local economic growth, will inevitably increase water consumption (Hidayati et al., 2023). Anticipating these changes through systematic reservoir planning is essential to ensure sustainable access to clean water and to improve the overall quality of life for the residents of Dusun Lebaho Lais.

This study is designed to address several key issues related to clean water supply planning in Dusun Lebaho Lais. The first issue concerns the projected population of Dusun Lebaho Lais in the year 2035, which serves as the basis for estimating future clean water demand. The second issue focuses on determining the required reservoir storage capacity to adequately meet the clean water needs of the community in Dusun Lebaho Lais by 2035, based on the projected population growth. To ensure that the research remains focused and well-directed, the scope of this study is limited to specific aspects. The analysis of clean water demand in Dusun Lebaho Lais is calculated based on projected population growth up to the year 2035. The population projection is determined using a single method, namely the Arithmetic method, based on historical population data from previous years. Furthermore, the calculation of the reservoir storage capacity in this study is limited to determining the radius and storage volume of the reservoir, without discussing other technical aspects such as structural design or distribution system planning. The objectives of this study are to determine the projected population of Dusun Lebaho Lais in 2035 as a basis for clean water demand planning. In addition, this study aims to determine the required reservoir storage capacity to meet the clean water needs of the community in Dusun Lebaho Lais by 2035, thereby supporting adequate and sustainable clean water availability.

## RESEARCH METHODS

This study was conducted in Dusun Lebaho Lais, an area that has potential surface water resources from nearby rivers but is not yet adequately served by a proper drinking water supply system. The selection of this location was based on existing community conditions, where most residents still rely on limited and vulnerable water sources. Therefore, effective and sustainable planning of a Drinking Water Supply System is required to meet current and future clean water needs (Peraturan Pemerintah (PP) Nomor 122 Tahun 2015 Tentang Sistem Penyediaan Air Minum, 2015). The research activities were carried out from June 10, 2025, to October 7, 2025.

The population in this study comprised all residents of Dusun Lebaho Lais, who are considered prospective beneficiaries of the planned drinking water supply system. The entire population was taken into account in estimating water demand to ensure that the planned system could adequately serve the community over the designated planning period.

This research utilized both primary and secondary data. Primary data were obtained through direct field observations at the research location, including observations of existing water sources, settlement conditions, and infrastructure characteristics relevant to the planning of the clean water system. Secondary data were collected from various supporting sources, such as literature studies, village administrative records, data from the Public Works Agency, statistical data from the Central Bureau of Statistics (BPS), internet sources, scientific journals, and reports from previous relevant projects. These secondary data were used to support population analysis, water demand estimation, and technical planning parameters.

The data analysis method applied in this study was a quantitative descriptive approach. This method was chosen to describe and analyze the existing conditions of clean water demand in the community and to calculate population projections and future water demand for the planning of the SPAM and reservoir system. The quantitative descriptive approach enables systematic numerical analysis that supports technical decision-making in field planning.

## RESULT AND DISCUSSION

### Results

### Projection of Population Growth Data

In this study, population projection calculations were used as an initial step in estimating future clean water demand. Population data were obtained from the Jembayan Dalam Village Office covering a period of the last 10 years. In this planning process, population projections were extended up to the year 2035. To calculate population growth, one method was applied, namely the Arithmetic Method. Based on the available data, the population of Dusun Lebaho Lais from 2015 to 2024 is presented in Table 1 as follows:

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**Table 1. Population Data of Dusun Lebaho Lais**

| No | Year | Population (Persons) |
|---|---|---|
| 1 | 2015 | 4,301 |
| 2 | 2016 | 4,329 |
| 3 | 2017 | 4,353 |
| 4 | 2018 | 4,380 |
| 5 | 2019 | 4,406 |
| 6 | 2020 | 4,431 |
| 7 | 2021 | 4,460 |
| 8 | 2022 | 4,488 |
| 9 | 2023 | 4,514 |
| 10 | 2024 | 4,544 |

Source: Jembayan Dalam Village Office

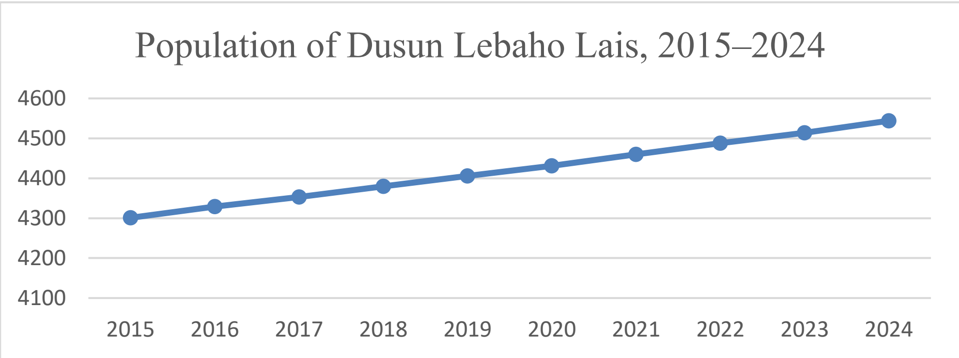


**Figure 1. Population Growth Chart of Dusun Lebaho Lais (2015–2024)**

**Population Analysis**

The analysis of the population in Dusun Lebaho Lais was carried out using the Arithmetic Method formula. Population data were obtained from the Jembayan Dalam Village Office for the years 2015 to 2024, with projections made for 2035. To determine the future rate of clean water usage, the population growth rate analysis was conducted after obtaining the projected population data from Table 2. The following is the calculation of the population growth rate in Dusun Lebaho Lais:

**Arithmetic Method**

$$r = \frac{1}{t}\left(\frac{P_n}{P_0} - 1\right)$$

$$r = \frac{1}{9}\left(\frac{4544}{4301} - 1\right)$$

$$r = 0.01\%$$

**Table 2. Percentage of Population Growth Rate**

| No | Year | Population | Increase (Persons) | Growth (%) |
|---|---|---|---|---|
| 1 | 2015 | 4,301 | – | – |
| 2 | 2016 | 4,329 | 28 | 0.651 |
| 3 | 2017 | 4,353 | 24 | 0.554 |
| 4 | 2018 | 4,380 | 27 | 0.620 |
| 5 | 2019 | 4,406 | 26 | 0.594 |
| 6 | 2020 | 4,431 | 25 | 0.567 |
| 7 | 2021 | 4,460 | 29 | 0.654 |
| 8 | 2022 | 4,488 | 28 | 0.628 |
| 9 | 2023 | 4,514 | 26 | 0.579 |
| 10 | 2024 | 4,544 | 30 | 0.665 |

| | | |
|---|---|---|
| **Total** | 243 | 5.513 |
| **Average** | | **1%** |

Source: Calculation Results

Based on Table 2 the population of Dusun Lebaho Lais increased from 4,301 persons in 2015 to 4,544 persons in 2024. After identifying the annual population growth rate, the next step was determining the appropriate population projection method to be applied until 2035.

**Determination of Population Projection Method**

The Arithmetic Method was selected to calculate population projections using the following formula:

$P_n = P_0 (1 + r \cdot n)$

Where:

$P_n$ = Projected population in year n (persons)

$P_0$ = Population at the beginning of the projection (persons)

r = Average annual population growth rate (%)

n = Projection period (years)

$P_0 = 4301 (1 + 0.01 \times 0) = 4{,}301$ persons
$P_1 = 4301 (1 + 0.01 \times 1) = 4{,}328$ persons
$P_2 = 4301 (1 + 0.01 \times 2) = 4{,}355$ persons
$P_3 = 4301 (1 + 0.01 \times 3) = 4{,}382$ persons
$P_4 = 4301 (1 + 0.01 \times 4) = 4{,}409$ persons
$P_5 = 4301 (1 + 0.01 \times 5) = 4{,}436$ persons
$P_6 = 4301 (1 + 0.01 \times 6) = 4{,}463$ persons
$P_7 = 4301 (1 + 0.01 \times 7) = 4{,}490$ persons
$P_8 = 4301 (1 + 0.01 \times 8) = 4{,}517$ persons
$P_9 = 4301 (1 + 0.01 \times 9) = 4{,}544$ persons

Based on the results of the population projection using the Arithmetic Method, the population in 2024 was calculated to be 4,544 persons.

**Standard Deviation and Correlation Coefficient Analysis**

According to (Peraturan Menteri Pekerjaan Umum Dan Perumahan Rakyat Nomor 18 Tahun 2007 Tentang Penyelenggaraan Pengembangan Sistem Penyediaan Air Minum, 2007), the most accurate method for calculating population projections is the one that produces the smallest standard deviation. Meanwhile, the correlation coefficient used should be close to **r = 1**. The formulas used are as follows:

**Standard Deviation**

$$S = \sqrt{\frac{\sum (x_i - \bar{x})^2}{n-1}} \text{ for } n > 20$$

$$S = \sqrt{\frac{\sum (x_i - \bar{x})^2}{n-1}} \text{ for } n = 20$$

Where:

- **S** = Standard deviation
- $\mathbf{X_i}$ = Independent variable X (population)
- $\bar{\mathbf{X}}$ = Average population
- **n** = Number of data points

**Table 3. Standard Deviation and Correlation Coefficient Analysis**

| Year | n | r (%) | Population | Arithmetic Result |
|---|---|---|---|---|
| 2015 | 0 | 0.01 | 4,301 | 4,301 |
| 2016 | 1 | 0.01 | 4,329 | 4,328 |
| 2017 | 2 | 0.01 | 4,353 | 4,355 |
| 2018 | 3 | 0.01 | 4,380 | 4,382 |
| 2019 | 4 | 0.01 | 4,406 | 4,409 |
| 2020 | 5 | 0.01 | 4,431 | 4,436 |
| 2021 | 6 | 0.01 | 4,460 | 4,463 |
| 2022 | 7 | 0.01 | 4,488 | 4,490 |
| 2023 | 8 | 0.01 | 4,514 | 4,517 |
| 2024 | 9 | 0.01 | 4,544 | 4,544 |
| **Standard Deviation** | | | | **81.747** |
| **Correlation Coefficient** | | | | **1** |

Source: Calculation Results

Based on the results of the standard deviation and correlation coefficient analysis, the Arithmetic Method was selected because it produced a perfect positive correlation (r = 1), indicating that this method provides stable and accurate projections for future population growth.

**Population Projection**

The following is the formula for calculating population projections using the Arithmetic Method:

$$P_n = P_0(1 + r \cdot n)$$

Where:
**$P_n$** = Projected population
**$P_0$** = Initial population
**r** = Population growth rate
**n** = Number of years

**Table 4. Population Projection**

| No | Year | $P_0$ | n | Growth Rate (%) | Projected Population |
|---|---|---|---|---|---|
| 1 | 2024 | 4,544 | 0 | 0.01 | 4,544 |
| 2 | 2025 | 4,544 | 1 | 0.01 | 4,573 |
| 3 | 2026 | 4,544 | 2 | 0.01 | 4,601 |
| 4 | 2027 | 4,544 | 3 | 0.01 | 4,630 |
| 5 | 2028 | 4,544 | 4 | 0.01 | 4,658 |
| 6 | 2029 | 4,544 | 5 | 0.01 | 4,687 |
| 7 | 2030 | 4,544 | 6 | 0.01 | 4,715 |
| 8 | 2031 | 4,544 | 7 | 0.01 | 4,744 |
| 9 | 2032 | 4,544 | 8 | 0.01 | 4,772 |
| 10 | 2033 | 4,544 | 9 | 0.01 | 4,801 |
| 11 | 2034 | 4,544 | 10 | 0.01 | 4,829 |
| 12 | 2035 | 4,544 | 11 | 0.01 | 4,858 |

Source: Calculation Results

Based on the analysis, the projected population in 2035 is 4,858 persons. Therefore, according to the Clean Water Planning Criteria of the (Kepdirjen Cipta Karya No.62/KPTS/CK/1998 Tentang Petunjuk Teknis Perencanaan, Pelaksanaan Dan Pengawasan Pembangunan Pengelolaan Sistem Penyediaan Air Minum Perdesaan, 1998), Dusun Lebaho Lais falls into the “Rural” category with a population of less than 20,000 people.

**Clean Water Demand**

**Table 5. Criteria for Clean Water Demand**

| No | Category | Population (people) | Water Consumption (liters/day/person) |
|---|---|---|---|
| 1 | Metropolitan | >1,000,000 | 150 |
| 2 | Large City | 500,000–1,000,000 | 120 |
| 3 | Small City | 100,000–500,000 | 100 |
| 4 | Medium City | 25,000–100,000 | 90 |
| 5 | District Capital | 10,000–25,000 | 60 |
| 6 | Rural Area | <10,000 | 50 |

Source: Cipta Karya, 1998

Based on the projected population of Dusun Lebaho Lais from 2025 to 2035, the clean water demand can be estimated.

**Table 6.Water Demand Projection**

| No | Year | Population (people) | Service Level (%) | Served Population (people) | Average Water Consumption (L/person/day) | Total Water Consumption (L/day) | Water Demand (L/s) |
|---|---|---|---|---|---|---|---|
| 1 | 2024 | 4,544 | 50 | 2,272 | 50 | 113,600 | 1.315 |
| 2 | 2025 | 4,573 | 50 | 2,286 | 50 | 114,313 | 1.323 |
| 3 | 2026 | 4,601 | 50 | 2,301 | 50 | 115,026 | 1.331 |
| 4 | 2027 | 4,630 | 50 | 2,315 | 50 | 115,739 | 1.340 |
| 5 | 2028 | 4,658 | 50 | 2,329 | 50 | 116,453 | 1.348 |
| 6 | 2029 | 4,687 | 50 | 2,343 | 50 | 117,166 | 1.356 |
| 7 | 2030 | 4,715 | 50 | 2,358 | 50 | 117,879 | 1.364 |
| 8 | 2031 | 4,744 | 50 | 2,372 | 50 | 118,592 | 1.373 |
| 9 | 2032 | 4,772 | 50 | 2,386 | 50 | 119,305 | 1.381 |
| 10 | 2033 | 4,801 | 50 | 2,400 | 50 | 120,018 | 1.389 |
| 11 | 2034 | 4,829 | 50 | 2,415 | 50 | 120,731 | 1.397 |
| 12 | 2035 | 4,858 | 50 | 2,429 | 50 | 121,445 | 1.406 |

Source: Calculation Results

**Clean Water Demand Calculation (Flow Rate)**

$$\text{Water Demand} = \text{Population} \times \text{Average Water Consumption} = 4{,}858 \times 50$$
$$= 242{,}889 \text{ liters/day} = 242.889 \text{ m}^3\text{/day}$$

Therefore, the projected clean water demand in Dusun Lebaho Lais for the year 2035 is 242.889 m³/day.

**Reservoir Calculation**

The reservoir capacity analysis in Dusun Lebaho Lais was carried out for the period from 2025 to 2035. The calculation of clean water demand until 2035 is used to determine the required reservoir capacity in that year. To calculate the storage capacity of the reservoir, its radius (**r**) must first be determined. The calculation is as follows:

**Given:**

- $V = 121.44$ m³(half of the total clean water demand)
- Height $(t)$ = 3 m
- Find: $r$

**Formula:**

$$V = \pi \times r^2 \times t$$
$$121.44 = \frac{22}{7} \times r^2 \times 3$$
$$r^2 = \frac{121.44}{\left(\frac{22}{7} \times 3\right)}$$

$$r^2 = 12.88$$
$$r = 3.59 \text{ m} \approx 3 \text{ m (rounded)}$$

Thus, the radius (**r**) of the reservoir is **3 m**.

After determining the radius, the reservoir capacity required to meet the clean water demand in Dusun Lebaho Lais is calculated as follows:

**Formula:**

$$V = \pi \times r^2 \times t$$
$$V = \frac{22}{7} \times 3^2 \times 3$$
$$V = \frac{22}{7} \times 9 \times 3$$
$$V = 84.86 \text{ m}^3$$

Therefore, a reservoir with a diameter of 6 m and a height of 3 m has a volume of 84.86 m³. To meet 100% of the clean water demand of Dusun Lebaho Lais, 3 reservoirs are required, with a total volume of 254.58 m³.

**Discussion**

**Population Growth Analysis Using Standard Deviation and Correlation Coefficient**

Population growth analysis is a crucial stage in planning basic infrastructure, including clean water supply systems. In this study, the selection of the projection method was based on the results of standard deviation and correlation coefficient calculations derived from historical population data. Standard deviation was used to measure the dispersion of data around the mean, thereby indicating the stability of population growth over time. A smaller standard deviation reflects lower variability and a more consistent growth pattern.

Meanwhile, the correlation coefficient was employed to determine the strength of the linear relationship between time and population size. A correlation coefficient value approaching +1 indicates a very strong or perfect positive linear relationship, meaning that the historical data show a consistent upward trend. Since the correlation coefficient obtained was 1 (perfect positive correlation), the Arithmetic method was considered the most appropriate for projecting future population growth. According to (Adioetomo & Samosir, 2010) the Arithmetic method is suitable for areas with relatively stable population growth patterns and without significant fluctuations. This method assumes that the annual population increase is constant. Given the stable deviation and perfect positive correlation identified in this study, the use of the Arithmetic method is considered capable of providing stable and reliable projections for planning clean water needs up to 2035.

**Clean Water Demand Analysis**

Based on the projection results, the total population of Dusun Lebaho Lais in 2035 is estimated to reach 4,858 inhabitants. This projected figure serves as the basis for calculating clean water demand. Referring to the Clean Water Planning Criteria issued by (Kepdirjen Cipta Karya No.62/KPTS/CK/1998 Tentang Petunjuk Teknis Perencanaan, Pelaksanaan Dan Pengawasan Pembangunan Pengelolaan Sistem Penyediaan Air Minum Perdesaan, 1998) areas with a population of less than 20,000 are categorized as rural areas. For rural areas, per capita clean water demand standards are generally lower than those in urban areas; however, they must still comply with the principles of quantity, quality, and service continuity. These planning standards emphasize that water demand calculations should consider domestic consumption, water losses (non-revenue water), as well as maximum daily demand and peak hour factors.

With a projected population of 4,858 people, clean water planning in Dusun Lebaho Lais must account for increased water consumption due to population growth. As stated by (Mays, 2010), water supply system planning that is not based on accurate demographic projections may lead to insufficient capacity in the future. Therefore, the population projection results provide a fundamental basis for determining the required storage infrastructure capacity.

**Reservoir Capacity Analysis**

Based on geometric calculations, a reservoir with a diameter of 6 meters and a height of 3 meters has a storage volume of 84.86 $m^3$. This volume is calculated using the cylindrical volume formula, which multiplies the base area by the height. In water supply system planning, reservoir capacity must be sufficient to accommodate daily demand fluctuations and ensure continuity of water distribution. According to (Peraturan Pemerintah (PP) Nomor 122 Tahun 2015 Tentang Sistem Penyediaan Air Minum, 2015) technical standards for drinking water supply system planning, a reservoir functions as a balancing facility between water production and consumption, as well as a reserve to anticipate distribution disruptions. Based on the projected total clean water demand of Dusun Lebaho Lais in 2035, three reservoir units are required to meet 100% of the community's water needs, with a total storage capacity of 254.58 $m^3$.

The provision of three reservoirs considers not only volume adequacy but also system reliability. As explained by (Fair et al., 1966) adequate storage capacity is essential for maintaining stable distribution pressure and ensuring sustainable service delivery. Thus, planning three reservoirs with a total volume of 254.58 $m^3$ is considered sufficient to support the clean water needs of Dusun Lebaho Lais up to the projected year 2035. Overall, the analysis of population growth, clean water demand, and reservoir capacity demonstrates that planning based on statistical data and established technical standards provides a strong foundation for developing sustainable clean water infrastructure tailored to rural area characteristics.

## CONCLUSION

The results of this study indicate that the population projection analysis using the Arithmetic Method produced a standard deviation value of 81.747 and a correlation coefficient of 1. This result demonstrates a perfect positive correlation between the projected and actual population data, indicating that the Arithmetic Method is highly reliable and suitable for estimating population growth in Dusun Lebaho Lais. The low standard deviation value also reflects minimal deviation from the average trend, confirming the stability and accuracy of the selected projection method for planning purposes.

Based on the population analysis, the total population of Dusun Lebaho Lais in 2024 was recorded at 4,544 persons. The projection results show a consistent increase in population up to 4,858 persons by 2035, with an average annual growth rate of 1%. This continuous population growth directly affects the demand for clean water, as an increase in the number of residents leads to higher water consumption. Therefore, population growth becomes a critical factor in determining the future capacity and sustainability of the clean water supply system in the study area.

Furthermore, the analysis of clean water demand indicates that by 2035, the total clean water requirement in Dusun Lebaho Lais is estimated at 242,889 liters per day, equivalent to 242.889 cubic meters per day. This demand calculation is based on rural water consumption standards and reflects the projected population size. The results highlight the importance of accurate population projections to ensure that water supply infrastructure can adequately meet community needs in the long term.

In terms of infrastructure capacity, the reservoir storage analysis shows that the required reservoir volume is 84.86 $m^3$, with a diameter of 6 meters and a height of 3 meters, requiring only three reservoir units. Based on these calculations, the existing reservoir capacity is considered sufficient to meet the projected clean water demand in 2035. This finding suggests that the planned reservoir design is capable of supporting the water supply system and ensuring the continuity of clean water services for the residents of Dusun Lebaho Lais under the projected growth conditions.

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