

# Evaluation of Infrastructure Condition in the Transmigration Area to Support Regional Development (Case Study: Labangka Transmigration Area)

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**Abstract.** This study evaluates the condition of public facilities and infrastructure in the Labangka Transmigration Area as a basis for strengthening area development grounded in local potential. The evaluation was conducted through descriptive analysis, spatial analysis, content analysis, and SWOT and PESTEL approaches to identify existing conditions, service accessibility, and strategic intervention needs. The findings indicate that educational and health infrastructure in the area remains insufficient, characterized by limited facilities at the secondary education level and the absence of referral-level health services. In addition, most Posyandu facilities and primary education infrastructure are in substandard to unfit condition. The road network also exhibits substantial structural gaps, with a predominance of severely damaged and unpaved segments, particularly in Labangka Village, Suka Mulya Village, and UPT Prode SP III, thereby hindering accessibility and reducing logistical efficiency. The accessibility analysis reveals pronounced spatial disparities in education and health services, which may further exacerbate social inequality. These findings underscore the need for place-based prioritization of basic infrastructure development to foster a more livable, productive, and sustainable region.

## 1 Introduction

The development of transmigration areas in Indonesia is currently directed not only as a population relocation program but also as a strategic effort to establish new economic growth centers based on local resources. The transmigration program was first regulated under Law No. 15 of 1997 on Transmigration, positioning transmigration as part of national development aimed at supporting equitable development and population redistribution. Historically, from the post-independence period through the New Order era, this policy facilitated the movement of people from densely populated regions such as Java and Bali to less populated areas including Sumatra, Kalimantan, Sulawesi, Maluku, and Papua [1].

The transmigration program has long contributed to national development, particularly through population redistribution and the establishment of new settlement areas. Transmigration zones are intended not only as residential areas but also as emerging economic centers grounded in local potential (Ministry of Village, Development of Disadvantaged Regions, and Transmigration, 2020). In practice, however, the development of transmigration areas continues to face persistent challenges, especially inadequate infrastructure, which remains a major barrier to local economic activities. Priyadi's study highlights that infrastructure significantly influences the development of transmigration areas [2].

Facilities and infrastructure constitute key determinants of economic growth, particularly in newly developed regions such as transmigration areas. Road networks, bridges, clean water systems, electricity, markets, and

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irrigation infrastructure have direct impacts on production, distribution, and marketing of local commodities. Adequate infrastructure reduces logistical costs, enhances accessibility, and expands economic participation opportunities [3].

Infrastructure plays a central role in opening economic pathways for transmigrant communities [4]. Road and bridge networks, for example, not only facilitate the distribution of key commodities to markets but also significantly reduce logistical expenses [5]. Access to electricity and irrigation similarly forms a fundamental foundation for supporting production and distribution activities. Du and Jiao (2023) demonstrate that rural infrastructure development improves environmental governance, subsequently stimulating local economic growth [6]. Furthermore, improvements in irrigation systems have been shown to produce measurable impacts on agricultural productivity; strategies that enhance total factor productivity in rice through irrigation rehabilitation and road improvement significantly increase rice output.

Strengthening basic infrastructure such as clean water systems, electricity, and rural bridges generates multiplier effects that promote broader local economic development. A study in Banjarnegara Regency found that water and electricity infrastructure significantly contributes to local Gross Regional Domestic Product (GRDP) [7]. With adequate basic facilities, transmigrant communities gain improved access to markets and production inputs while optimizing the potential of local resources [8]. Consequently, investments in infrastructure within transmigration areas should be viewed as essential drivers of regional transformation toward sustainable and equitable economic growth.

## **2 Methodology**

### **2.1 Data Analysis Methods**

Various analytical methods were employed in accordance with the expected outputs of the TEP program. For the output describing the General Overview of the Area, Descriptive Analysis [9], Spatial Analysis (for geographical and administrative conditions) [10], and Content Analysis (for the historical development of the area) [11] were utilized. For the Social and Institutional Conditions output, the applied methods included Stakeholder Mapping (Salience/Power–Interest Matrix) [12], Descriptive Analysis, and Content Analysis. The Economic Conditions of the Area were examined through Descriptive Analysis, Content Analysis, and SWOT Analysis [13]. For Ecological Conditions and Basic Services, Carrying Capacity Analysis [14], Land Suitability Analysis, Spatial Analysis, Zoning and Land Designation Analysis, and Infrastructure Needs Assessment were conducted. Field findings and their synthesis were analyzed using Descriptive Analysis, SWOT Analysis for transmigration areas, and sector-based PESTEL Analysis. Finally, Strategic Recommendations were formulated using Benchmarking Analysis (policies, best practices, and community aspirations) and Descriptive Analysis [15].

### **2.2 Cross-Sector Coordination and Stakeholder Engagement**

To ensure the effectiveness of the TEP program, cross-sector coordination and stakeholder engagement were essential components. The team was required to establish systematic collaboration with various strategic actors at the national, regional, and local levels. This collaborative mechanism involved cooperation with Local Government (through potential mapping, development program integration, and utilization of regional data), partnership with Higher Education Institutions (through placement of students/alumni and involvement of faculty members as research supervisors), synergy with Patriot Scholarship Recipients (through the role of the Expedition Team as field mentors and co-development of projects), and engagement with Local Communities (through participatory research training and regular forums for sharing research findings).

### 3 Result and Discussion

#### 3.1 Existing Condition of Infrastructure in the Study Area

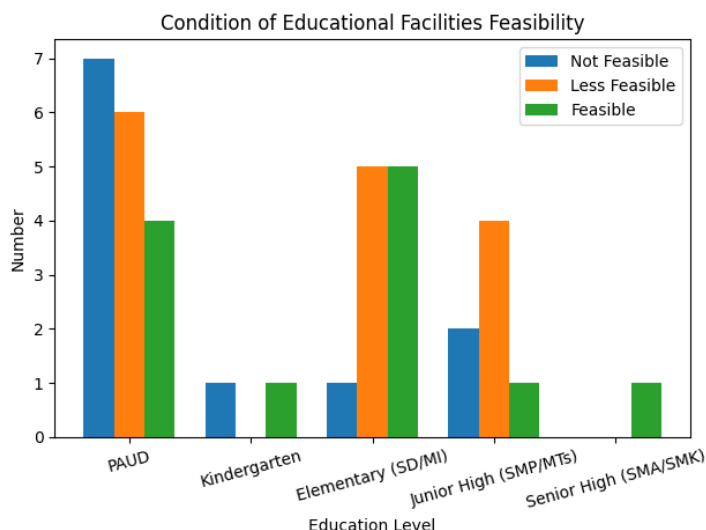
This subsection presents an in-depth evaluation of the existing public facilities and infrastructure (Sarpras) in the Labangka Transmigration Area. The assessment focuses on three critical pillars of infrastructure that determine the social and economic sustainability of the region: educational facilities, health facilities, and road network conditions.

Educational and health facilities constitute essential social infrastructure for improving Human Resources (HR) quality and the Human Development Index (HDI) in Labangka, which in turn supports long-term economic productivity. Meanwhile, the road network functions as the economic backbone of the area, playing a vital role in connecting agricultural production centers to markets, influencing logistical costs, and determining overall accessibility.

**Table 1.** Number of Educational Facilities in the Study Area  
 Source: Kecamatan dalam Angka 2025

Village	PAUD	TK	SD/MI	SMP/MTs	SMA/SMK	PT
Jaya Makmur	2	0	1	0	0	0
Suka Damai	4	1	2	3	0	0
Suka Mulya	3	0	2	1	0	0
Sekokat	2	0	1	0	0	0
Labangka	2	0	2	1	1	0
UPT Prode SP I	2	0	1	1	0	0
UPT Prode SP II	1	0	1	0	0	0
UPT Prode SP III	1	1	1	1	0	0

The evaluation indicates that the availability of educational facilities in the Labangka Transmigration Area is dominated by early childhood institutions, with a total of 17 PAUD units distributed evenly across the region, whereas only 2 kindergarten units are available, creating an access gap at the formal preschool level. At the primary level, the availability of SD/MI is relatively adequate, with 11 units present across all villages/UPTs; however, accessibility declines sharply at the lower secondary level, with only 6 SMP/MTs units operating in four out of eight villages. The most significant disparity appears at the upper secondary and tertiary levels, where only one SMA/SMK unit exists—concentrated in Labangka Village—and no higher education facilities are present throughout the entire area. This pattern indicates that the higher the education level, the more limited the accessibility for the residents of Labangka.



**Fig. 1.** Diagram of Educational Facility Conditions

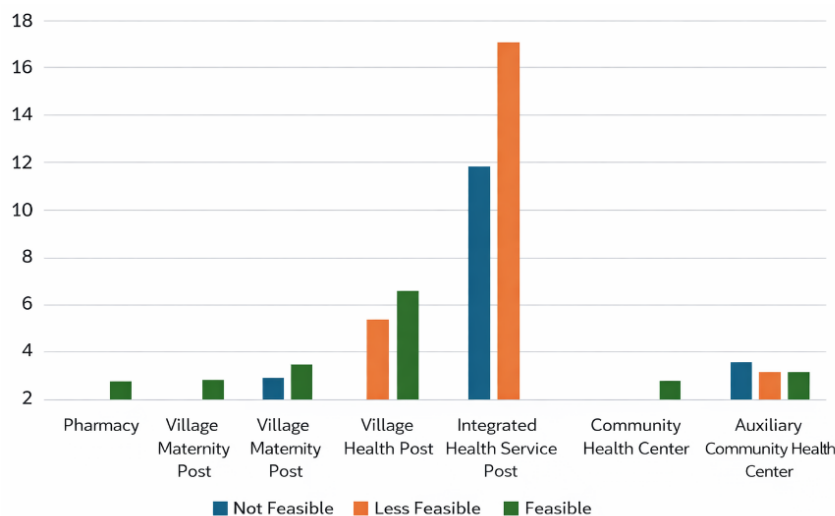
The overall condition of educational facilities in the Labangka Transmigration Area is dominated by units requiring substantial rehabilitation. Early childhood education facilities (PAUD) exhibit the most critical condition, with 13 units categorized as Unfit (7 units) and Poor (6 units). At the lower secondary level, the majority of SMP/MTs facilities also fall into the Poor category (4 units), significantly outnumbering those deemed Adequate (1 unit). Although SD/MI facilities show a more balanced distribution between Poor and Adequate conditions (5 units each), one unit remains categorized as Unfit. This pattern indicates that most educational infrastructure—except for the single Adequate SMA/SMK unit and the relatively balanced condition of kindergarten facilities—requires immediate rehabilitation to ensure functional performance in supporting human capital development within the area.

**Table 2.** Number of Health Facilities in the Study Area  
 Source: Kecamatan dalam Angka 2025

Village	Hospital	Health Center	Posyandu	Pharmacy	Village Health Post	Auxiliary Health Center
Jaya Makmur	0	0	5	0	1	1
Suka Damai	0	1	6	0	1	0
Suka Mulya	0	0	3	0	1	1
Sekokat	0	0	4	0	1	1
Labangka	0	0	6	1	1	1
UPT Prode SP I	0	0	1	0	1	1
UPT Prode SP II	0	0	1	0	1	1
UPT Prode SP III	0	0	1	0	1	1

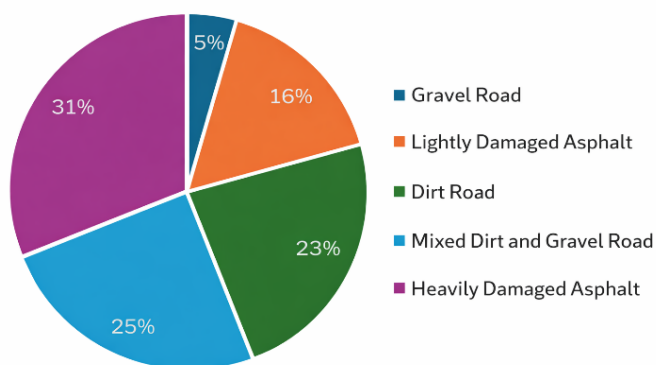
The evaluation reveals that the Labangka Transmigration Area does not possess a hospital or pharmacy in most villages, except for Labangka Village which has one pharmacy, while a single health center (Puskesmas) is available only in Suka Damai. Primary healthcare facilities are more widely distributed, with one Village Health Post (Poskesdes/Polindes) in every village/UPT (8 units total) and six Auxiliary Health Centers (Pustu). This distribution reflects a system emphasizing community-level and primary care services. Posyandu constitutes the most abundant health facility (27 units), with the highest concentrations in Suka Damai and Labangka (6 units each), highlighting

substantial efforts toward maternal and child health services. However, the absence of hospitals and limited availability of health centers indicate restricted access to referral care and pharmaceutical services.



**Fig. 2.** Diagram of Health Facility Conditions

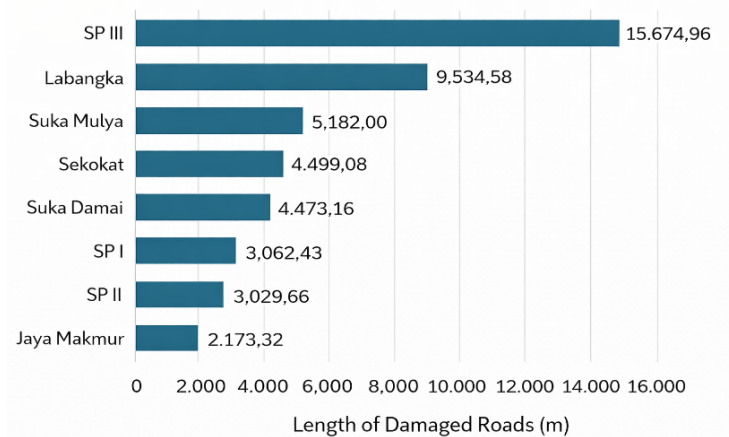
The condition of healthcare facilities in the Labangka Transmigration Area demonstrates severe adequacy issues, particularly among community-level facilities. Most of the 27 Posyandu units fall into the Poor (17 units) and Unfit (10 units) categories, suggesting that nearly all maternal and child health posts require comprehensive rehabilitation. While the condition of Auxiliary Health Centers shows a more balanced distribution, Village Health Posts exhibit relatively better adequacy, with a majority classified as Fit. Overall, the primary healthcare infrastructure, especially Posyandu, operates at low functional capacity, posing significant barriers to providing optimal primary healthcare services.



**Fig. 3.** Diagram of Pavement Conditions in the Study Area

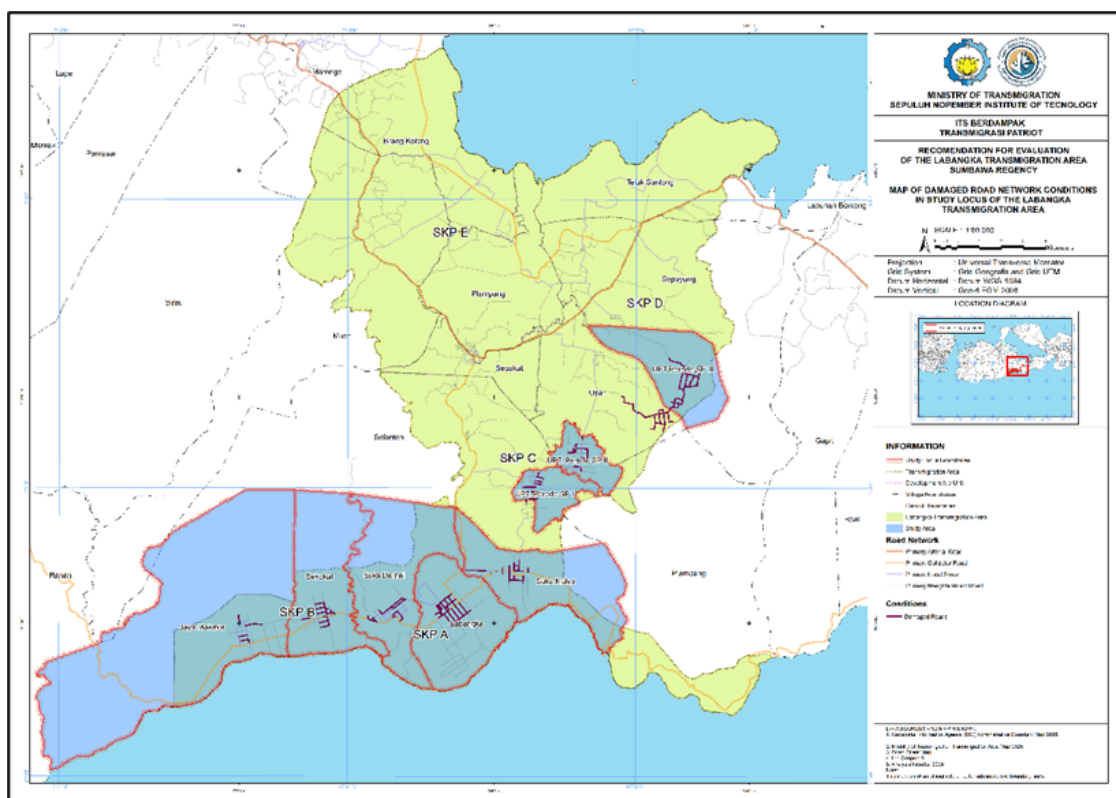
Analysis of road accessibility gaps indicates that the quality of basic transportation services in Labangka is in critical condition, with 79% of problematic road segments characterized by severe structural damage and inadequate pavement (dirt or gravel roads). These conditions substantially hinder mobility and increase logistical costs for

transmigrant households. In several settlement units, asphalt roads have deteriorated to the point that full reconstruction is urgently required to restore the area's livability and economic function.



**Fig. 4.** Diagram of Road Damage Length in the Study Area

Further analysis of road damage highlights stark disparities in infrastructure quality, with the worst structural failures and unpaved segments concentrated in Labangka Village, which recording the highest number of severely damaged roads, followed by Suka Mulya and Sekokat. This uneven distribution underscores the need for priority allocation of road rehabilitation resources to these areas, which serve as key economic corridors within the region.

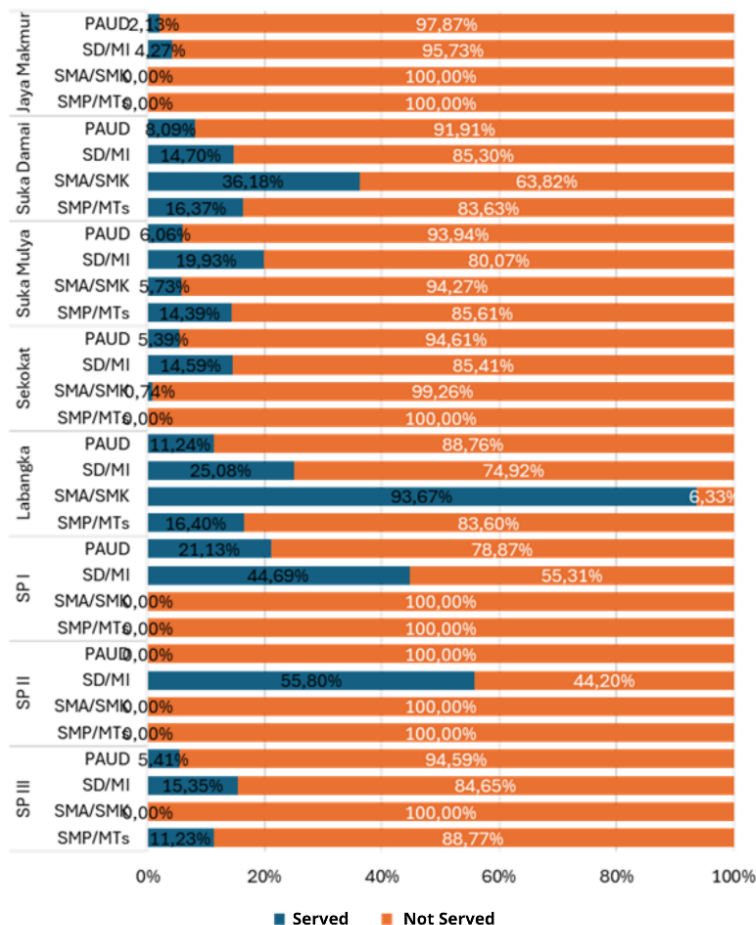


**Fig. 5.** Map of Damaged Road Network in the Study Area

### 3.2 Accessibility of Public Facilities

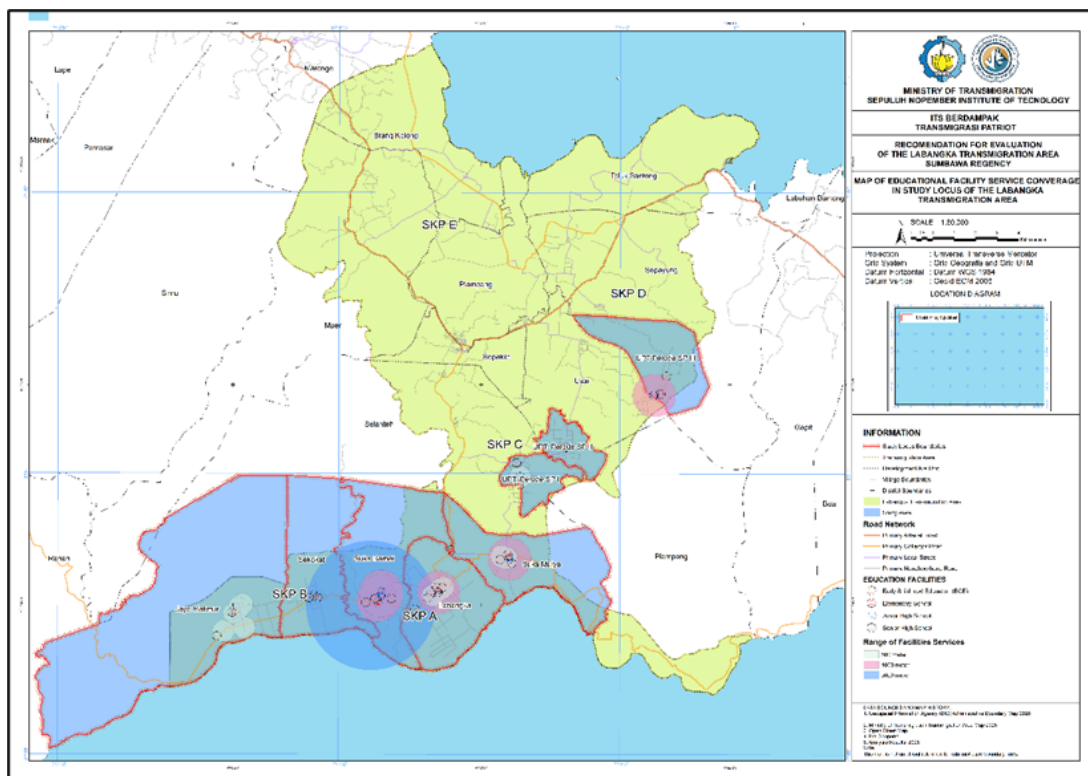
This subsection presents a detailed assessment of service accessibility for existing public facilities in the Labangka Transmigration Area. The analysis focuses on spatial disparities and quality conditions across three critical infrastructure pillars: Educational Facilities, Health Facilities, and Road Improvement Requirements.

Assessing the accessibility of educational and healthcare facilities is essential, as both serve as fundamental drivers of human capital development and improvements in the Human Development Index (HDI). Spatial inequity in access to these services directly contributes to social disparities and reduced economic productivity. Meanwhile, the assessment of road improvement needs is crucial because road networks serve as the economic backbone of the area, connecting production centers with markets and shaping logistical efficiency and daily mobility.

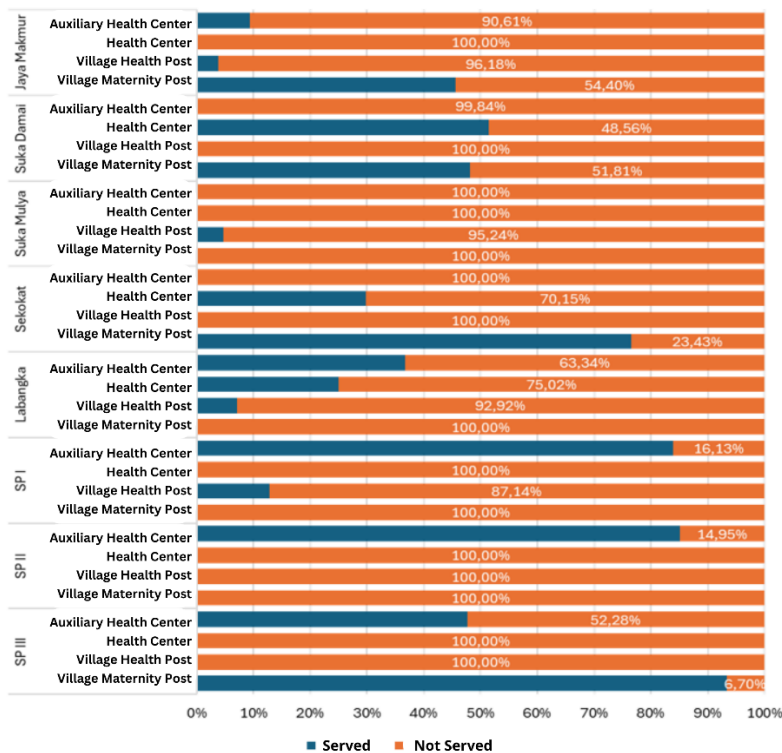


**Fig. 6.** Diagram of Educational Facility Accessibility

The visualization illustrates significant spatial disparities in access to educational facilities across the area. While certain villages—such as Sekokat and Suka Mulya—demonstrate high levels of service coverage (exceeding 90% of the area served), critical gaps persist in major locations such as Jaya Makmur (approximately 70% unserved) and Labangka (approximately 60% unserved). The predominance of unserved areas reflects suboptimal facility placement and underscores the need for place-based construction of new schools to ensure equitable access to basic education. A map illustrating this accessibility is provided in the following figure.

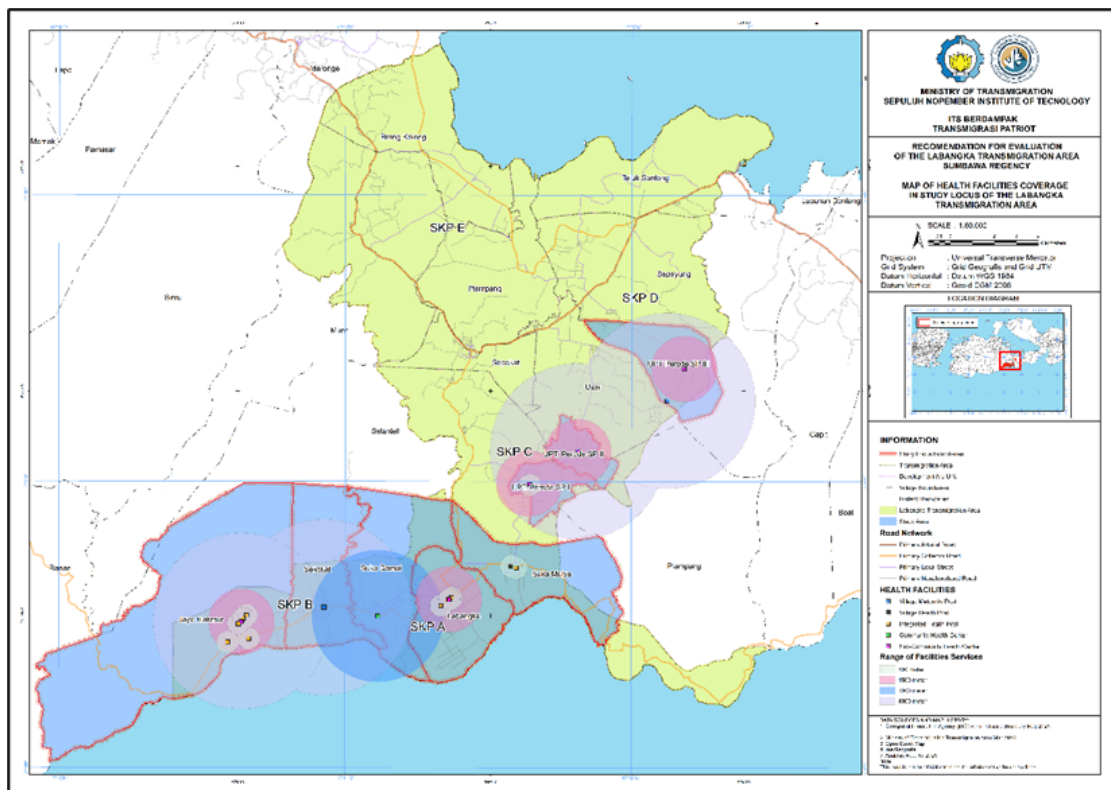


**Fig. 7.** Map of Educational Facility Accessibility in the Study Area

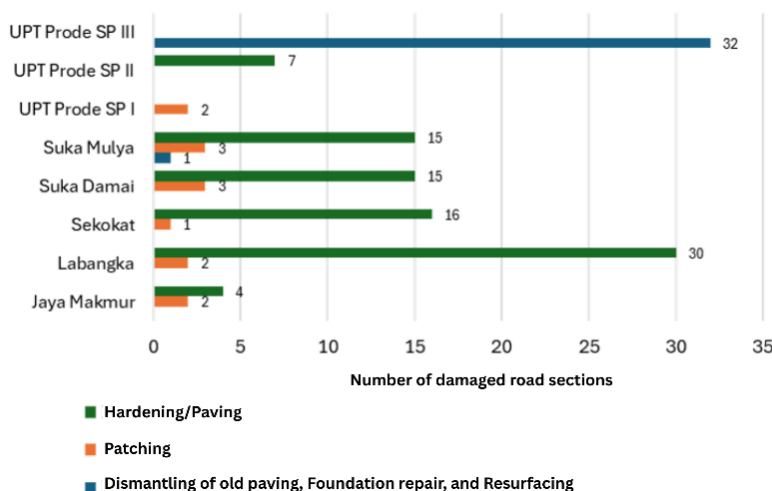


**Fig. 8.** Diagram of Health Facility Accessibility

The visualization reveals alarming spatial inequities in healthcare service coverage, with substantial areas across the region remaining unserved. Although Sekokat, Suka Mulya, and SP1 exhibit relatively good coverage (over 80% served), critical deficits appear in Jaya Makmur (85–90% unserved), Plampang (around 80% unserved), and Labangka (approximately 75% unserved). These substantial service gaps highlight major risks of social inequity and low facility utilization, thus necessitating strengthened primary healthcare networks through the construction of additional Auxiliary Health Centers or the deployment of mobile clinics.



**Fig. 9.** Map of Health Facility Accessibility in the Study Area



**Fig. 10.** Diagram of Road Damage Length in the Study Area

The visualization categorizes repair needs across damaged road segments, clearly indicating that the primary issue in the road network is not routine maintenance but fundamental structural deficiency and the absence of basic pavement. Data show that UPT Prode SP III contains the highest number of severely damaged segments requiring full reconstruction. This settlement unit represents a critical hotspot within the region, where comprehensive road rehabilitation is an urgent prerequisite for restoring mobility, reducing logistical burdens, and improving the overall viability of the transmigration area.

## 4 Conclusion

This study demonstrates that the condition of infrastructure in the Labangka Transmigration Area remains far from adequate to support the acceleration of socio-economic development. The availability of educational and healthcare facilities reveals imbalances across levels and locations, while the quality of these facilities is often categorized as Poor or Unfit. The severely damaged and underdeveloped road network represents the most significant barrier to population mobility and the distribution of local commodities. Furthermore, major spatial disparities in accessibility to essential services highlight structural inequities that hinder human capital development and local productivity.

These findings underscore the importance of targeted infrastructure interventions, particularly in rehabilitating educational and healthcare facilities, improving road quality, and redesigning the spatial allocation of public services based on actual accessibility needs. Implementing these recommendations is expected to strengthen the region's function as an emerging growth center and enhance the long-term welfare of transmigrant communities.

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