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Dataset on the Number of Schools, Teachers, and Students in Sulawesi, Indonesia: Kindergarten, Primary, Junior, Senior High, Vocational, and Islamic Boarding Schools with Educational Access, Quality, and Cultural Implications to Solve Challenges and Strategies in Education Management and Support Sustainable Development Goals (SDGs)

Amirullah Abduh[1,], Sitti Fatimah Achmad[2], Chaidir Syam[3], Sulaeman Samad[4], Muhammad Arham[1], Mustafa Mustafa[1], Abdullah Pandang[1]*

[1]Universitas Negeri Makassar, Makassar, Indonesia
[2]UPTD SDN 57 Bulu-Bulu, Maros, Indonesia
[3]Kabupaten Maros, Maros, Indonesia
[4]Baperida Kabupaten Maros, Maros, Indonesia
Correspondence: E-mail: amirullah@unm.ac.id

A B S T R A C T

This study presents a dataset on schools, teachers, and students in Sulawesi, Indonesia, covering kindergarten, primary, junior, senior high, and Islamic boarding schools. Using a descriptive mixed approach that combines statistical data, interviews, focus group discussions, observations, and document reviews, the study examines educational access, quality, governance, and cultural dimensions. Findings reveal disparities in enrollment across school levels, unequal teacher distribution between urban and rural areas, and limited cultural integration in curricula. Some levels showed participation gaps, while community involvement in school management remained weak. The dataset emphasizes the need for equitable teacher deployment, culturally responsive pedagogy, and community-based governance to support sustainable education reform and the achievement of Sustainable Development Goals.

1. INTRODUCTION

Education is a strategic foundation for developing equitable, adaptive, and culturally grounded human capital. That is the main reason many reports regarding education, including teaching and learning processes, have been well-documented (**Table 1**).

Table 1. Previous studies on education.

No	Title	Reference
1	Impact of e-learning on college of education lecturers' knowledge of quantitative data analysis in SPSS	Adeniran & Onasanya (2024)
2	How language and technology can improve student learning quality in engineering? Definition, factors for enhancing students comprehension, and computational bibliometric analysis	Al Husaeni *et al.* (2022)
3	Bibliometric computational mapping analysis of publications on mechanical engineering education using VOSviewer	Al Husaeni & Nandiyanto (2022)
4	How technology can change educational research? Definition, factors for improving quality of education and computational bibliometric analysis	Al Husaeni *et al.* (2024a)
5	Chatbot artificial intelligence as educational tools in science and engineering education: A literature review and bibliometric mapping analysis with its advantages and disadvantages	Al Husaeni *et al.* (2024b)
6	Evaluating the impact of primary education: An in-depth investigation	Al Zaman *et al.* (2024)
7	Project effectivity of adsorbent from food waste for handling wastewater as a learning strategy to learning achievement of education for sustainable development and inquiry abilities	Anggraeni *et al.* (2023)
8	Geosmart application as a tool for interactive learning: Literature review completed with experiments for improving understanding of geospheric phenomena in geography education	Fadjarajani *et al.* (2024)
9	Technology and hybrid multimedia for language learning and cross-cultural communication in higher education	Farida *et al.* (2024)
10	Strategies in language education to improve science student understanding during practicum in laboratory: Review and computational bibliometric analysis	Fauziah *et al.* (2021)
11	Advancing sustainability and green engineering in mechanical engineering education: Concepts, research trends, challenges, and implementation strategies	Fiandini *et al.* (2025)
12	Teachers' questioning strategies as a scaffold to the middle school students' knowledge building in constructing hortatory exposition texts: A thematic analysis	Gunawan & Wirza (2025)
13	Interlanguage pragmatic competence of university students: An error analysis of apology speech act strategies in Japanese learners	Haristiani & Christianwati (2024)
14	Chatbots as digital language tutors: revolutionizing education through AI	Luckyardi *et al.* (2024a)
15	Advancing language education in Indonesia: Integrating technology and innovations	Luckyardi *et al.* (2024b)
16	Teaching high school students with/without special needs and their misconception on corrosion	Maryanti *et al.* (2022a)

Table 1 (continue). Previous studies on education.

No	Title	Reference
17	Measurement of the level of digital competence of vocational teachers in learning development	Massadah & Widaningsih (2024)
18	Techno-economic feasibility of educational board game production from agro-industrial waste in support of Sustainable Development Goals (SDGs) through science and technology integration	Mukmin *et al.* (2025)
19	Investigating senior high school students' metacognition in Indonesian learning reading comprehension: Does it have a positive impact?	Mustopa *et al.* (2024)
20	Portfolio-based assessment in research methodology course students in vocational education	Nurhayati *et al.* (2024)
21	Sustainable global economy through technical and vocational education and training for skilled workforce in achieving good governance	Olabiyi (2025)
22	Literacy development through independent learning model in the eastern part of Indonesia	Putra *et al.* (2024)
23	Difficulties encountered by the students in learning mathematics	Radiamoda (2024)
24	Trends and developments in research on adsorption in education: Bibliometric analysis	Raghadita *et al.* (2024)
25	Digital educational media for hospital waste management: addressing waste types, illegal disposal, and environmental impact	Rahadi et al. (2025)
26	An application of statistical testing: A guide to basic parametric statistics in educational research using SPSS	Rahayu *et al.* (2024)
27	Students' abilities in reading infographics text in junior high schools	Retnaningtyas *et al.* (2024)
28	Indigenous values of short stories in Indonesian fictional prose in higher education: Implication on language education	Sari *et al.* (2023)
29	Demystifying pedagogic discourse of Indonesian language in-service teachers in the pre-teaching phase of communication	Sastromiharjo *et al.* (2025)
30	IT and management strategies for language education: Lessons from the digitalization of education activities	Soegoto *et al.* (2024)
31	A systematic literature review of Internet of Things for higher education: Architecture and implementation	Soegoto *et al.* (2022)
32	Prototype of greenhouse effect for improving problem-solving skills in science, technology, engineering, and mathematics (STEM)-education for sustainable development (ESD): Literature review, bibliometric, and experiment	Solihah *et al.* (2024)
33	Artificial intelligence (AI)-based learning media: Definition, bibliometric, classification, and issues for enhancing creative thinking in education	Solihat *et al.* (2024)
34	Teaching implication of meaning construction at morphological level of affixation in a complex Indonesian verb formation	Sudana *et al.* (2024)
35	Exploring metacognitive strategies to support young learners in developing their learner autonomy	Suharto *et al.* (2025)
36	How to improve student understanding in learning science by regulating strategy in language education? Definition, factors for enhancing students comprehension, and computational bibliometric review analysis	Suherman *et al.* (2023)
37	Linguistic technopreneurship in business success digitalization for small medium enterprises in West Java: Implications for language education	Suprayogi *et al.* (2024)

Table 1 (continue). Previous studies on education.

No	Title	Reference
38	Technology-supported project-based learning: Trends, review and future research in science, technology and engineering education	Wahyudi *et al.* (2024)
39	The endangered Central Malay folklore: A medium for internalizing character values in Indonesian language and literature	Youpika *et al.* (2024)
40	Bibliometric approach of the demands, availability, and difficulty of digital academic writing sources for undergraduate students	Zulfadhli *et al.* (2024)

Education becomes the most important aspect, and it is in the context of the Sustainable Development Goals (SDGs) (Ragadhita *et al.*, 2026; Maryanti *et al.*, 2022b). As emphasized in SDG 4, inclusive and equitable quality education is essential to ensuring lifelong learning for all. However, achieving this goal requires more than universal access; it demands contextual education management that respects local identity and bridges geographic inequalities. Educational equity refers not only to fair access but also to quality, relevance, and outcome parity across diverse regions (Adeoye *et al.*, 2024; Oktamovna & Ruslanovna, 2024). At the same time, integrating cultural values into the learning process enhances student engagement, strengthens identity, and enriches pedagogical practices. In decentralized systems like Indonesia's, education management must be locally responsive, ensuring that strategic planning, teacher deployment, and curriculum adaptation align with community needs and sociocultural contexts. Therefore, contextualizing educational equity and cultural integration becomes essential for supporting national and global education goals through practical, location-sensitive strategies.

Various studies have documented the persistent educational disparities between urban and remote regions. Infrastructure limitations, teacher shortages, and low parental involvement continue to characterize education in underdeveloped areas (Hasan, 2018; Amini, 2021; Prasojo *et al.*, 2025). Previous research (Nasir *et al.*, 2019) found that unequal resource distribution and weak policy implementation significantly affect education quality in rural districts. Moreover, efforts to incorporate local wisdom into the curriculum often fall short due to inadequate teacher training and a lack of instructional materials (Yusra *et al.*, 2020; Herlina, 2019). Inclusive education remains largely symbolic in many regions due to insufficient facilities and limited teacher competence (Saputra, 2018). These findings underscore the need to reassess regional education policies and explore how local potentials (such as traditional cultural values) can be leveraged for more effective and inclusive education systems.

This study aims to analyze the key challenges in education management in Maros, focusing on access, quality, governance, and cultural integration. It also seeks to identify local potentials that can support sustainable improvements in education through policy reform and community participation. Maros in South Sulawesi presents a compelling case for examining the interplay of educational equity, local culture, and decentralized governance. With a diverse geography encompassing coastal, mountainous, and rural zones, Maros experiences significant disparities in access to education, especially in sub-districts such as Mallawa, Camba, and Cenrana. Despite policies such as Regional Regulation No. 14 of 2016, implementation gaps persist, particularly in teacher qualification, infrastructure provision, and curriculum relevance. While primary school enrollment is nearly universal, participation in early childhood and higher education remains low. Additionally, values such as sipakatau, sipakalebbi, and sipakainge, which are deeply rooted in local identity, are rarely reflected in formal educational content, despite their potential for character education and community

engagement. These challenges are compounded by centralized curriculum models and limited stakeholder involvement at the school level.

The novelty of this research lies in its contextual analysis of educational equity within a decentralized governance framework, while highlighting the strategic role of local culture in achieving SDG 4. By offering place-based, culturally responsive solutions, the study contributes to a growing discourse on transforming rural education systems through grounded and inclusive strategies.

2. LITERATURE REVIEW

Education management involves a systematic process of planning, organizing, implementing, and evaluating educational programs to ensure equity, relevance, and effectiveness (Wahyuni, 2021; Muhabbat *et al.*, 2024). In Indonesia, several regulations are available:

(i) Peraturan Menteri Pendidikan Nasional Republik Indonesia Nomor 70 Tahun 2009 Tentang Pendidikan Inklusif Bagi Peserta Didik Yang Memiliki Kelainan Dan/Atau Bakat Istimewa.

(ii) Permendikbud Nomor 51 Tahun 2018 Tentang Penerimaan Peserta Didik Baru Jenjang TK, SD, SMP, SMA, SMK.

(iii) Permendikbud Nomor 6 Tahun 2018 Tentang Penugasan Guru Sebagai Kepala Sekolah.

(iv) Permendikbud Nomor 14 Tahun 2018 Tentang Penerimaan Peserta Didik Baru.

(v) Permendikbud Nomor 15 Tahun 2018 Tentang Pemenuhan Beban Kerja Guru, Kepala Sekolah dan Pengawas.

(vi) Permendikbud Nomor 10 Tahun 2018 Tentang Petunjuk Teknis Penyaluran TPG, TK, Tamsil Guru PNSD.

(vii) Permendikbud 8 Tahun 2020: Petunjuk Teknis Bantuan Operasional Sekolah (BOS) Reguler.

(viii) Permendikbud 44 Tahun 2019: Penerimaan Peserta Didik Baru Pada TK, SD, SMP, SMA, dan SMK.

(ix) Permendikbud 43 Tahun 2019: Penyelenggaraan Ujian yang Diselenggarakan Satuan Pendidikan dan Ujian Nasional.

(x) Permendikbud Nomor 38 Tahun 2020 Tentang Tata Cara Memperoleh Sertifikat Pendidik Bagi Guru Dalam Jabatan.

(xi) Permendikbud Nomor 1 Tahun 2021 Tentang Penerimaan Peserta Didik Baru.

(xii) Permendikbudristek Nomor 12 Tahun 2024 Tentang Kurikulum Pada Pendidikan Anak Usia Dini, Pendidikan Dasar dan Menengah.

(xiii) Undang-Undang Nomor 23 Tahun 2002 Tentang Perlindungan Anak.

(xiv) Undang-Undang Nomor 35 Tahun 2014 Tentang Perubahan Atas Undang-Undang Nomor 23 Tahun 2002 Tentang Perlindungan Anak.

In Indonesia, Law No. 20 of 2003 emphasizes the need for an equitable and efficient education system that supports national development. However, in decentralized contexts, education management must account for local geographical, economic, and cultural variations. District governments bear the responsibility for ensuring that schools are adequately resourced and responsive to community needs. Despite regulatory frameworks, many local governments still face challenges in translating national mandates into effective local policies. As a result, disparities in access and quality often persist, particularly in rural and underdeveloped areas where strategic planning and resource allocation remain weak (Nasir *et al.*, 2019).

Educational inequality in remote regions of Indonesia remains a persistent problem, marked by inadequate infrastructure, low teacher availability, and poor student retention. According to the Ministry of Education and Culture in 2020, a substantial percentage of schools in isolated areas lack access to basic learning resources such as libraries, laboratories, and internet facilities. Logistical barriers, including long travel distances and a lack of transportation, contribute to high dropout rates and discourage both students and teachers (Hasan, 2018). Limited funding and urban-biased budgeting mechanisms have marginalized rural schools, leaving them without the necessary tools to support meaningful learning (Amini, 2021). These structural inequities highlight the urgent need for localized interventions and inclusive policy design that can bridge the education gap between urban centers and remote districts.

Integrating local wisdom into the school curriculum has emerged as a key strategy to make education more relevant and culturally resonant. Ministry of Education and Culture Regulation No. 79 of 2014 mandates the inclusion of local content to promote cultural identity and contextual understanding. In regions such as South Sulawesi, values like sipakatau (mutual humanization), sipakalebbi (mutual respect), and sipakainge (mutual admonition) embody rich philosophical foundations that can be used to foster student character development. Incorporating local culture into education improved learner motivation and strengthened community-school relations (Yusra *et al.*, 2020). However, the implementation of this approach is often constrained by a lack of culturally relevant teaching materials and limited teacher preparedness (Herlina, 2019). Without systematic support from education authorities, the promise of local wisdom remains underutilized in practice.

Inclusive education is another important dimension in achieving educational equity, especially for children with special needs or those from disadvantaged backgrounds. Ministry of National Education Regulation No. 70 of 2009 outlines the requirement for every district to have at least one inclusive school at each level. In practice, however, many regions struggle to meet this mandate. Inclusive education initiatives are frequently hindered by the absence of suitable facilities and a shortage of trained teachers capable of accommodating diverse learning needs (Saputra, 2018). In rural areas, inclusive policies are often underprioritized, leading to the exclusion of children with disabilities from formal education. These shortcomings reflect the broader challenge of translating inclusive policy goals into effective, on-the-ground implementation.

A comprehensive set of ministerial regulations has been issued to address governance, access, and quality in Indonesian education. Regulations such as Permendikbud No. 51/2018, No. 14/2018, No. 44/2019, and No. 1/2021 standardize student admissions across early childhood, primary, and secondary levels, emphasizing zoning and equity. Policies like Permendikbud No. 6/2018 and No. 15/2018 regulate school leadership assignment and workload distribution for principals and supervisors, while Permendikbud No. 10/2018 provides technical guidelines for the distribution of teacher allowances and incentives. Permendikbud No. 8/2020, which governs School Operational Assistance (BOS), serves as a key funding mechanism to ensure basic school needs are met. Quality assurance is further supported through Permendikbud No. 38/2020 concerning teacher certification and Permendikbud No. 43/2019 regulating the administration of school and national examinations. Most recently, Permendikbudristek No. 12/2024 introduced a new curriculum framework spanning early childhood to secondary education, aligning with global trends toward holistic and student-centered learning. These policies collectively form the backbone of national education governance, yet their real-world implementation remains uneven across regions.

Taken together, the literature reveals critical gaps between national education objectives and their realization in decentralized and remote settings. While frameworks for equity, cultural integration, and inclusion exist, their implementation is frequently impeded by infrastructural limitations, weak governance, and limited local capacity. This study contributes to the literature by providing a grounded analysis of how these issues manifest at the district level, and by offering culturally informed strategies that align with the Sustainable Development Goals. By focusing on Maros as a case study, the research bridges theoretical concepts with empirical realities, offering insights into how education systems can become more inclusive, context-sensitive, and culturally responsive.

3. METHOD

This study employed a qualitative descriptive approach to investigate the challenges, local potentials, and strategic solutions related to education management in a decentralized context. Detailed information regarding this method is explained elsewhere (Susilawati *et al.,* 2025). The design was chosen to allow an in-depth exploration of complex phenomena such as education policy implementation, infrastructure disparities, teacher deployment, and cultural integration within the education system. A qualitative approach was deemed suitable for capturing participants' lived experiences, institutional perspectives, and the cultural dynamics shaping educational practices in the region.

The research was conducted in Maros, South Sulawesi, Indonesia, an area characterized by geographical diversity, including coastal, mountainous, and rural landscapes. The selected research sites represented both remote sub-districts (such as Mallawa, Camba, and Cenrana) and more urbanized areas like Turikale. These contrasting settings provided a comprehensive overview of the disparities and variations in education management within the regency. Participants were purposively selected and included education office officials, school principals, teachers across educational levels, parents, community leaders, school dropouts in non-formal programs, and representatives from cultural and educational institutions.

Data were collected through multiple sources to ensure validity and triangulation. Primary data included in-depth interviews, focus group discussions (FGDs), and on-site observations in schools and communities. Secondary data were obtained from official policy documents, statistical reports, annual evaluations from the Education Office, and relevant academic literature. These various data sources enabled the researchers to cross-check findings and provide a holistic understanding of the educational landscape.

The research instruments were carefully designed to align with the study objectives. Interview guides were used to explore participants' insights on policy implementation, challenges in access and quality, and perceptions of cultural relevance in education. Observation checklists captured physical infrastructure conditions, teaching practices, and stakeholder interactions. A document analysis guide was used to assess the content of regional regulations and institutional reports related to education governance.

The data collection process was conducted in four stages:
(i) Key stakeholders were interviewed individually to gain contextual understanding of the issues faced in their respective domains.
(ii) FGDs were conducted with groups of parents, teachers, and community leaders to encourage dialogue and identify recurring concerns.
(iii) The research team carried out field observations in selected schools to assess real-time classroom activities, infrastructure conditions, and teacher-student interactions.

(iv) Relevant documents were reviewed to identify policy gaps, budget allocations, and statistical trends that supported or contradicted field data.

For data analysis, the study applied thematic analysis with a six-phase framework, which includes familiarization with the data, generating initial codes, searching for themes, reviewing themes, defining and naming themes, and producing the report. This method enabled the researchers to systematically identify patterns and generate themes that represented both challenges and opportunities in the education system. Thematic analysis was selected due to its flexibility in managing diverse qualitative data and its capacity to reveal contextual nuances that might be overlooked in purely quantitative designs.

Throughout the process, the researchers maintained a reflexive stance to ensure credibility and minimize bias. Participant quotations and field notes were used to enrich the thematic narrative and provide grounded insights into how education policy, access, and cultural values intersect in Maros. The integration of multiple data sources and stakeholder perspectives enhanced the study's reliability and contributed to a comprehensive understanding of education management in a decentralized and culturally diverse setting.

4. RESULTS AND DISCUSSION

This section presents and interprets the findings of the study thematically, based on the challenges, opportunities, and proposed strategies in the education management system. Data were derived from interviews, focus group discussions, observations, and document analysis, and analyzed using thematic analysis. Key themes include disparities in educational access, resource allocation, teacher quality, and cultural relevance.

4.1. Disparities in Education Access

Figure 1 shows the human development index (HDI) in education from 2020 to 2023. Although Maros has shown a consistent upward trend, its average HDI increase remains below the provincial and national levels. This suggests that while progress exists, it is uneven and concentrated in specific areas.
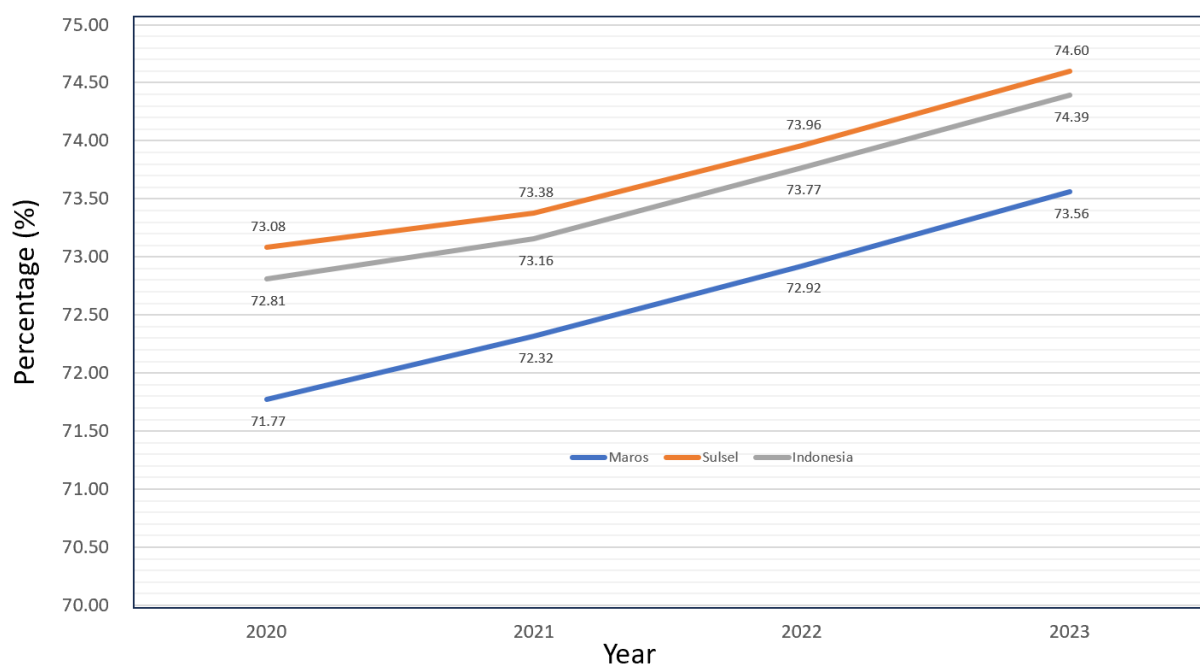

Figure 1. Human development index achievements.

Similarly, disparities persist in expected years of schooling (EYS) and average years of schooling (AYS). As shown in **Tables 2** and **3**, the EYS in Maros has improved steadily to 13.5 years by 2023, while the AYS reached only 8.03 years. These figures reflect the gap between educational aspirations and actual outcomes.

Table 2. Expected years of schooling (2020–2023).

Year	Maros	Sulsel	Indonesia
2020	13.04	13.45	12.98
2021	13.16	13.52	13.08
2022	13.30	13.53	13.10
2023	13.50	13.54	13.15

Table 3. Average length of schooling (2020-2023).

Year	Maros	Sulsel	Indonesia
2020	7.73	8.38	8.48
2021	8.01	8.46	8.54
2022	8.02	8.63	8.69
2023	8.03	8.76	8.77

Access to early childhood and higher education remains notably low. **Tables 4** and **5** show that only a small proportion of children aged 0–6 attend preschool, with participation at just 19.01%, well below the national average. Meanwhile, participation for ages 3-6 was estimated at 28.05%. This gap in early childhood education access hinders foundational learning, especially in remote districts such as Mallawa and Camba.

Table 4. Percentage of population 0–6 years who have ever/currently attended preschool education by regional category.

Regional Category	Indonesia	South Sulawesi	Maros
Urban Area	27.67	23.14	13.39
Rural Area	26.99	23.77	22.97
Total	27.30	23.48	19.01

Table 5. Percentage of population aged 0–6 years who have ever/are currently attending preschool education by gender.

Gender	Indonesia	South Sulawesi	Maros
Male	27.30	23.75	21.35
Female	27.46	23.19	16.65
Total	27.30	23.48	19.01

As **Table 6** illustrates, while primary education has achieved near-universal participation (99.71%), enrollment drops drastically at higher levels: 95.15% at junior secondary, 70.84% at senior secondary, and only 34.12% in higher education. These steep declines indicate limited transition and progression, particularly among rural students who face transportation and motivation barriers.

Table 6. School participation rate by age group (%).

Age Group (Years)	Maros	Sulawesi Selatan	Indonesia
07–12	99.71	99.43	99.16
13–15	95.15	93.20	96.10
16–19	70.84	70.81	73.42
19–25	34.12	34.47	26.85

4.2. Literacy and Educational Outcomes

The literacy rate among individuals aged 15 and above was recorded at 92.32% in 2023, still below the provincial and national averages. Notably, a gender gap persists (95.16% literacy among males versus 89.66% among females), highlighting social inequalities in access to continued education (**Figure 2**).
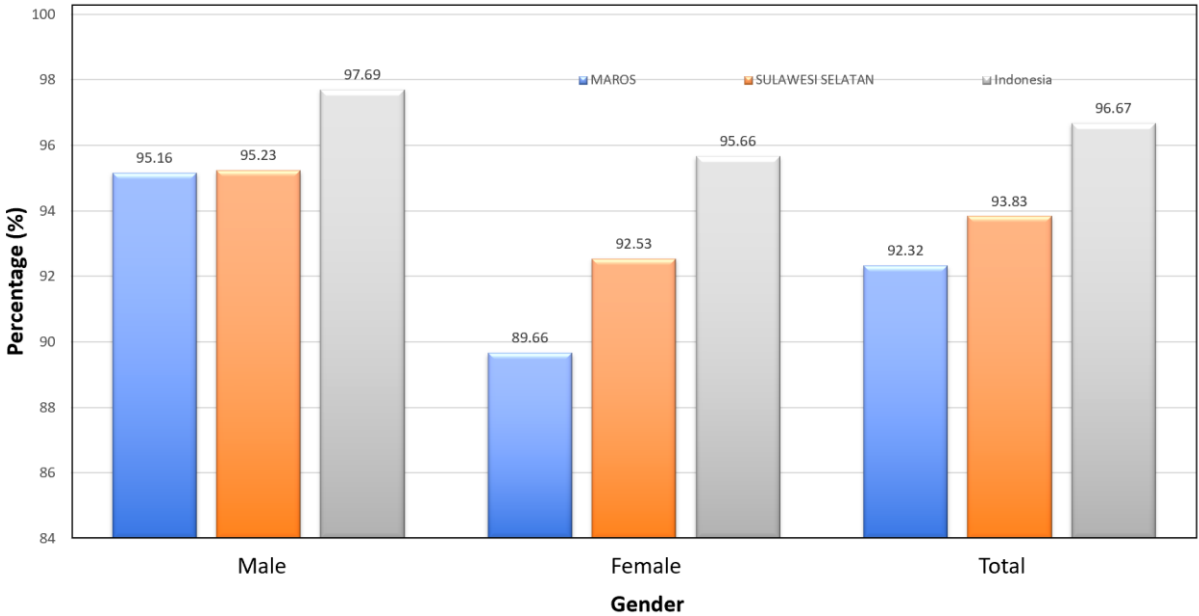

Figure 2. Literacy rate by gender (15+ years).

Despite these disparities, the Literacy Development Index (LDI) score reached 83.57, placing Maros in the "high" category and above the national average. However, it still lags behind the provincial aspect (**Table 7**). While the LDI reflects progress in library access and community engagement, it does not fully compensate for poor early learning conditions in rural schools.

Table 7. Regional literacy development index.

Region	Index Value
Maros	83.00
Sulawesi Selatan	86.74
Indonesia	69.42

4.3. Availability and Distribution of Education Facilities

Educational infrastructure across sub-districts shows stark imbalances. As **Table 8** indicates, Mallawa (one of the most remote sub-districts) has only one senior high school and

no university, despite covering a large geographic area. In contrast, Turikale, a more urban center, hosts six senior high schools and four universities within a smaller population.

Table 8. Number of schools by sub-district and level.

Sub-district	Area (km²)	Population	Elementary	SMP	SMA	SMK	University
Mandai	49.11	50,540	6	4	3	1	0
Moncongloe	46.87	21,513	5	4	2	1	1
Maros Baru	53.76	28,826	7	5	4	1	0
Marusu	53.73	34,830	7	6	2	2	0
Turikale	29.93	48,218	6	6	6	1	4
Lau	73.83	25,575	6	5	3	1	1
Bontoa	93.52	31,021	9	7	5	1	0
Bantimurung	173.7	32,335	8	6	4	1	0
Simbang	105.31	26,038	6	5	5	1	0
Tanralili	89.45	33,349	8	4	4	2	0
Tompu Bulu	287.66	16,110	8	7	4	1	0
Camba	145.36	13,426	8	6	3	0	0
Cenrana	180.97	14,808	7	6	2	0	1
Mallawa	235.92	12,688	11	4	1	0	0
Total	**1619.20**	**389,277**	**102**	**75**	**48**	**13**	**7**

In early childhood education, teacher-to-student ratios vary considerably across sub-districts. **Table 9** shows that while the overall ratio is favorable (1:3.98), some areas suffer from shortages or excess burdens. In urban Marusu, for example, one teacher may handle up to 50 children, indicating overcapacity.

Table 9. Kindergarten (TK) teacher and student ratios.

Sub-district	No. of Schools	No. of Teachers	No. of Students	Teacher/School	Student/School
Mandai	18	75	618	4.17	34.33
Moncongloe	18	65	556	3.61	30.89
Maros Baru	6	25	252	4.17	42.00
Marusu	12	39	600	3.25	50.00
Turikale	19	79	726	4.16	38.21
Lau	9	40	359	4.44	39.89
Bontoa	6	29	228	4.83	38.00
Bantimurung	12	63	505	5.25	42.08
Simbang	10	38	274	3.80	27.40
Tanralili	9	37	393	4.11	43.67
Camba	14	43	281	3.07	20.07
Cenrana	7	24	147	3.43	21.00
Mallawa	12	48	243	4.00	20.25
Total	**152**	**605**	**5,182**	**3.98**	**34.09**

Islamic kindergartens (RA) generally show better ratios, with an average of 1:4.11 across the regency (**Table 10**). Yet certain districts (such as Mallawa, Camba, and Cenrana) have no RA schools at all, reflecting religious education access gaps that affect early cognitive and character development.

Table 10. Teacher and student ratios in raudatul atfhal (RA).

Sub-district	No. of RA Schools	No. of Teachers	No. of Students	Teacher/School	Student/School
Mandai	5	26	346	5.20	13.31
Moncongloe	1	6	53	6.00	8.83
Maros Baru	1	3	60	3.00	20.00
Marusu	1	4	47	4.00	11.75
Turikale	7	27	264	3.86	9.78
Lau	3	10	118	3.33	11.80
Bontoa	1	5	45	5.00	9.00
Bantimurung	1	7	31	7.00	4.43
Simbang	4	8	100	2.00	12.50
Tanralili	2	11	158	5.50	14.36
Tompu Bulu	1	4	5	4.00	1.25
Camba	0	0	0	0	0
Cenrana	0	0	0	0	0
Mallawa	0	0	0	0	0
Total	**27**	**111**	**1,227**	**4.11**	**11.05**

At the primary level, teacher availability exceeds the national standard of 1:20, with an average of 1:10.73 (**Table 11**). However, this surplus is unevenly distributed, with remote schools often lacking certified staff, while urban areas host many underutilized teachers. In Islamic elementary schools (MI), the teacher–student ratio is similarly favorable at 1:11.67, as presented in **Table 12**. Yet, as with TK and RA, these facilities are absent in several remote districts, contributing to limited school choice and diversity in basic education.

Table 11. Number of schools compared to teachers and students in elementary schools (SD).

Sub-district	Number of Schools	Number of Teachers	Number of Students	Teacher-School Ratio	Student-School Ratio
Mandai	20	295	5,664	14.75	283.20
Moncongloe	8	102	2,464	12.75	308.00
Maros Baru	14	174	3,170	12.43	226.43
Marusu	11	186	4,058	16.91	368.91
Turikale	24	295	5,317	12.29	221.54
Lau	14	181	3,548	12.93	253.43
Bontoa	23	216	3,419	9.39	148.65
Bantimurung	25	234	3,606	9.36	144.24
Simbang	18	168	2,650	9.33	147.22
Tanralili	18	206	3,794	11.44	210.78
Tompu Bulu	14	123	1,769	8.79	126.36
Camba	18	150	1,224	8.33	68.00
Cenrana	20	144	1,495	7.20	74.75
Mallawa	17	144	1,307	8.47	76.88
Total	**244**	**2,618**	**43,485**	**10.73**	**178.22**

Table 12. Number of schools compared to teachers and students in elementary madrasahs.

Sub-district	Number of Schools	Number of Teachers	Number of Students	Teacher-School Ratio	Student-School Ratio
Mandai	3	45	617	15.00	205.67
Moncongloe	1	14	165	14.00	165.00
Maros Baru	1	16	228	16.00	228.00
Marusu	3	25	402	8.33	134.00
Turikale	3	61	863	20.33	287.67
Lau	1	15	242	15.00	242.00
Bontoa	1	9	127	9.00	127.00
Bantimurung	3	32	144	10.67	48.00
Simbang	3	24	235	8.00	78.33
Tanralili	2	14	96	7.00	48.00
Tompu Bulu	4	44	363	11.00	90.75
Camba	1	9	57	9.00	57.00
Cenrana	0	0	0	0.00	0.00
Mallawa	1	7	37	7.00	37.00
Total	**27**	**315**	**3,576**	**11.67**	**132.44**

4.4. Challenges in Teacher Distribution and Qualifications

Secondary-level schools also reveal disparities in teacher deployment. The results from different levels of school are explained in the following:

(i) **Table 13** shows that junior secondary schools (SMP) have an average teacher-student ratio of 1:20.87, with some urban areas exceeding the threshold due to over-enrollment, while remote areas remain understaffed.

(ii) Islamic junior secondary schools (MTs) fare better, with a 1:14.11 ratio (**Table 14**). Yet again, the availability of qualified personnel varies widely between districts, and in some areas, teaching loads are below capacity due to low student enrollment.

(iii) Senior high schools (SMA) show less favorable figures. **Table 15** reveals an average teacher–student ratio of 1:21.82, slightly above the national maximum. In Marusu and Lau, the ratio reaches 1:38, raising concerns over instructional quality and classroom management.

(iv) Vocational high schools (SMK) perform moderately better, with a ratio of 1:16.11 (**Table 16**). Nonetheless, certain schools report inflated ratios due to a lack of specialized teachers, especially in technical fields.

The qualitative data confirmed these quantitative patterns. Interviews with school leaders revealed that remote schools often rely on underqualified or non-permanent staff. In some cases, honorarium teachers were tasked with multiple subjects, stretching their competencies and lowering learning quality. These issues align with national findings that rural schools are disproportionately staffed by non-certified personnel (Hendriani *et al.,* 2024).

The data from **Table 13** indicates that junior high schools (SMP) in Maros are relatively well-staffed in terms of teacher availability. With 1,628 teachers serving 15,432 students across 78 schools, the average teacher-to-student ratio is about 1:9.48, which aligns with national education quality standards. However, disparities remain. For instance, Bontoa shows a high teacher-per-school ratio (25.71) but a notably low student-per-school ratio

(4.27), suggesting an under-enrollment issue rather than an overstaffing problem. This disparity calls for targeted strategies to promote enrollment in rural or less accessible areas.

Table 13. Teacher ratios in SMP.

Sub-district	No. of Schools	No. of Teachers	No. of Students	Teacher/School	Student/School
Mandai	7	174	2,474	24.86	14.22
Moncongloe	6	113	854	18.83	7.56
Maros Baru	6	96	918	16.00	9.56
Marusu	4	93	1,196	23.25	12.86
Turikale	8	175	2,069	21.88	11.82
Lau	6	154	1,586	25.67	10.30
Bontoa	7	180	768	25.71	4.27
Bantimurung	6	144	1,535	24.00	10.66
Simbang	4	99	930	24.75	9.39
Tanralili	4	61	558	15.25	9.15
Tompu Bulu	5	67	717	13.40	10.70
Camba	6	109	777	18.17	7.13
Cenrana	5	90	563	18.00	6.26
Mallawa	4	73	487	18.25	6.67
Total	**78**	**1,628**	**15,432**	**20.87**	**9.48**

Table 14. Teacher ratios in MTs.

Sub-district	No. of Schools	No. of Teachers	No. of Students	Teacher/School	Student/School
Mandai	3	55	350	18.33	6.36
Moncongloe	2	17	268	8.50	15.76
Maros Baru	2	31	320	15.50	10.32
Marusu	4	42	225	10.50	5.36
Turikale	5	98	812	19.60	8.29
Lau	5	103	844	20.60	8.19
Bontoa	2	34	434	17.00	12.76
Bantimurung	4	41	310	10.25	7.56
Simbang	4	48	348	12.00	7.25
Tanralili	4	43	460	10.75	10.70
Tompu Bulu	6	77	478	12.83	6.21
Camba	2	21	67	10.50	3.19
Cenrana	1	11	30	11.00	2.73
Mallawa	–	–	–	–	–
Total	**44**	**621**	**4,946**	**14.11**	**7.96**

In contrast, the Madrasah Tsanawiyah (MTs) institutions, detailed in **Table 14**, display more modest staffing and enrollment patterns. With 44 schools, 621 teachers, and 4,946 students, the average ratios are 14.11 teachers and 7.96 students per school. Interestingly, while some sub-districts like Turikale and Lau demonstrate strong teacher capacity (over 20 teachers per school), other areas like Cenrana and Camba report very low student enrollment figures. The absence of data for Mallawa may indicate a lack of MTs institutions in that sub-district. These findings suggest that cultural preferences and parental choices may influence school type selection, a phenomenon noted in religious-based education literature.

Table 15. Teacher ratios in SMA.

Sub-district	No. of Schools	No. of Teachers	No. of Students	Teacher/School	Student/School
Mandai	5	104	–	20.80	–
Moncongloe	3	41	484	13.67	11.80
Maros Baru	2	53	675	26.50	12.74
Marusu	1	38	759	38.00	19.97
Turikale	8	133	–	16.63	–
Lau	2	64	–	32.00	–
Bontoa	1	33	478	33.00	14.48
Bantimurung	2	51	944	25.50	18.51
Simbang	1	27	367	27.00	13.59
Tanralili	2	60	769	30.00	12.82
Tompu Bulu	2	31	398	15.50	12.84
Camba	2	48	522	24.00	10.88
Cenrana	2	35	450	17.50	12.86
Mallawa	1	24	343	24.00	14.29
Total	**34**	**742**	**6,189**	**21.82**	**8.34**

Table 16. Teacher ratios in SMK.

Sub-district	No. of Schools	No. of Teachers	No. of Students	Teacher/School	Student/School
Mandai	4	31	79	7.75	2.55
Moncongloe	1	12	178	12.00	14.83
Maros Baru	1	10	25	10.00	2.50
Marusu	1	10	51	10.00	5.10
Turikale	3	26	263	8.67	10.12
Lau	2	98	1,449	49.00	14.79
Bontoa	0	0	0	0	0
Bantimurung	2	15	94	7.50	6.27
Simbang	1	53	599	53.00	11.30
Tanralili	2	26	262	13.00	10.08
Tompu Bulu	1	9	62	9.00	6.89
Camba	0	0	0	0	0
Cenrana	0	0	0	0	0
Mallawa	0	0	0	0	0
Total	**18**	**290**	**3,062**	**16.11**	**10.56**

The senior high school (SMA) data in **Table 15** further reflect uneven distribution. While the total number of schools (34) and teachers (742) appears adequate, student data is missing for several sub-districts (specifically Mandai, Turikale, and Lau). The average teacher-per-school ratio of 21.82 indicates a reasonable deployment. However, schools like Marusu stand out, having only one school with 38 teachers serving 759 students. This yields the highest student-per-school figure in the SMA category (19.97), potentially affecting instructional effectiveness and teacher workload. Regions with such concentration require additional attention to infrastructural expansion or redistribution of school locations to reduce pressure points.

On the other hand, vocational schools (SMK) portray a different narrative. As shown in **Table 16**, only 18 SMK institutions operate in Maros, serving 3,062 students with 290 teachers. Some sub-districts like Camba, Cenrana, and Mallawa have no vocational schools at all, creating equity gaps in access to skills-based education. Vocational pathways are crucial for enhancing youth employability and regional economic development. Notably, schools in Lau and Simbang report high teacher and student numbers, indicating that when facilities are available, the demand is significant. For example, Lau's two schools employ 98 teachers to teach 1,449 students, suggesting that urbanized sub-districts host larger institutions due to centralized demand.

These observed disparities across educational levels and sub-districts resonate with the principles of educational equity highlighted in the SDGs, which advocate for inclusive and quality education for all. The geographic concentration of educational resources in certain sub-districts and their scarcity in others exemplifies the challenge of achieving spatial equity. According to UNESCO in 2021, spatial inequality in education is often linked to socio-economic status and infrastructural development, which is also likely the case in Maros.

Another significant issue is the fragmentation between general education (SMP/SMA) and religious or vocational alternatives (MTs/SMK). While general schools are more evenly distributed, religious and vocational schools are clustered, leaving many sub-districts underserved. From a policy integration perspective, this highlights the need for more coherent planning to ensure that all pathways are equitably represented across the region.

Furthermore, from a management standpoint, the uneven ratios across schools and levels complicate resource planning, teacher allocation, and curriculum delivery. For example, sub-districts with relatively high teacher-per-student ratios might experience underutilized human resources, while others could suffer from teacher shortages. A more integrated management information system (EMIS) could be implemented to assist in forecasting and balancing such disparities dynamically.

In light of the findings, the education management strategies in Maros should focus on three key areas:

(i) Infrastructure Development in Underserved Areas: Sub-districts like Mallawa, Camba, and Cenrana lack significant representation in some educational levels. Government and non-state actors should prioritize infrastructure funding here.

(ii) Teacher Redistribution and Incentivization: High ratios in certain schools can be addressed through relocation policies and incentive structures that motivate teachers to work in less accessible areas (OECD, 2019).

(iii) Curriculum and Institutional Alignment: Ensuring that MTs and SMK schools are equally prioritized in planning will help reduce the urban-rural and general-vocational divide. Partnerships with industry and religious organizations can also strengthen institutional relevance and quality.

Additionally, the data reinforce the importance of community-based planning, where local stakeholders are involved in identifying educational needs. This is essential not only for meeting SDG 4 but also for achieving broader SDG 10 (Reduced Inequalities) by addressing systemic imbalances in education provision.

To further enhance inclusive education, digital technologies and distance learning infrastructure could be explored, particularly for geographically remote sub-districts. Blended learning models, supported by national policy and local implementation capacity, would extend educational reach without demanding immediate large-scale infrastructure development.

Finally, to build a resilient and adaptive education system, data such as those provided in **Tables 13-16** must be systematically updated, monitored, and analyzed. Real-time educational dashboards and feedback mechanisms will enable data-driven decision-making, improve transparency, and ensure that educational equity remains a dynamic and evolving goal.

Figure 1 presents the distribution of schools across selected sub-districts in Maros. The figure highlights a pattern of spatial concentration, with educational institutions clustering in urban and semi-urban areas like Turikale, Mandai, and Lau. In contrast, sub-districts such as Mallawa, Cenrana, and Camba display fewer institutions across educational levels. This spatial concentration correlates with earlier findings regarding teacher and student distribution (**Tables 7-16**), indicating that urban centers act as educational hubs, often at the expense of rural educational access.

Such spatial inequality is a recognized barrier to educational equity. As emphasized by the World Bank in 2018, proximity to educational institutions significantly affects enrollment, retention, and academic performance. Children in remote or underdeveloped sub-districts face logistical, financial, and motivational obstacles, especially when required to travel long distances or relocate. This systemic issue challenges the SDG 4 goal of ensuring equitable access to all levels of education for vulnerable and marginalized populations.

Furthermore, the distribution shown in **Table 17** reflects a centralization of secondary and vocational education in a few sub-districts. For example, while most sub-districts have adequate primary education institutions, only a few host SMA or SMK. This creates a bottleneck in educational progression, especially for students in areas like Mallawa or Camba who may not be able to pursue education beyond elementary school without migrating. Migration for education introduces new socio-economic burdens on families and deepens inequality.

Table 17. Distribution of schools in selected sub-districts.

Sub-district	TK (Kindergarten)	SD (Elementary)	SMP (Junior HS)	SMA (Senior HS)	Challenges
Mallawa	0	17	4	1	Long distance, poor infrastructure
Turikale	7	24	8	6	Minimal challenges
Marusu	1	11	4	2	Lack of kindergartens
Camba	0	18	6	3	Difficult geographical terrain

This imbalance is further explored in **Table 18**, which details the percentage of qualified teachers by sub-district. The data indicate significant variance. Urban areas such as Turikale, Mandai, and Marusu report high levels of teacher qualification (often exceeding 80%). Conversely, remote sub-districts like Mallawa and Camba show qualification rates as low as 55–60%. This discrepancy suggests that qualified educators are concentrated in regions with better infrastructure, resources, and professional development opportunities.

These findings affirm the theory of urban bias in education planning, whereby development efforts are disproportionately channeled toward already advantaged regions. While some of this bias may be unintentional (rooted in population density or economic activity), it nonetheless perpetuates educational exclusion. Students in areas with lower-qualified teachers may receive lower-quality instruction, affecting both short-term learning outcomes and long-term opportunities.

Table 18. Percentage of qualified teachers per sub-district.

Educational level	Urban Area (%)	Remote Area (%)
PAUD (Early Childhood Education)	80	45
SD (Elementary)	90	70
SMP (Junior High School)	85	65

To address these inequities, education management strategies in Maros must focus on systemic transformation, not just infrastructure expansion. This includes:

(i) Teacher Capacity Development in Rural Areas. The concentration of qualified teachers in urban sub-districts reflects the challenges of professional development access, resource scarcity, and job satisfaction in rural regions. To resolve this, Maros' education authorities can deploy incentive-based rotations, prioritize rural teacher scholarships, and invest in ICT-based upskilling programs that allow teachers to access training without geographical constraints.

(ii) Decentralization of Vocational and Religious Education. As vocational education is central to workforce readiness and economic development, especially in rural economies, SMK institutions must be more evenly distributed. Moreover, religious schools such as MTs often serve both educational and cultural functions in rural areas. Supporting the expansion and integration of these institutions into national planning frameworks is crucial. This requires policy coordination between the Ministry of Education and the Ministry of Religious Affairs.

(iii) Mobile and Satellite Education Models. To overcome spatial limitations, mobile schools or satellite classes can be piloted in underserved areas. These models have been effective in archipelagic and rural areas of Indonesia and other developing nations. For instance, mobile teacher units or distance learning centers can extend access without needing to build full-scale schools.

(iv) Community-Based School Planning. Local communities should be empowered to participate in educational planning through School Committees and Village Development Forums. These bodies can provide data on local needs, coordinate with the government, and help co-manage school improvements. Studies show that community engagement increases accountability, resource mobilization, and policy responsiveness.

(v) Strengthening Educational Governance and Data Transparency. Accurate, timely, and accessible data is critical for effective planning. The variation in data availability across tables (notably missing figures in SMA and SMK) indicates a need for a robust Education Management Information System (EMIS) at the regency level. An EMIS enables dynamic teacher allocation, infrastructure planning, and performance monitoring, aligned with real-time needs and demographic changes.

Integrating these strategies within the broader context of SDG 4 and SDG 10 ensures that efforts are not only focused on increasing access but also on promoting inclusion, quality, and equity. For instance, SDG 4 emphasizes lifelong learning, qualified teachers, and gender-sensitive education. Meanwhile, SDG 10 addresses inequality in opportunities, which includes educational disparities due to geographic location.

The challenges observed in Maros also intersect with the global literature on educational decentralization and regional autonomy. Indonesia's post-Reformasi policy framework delegates education governance to local governments, which has both empowered innovation and revealed capacity gaps in planning and implementation. As such, strengthening institutional capacity at the district education office level is equally crucial for achieving these strategies.

Moreover, the cultural dimension of education must not be overlooked. Many rural communities value local wisdom, religious traditions, and indigenous pedagogies. Integrating culturally responsive curricula into formal schooling (particularly in MTs or community-based schools) can increase relevance and acceptance, improving attendance and engagement. This aligns with SDG 4.7, which promotes education that fosters cultural appreciation and sustainable living.

The data in **Tables 17 and 18** reinforce the recurring themes throughout this study: geographic disparity, resource concentration, and institutional imbalance. These issues require not only infrastructural responses but also strategic educational management that is equity-focused, culturally informed, and technologically adaptive. As Maros continues to develop, addressing these educational challenges will play a pivotal role in shaping inclusive human capital and achieving the broader Sustainable Development Goals.

To consolidate the findings from **Tables 8-18** and previous discussions, it is necessary to transition toward actionable strategies that can inform education management reform in Maros. The data clearly illustrate structural disparities, spatial imbalances, and systemic challenges. However, translating these into practical steps requires alignment with broader governance frameworks and global sustainability goals.

One key insight is the role of multi-level governance. While education is a decentralized sector in Indonesia, many schools (especially religious and vocational institutions) still rely on inter-ministerial coordination. This complicates strategic planning and leads to fragmentation. For example, SMA and SMK schools are under provincial government oversight, while SD and SMP are managed by the regency. Meanwhile, madrasah and pesantren fall under the Ministry of Religious Affairs. A first-order strategy should be the creation of a Maros Education Coordination Board (MECB), comprised of stakeholders from various education ministries, religious leaders, school principals, and community organizations.

This kind of cross-sectoral platform would help:
 (i) Streamline funding and infrastructure decisions,
 (ii) Monitor teacher distribution and qualification gaps,
 (iii) Integrate local wisdom and cultural assets into curricula,
 (iv) Support inclusive policies for marginalized learners.

Another implication stems from the teacher qualification gap outlined in **Table 18**. While urban sub-districts retain a large share of certified teachers, remote areas lag. In response, Maros could adopt a Targeted Teacher Redistribution and Development Policy (TTRDP). This policy would operate on two fronts: (i) rotating urban-based certified teachers to rural zones on annual missions with housing incentives, and (ii) establishing Teacher Resource Centers (TRCs) in rural clusters, serving as hubs for training, mentoring, and ICT-based pedagogy sharing.

In addition, the underrepresentation of SMK and SMA in rural sub-districts calls for alternative delivery models. Research in similar Indonesian contexts (e.g., East Nusa Tenggara and Central Kalimantan) suggests the effectiveness of Community-Based Vocational Education (CBVE). CBVE enables rural students to acquire practical skills without needing to relocate. These programs often include local crafts, sustainable agriculture, or fisheries and are delivered in partnership with local cooperatives and NGOs.

To further promote gender equity and cultural integration, the curriculum in Maros must become more inclusive, contextualized, and pluralistic. As some religious schools already serve as cultural anchors, incorporating multilingual education, traditional arts, and local

histories can strengthen student identity and retention. The data indicate that MTs and MA institutions exist across nearly all sub-districts (**Table 15**), and thus serve as important access points for such integration.

Moreover, ICT and digital infrastructure remain under-discussed in existing data, yet they are crucial for expanding access and enhancing quality. According to UNESCO (2022), digital learning tools can bridge educational gaps in rural areas, but only if schools are equipped with electricity, connectivity, and trained facilitators. A Maros-wide Digital Equity Initiative (DEI) could prioritize ICT investment in under-resourced areas, with an emphasis on:

 (i)   Equipping rural schools with solar-powered tablets or low-energy laptops,
 (ii) Training local ICT facilitators and digital pedagogical mentors,
 (iii) Creating an open-source repository of culturally relevant digital content.

Aligned with SDG 10, such measures would reduce digital divides that compound existing geographic inequalities. Meanwhile, within SDG 4.5, which focuses on eliminating disparities based on location, disability, or income, the DEI supports inclusion through digital empowerment.

Another emerging issue concerns the absence of real-time, transparent educational data at the local level. While this study reconstructed data into 11 analytical tables, most school-level or sub-district data are not publicly accessible. This limits policy responsiveness and hinders accountability. A recommendation here is to develop a Local Education Dashboard (LED) that visualizes key indicators such as enrollment, completion, teacher qualification, and school facilities. This LED can be managed by the District Education Office and updated quarterly through coordination with school heads.

At the macro policy level, achieving educational sustainability in Maros requires synergy with national programs such as Merdeka Belajar and the School Operational Assistance (BOS) fund. Many reports regarding this matter have been well-documented (Fiandini *et al.*, 2024; Rozak *et al.*, 2024; Susilowati *et al.*, 2023). However, the local government must be more proactive in tailoring these programs to local challenges. Several examples are in the following:

 (i)   Merdeka Belajar modules should include modules on local ecology, industry, and cultural narratives.
 (ii) BOS funding formulas should integrate a geographic hardship index, ensuring fair allocation to remote schools.

Monitoring and evaluation mechanisms should also be adapted to the local context. Instead of relying solely on national exams or standardized tests, alternative metrics such as community engagement, student agency, and school resilience indicators could be introduced. These dimensions reflect the holistic learning goals of SDG 4, especially Target 4.7, which highlights global citizenship and sustainable development values.

Importantly, sustainable education management also implies fiscal sustainability. Many strategies mentioned (like ICT development, teacher redistribution, or CBVE) require multi-year budgeting and co-financing mechanisms. The regency could explore partnerships with:

 (i)   Private sector CSR initiatives, especially from local mining, agriculture, or tourism industries.
 (ii) Development agencies or international NGOs focused on rural education.
 (iii) Universities, such as Hasanuddin University in Makassar, for capacity-building research and evaluation.

Lastly, the findings have strong implications for disaster-resilient education planning. Given that certain parts of Maros are prone to seasonal flooding or geological instability (especially in Mallawa and Cenrana), school infrastructure development must follow climate-resilient

guidelines. Temporary displacement of students due to natural hazards often leads to dropout or prolonged absenteeism. Investment in flexible learning spaces and emergency learning protocols will safeguard learning continuity.

4.5. Synthesis and Strategic Priorities

From the cumulative findings across four parts of this section, several strategic education management priorities emerge for Maros, as shown in **Table 19**. Each strategy aligns not only with SDG 4 (Quality Education) but also with SDG 10 (Reducing Inequality), SDG 11 (Sustainable Cities and Communities), and SDG 17 (Partnerships for the Goals). This comprehensive and contextualized approach can transform Maros into a model for sustainable, equitable, and inclusive education management. Finally, this study adds new information regarding SDGs as reported elsewhere (Djirong *et al.*, 2024; Kerans *et al.*, 2024; Al Husaeni & Haristiani, 2025; Prasetyo *et al.*, 2025; Xing *et al.*, 2025; Imaniyati *et al.*, 2025; Makinde *et al.*, 2024; Gemil *et al.*, 2024; Keisyafa *et al.*, 2024).

Table 19. Strategic priorities.

Priority Area	Strategic Response
Teacher Inequality	TTRDP: Redistribution, incentives, and training hubs
Vocational Access in Rural Areas	CBVE models and decentralization of SMK access
Cultural Integration	Inclusion of local languages, values, and traditions into the curriculum
ICT and Digital Gaps	DEI: Device provision, digital content, and training in rural areas
Data Governance	LED: Visual dashboards, data transparency, and real-time monitoring
Inclusive Budgeting	Hardship-indexed BOS allocation and fiscal co-financing
Disaster Resilience	Infrastructure aligned with climate and hazard risk assessments.

5. CONCLUSION

This study revealed significant disparities and systemic challenges in education management across Maros, Indonesia. Through comprehensive data analysis and strategic reflection, the research identified critical areas requiring intervention, including teacher distribution, vocational access, digital equity, and data transparency. Aligning with Sustainable Development Goals 4 and 10, the proposed strategies emphasize inclusive, contextual, and culturally integrated approaches. Strengthening coordination across sectors and ensuring equity in resource allocation are essential for sustainable educational development. These findings offer actionable insights for policymakers seeking to implement transformative reforms in decentralized education systems within Indonesia and beyond.

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