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RESEARCH ARTICLE

Effectiveness of Local Government Led School Management in Boosting Enrolment Rates: Evidence from Nepal

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ABSTRACT

Local government-led school management has emerged as a transformative approach to enhance access, equity, and efficiency in education. In Nepal, decentralization reforms have sought to improve enrollment rates and gender equity, but their long-term effectiveness and challenges have received limited scholarly attention. This study evaluates the impact of local governance on enrollment trends using a mixed-methods approach, analyzing quantitative data from World Bank Indicator (1999–2023) and contextualizing findings with qualitative insights. Fully Modified Ordinary Least Squares (FMOLS) regression was employed to examine long-run relationships and structural changes. The results reveal a significant post-2017 boost in primary enrollment rates, driven by decentralization reforms, but also indicate a declining growth rate in enrollment thereafter. Regarding the key variables, Net Enrollment Rates (NER), Gross Enrollment Rates (GER), and Gender Parity Index (GPI) demonstrate progress, with GPI achieving parity in primary education by 2012. However, challenges persist, including disparities in secondary education, a decline in secondary GPI, and increasing reliance on private schooling, which raises equity concerns. The FMOLS findings underscore the transformative potential of decentralization while highlighting systemic gaps in retention, public school competitiveness, and regional equity. Strengthening local leadership, addressing socio-economic barriers, and reducing disparities are essential to sustain progress. Nepal's experience demonstrates that while local government-led reforms can ignite progress, targeted interventions are critical to ensuring inclusive and equitable educational outcomes.

KEYWORDS*:* Enrollment rates, local governance, gender parity, fully modified, education equity

INTRODUCTION

Education is universally recognized as a cornerstone for socio-economic development, yet access to quality education remains a pressing challenge in many developing countries. In Nepal, addressing low school enrollment rates has been a policy priority, particularly in the context of decentralization and local governance reforms (Khanal, 2010). The introduction of community-managed schools under local government leadership was envisioned as a means to empower communities, improve governance, and enhance educational outcomes (Edwards, 2011). This decentralized approach aligns with global trends where school-based management has been associated with improved accountability, student outcomes, and school enrollment rates (Muralidharan & Singh, 2020).

Despite these aspirations, the effectiveness of local government-led school management in Nepal has been met with mixed results. While some studies highlight its potential to foster community participation and ownership (Khanal, 2013), others point to a disconnect between policy intentions and on-ground realities, such as resource constraints and capacity gaps (Daly et al., 2020). Additionally, the role of remittances in influencing school enrollment patterns has become increasingly significant, particularly in rural areas where remittance income enables access to private schooling (Khatri et al., 2024).

This study examines how local government-led school management influences enrollment rates in Nepal, identifying key enablers and constraints within the decentralized education framework. By synthesizing insights from global and local literature, it aims to provide evidence-based recommendations for enhancing decentralized educational governance.

LITERATURE REVIEW

The impact of local government-led school management on enrollment rates can be examined through the lenses of decentralization theory, participatory governance, and school-based management. Decentralization theory posits that transferring authority from central to local levels enhances service delivery by fostering accountability, efficiency, and responsiveness to community needs (Muralidharan & Singh, 2020). In education, this translates to locally tailored interventions that address socio-economic and cultural factors affecting school participation (Ninković & Knežević Florić, 2024). However, critics argue that decentralization alone is insufficient without adequate leadership capacity and resource allocation (Leaver et al., 2019). Research also suggests that governance quality and corruption control are crucial factors influencing policy effectiveness in Nepal's education sector (Poudel et al., 2025).

Participatory governance emphasizes community involvement in public service management, including education (Sharma, 2008). It fosters transparency, trust, and parental engagement, which are crucial for increasing school enrollment (Beatriz et al., 2008). However, participation often remains symbolic rather than substantive due to power imbalances, lack of technical expertise, and governance challenges (Ahn et al., 2023). Participatory governance emphasizes the inclusion of community members in the planning and management of public services, including education (Sharma, 2008; Lassibille, 2016).

In the Nepalese context, the role of leadership is particularly critical, as local governments and schools often operate in challenging environments characterized by limited resources and infrastructure (Gamage et al., 2009). In Nepal, the community-managed school model emerged as a decentralization initiative

designed to empower local stakeholders in decision-making processes (Carney et al., 2007). School Based Management (SBM) decentralizes decision-making to school administrators, teachers, and parents, operating under the premise that those closest to students are best positioned to make effective educational decisions (Khattri et al., 2012). However, other studies reveal that participation is often symbolic rather than substantive, with limited actual influence on decision-making processes (Wagle et al., 2019).

Studies indicate that well-executed SBM can enhance enrollment and learning outcomes, provided it is supported by leadership training and policy coherence (Rautiola, 2009). In Nepal, SBM principles have been integrated into community-managed schools, but resource limitations and misaligned policies have hindered their effectiveness (Carney & Rappleye, 2011). Furthermore, recent research highlights that remittance inflows significantly impact private school enrollment, suggesting that economic factors play a role in education accessibility (Acharya et al., 2024a).

Leadership plays a crucial role in shaping enrollment trends within decentralized school management structures. Transformational and instructional leadership frameworks emphasize the importance of vision-driven school leadership in fostering stakeholder engagement and improving student outcomes (Özdemir et al., 2024). However, in Nepal, leadership development remains underexplored, affecting the overall success of local governance in education. Collaborative pedagogy has been suggested as a means to enhance teacher effectiveness and improve student learning outcomes in decentralized education systems (Acharya et al., 2024).

Effective school leaders not only ensure efficient management but also foster a positive school culture and build partnerships with stakeholders to boost enrollment rates (Tan et al., 2024). Empirical research from various contexts underscores the significance of effective school management in improving enrollment. Studies from Latin America and South Asia suggest that localizing decision-making can enhance school performance, provided that governance structures are robust and adequately resourced (Galiani & Perez-Truglia, 2012). Nepal's experience demonstrates similar patterns, though disparities in implementation highlight the need for further refinement of decentralized education policies.

Despite the theoretical benefits of decentralization, significant gaps persist between policy intentions and practical implementation in Nepal's education sector. Khanal (2013) identified bureaucratic inefficiencies and resource constraints as major obstacles to translating decentralization policies into effective school governance. Edwards (2011) similarly highlighted that while decentralization aims to enhance accountability, insufficient technical and financial support undermines its success. Additionally, studies show that the effectiveness of foreign aid in improving Nepal's school system remains inconsistent due to governance challenges (Acharya et al., 2024b).

Existing research on Nepalese community-managed schools primarily focuses on governance, accountability, and resource mobilization (Carney et al., 2007). However, limited attention has been paid to how these factors directly influence school enrollment rates. The impact of local governance structures on educational access remains underexplored, particularly in rural and marginalized communities. While some studies acknowledge disparities in enrollment among different socio-economic and geographic groups (Wagle et al., 2019), few have systematically investigated how local government-led management addresses or exacerbates these inequities. Understanding the inclusivity of these reforms, particularly for marginalized populations, remains a significant research gap.

Another overlooked aspect is the role of leadership in enrollment dynamics. Global studies emphasize the critical role of school leadership in improving enrollment and student outcomes (Huguet, 2017), yet Nepali research has not systematically examined how local school leaders shape enrollment trends. Understanding the interplay between leadership and decentralized school management is essential for improving educational outcomes. Additionally, Nepal's education system faces challenges in adapting teaching strategies to accommodate diverse learning needs, as studies suggest inadequate support for slow learners (Acharya et al., 2023). Furthermore, while global studies provide valuable insights into decentralized education management, comparative research contextualized to Nepal is scarce. Examining how decentralization has influenced school enrollment in comparable low-income contexts can offer practical lessons for refining Nepal's education policies.

Bridging these policy gaps requires a comprehensive approach that strengthens leadership development, enhances community participation, and ensures alignment between national education goals and local governance structures. This study aims to contribute to this discourse by providing an evidence-based assessment of the effectiveness of local government-led school management in boosting enrollment rates in Nepal.

RESEARCH METHODS

This study adopts a mixed-methods approach, leveraging quantitative data analysis to examine enrollment trends and qualitative insights to contextualize the effectiveness of local government-led school management in boosting enrollment rates in Nepal. The methodology is aligned with the study's focus on exploring how decentralization policies and community-based management have impacted enrollment outcomes.

Data Sources

The quantitative data for this study were derived from the World Bank Indicator database, 2024, spanning the years 1999 to 2023. Key indicators analyzed include:

i. Net Enrollment Rates (NER) for primary and secondary education
ii. Gross Enrollment Rates (GER) for primary, secondary, and preprimary education
iii. Gender Parity Index (GPI) for GER
iv. Private school enrollment as a percentage of total primary and secondary enrollment
v. Rates of over-age students and grade repetition in primary education

These indicators provide a comprehensive understanding of enrollment trends and equity dimensions, offering insights into the progress and challenges of Nepal's education system under local governance reforms.

Data Analysis

This study employs a robust econometric methodology to analyze the long-term impact of local government-led school management reforms on school enrollment trends in Nepal from 1999 to 2023. The key variables include gross primary and secondary school enrollment rates, gender parity indices, and the proportion of private school enrollments. To capture structural changes introduced by decentralization reforms in 2017, a dummy variable (Dummy2017) and an interaction term (Dummy2017*Year) were incorporated to examine shifts in enrollment levels and growth rates. The methodology is grounded in Fully Modified Ordinary Least Squares (FMOLS), a technique designed for analyzing non-stationary time-series data that are cointegrated.

Before conducting FMOLS, unit root testing was performed to verify the stationarity properties of the data. The Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests confirmed that all variables were non-stationary in levels (I(1))

but stationary in first differences, meeting the preconditions for cointegration testing. The Johansen Cointegration Test further established the existence of at least one long-run equilibrium relationship between the dependent and independent variables. These preliminary tests ensured the validity of FMOLS and provided a robust foundation for analyzing the effects of decentralization reforms on school enrollment trends.

FMOLS was chosen for its ability to correct for endogeneity, serial correlation, and heteroskedasticity, ensuring unbiased and consistent parameter estimates. The model specification included the time trend (Year), the reform dummy (Dummy2017), and an interaction term (Dummy2017*Year) to capture changes in enrollment levels and growth trends after 2017. Results from FMOLS estimation highlighted significant structural changes, with a notable level increase in enrollment rates post-2017 but a slowing growth rate thereafter. These findings provide valuable insights into the long-term effectiveness of decentralization reforms and inform policy recommendations to sustain progress in educational outcomes.

Qualitative Component

To complement the quantitative findings, qualitative data were sourced from existing literature and policy documents. This component focused on understanding the role of:

i. Leadership practices in local government-managed schools
ii. Community participation in school governance
iii. Policy-practice gaps in implementing decentralization reforms

The qualitative analysis provided context to the quantitative trends, highlighting systemic barriers and successes in policy implementation.

Integration of Data

Quantitative and qualitative findings were integrated to provide a comprehensive analysis of local government-led school management effectiveness. For instance, trends in enrollment rates were juxtaposed with documented challenges such as resource constraints, leadership capacity, and community involvement to draw nuanced conclusions.

Ethical Considerations

All data used in this study were secondary and publicly available. No primary data collection involving human subjects was conducted, ensuring compliance with ethical standards in research.

Limitations

The study acknowledges limitations such as the reliance on secondary data, which may not fully capture on-ground realities. Additionally, the focus on national-level trends may overlook regional disparities in enrollment outcomes. By combining robust quantitative analysis with qualitative insights, this study provides an evidence-based assessment of the impact of local government-led school management on boosting enrollment rates in Nepal.

RESULTS AND DISCUSSION

Over-age Students in Primary Education

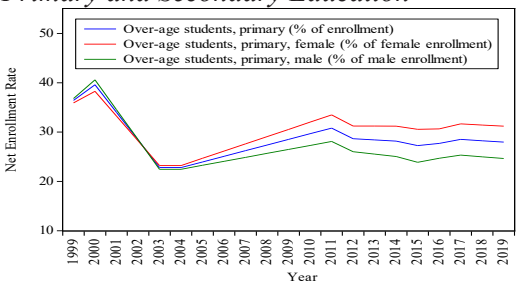
Figure 1 depicts the percentage of over-age students (both male and female) enrolled in primary education in Nepal from 1999 to 2019. It highlights a noticeable decline in the proportion of over-age students, with significant reductions observed from 2001 to 2007, followed by a more gradual decline thereafter. This trend indicates progress in aligning students' ages with grade levels, reflecting efforts to improve early enrollment and reduce grade repetition.

Figure 1 illustrates the decline in the percentage of over-age students in Nepal's primary education system from 1999 to 2019, with notable reductions between 2001 and 2007, followed by a gradual decrease. This trend reflects the success of policies and practices aimed at encouraging timely school enrollment and reducing

grade repetition. Gender-disaggregated data shows minimal differences between male and female over-age enrollment, indicating progress toward equity in addressing age-related disparities in education access and progression.

Figure 1

Trends in Net Enrollment Rates (NER) in Primary and Secondary Education



Note. Adapted from data in Appendix-1, compiled from World Bank. (2024). World Development Indicators 2024. https://data.worldbank.org/

The decline in over-age students highlights improved efficiency in resource utilization, reducing the cost of repeated education for families and the government. From a management perspective, it demonstrates the effectiveness of local governance, community engagement, and data-driven policy interventions. However, ensuring consistent enrollment at the appropriate age across all regions remains a critical goal for further improving educational outcomes and equity.

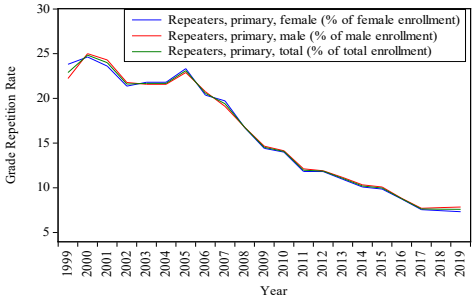
Grade Repetition Rates in Primary Education

Figure 2 highlights a steady decline in the percentage of students repeating grades in Nepal's primary education system from 1999 to 2019.

Across all groups-female, male, and total enrollment grade repetition rates fell significantly, with the sharpest decreases observed between 2005 and 2012. This trend reflects the effectiveness of policy interventions such as remedial programs, competency-based curricula, and efforts to improve teaching quality and student engagement. Economically, the reduction in repeaters indicates improved efficiency in education resource allocation, reducing the financial burden on families and public expenditures associated with repeated schooling. Management-wise, the downward trend demonstrates the success of local governance and school-based monitoring systems in addressing barriers to student progression. While progress has been significant, sustaining these gains will require continued efforts to enhance teaching strategies, promote inclusive policies, and ensure consistent learning outcomes across all regions.

Figure 2

Trends in Grade Repetition Rates in Primary Education



Note. Adapted from data in Appendix-1, compiled from World Bank. (2024). World Development Indicators 2024. https://data.worldbank.org/

Net Enrollment Rate (NER) in Primary Education

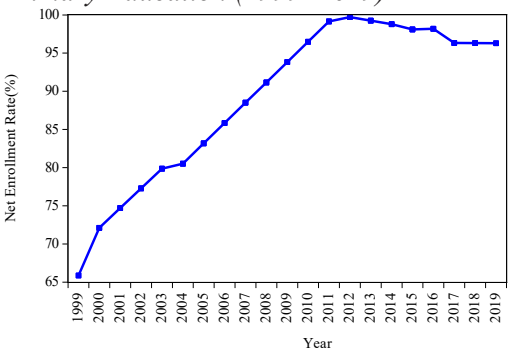
Figure 3 illustrates the trends in net Enrollment Rates (GER) for primary education in Nepal from 1999 to 2019, showcasing significant improvements over the years.

The figure depicts the steady rise in the Net Enrollment Rate (NER) for primary education in Nepal from 1999 to 2012, where it reached near-universal levels, followed by a plateau from 2013 to 2019. This upward trend demonstrates the success of initiatives aimed at expanding educational access, such as universal enrollment policies, community-based school management, and

targeted outreach programs to marginalized groups. The stabilization in NER after 2012 suggests that most children of primary school age are enrolled, though challenges may persist in retention and quality.

Figure 3

Trends in Net Enrollment Rate (NER) in Primary Education (1999–2019)



Note. Adapted from data in Appendix-1, compiled from World Bank. (2024). World Development Indicators 2024. https://data.worldbank.org/

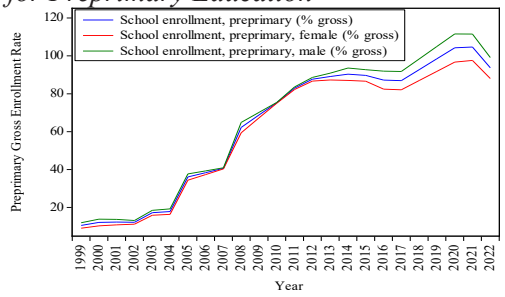
From an economic perspective, the increased NER signifies Nepal's progress in human capital development, as higher enrollment rates correlate with improved long-term economic productivity. Management-wise, the role of local governance and decentralized school management has been pivotal in addressing barriers to enrollment, particularly through tailored interventions at the community level. To sustain this achievement, future efforts must focus on maintaining retention rates and improving educational quality to ensure enrolled students successfully progress through the system and acquire essential competencies.

Gross Enrollment Rates (GER) for Preprimary Education

Gross Enrollment Rates (GER) for preprimary education in Nepal have shown significant growth from 1999 to 2022, reflecting increased access and awareness of early childhood education. The sharp rise post-2005 indicates successful policy interventions and improved infrastructure for preprimary schooling. Gender parity in GER highlights progress toward equitable access, though sustained efforts are needed to ensure quality and retention.

Figure 4

Trends in Gross Enrollment Rates (GER) for Preprimary Education



Note. Adapted from data in Appendix-1, compiled from World Bank. (2024). World Development Indicators 2024. https://data.worldbank.org/

Figure 4 shows the steady increase in the Gross Enrollment Rates (GER) for preprimary education in Nepal from 1999 to 2022, with enrollment rates for both males and females improving significantly. The GER rose sharply between 2005 and 2010, followed by consistent growth and near-parity between genders. This upward trajectory reflects the success of policies promoting early childhood education, community-based programs, and efforts to increase awareness of the importance of preprimary education among parents.

Economically, the growth in GER highlights increased investments in early childhood education, a critical factor in human capital formation.

Early enrollment fosters cognitive development and better preparedness for primary education, which contributes to long-term economic productivity. Management-wise, the trend indicates effective implementation of decentralized governance, enabling local governments to expand access and infrastructure for preprimary education. While significant progress has been made, future policies should address disparities and retention

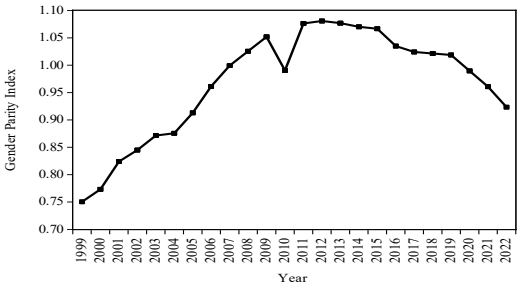
issues to ensure sustained growth and quality in early childhood education.

Gender Parity Index (GPI) for Gross Enrollment Rates

Figure 5 illustrates the Gender Parity Index (GPI) for Gross Enrollment Rates (GER) in primary education in Nepal from 1999 to 2022. The GPI shows a steady increase from 1999, reaching parity (GPI = 1) in 2010, indicating balanced enrollment between male and female students. After achieving parity, the index fluctuates slightly before gradually declining post-2017, suggesting emerging disparities favoring male enrollment. The rise to parity reflects effective gender-focused policies, such as scholarships for girls, awareness programs, and inclusive community engagement under decentralized school management. However, the decline post-2017 highlights persistent challenges in sustaining equity, likely influenced by socio-cultural factors or regional disparities. Addressing these issues requires targeted interventions, particularly in underprivileged areas, to maintain and strengthen gender equality in primary education.

Figure 5

Trends in Repeaters and Overage Students in Primary Education



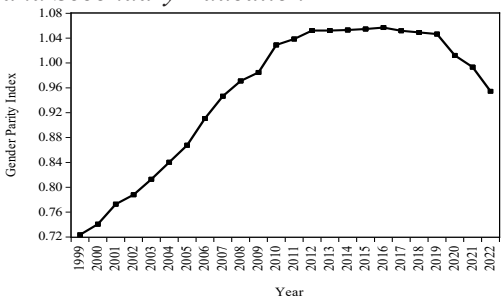
Note. Adapted from data in Appendix-2, compiled from World Bank. (2024). World Development Indicators 2024. https://data.worldbank.org/

Gender Parity Index (GPI) for Gross Enrollment Rates (GER) in Primary and Secondary Education

The Gender Parity Index (GPI) for Gross Enrollment Rates (GER) in primary and secondary education in Nepal steadily improved from 1999, achieving parity by 2012. However, a slight decline post-2018 indicates emerging gender disparities, requiring targeted interventions to sustain equity.

Figure 6

Trends in Gender Parity Index (GPI) for Gross Enrollment Rates (GER) in Primary and Secondary Education



Note. Adapted from data in Appendix-2, compiled from World Bank. (2024). World Development Indicators 2024. https://data.worldbank.org/

The figure depicts the Gender Parity Index (GPI) for Gross Enrollment Rates (GER) in primary and secondary education in Nepal from 1999 to 2022. The GPI steadily increased from 1999, achieving parity (GPI = 1) around 2012, indicating balanced enrollment across genders. After reaching parity, the index stabilized before declining slightly post-2018, suggesting a widening gap in favor of male enrollment in recent years.

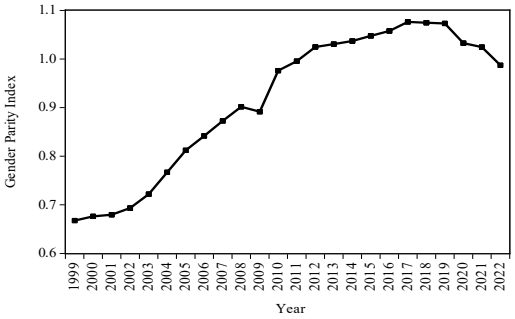
This trend reflects the success of policies promoting gender equality in education, particularly during the early 2000s, through initiatives like scholarships for girls and gender-sensitive community mobilization. However, the recent decline highlights challenges in sustaining equity, especially at the secondary level, likely due to socio-economic barriers and cultural norms affecting female retention. Continued efforts are essential to address these disparities and ensure sustained gender parity in both primary and secondary education.

GPI for Gross Enrollment Rates (GER) in Secondary Education

The Gender Parity Index (GPI) for Gross Enrollment Rates (GER) in secondary education in Nepal improved steadily from 1999, reaching parity by 2016. However, a decline post-2019 indicates growing gender disparities, with male enrollment outpacing female enrollment. Figure 7 shows the Gender Parity Index (GPI) for Gross Enrollment Rates (GER) in secondary education in Nepal from 1999 to 2022. The GPI rose steadily from 1999, achieving parity (GPI = 1) around 2016, reflecting significant progress in gender equity. However, a decline post-2019 indicates emerging disparities, with male enrollment surpassing female enrollment in secondary education.

Figure 7

Trends in GPI for GER in Secondary Education



Note. Adapted from data in Appendix-2, compiled from World Bank. (2024). World Development Indicators 2024. https://data.worldbank.org/

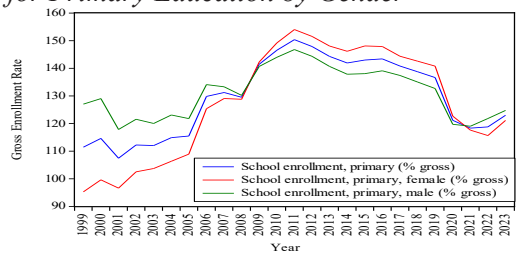
This trend underscores the success of policies aimed at promoting gender equality in education, such as scholarships and awareness campaigns, during the early 2000s. The recent decline suggests persistent challenges, particularly in retaining girls at the secondary level, driven by socio-economic and cultural barriers. Addressing these issues requires targeted interventions to ensure sustained progress toward gender parity in secondary education.

GER for Primary Education by Gender

Gross Enrollment Rates (GER) for primary education in Nepal steadily increased for both genders until peaking around 2012, followed by a decline post-2017. While male GER remained slightly higher, the gender gap narrowed significantly, reflecting progress toward equitable enrollment. Figure 8 shows the Gross Enrollment Rates (GER) for primary education in Nepal, disaggregated by gender, from 1999 to 2022. GER for both males and females exhibited a consistent upward trend from 1999, peaking around 2012, followed by a gradual decline after 2017. Male enrollment has remained slightly higher than female enrollment throughout the period, although the gap has narrowed significantly over time.

Figure 8

Trends in Gross Enrollment Rates (GER) for Primary Education by Gender



Note. Adapted from data in Appendix-3, compiled from World Bank. (2024). World Development Indicators 2024. https://data.worldbank.org/

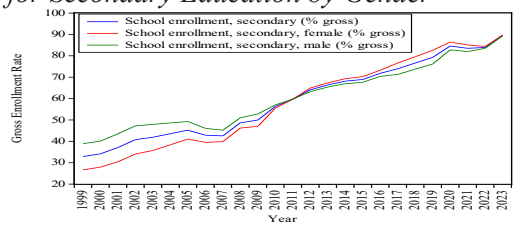
The trends reflect the success of efforts to increase enrollment through inclusive policies and gender-focused interventions, particularly during the early 2000s. The post-2017 decline suggests emerging challenges in sustaining high enrollment rates, potentially due to population shifts or retention issues. To maintain progress, future policies should focus on addressing barriers to enrollment and retention, particularly for disadvantaged groups, while ensuring equitable access for both genders.

GER for Secondary Education by Gender

Gross Enrollment Rates (GER) for secondary education in Nepal show a steady increase from 1999 to 2023, with near parity achieved between male and female enrollment. This reflects significant progress in promoting gender equity through targeted policies and interventions. Figure 9 illustrates the Gross Enrollment Rates (GER) for secondary education in Nepal from 1999 to 2023, disaggregated by gender. GER shows a consistent upward trajectory for both males and females, with a significant narrowing of the gender gap over time. By 2023, male and female GER are nearly aligned, reflecting progress in achieving gender equity in secondary education enrollment.

Figure 9

Trends in Gross Enrollment Rates (GER) for Secondary Education by Gender



Note. Adapted from data in Appendix-3, compiled from World Bank. (2024). World Development Indicators 2024. https://data.worldbank.org/

The overall increase in GER highlights the success of policies promoting access to secondary education, such as scholarships, infrastructure development, and community engagement. The near parity in gender enrollment demonstrates the effectiveness of targeted interventions for female students. However, continued efforts are necessary to sustain this growth and ensure equitable access, particularly for economically disadvantaged and rural populations.

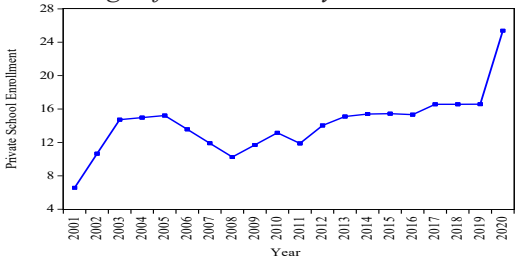
Private School Enrollment as a Percentage of Total Primary Enrollment

Private school enrollment in primary education in Nepal steadily increased from 2001, with a sharp rise after 2019, reaching over 24 percent in 2020. This trend highlights growing reliance on private schools, raising concerns about equity for economically disadvantaged families. Figure 10 illustrates the share of private school enrollment in primary education as a percentage of total primary enrollments in Nepal from 2001 to 2020.

Private enrollment shows a steady increase, fluctuating around 12–16 percent for most of the period, followed by a sharp rise after 2019, reaching over 24 percent in 2020. This indicates growing reliance on private schools for primary education, despite the presence of public schools. The increase in private school enrollment reflects parental preference for perceived higher quality education, better facilities, and improved learning outcomes in private institutions. Economically, this trend underscores the role of market forces in education, with private schools increasingly filling gaps in public education systems.

Figure 10

Trends in Private School Enrollment as a Percentage of Total Primary Enrollments



Note. Adapted from data in Appendix-4, compiled from World Bank. (2024). World Development Indicators 2024. https://data.worldbank.org/

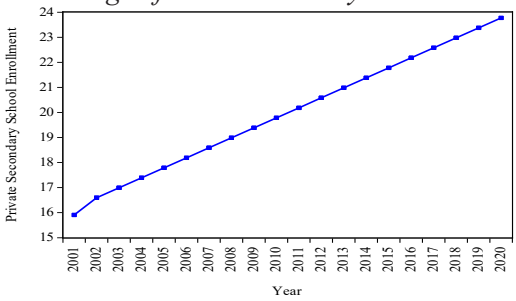
However, this reliance on private institutions raises equity concerns, as it may widen access gaps for economically disadvantaged families. Addressing these disparities requires strengthening the quality and accessibility of public primary education.

Private School Enrollment as a Percentage of Total Secondary Enrollment

Private school enrollment as a percentage of total secondary enrollments in Nepal steadily increased from 15 percent in 2001 to nearly 24 percent in 2020. This reflects growing reliance on private education, raising concerns about equitable access for economically disadvantaged students. Figure 11 shows the consistent rise in private school enrollment as a percentage of total secondary enrollments in Nepal from 2001 to 2020. Starting at approximately 15 percent in 2001, the proportion of secondary students enrolled in private schools has increased steadily, reaching nearly 24 percent by 2020. This reflects a growing preference for private education at the secondary level.

Figure 11

Private School Enrollment as a Percentage of Total Secondary Enrollment



Note. Adapted from data in Appendix-4, compiled from World Bank. (2024). World Development Indicators 2024. https://data.worldbank.org/

The upward trend highlights perceptions of better quality education and facilities in private schools, as well as a response to gaps in public secondary education. Economically, this trend signals an increasing privatization of education, which may exacerbate inequities as economically disadvantaged families struggle to afford private schooling. Strengthening public secondary education quality and accessibility is essential to address these disparities and promote equitable opportunities for all students.

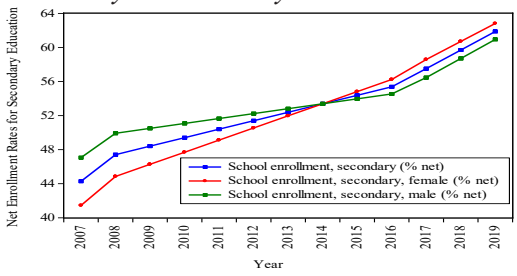
Net Enrollment Rates (NER) for Secondary Education by Gender

Net Enrollment Rates (NER) for secondary education in Nepal steadily increased from 44 percent in 2007 to over 60 percent in 2019, with female enrollment surpassing male enrollment post-2014. This reflects progress in gender equity and the impact of targeted education policies.

Figure 12 depicts the Net Enrollment Rates (NER) for secondary education in Nepal from 2007 to 2019, disaggregated by gender. Overall NER shows a consistent upward trend, increasing from approximately 44 percent in 2007 to over 60 percent in 2019. Female enrollment initially lagged behind male enrollment but surpassed it slightly post-2014, reflecting progress in achieving gender equity in secondary education.

Figure 12

Trends in Net Enrollment Rates (NER) for Secondary Education by Gender



Note. Adapted from data in Appendix-1, compiled from World Bank. (2024). World Development Indicators 2024. https://data.worldbank.org/

The steady increase in NER highlights the success of targeted interventions such as scholarships for girls, community awareness campaigns, and improved infrastructure. Gender equity improvements align with inclusive education policies, although the gradual growth in overall enrollment indicates the need for continued efforts to address retention challenges and socio-economic barriers. Ensuring sustained growth and equitable access for marginalized groups remains a priority.

Econometric Analysis

The Unit Root Test results, conducted using Phillips-Perron (PP) and Augmented Dickey-Fuller (ADF) methods, confirm that both ENROLLMENT_PRIMARY and DUMMY2017 are non-stationary in levels but become stationary after first differencing, indicating they are integrated of order 1 (I(1)). This suggests that enrollment trends follow stochastic patterns influenced by long-term policy changes and external factors, while short-term fluctuations stabilize after differencing. The findings support the use of cointegration techniques like FMOLS for long-run analysis, provided a cointegrating relationship exists, or alternative models like ARDL to capture short-term dynamics. The non-stationarity of DUMMY2017 reflects its nature as a binary policy indicator, emphasizing the structural impact of post-2017 decentralization reforms on educational outcomes.

Table 1

Unit Root Testing

UNIT ROOT TEST TABLE (PP)			
At Level		ENROLLMENT_PRIMARY	DUMMY2017
With Constant	t-Statistic	-1.4831	-0.5688
With Constant & Trend	t-Statistic	-0.7131	-1.8574
Without Constant & Trend	t-Statistic	0.1986	0.0000
At First Difference		d(ENROLLMENT_PRIMARY)	d(DUMMY2017)
With Constant	t-Statistic	-3.9179***	-4.7959***
With Constant & Trend	t-Statistic	-4.1413**	-4.8180***
Without Constant & Trend	t-Statistic	-3.9960***	-4.6904***
UNIT ROOT TEST TABLE (ADF)			
At Level		ENROLLMENT_PRIMARY	DUMMY2017
With Constant	t-Statistic	-1.3912	-0.5688
With Constant & Trend	t-Statistic	-0.7131	-1.8574
Without Constant & Trend	t-Statistic	0.2546	0.0000
At First Difference		d(ENROLLMENT_PRIMARY)	d(DUMMY2017)
With Constant	t-Statistic	-3.9117***	-4.7958***
With Constant & Trend	t-Statistic	-4.1430**	-4.8140***
Without Constant & Trend	t-Statistic	-3.9898***	-4.6904***

The Fully Modified Ordinary Least Squares (FMOLS) method was selected for this study to estimate the long-run relationships between school enrollment rates and explanatory variables, even in the presence of potential challenges such as endogeneity and serial correlation. The Johansen Cointegration Test produced mixed results regarding the presence of cointegration. While the trace test did not find evidence of cointegration at the 5 percent significance level, the maximum eigenvalue test identified one cointegrating equation among the variables. Based on this evidence, FMOLS was deemed appropriate for capturing potential long-run equilibrium relationships.

FMOLS is particularly well-suited for time-series data where variables are non-stationary in levels (I(1)) but may exhibit cointegration. The method adjusts for endogeneity and serial correlation by modifying the ordinary least squares estimates, making it robust for long-run analysis. Additionally, FMOLS accommodates small sample sizes effectively and provides unbiased parameter estimates for cointegrated systems, ensuring the reliability of results even in cases of weak or borderline cointegration.

Table 2

Results of Cointegration Test

Series: ENROLLMENT_PRIMARY YEAR DUMMY2017				
Unrestricted Cointegration Rank Test (Trace)				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None	0.629482	26.68431	29.79707	0.1096
At most 1	0.168417	4.841566	15.49471	0.8254
At most 2	0.035019	0.784221	3.841466	0.3759
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.629482	21.84274	21.13162	0.0397
At most 1	0.168417	4.057345	14.26460	0.8533
At most 2	0.035019	0.784221	3.841466	0.3759

Note. Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level.

Given the importance of understanding long-term trends in school enrollment and the structural changes introduced by decentralization reforms post-2017, FMOLS offers an ideal framework. It allows for the estimation of both level shifts and changes in trends while addressing common econometric issues that arise in time-series analysis. This makes FMOLS a robust and theoretically justified choice for analyzing the impact of local government-led school management on enrollment rates.

The results of the Fully Modified Ordinary Least Squares (FMOLS) regression reveal significant insights into the long-run relationship between primary school enrollment and explanatory variables. The coefficient for YEAR indicates a steady annual increase of 0.0078 percentage points in enrollment before 2017, reflecting consistent progress driven by pre-existing education policies. The DUMMY2017 variable shows a substantial post-reform boost of 12,843.54 percentage points in enrollment, highlighting the positive impact of decentralization reforms on improving access to primary education. However, the negative coefficient for DUMMY2017_YEAR (-6.38) suggests a declining growth rate post-2017, likely due to saturation effects, resource constraints, or challenges in maintaining progress.

Table 3

Results of Fully Modified Ordinary Least Squares

Dependent Variable: ENROLLMENT_PRIMARY				
Method: Fully Modified Least Squares (FMOLS)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
YEAR	0.007843	0.001158	6.770553	0.0000
DUMMY2017	12843.54	3371.100	3.809895	0.0011
DUMMY2017_YEAR	-6.376783	1.669495	-3.819587	0.0011
C	-5617.611	849.1193	-6.615809	0.0000
R-squared	0.798452	Mean dependent var		130.1568

Adjusted R-squared	0.768220	S.D. dependent var	13.64741
S.E. of regression	6.570345	Sum squared resid	863.3886
Long-run variance	73.03093		

The model demonstrates a strong fit, explaining 79.85 percent of the variation in enrollment rates, but the slowing growth trend underscores the need for sustained efforts to address systemic challenges. Policymakers should focus on enhancing education quality, ensuring equitable access for marginalized groups, and investing in infrastructure and teacher training to sustain enrollment gains. While the reforms had an immediate positive impact, maintaining long-term benefits will require targeted interventions to balance quantity and quality in education. These findings provide critical insights into the effectiveness of policy reforms and inform strategies for sustainable improvements in educational outcomes.

Figure 13

Normality Test

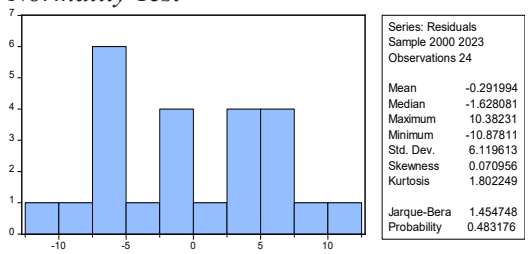


Figure 13 depicts the Normality Test evaluates whether the residuals of the regression model follow a normal distribution, critical for valid inference. The Jarque-Bera statistic measures the skewness and kurtosis of the residuals, with a p-value of 0.483176, which is greater than 0.05. This supports the assumption of normality, indicating that the model's residuals are consistent with a normal distribution.

DISCUSSION

This study highlights the significant contributions of local government-led school management to improving enrollment rates in Nepal while shedding light on persistent challenges. The observed increase in Net Enrollment Rate (NER) and Gross Enrollment Rate (GER) aligns with global evidence suggesting that decentralization can enhance access to education (Galiani & Perez-Truglia, 2012). The FMOLS results reinforce this trend, indicating a significant post-2017 boost in enrollment levels, driven by decentralization reforms. However, the observed decline in growth rates post-2017 aligns with systemic barriers such as resource allocation inefficiencies and capacity gaps, as noted by Edwards (2011). These challenges suggest that while decentralization can create immediate improvements, its sustainability depends on addressing underlying systemic issues.

Gender-focused policies have significantly improved the Gender Parity Index (GPI) for primary and secondary education, reflecting progress toward equity (Carney et al., 2007). Yet, the recent decline in GPI for secondary education resonates with findings by Khanal (2013), emphasizing socio-cultural and economic barriers that disproportionately affect female students. These results mirror global trends, such as those observed in sub-Saharan Africa, where socio-cultural challenges impede girls' education (Özdemir et al., 2024). Sustained interventions addressing these barriers are critical to ensuring equitable progress in education, particularly for marginalized groups.

The rise in private school enrollment as a share of total enrollment reveals a growing reliance on private education, reflecting trends observed in the Philippines by Khattri et al. (2012). While this indicates a diversification of education providers, it raises equity concerns, as private schooling can exacerbate inequalities (Wagle et al., 2019). The FMOLS results further suggest that while decentralization has boosted public school enrollment, the expanding private sector creates dual pressures on

quality and affordability, particularly for disadvantaged communities.

Effective policies must address this balance to prevent widening socio-economic disparities. Reductions in over-age students and grade repetition rates align with findings by Lassibille (2016), highlighting progress in improving internal efficiency within the education system. However, persistent delayed enrollment and socio-economic challenges mirror concerns raised by Carney and Rappleye (2011), indicating the need for sustained interventions targeting vulnerable populations.

Policy-practice gaps observed in this study echo observations by Daly et al. (2020) and Sharma (2008), who noted that decentralization often struggles with coordination and resource limitations. These gaps are exacerbated by limited leadership capacity, as emphasized by Leaver et al. (2019), and underscore the need for effective leadership and community engagement (Tan et al., 2024). Addressing these challenges requires a holistic approach that integrates global insights and local adaptations, ensuring sustainable and inclusive educational development in Nepal.

CONCLUSION

The findings of this study reveal the significant contributions of local government-led school management in Nepal, driving notable improvements in primary school enrollment rates through decentralization reforms. The FMOLS results confirm a transformative post-2017 boost in enrollment, reflecting the effectiveness of grassroots governance in mobilizing resources and addressing local educational needs. Gender-focused policies have also delivered progress, with the Gender Parity Index (GPI) achieving parity at the primary level.

However, challenges such as declining enrollment growth rates, increasing reliance on private schools, and persistent socio-cultural barriers in secondary education signal the need for continued efforts to strengthen public education systems.

This study not only highlights the success of decentralization but also underscores the importance of addressing its limitations. Policymakers must focus on balancing the growth of public and private education to ensure equitable access, especially for marginalized communities. Strengthening leadership capacity at the local level, reducing regional disparities, and implementing targeted retention strategies are critical to sustaining progress.

Future research should explore the long-term effects of decentralized leadership on educational outcomes, the interplay between enrollment and retention, and strategies to bridge quality gaps between public and private schools. By tackling these challenges, Nepal has the opportunity to transform its education system into a foundation for inclusive growth and sustainable development.

AUTHOR CONTRIBUTIONS

Bisna Acharya conceptualization, writing original draft, writing review & editing and formal analysis.

Dhruba Kumat Budhathoki data collection, review literature, resources management and supervision.

Omkar Poudel conceptualization, methodology, data curation and original draft writing.

Khom Raj Kharel formal analysis, investigation, methodology, visualization,writing original draft and writing review and editing.

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Appendix-1

Year	Over-age students, primary (percent of enrollment)	Over-age students, primary, female (percent of female enrollment)	Over-age students, primary, male (percent of male enrollment)	Repeaters, primary, female (percent of female enrollment)	Repeaters, primary, male (percent of male enrollment)	Repeaters, primary, total (percent of total enrollment)	School enrollment, primary (percent net)
1999	36.43361	35.92179	36.80293	23.81144	22.22605	22.89054	65.86436
2000	39.6084	38.27272	40.60068	24.63631	25.00183	24.84603	72.11046
2001	34.00839	33.2551	34.55589	23.6128	24.30129	23.99771	74.69632
2002	28.40839	28.23748	28.51111	21.37375	21.78018	21.59812	77.28219
2003	22.80838	23.21986	22.46632	21.80562	21.58389	21.68454	79.86805
2004	22.8084	23.21985	22.46631	21.80564	21.58386	21.68455	80.51963
2005	23.95129	24.68566	23.27062	23.33529	22.89868	23.10073	83.18016
2006	25.09418	26.15148	24.07494	20.36155	20.75116	20.56645	85.84069
2007	26.23707	27.61729	24.87925	19.72982	19.1101	19.40949	88.50122
2008	27.37996	29.08311	25.68356	16.73359	16.77239	16.75343	91.16174
2009	28.52285	30.54892	26.48787	14.41228	14.65634	14.53562	93.82227
2010	29.66574	32.01474	27.29219	13.99274	14.14415	14.06834	96.4828
2011	30.80863	33.48055	28.0965	11.82852	12.12171	11.97402	99.14333
2012	28.65114	31.23616	26.02162	11.82193	11.9134	11.86727	99.71319
2013	28.40886	31.21623	25.53876	10.9507	11.16078	11.05475	99.25178
2014	28.16658	31.19629	25.0559	10.09643	10.33743	10.21534	98.79036
2015	27.27237	30.57316	23.86752	9.86025	10.09952	9.97803	98.09886
2016	27.71623	30.64567	24.69494	8.74518	8.82958	8.78673	98.18273
2017	28.52365	31.66518	25.32527	7.56493	7.71475	7.63917	96.33409
2018	28.2436	31.43229	24.98636	7.451205	7.787245	7.61729	96.31625
2019	27.96354	31.1994	24.64745	7.33748	7.85974	7.59541	96.2984

Source: *World Bank. (2024).*

Appendix-2

Year	School enrollment, preprimary (percent gross)	School enrollment, preprimary, female (percent gross)	School enrollment, preprimary, male (percent gross)	School enrollment, primary (gross), gender parity index (GPI)	School enrollment, primary and secondary (gross), gender parity index (GPI)	School enrollment, secondary (gross), gender parity index (GPI)
1999	10.52386	9.06791	11.90535	0.7505	0.7237	0.66777
2000	12.09438	10.28713	13.80557	0.77323	0.74062	0.67614
2001	12.29222	10.81479	13.68564	0.824	0.77268	0.6798
2002	12.17976	11.17676	13.12548	0.84496	0.78804	0.6935
2003	17.22261	15.89792	18.4658	0.87155	0.81287	0.72182
2004	17.84034	16.32251	19.25905	0.87572	0.8403	0.76699
2005	36.08837	34.39246	37.66974	0.9129	0.86773	0.81216
2006	38.36699	37.36118	39.3045	0.96129	0.91069	0.84175
2007	40.64561	40.3299	40.93926	0.99924	0.94644	0.87278

2008	62.24113	59.42708	64.85478	1.02561	0.97097	0.90168
2009	68.81538	67.31272	70.21041	1.05202	0.98486	0.89168
2010	75.2466	75.04424	75.43438	0.990474	1.02896	0.97618
2011	82.96986	82.25298	83.64278	1.076405	1.03849	0.99539
2012	87.67585	86.67433	88.62493	1.080809	1.05223	1.02474
2013	89.11589	87.2645	90.90475	1.076826	1.0522	1.03074
2014	90.36234	87.06998	93.61327	1.070247	1.05302	1.03702
2015	89.67999	86.63371	92.70998	1.066621	1.05463	1.04752
2016	87.22128	82.47099	91.94829	1.03502	1.05691	1.05752
2017	86.92915	82.08042	91.77609	1.024217	1.051779	1.076299
2018	92.70112	86.96964	98.3847	1.021439	1.049135	1.07467
2019	98.47309	91.85885	104.9933	1.01866	1.04649	1.07304
2020	104.2451	96.74807	111.6019	0.98956	1.01227	1.03256
2021	104.6622	97.6199	111.5052	0.960808	0.99329	1.024548
2022	93.69803	88.07983	99.11867	0.923407	0.954388	0.987173

Source: World Bank. (2024).

Appendix-3

Year	School enrollment, primary (percent gross)	School enrollment, primary, female (percent gross)	School enrollment, primary, male (percent gross)	School enrollment, secondary (percent gross)	School enrollment, secondary, female (percent gross)	School enrollment, secondary, male (percent gross)
1999	111.47	95.28938	127.035	32.90382	26.65228	38.88682
2000	114.6277	99.64411	129.0433	34.15637	27.94995	40.1095
2001	107.4683	96.64454	117.8807	37.11553	30.45258	43.52067
2002	112.2343	102.5372	121.5631	40.76898	34.05654	47.23239
2003	112.041	103.7213	120.0454	41.93066	35.71677	47.93781
2004	114.8929	106.3477	123.1181	43.57475	38.37864	48.60676
2005	115.4857	108.9251	121.8054	45.21885	41.04051	49.27571
2006	129.8235	125.3796	134.1083	42.84846	39.51782	46.0867
2007	131.2217	129.0618	133.3068	42.56725	39.88069	45.18302
2008	129.5192	128.8027	130.2117	48.64606	46.19592	51.03449
2009	141.4711	142.2997	140.6694	49.93654	47.00998	52.79273
2010	146.5406	149.1829	143.9828	56.34319	55.60744	57.06217
2011	150.3542	154.0322	146.7926	59.7314	59.73641	59.72651
2012	147.89	151.5526	144.3416	64.07684	64.9107	63.25935
2013	144.3059	148.0563	140.6707	66.36922	67.36698	65.38869
2014	141.9366	146.1568	137.8435	68.13395	69.29521	66.99097
2015	142.991	148.0849	138.0485	68.92825	70.29556	67.58292
2016	143.4145	147.8757	139.0869	71.8179	73.28247	70.37974
2017	140.8214	144.3587	137.3939	73.94235	76.62525	71.31689
2018	138.7435	142.5729	135.0395	76.62959	79.59296	73.73276
2019	136.6657	140.7871	132.6851	79.31682	82.56068	76.14863
2020	121.1867	122.6847	119.7428	84.5885	86.425	82.79579
2021	118.3386	117.6104	119.0387	83.51622	85.09714	81.97921
2022	118.804	115.66	121.8209	83.92281	84.34871	83.50984
2023	122.9841	121.1404	124.7504	89.55136	89.73098	89.37719

Source: *World Bank. (2024).*

Appendix-4

Year	School enrollment, primary, private (percent of total primary)	School enrollment, secondary, private (percent of total secondary)
2001	6.57221	15.90953
2002	10.64847	16.59273
2003	14.72473	16.99167
2004	14.97289	17.39061
2005	15.22105	17.78955
2006	13.56274	18.1885
2007	11.90442	18.58744
2008	10.24611	18.98638
2009	11.70025	19.38532
2010	13.1544	19.78426
2011	11.88446	20.1832
2012	14.0335	20.58215
2013	15.10357	20.98109
2014	15.39688	21.38003
2015	15.44732	21.77897
2016	15.32298	22.17791
2017	16.57045	22.57685
2018	16.57176	22.9758
2019	16.57308	23.37474
2020	25.38115	23.77368

Source: World Bank. (2024).

Appendix-5

Year	School enrollment, secondary (percent net)	School enrollment, secondary, female (percent net)	School enrollment, secondary, male (percent net)
2007	44.2879	41.4615	47.07093
2008	47.41153	44.85088	49.91742
2009	48.40696	46.27368	50.49587
2010	49.40238	47.69649	51.07432
2011	50.39781	49.11929	51.65277
2012	51.39324	50.54209	52.23123
2013	52.38866	51.96489	52.80968
2014	53.38409	53.3877	53.38813
2015	54.37951	54.8105	53.96658
2016	55.37494	56.2333	54.54503
2017	57.51369	58.58795	56.46276
2018	59.69311	60.70322	58.7009
2019	61.87253	62.81848	60.93904

Source: World Bank. (2024).