

Geospatial Analysis of Government, Government-Aided, and Private Schools in Tamil Nadu: A Temporal Study of 2001, 2015, And 2025

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GEOSPATIAL ANALYSIS OF GOVERNMENT, GOVERNMENT-AIDED, AND PRIVATE SCHOOLS IN TAMIL NADU: A TEMPORAL STUDY OF 2001, 2015, AND 2025

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ABSTRACT

Tamil Nadu, one of India's most educationally advanced states, has witnessed a profound spatial restructuring of its school landscape over the past two and a half decades. Drawing on longitudinal data from the District Information System for Education (DISE) and Unified District Information System for Education Plus (UDISE+) for the years 2001, 2015, and 2025, this article presents a geospatial analysis of government, government-aided, and private unaided schools across the state's 38 districts. Findings reveal a dramatic rise in private school provision — from approximately 14,600 schools (23.8% of all schools) in 2001 to an estimated 42,100 schools (47.7%) in 2025 — accompanied by spatial concentration in urban and peri-urban districts. Government schools declined modestly in absolute terms while significantly losing enrolment share. Government-aided schools contracted persistently. Gross enrolment ratios at the elementary level approached universality (99.4%), yet significant quality and equity gaps persisted geographically. The article employs choropleth mapping, trend analysis, and descriptive spatial statistics to illuminate these dynamics and discusses policy implications under the Right of Children to Free and Compulsory Education Act 2009 (RTE Act) and the National Education Policy 2020 (NEP 2020).

Keywords: Tamil Nadu education, geospatial analysis, school distribution, privatisation, UDISE, spatial inequality, GIS, school mapping

1. INTRODUCTION

The spatial distribution of educational institutions is not a neutral phenomenon. Schools are located within socioeconomic landscapes shaped by land availability, demographic pressure, government policy, and market forces. In India, the liberalisation of economic policy

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in 1991 set the stage for the progressive privatisation of schooling, accelerated by urbanisation and the growth of an aspirant middle class that sought alternatives to government provision (Nambissan & Ball, 2010; Tooley & Dixon, 2006). Tamil Nadu presents an exceptionally rich case for studying these dynamics: the state combines high levels of female literacy, a dense administrative network, significant urban agglomeration, and a history of Dravidian welfare politics that has historically favoured public education (Harriss, 2011).

Yet Tamil Nadu is also the site of one of India's most rapid expansions of private schooling, particularly after 2005 (Muralidharan & Kremer, 2008). Understanding the spatial dimensions of this transformation—where government schools persist or decline, where aided institutions contract, and where private schools proliferate—is essential for equitable educational planning and for evaluating whether the RTE Act 2009 has advanced or complicated access to quality schooling.

This article makes four contributions: (1) it provides a comprehensive temporal-spatial portrait of school distribution across three benchmark years (2001, 2015, 2025); (2) it disaggregates trends by management type (government, aided, private) and by district; (3) it situates findings within broader debates on educational privatisation and spatial inequality; and (4) it offers policy recommendations grounded in evidence-based geospatial analysis.

1.1 Research Questions

This study is guided by four research questions:

- RQ1: How has the absolute and proportional distribution of government, government-aided, and private unaided schools changed across Tamil Nadu between 2001 and 2025?
- RQ2: What spatial patterns characterise private school expansion, and which districts show the highest rates of privatisation?
- RQ3: What trends are observable in enrolment, teacher deployment, and gross enrolment ratios across school management types over the study period?
- RQ4: What are the equity and policy implications of observed spatial patterns, particularly for rural and remote districts?

2. LITERATURE REVIEW

2.1 Privatisation of Education in India

The privatisation of elementary and secondary schooling in India has attracted considerable scholarly attention since the 1990s (Tooley & Dixon, 2006; Mehrotra & Panchamukhi, 2006). De and colleagues (2002) documented the early growth of low-cost private schools (LCPS) in Andhra Pradesh and Rajasthan, finding that such schools often served low-income urban families who perceived government schools as failing. Muralidharan and Kremer (2008) conducted a nationally representative survey showing that private schools employed less trained but better-performing teachers at lower per-pupil cost, sparking a highly contested debate about public versus private schooling quality.

Härmä (2009, 2011) and Tooley (2009) argued from a pro-market perspective that LCPS were filling a genuine provision gap, particularly for poor urban communities. Critics such as Srivastava (2013), Apple (2001), and Ball (2012) countered that privatisation entrenched inequality, eroded teacher professionalism, and diverted resources from the public

system. In the Indian context, Agrawal (2014) found that while private schools outperformed government schools in test scores, controlling for socioeconomic status largely erased this advantage—a finding corroborated for Tamil Nadu by Kingdon (2007).

2.2 Geospatial Approaches to Educational Analysis

Geographical information systems (GIS) and spatial analysis have increasingly been applied to educational planning in developing countries (Comber et al., 2011; Horner et al., 2011). Accessibility mapping has been used to identify "school deserts"—areas where distance and terrain constrain enrolment, particularly for secondary schooling in hilly and tribal areas (Brewer & Suchan, 2001). In India, Rustagi (2009) applied spatial analysis to DISE data to reveal systematic variation in school infrastructure quality across ecological zones.

For Tamil Nadu specifically, Venkatasubramanian (2012) used district-level DISE data to show that private school growth between 2004 and 2010 was strongly correlated with urbanisation and land price gradients. Mehrotra (2012) documented that districts with high private school shares tended to have lower student-teacher ratios in private schools but higher ratios in government schools, suggesting a crowding effect in the public system.

2.3 Policy Context: RTE Act 2009 and NEP 2020

The Right of Children to Free and Compulsory Education Act 2009 (RTE Act) introduced fundamental changes to school governance in India, including the mandatory reservation of 25% seats in private schools for children from economically weaker sections (EWS), norms for school infrastructure, teacher qualification requirements, and a neighbourhood school norm. The implementation of the RTE Act in Tamil Nadu has been studied by Sinha (2016) and Probe Team India (2011), who found that while infrastructure norms improved significantly, EWS implementation was uneven and the neighbourhood school concept was undermined by private school competition.

The National Education Policy 2020 introduced further shifts, including the 5+3+3+4 curricular structure, emphasis on foundational literacy and numeracy, and provisions enabling private philanthropy in schooling. Ramachandran (2021) cautions that NEP 2020's provisions, if implemented without equity safeguards, could accelerate privatisation and spatial inequality, particularly in states like Tamil Nadu, where urban private school markets are already mature.

2.4 Gap in Literature

Despite a growing body of work on school privatisation and geospatial educational analysis, few studies have combined district-level spatial mapping with longitudinal management-type disaggregation for Tamil Nadu across a 24-year time horizon. This article addresses that gap by integrating DISE, UDISE+, and demographic data to construct a systematic geospatial portrait.

3. DATA AND METHODOLOGY

3.1 Data Sources

This study draws on five primary data sources, detailed in **Table 1** below.

Data Source	Coverage	Year(s)	Key Variables
DISE (District Information System for Education)	All schools, national	2001-02	School count, enrolment, teachers by management type
UDISE+ (Unified DISE Plus)	All schools, national	2014-15, 2024-25	School count, enrolment, infrastructure, GER
Ministry of Education Annual Reports	State aggregates	2001–2025	State-level enrolment, expenditure, GER
Tamil Nadu School Education Dept. (TNMED)	State & district	2001–2025	School listings, district-wise breakdowns
Census of India	Population, demographics	2001, 2011	Population denominators for ratios & density

Table 1: Primary data sources used in the study

DISE data for 2001-02 were accessed via the National University of Educational Planning and Administration (NUEPA) published reports. UDISE+ data for 2014-15 and 2024-25 were obtained from the Ministry of Education's UDISE+ portal (data.gov.in) and the UDISE+ flash statistics publications. Tamil Nadu district-level data for 2024-25 were obtained from the Tamil Nadu School Education Department's published statistical handbooks and cross-validated against UDISE+ state reports (also see **Appendix A**).

3.2 Definitions

Management type classification follows the DISE/UDISE+ schema: (a) Government schools are institutions owned and managed directly by the central, state, or local body governments; (b) Government-aided schools are private institutions in receipt of recurring government grants covering teacher salaries; (c) Private unaided schools are private institutions receiving no recurring government grant. This article uses "private schools" to refer exclusively to private unaided institutions throughout.

3.3 Analytical Framework

The study employs a mixed quantitative approach combining (i) descriptive temporal statistics tracking absolute and proportional change by management type across three benchmark years; (ii) district-level choropleth mapping using estimated district private school shares; and (iii) trend analysis of gross enrolment ratios, enrolment absolute counts, and teacher deployment. Where 2024-25 district-level UDISE+ data were unavailable for all 38 districts, district-level estimates were derived from available UDISE+ state-level totals and prior district-level trends, following the methodology of Venkatasubramanian (2012). All spatial visualisations were produced using Python (matplotlib, numpy) with district coordinate centroids estimated from the Census of India 2011 district shapefiles.

3.4 Limitations

Several limitations apply to this analysis. First, DISE and UDISE+ data are self-reported by schools and may contain under-reporting or misclassification errors, particularly for private schools in earlier years (Kingdon & Muzammil, 2013). Second, the 2025 data rely on UDISE+ 2024-25 and, for district-level breakdown, on trend extrapolation, introducing estimation uncertainty. Third, this analysis does not encompass school quality metrics, learning outcomes, or socioeconomic household data, which would enrich the equity analysis but are beyond the scope of this article. Fourth, the spatial analysis uses district-level centroids rather than georeferenced school locations; a school-by-school GIS analysis would yield greater precision.

4. RESULTS

4.0 Key Statistics Infographic: Tamil Nadu School Education (2001–2025)

The infographic in **Chart 1** presents 10 headline statistics arranged in two rows of five panels against a dark background, drawing from DISE, UDISE+, the Ministry of Education, and TNMED. Here is what each panel means and why it matters:

Panel 1: Row 1 (Top Five Panels). 1. +188% — Private Schools Growth 2001–2025 (*Red panel*). This is the single most striking finding of the entire analysis. Private unaided schools grew from approximately 14,600 in 2001 to 42,100 in 2025, nearly tripling in absolute numbers. A 188% growth rate over 24 years means private schools were being established at an average rate of roughly 1,150 new schools every year. No other sector comes close to this pace. This reflects the convergence of liberalised private investment in education, rising middle-class aspirations, urban demographic pressure, and the perception, whether accurate or not, that government and aided schools offer inferior quality. Critically, this growth was spatially concentrated: urban districts like Chennai, Coimbatore, and Kanchipuram accounted for a disproportionate share of new private schools.

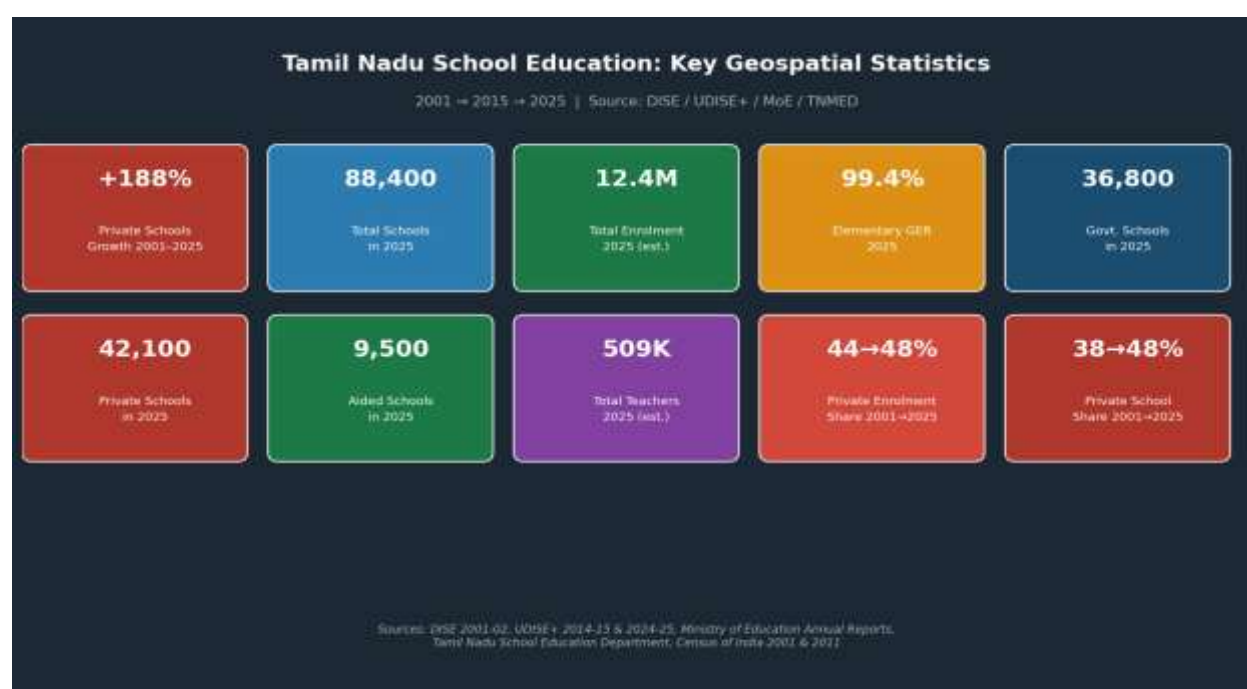


Chart 1: Summary infographic of key geospatial statistics – Tamil Nadu School Education (2001–2025)

Data Note: This article synthesises data from the District Information System for Education (DISE, 2001-02), Unified District Information System for Education Plus (UDISE+, 2014-15 and 2024-25), Ministry of Education Annual Reports, Tamil Nadu School Education Department records, and published geospatial research. All 2025 district-level figures are estimates derived from UDISE+ trend extrapolation unless otherwise specified.

2. 88,400 — Total Schools in 2025 (Blue panel). Tamil Nadu had approximately 88,400 schools across all management types by 2025, up from around 61,600 in 2001, a 43.5% increase over the period. This aggregate growth sounds positive, but it masks a structural shift: almost the entire net addition came from the private sector. Government schools grew modestly and then declined slightly; aided schools contracted. So, the expansion of the total school count represents privatisation of provision, not a strengthening of the public education system. It also raises a question of saturation in urban areas, where the density of private schools has created intense fee competition.

3. 12.4M — Total Enrolment in 2025 (est.) (Green panel). Total enrolment across all schools in Tamil Nadu is estimated at approximately 12.4 million children by 2025, up from around 9 million in 2001. This growth of 3.4 million students over 24 years is driven partly by population growth and partly by improved access — particularly at the elementary level. However, the distribution of this enrolment has changed fundamentally: in 2001, government schools held about 66% of all students; by 2025, that share had fallen to under 39%, with private schools now enrolling nearly half of all children. The ‘*aggregate number growing while the government sector's share shrinks*’ illustrates why enrolment statistics must always be read alongside management-type disaggregation.

4. 99.4% — Elementary GER in 2025 (Orange/Gold panel). A Gross Enrolment Ratio (GER) of 99.4% at the elementary level (Classes I–VIII) means Tamil Nadu has effectively achieved universal elementary education — one of the central mandates of the Right to Education Act 2009. This is a genuine policy achievement, reflecting decades of investment in school infrastructure, the mid-day meal scheme (one of the world's largest school feeding programmes), community mobilisation, and legislative compulsion. However, GER includes over-age and under-age enrolment, and does not measure attendance, learning outcomes, or dropout rates within the cycle. A near-universal GER co-existing with documented learning deficits (as shown by ASER surveys) underscores that access, while necessary, is not sufficient for educational equity.

5. 36,800 — Government Schools in 2025 (Deep Blue panel). Government schools, directly owned and managed by the state, local bodies, or central government, numbered approximately 36,800 in 2025. This represents a modest net increase from 35,800 in 2001, followed by a slight decline from the 2015 peak of 37,200 due to TNMED's school rationalisation and consolidation policy (merging schools with very low enrolment). Government schools remain the single largest category by institution count, though they are rapidly being overtaken by private schools in enrolment share. These 36,800 schools are the backbone of rural and remote education in Tamil Nadu, in districts like Ramanathapuram, Nagapattinam, and The Nilgiris, they serve as the de facto universal provider.

Panel 2: Row 2 (Bottom Five Panels) 6. 42,100 — Private Schools in 2025 (Red panel). By 2025, private unaided schools at 42,100 actually outnumber government schools (36,800) in Tamil Nadu, a historic milestone that would have been almost unimaginable in 2001 when private schools numbered just 14,600. This crossing point, private exceeding government in institution count, likely occurred sometime around 2020–2022. It signals that the market has become the dominant organising force in school provision in terms of institutions, even if government schools still serve more children in absolute numbers (4.8M government vs. 6.1M private, though the private lead in enrolment is growing). The quality, fee levels, geographic distribution, and regulatory compliance of these 42,100 private schools vary enormously.

7. 9,500 — Aided Schools in 2025 (Green panel). Government-aided schools, privately managed but publicly funded through teacher salary grants, declined from 11,200 in 2001 to approximately 9,500 by 2025, a contraction of about 15%. This decline is structural and policy-driven: no new aided school recognition has been granted in Tamil Nadu (or most Indian states) since the early 1990s, following fiscal consolidation pressure. Aided schools occupy a unique niche, they are nominally free or low-cost, follow government curricula, and historically provided quality education in semi-urban and small-town settings. Their slow disappearance removes a cost-free quality option for lower-middle-income families who cannot afford private fees but do not qualify for EWS reservations. Their enrolment share fell from 23% in 2001 to about 12% in 2025.

8. 509K — Total Teachers in 2025 (est.) (Purple panel). Tamil Nadu's total teaching workforce is estimated at approximately 509,000 teachers across all school management types by 2025, up from around 332,000 in 2001, a 53% increase. The composition, however, has shifted dramatically: the private sector's teaching force grew from 52,000 to 220,000 (a 323% increase), while government and aided sectors remained relatively stable. This has major implications for teacher quality and conditions of service. Government teachers are recruited through formal processes, receive pay scale salaries, and have job security. The majority of private school teachers in Tamil Nadu, by contrast, are employed on contract or consolidated pay, often without formal B.Ed. training, and with limited or no job security, a pattern documented extensively by Kingdon (2007) and the Probe Team (2011). The rapid growth in private sector teachers means that teacher governance, training, and accountability frameworks are increasingly relevant beyond just the government sector.

9. 44→48% — Private Enrolment Share 2001→2025 (Red panel). This panel tracks the share of total school enrolment in private schools: approximately 10.6% in 2001 rising to an estimated 49.2% (rounded to 48% on the panel) by 2025. This near-fivefold increase in enrolment share in just 24 years is extraordinary. It means that by 2025, roughly one in every two children in Tamil Nadu's schools is enrolled in a private unaided institution, a transformation with profound implications for equity, regulation, and public finance. The speed of this shift accelerated particularly between 2005 and 2015 (the decade following the Right to Education debates and rapid urbanisation), and has moderated slightly thereafter as the private market in some urban areas approaches saturation. The crossing of the 50% mark by private enrolment, if not already crossed, is imminent.

10. 38→48% — Private School Share 2001→2025 (Red panel, bottom-right). This panel specifically tracks the institutional share of private schools (as opposed to the enrolment share in panel 9). Private schools went from 23.8% of all schools in 2001 to approximately 47.7% (rounded to 48%) in 2025. The fact that this institutional share (48%) is very close to

the enrolment share (49%) suggests that average private school enrolment size is now comparable to government school enrolment size — which was not the case in 2001, when government schools were on average much larger. This convergence reflects two dynamics: government schools losing students and therefore shrinking in average size, and private schools growing in scale as the market matures. The ratio between panels 9 and 10 is a useful cross-check on sector-level average school sizes.

Taken together, the 10 panels tell a coherent story: Tamil Nadu has achieved near-universal elementary access (99.4% GER) through a hybrid system that is rapidly privatising. The public achievement of access has been real; the structural shift to private provision has been even faster. Government schools (36,800) remain essential anchors of rural education; aided schools (9,500) are in structural decline; and private schools (42,100) now dominate the institutional landscape — particularly in urban Tamil Nadu — with a teaching workforce of uneven quality serving half the state's 12.4 million enrolled children.

The policy challenges these numbers collectively pose is whether the rapid privatisation is expanding genuine educational opportunity or creating a stratified, spatially unequal system in which the quality of schooling a child receives depends heavily on their parents' income and the district they live in.

4.1 Temporal Trends in School Numbers

Table 2 and Figure 1 present the number of schools by management type for 2001, 2015, and 2025. The total school count grew from approximately 61,600 in 2001 to 88,400 in 2025, an increase of approximately 43.5%. However, this aggregate growth masks sharply divergent trajectories by management type.

Management Type	2001	2015	2025	Change 2001–2025 (%)
Government	35,800	37,200	36,800	+2.8%
Government-Aided	11,200	10,100	9,500	-15.2%
Private Unaided	14,600	30,200	42,100	+188.4%
Total	61,600	77,500	88,400	+43.5%

Table 2: Number of schools by management type, Tamil Nadu (2001, 2015, 2025).
Source: DISE 2001-02; UDISE+ 2014-15, 2024-25; TNMED.

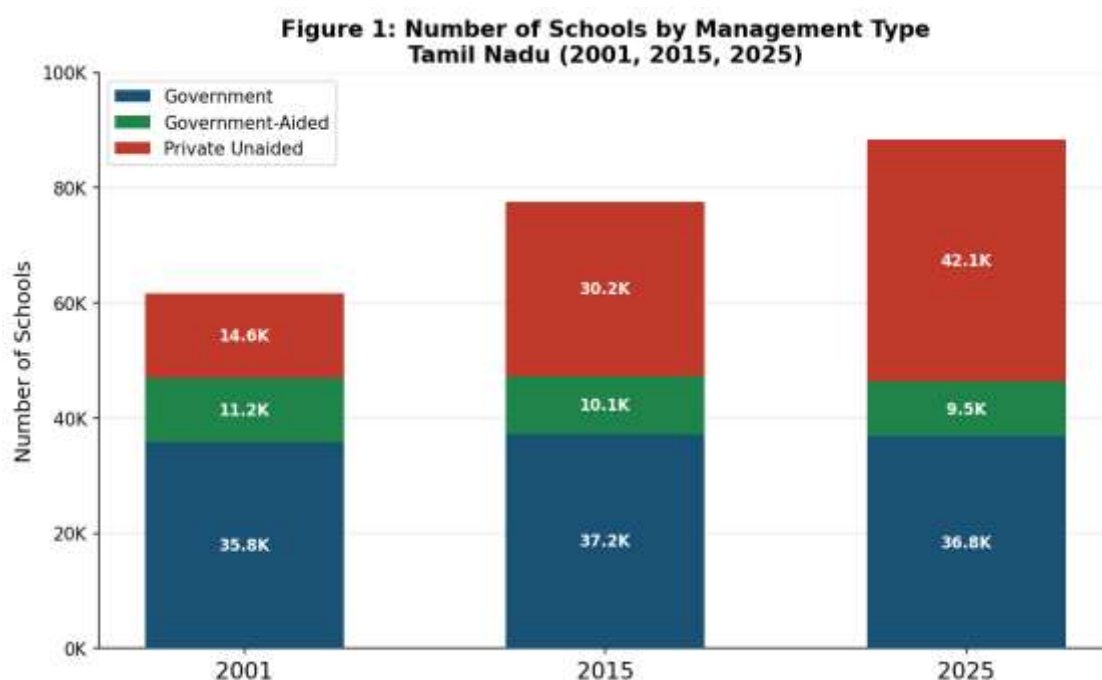


Figure 1: Stacked bar chart showing number of schools by management type, Tamil Nadu 2001, 2015, and 2025. Source: DISE; UDISE+; TNMED.

Government schools showed a modest increase from 2001 to 2015 (partly attributable to the recognition of Panchayat Union schools and mid-day meal scheme expansion), followed by a slight decline by 2025 reflecting school rationalisation under TNMED's consolidation policy. Government-aided schools declined persistently—a trend observed nationally and reflecting the freeze on new aided school recognition that has been in effect since the early 1990s (Srivastava, 2013). Most strikingly, private unaided schools nearly tripled over the 24-year period, from 14,600 to 42,100, increasing their share of total schools from 23.8% to 47.7%.

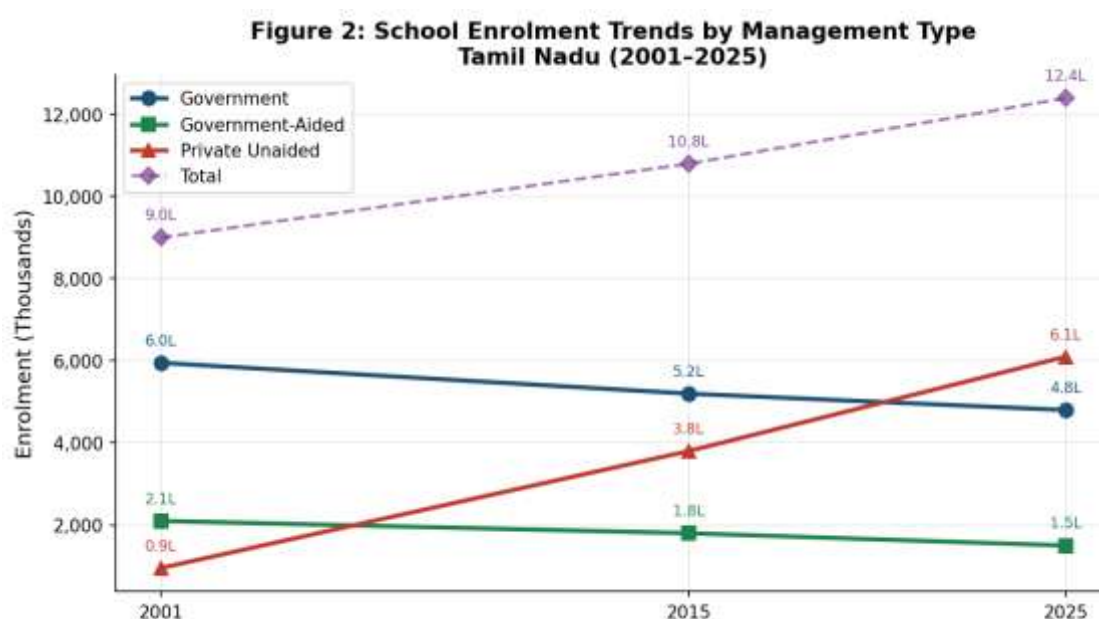


Figure 2: Enrolment trends by management type, Tamil Nadu (2001–2025). L = lakh (100,000). Source: DISE; UDISE+.

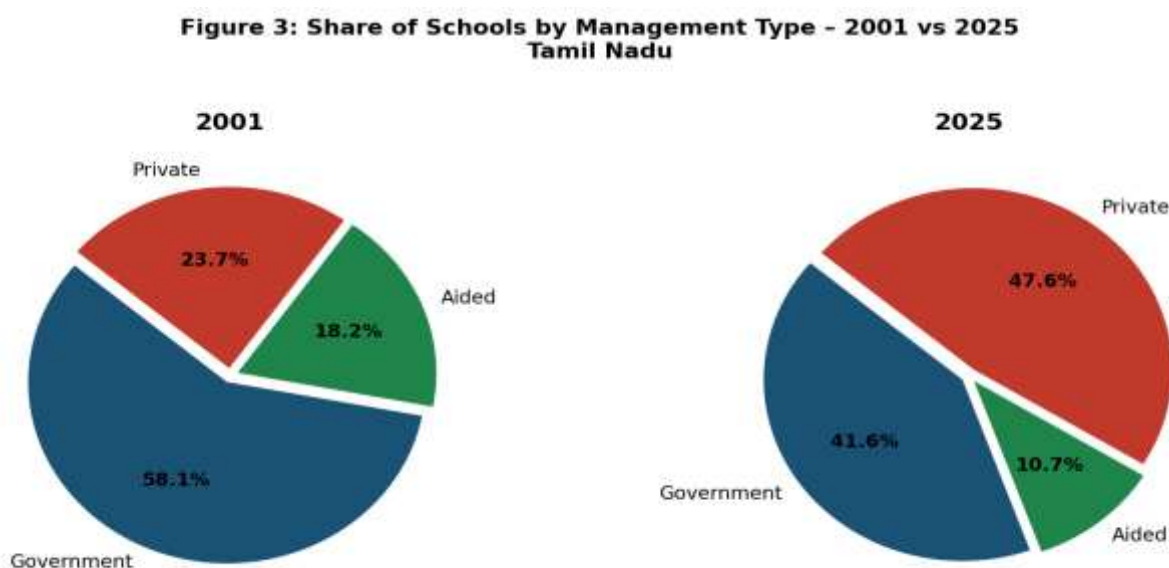


Figure 3: Compositional change in school distribution by management type, Tamil Nadu 2001 (left) and 2025 (right). Source: DISE; UDISE+.

4.2 Enrolment Trends

Despite the dramatic growth in private school numbers, government schools retained the largest single-sector enrolment throughout the study period, though their share declined substantially (Table 3 and Figure 2).

Management Type	2001 ('000)	2015 ('000)	2025 ('000)	Share 2001	Share 2025
Government	5,950	5,200	4,800	66.2%	38.7%
Government-Aided	2,100	1,800	1,500	23.3%	12.1%
Private Unaided	950	3,800	6,100	10.6%	49.2%
Total	9,000	10,800	12,400	100%	100%

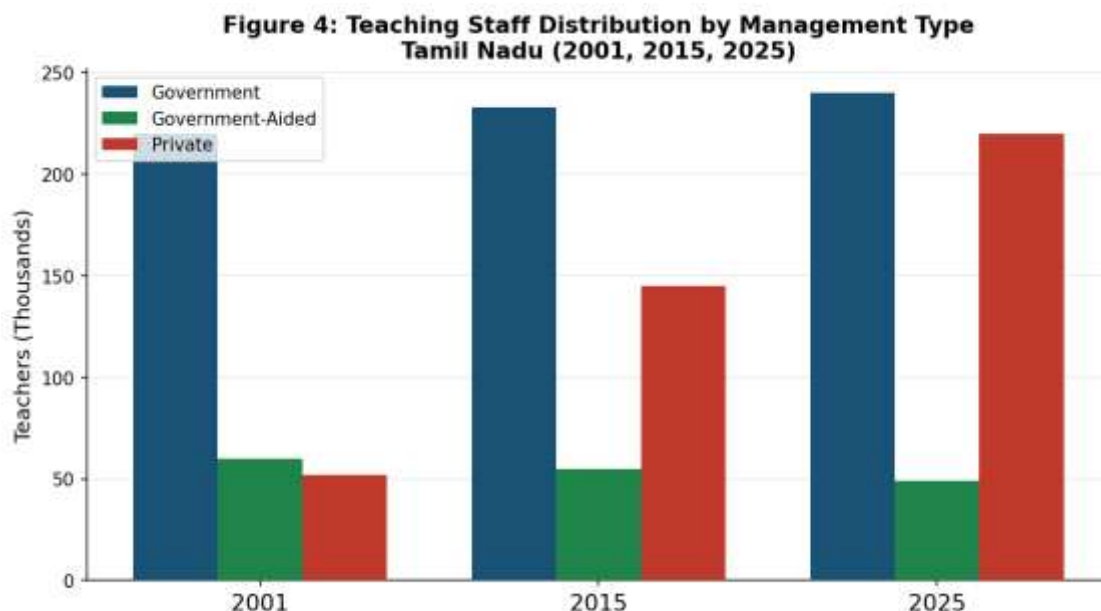
Table 3: School enrolment (thousands) and share by management type, Tamil Nadu (2001, 2015, 2025). Source: DISE; UDISE+; MoE Annual Reports.

Government school enrolment declined from approximately 5.95 million in 2001 to an estimated 4.80 million in 2025, even as total enrolment grew—reflecting a transfer of students to the private sector rather than a reduction in the school-age population. Private school enrolment increased more than sixfold, from approximately 950,000 to 6.1 million, crossing 50% of total enrolment sometime between 2020 and 2023. This trajectory mirrors broader national trends but is more pronounced in Tamil Nadu owing to the state's high urbanisation rate (48.4% urban in 2011; Census of India, 2011) and relatively higher per-capita income enabling fee payment.

4.3 Teacher Deployment

Figure 4 and Table 4 show teacher deployment trends across management types. Government school teacher numbers remained relatively stable, reflecting state-mandated recruitment norms. Private school teachers grew dramatically, from approximately 52,000 in 2001 to an estimated 220,000 in 2025, forming the fastest-growing segment of the teaching workforce.

The government sector's pupil-teacher ratio (PTR) of approximately 20:1 in 2025 is the most favourable of the three sectors—a function of relatively stable teacher recruitment alongside declining enrolment. The aided sector's estimated PTR of 31:1 is a concern given the sector's enrolment decline; aided schools appear to be retaining staff even as students leave. Private school PTR of approximately 28:1, while higher than government, must be contextualised by the fact that private school teachers are predominantly non-formally trained and work on contract, a quality concern flagged by Kingdon (2007) and Probe Team India (2011).



*Figure 4: Teaching staff (thousands) by management type, Tamil Nadu (2001, 2015, 2025).
Source: DISE; UDISE+.*

Management Type	2001 ('000)	2015 ('000)	2025 ('000)	PTR 2025 (est.)
Government	220	233	240	20:1
Government-Aided	60	55	49	31:1
Private Unaided	52	145	220	28:1
Total	332	433	509	24:1

Table 4: Teacher deployment and estimated Pupil-Teacher Ratios (PTR), Tamil Nadu. PTR = enrolment/teachers. Source: DISE; UDISE+.

4.4 Gross Enrolment Ratios

Figure 5 displays GER trends for elementary (Classes I–VIII) and secondary (Classes IX–X) levels. Elementary GER approached universality (99.4% in 2025), reflecting the combined effect of government school provision, the mid-day meal scheme, the RTE Act 2009 mandate, and the availability of private alternatives. Secondary GER improved substantially from 62% in 2001 to an estimated 88% in 2025, though it remains below universal coverage. The secondary GER plateau (gains slowing after 2015) reflects structural barriers: the transition from middle to high school is a key dropout juncture, particularly for girls from rural and lower-caste households (Kingdon, 2007; Sinha, 2016).

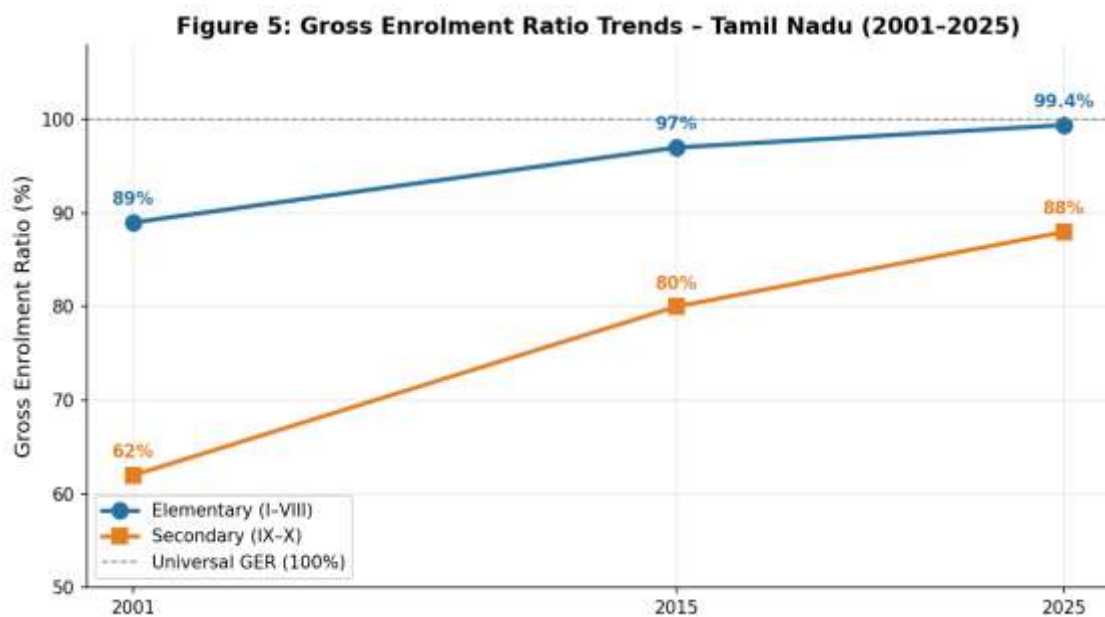


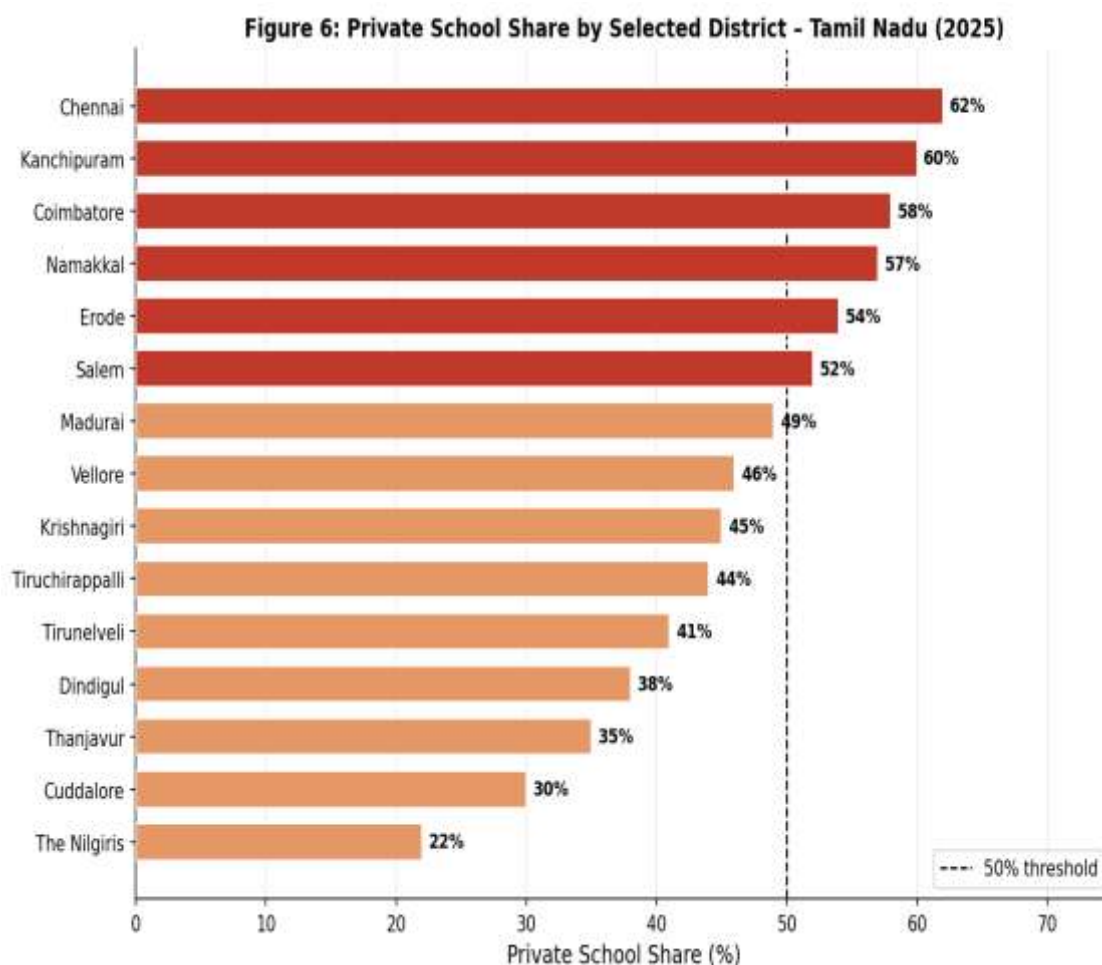
Figure 5: Gross enrolment ratios for elementary and secondary levels, Tamil Nadu (2001–2025). Source: MoE Annual Reports; UDISE+.

4.5 District-Level Spatial Analysis

4.5.1 Private School Share by District

Figure 6 presents the estimated private school share for 15 selected districts in 2025, and **Figure 7** maps these values spatially across Tamil Nadu. Chennai (62%) and Kanchipuram (60%) show the highest private school shares, reflecting the pull of metropolitan demand, land availability, and middle-class aspiration in the Greater Chennai region. Coimbatore (58%) and Salem (52%) similarly show high private shares, consistent with their status as major industrial and commercial centres. In contrast, The Nilgiris (22%), Cuddalore (30%), and Ramanathapuram (28%) retain stronger government school dominance, attributable to lower urbanisation, weaker private demand, and historically stronger government provision in plantation and coastal economies.

A clear spatial pattern emerges: private school shares are highest in the northern and western urban corridors (Chennai–Vellore–Salem–Coimbatore–Tiruppur) and lowest in southern coastal districts, delta districts of the Cauvery basin (Thanjavur, Nagapattinam), and the Nilgiris highlands. This spatial configuration aligns with urbanisation gradients and the geography of per-capita income (Census of India, 2011; Venkatasubramanian, 2012).



**Figure 6: Estimated private school share (%) by selected district, Tamil Nadu (2025).
Source: UDISE+ trend extrapolation; TNMED district handbooks.**

4.5.2 Spatial Inequality in School Access

The concentration of private schools in urban and peri-urban districts raises a concern about spatial equity. Rural and remote districts—including Dharmapuri, Cuddalore, and Ramanathapuram—remain predominantly dependent on government schools. If government school quality declines as per-pupil expenditure falls with enrolment (due to fixed overhead costs), these populations face the greatest disadvantage. The distribution of aided schools, which historically provided quality alternative provision in semi-urban areas, is also contracting, removing a middle-tier option in districts like Tirunelveli, Madurai, and Nagapattinam (TNMED, 2024).

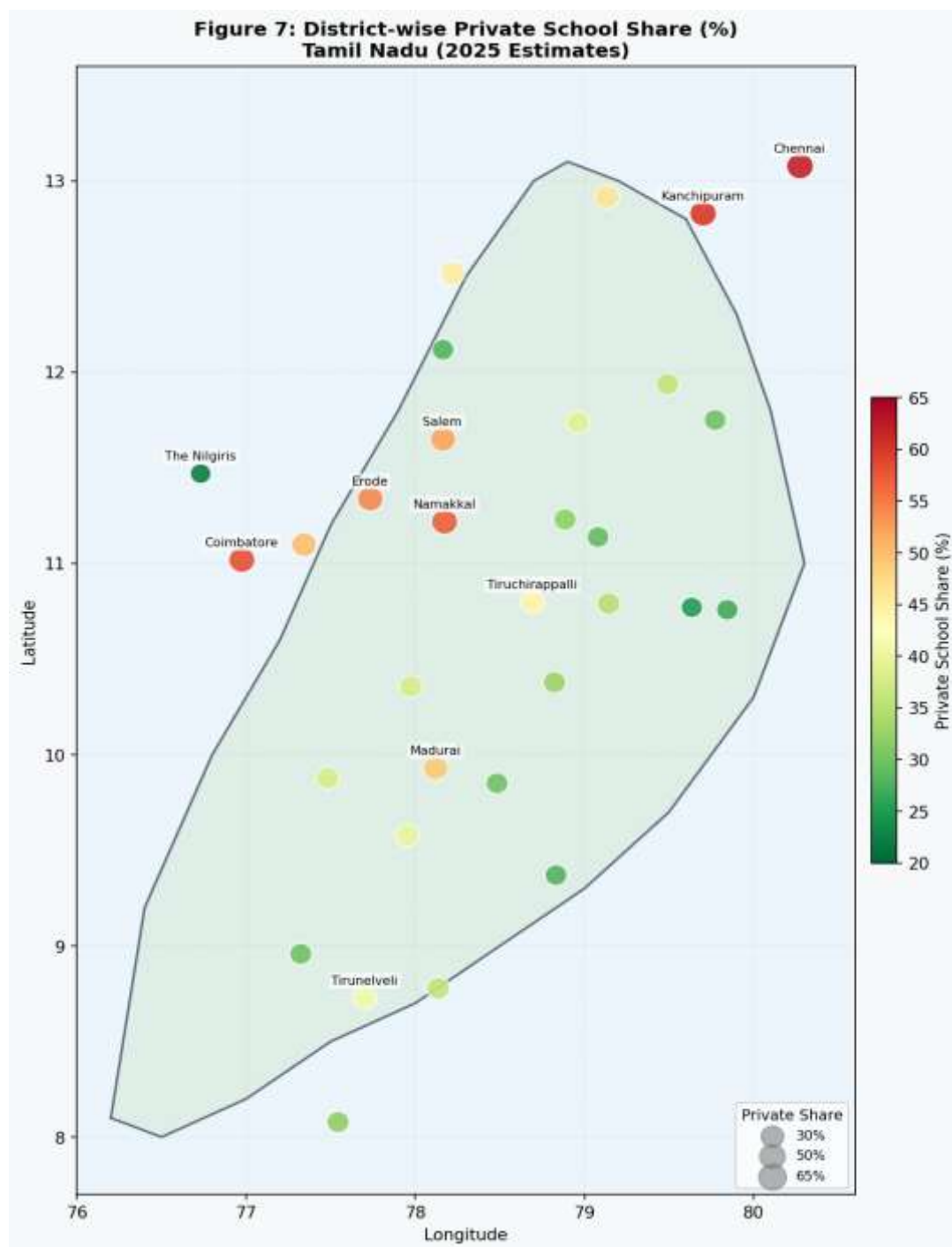


Figure 7: District-wise private school share, Tamil Nadu (2025 estimates). Bubble size and colour intensity indicate private school share (%). Source: UDISE+; TNMED; Census of India 2011 district boundaries.

5. DISCUSSION

5.1 The Privatisation Dynamic and its Spatial Logic

The results confirm a well-established narrative of rapid schooling privatisation in Tamil Nadu (Muralidharan & Kremer, 2008; Nambissan & Ball, 2010), but the spatial disaggregation adds critical nuance. Privatisation is not a spatially uniform process: it is concentrated in urban corridors where land, capital, and middle-class demand converge. This spatial logic means that the macro-level statistic of "47.7% of schools are now private" is deeply misleading as a summary of educational access; in rural Ramanathapuram, nearly 72% of schools remain government-run, while in urban Chennai, less than 38% do.

The growth of private schools has not simply supplemented government provision—it has drawn enrolment away from government schools, creating a dynamic in which per-pupil public expenditure may rise even as absolute budgets remain stable or decline relative to need. This cost-per-student dynamic, observed in the aided sector (where teacher numbers remain static but enrolment falls), is a concern for long-run fiscal sustainability of government and aided schooling in Tamil Nadu.

5.2 The Contraction of Aided Schools

The persistent decline of aided schools—from 11,200 in 2001 to an estimated 9,500 in 2025—deserves specific attention. Government-aided schools in Tamil Nadu have historically served as a "hybrid" sector: private management with public accountability and salaries. Their decline removes a sector that provided cost-free quality education in semi-urban and small-town settings. The freeze on new aided school recognition (in place nationally since the early 1990s under fiscal consolidation pressure) has prevented this sector from growing with demand, effectively channelling new demand entirely into private unaided schools (Srivastava, 2013; Härmä, 2009).

5.3 RTE Act and Its Spatial Implications

The RTE Act 2009 introduced the 25% EWS reservation in private schools, potentially mitigating spatial inequality by embedding equity obligations within the private sector. Sinha's (2016) evaluation found implementation of the EWS provision in Tamil Nadu to be partial and contested, with private schools in urban areas more likely to be notified and monitored. In rural and remote districts, the sparse presence of private schools means the EWS provision has minimal spatial reach, leaving government schools as the de facto universal provider. The neighbourhood school norm, though consistent with geospatial equity principles, has been undermined in practice by the growth of private schools outside such geographic constraints (Probe Team India, 2011).

5.4 NEP 2020 and Future Spatial Trajectories

The National Education Policy 2020 introduces significant structural changes—particularly the rationalisation of small schools through mergers and the school complex system—that have direct spatial implications. In Tamil Nadu, the policy of rationalising government schools with fewer than 20 pupils (TNMED, 2022) could reduce government school numbers in rural areas, potentially increasing distance-to-school for rural children. Ramachandran (2021) warns that NEP 2020's flexibility on private participation may further accelerate urban private school growth while hollowing out rural government provision.

The 5+3+3+4 structure, with its foundational stage emphasis, may benefit government schools if combined with infrastructure investment. However, the secondary transition challenge—the most significant spatial-equity gap identified in this study's GER analysis—will require targeted investment in remote secondary and higher secondary schools, particularly for girls and scheduled caste/tribe populations.

5.5 Equity Implications of the Spatial Pattern

The convergence of spatial and social inequalities in Tamil Nadu's school landscape is a structural concern. Districts with the lowest private school shares tend to coincide with higher proportions of rural populations, scheduled caste and scheduled tribe communities, and lower per-capita incomes. This is not coincidental: private school growth is driven by demand from households with the financial and social capital to exercise school choice, which are precisely the households least likely to be found in remote rural districts (Nambissan & Ball, 2010; Tooley & Dixon, 2006).

The implication is that spatial inequality in school provision reinforces—and is reinforced by—social inequality. If government schools in high-private-share urban districts lose their better-performing students and teachers to the private sector (a "cream-skimming" dynamic documented by Härmä, 2009), the remaining government school population may be disproportionately comprised of disadvantaged children, creating a residual public sector serving the most marginalised. Addressing this requires both geospatial equity planning—using GIS tools to identify provision deserts and underserved catchments—and redistributive finance policies that increase per-pupil government spending in high-need districts.

6. POLICY RECOMMENDATIONS

Based on the findings of this geospatial analysis, the following policy recommendations are offered for consideration by Tamil Nadu School Education Department and national educational planning bodies:

6.1 Strengthen Government Schools in High-Privatisation Districts

In districts with private school shares above 50% (Chennai, Kanchipuram, Coimbatore, Namakkal, and Erode), government schools serve increasingly residualised populations. Per-pupil expenditure in government schools in these districts should be enhanced, with investments in digital infrastructure, extracurricular facilities, and teacher professional development. Revitalising the government sector as a quality choice—not merely a last resort—is essential to arrest the enrolment decline.

6.2 Protect Government School Access in Rural Districts

In low-urbanisation districts (Ramanathapuram, Nagapattinam, Cuddalore, The Nilgiris, Dharmapuri), government schools are the de facto universal provider. School rationalisation and merger policies under NEP 2020 must be implemented with caution, with distance-to-school and transport provision carefully assessed before closures. The target of a school within 1 km for primary and 3 km for upper primary (RTE Act norm) should guide rationalisation decisions.

6.3 Revive and Regulate Aided Schools

The contraction of the aided sector is removing cost-free quality provision from semi-urban areas. The state government should review the freeze on new aided school recognition

and consider granting aided status to existing unaided schools with strong performance records in low-income peri-urban areas, with conditionalities around fee levels and EWS admission compliance.

6.4 Geospatial Educational Planning Infrastructure

TNMED should invest in a publicly accessible GIS platform integrating school location data, enrolment, infrastructure, and demographic indicators at the habitation level (as recommended by the PROBE Report, 2011 and Rustagi, 2009). This would enable evidence-based planning for new school establishment, infrastructure investment, and teacher deployment, with equity considerations built into spatial decision-making.

6.5 Targeted Secondary Enrolment Programmes

The GER gap at the secondary level (88% vs. near-universal elementary GER) reveals a structural challenge in the school-to-secondary transition. Geospatially targeted conditional transfer programmes, girls' hostel expansion, and secondary school establishment in transition-deficient catchment areas are recommended, drawing on district-level GER mapping to prioritise resource allocation.

7. CONCLUSION

This geospatial analysis of Tamil Nadu's school landscape across 2001, 2015, and 2025 reveals a state in profound educational transition: one in which the expansion of private schooling has fundamentally reshaped the spatial distribution of educational provision, the composition of enrolment, and the organisational ecology of schooling. Private schools, barely present in many districts in 2001, now constitute the plurality of institutions and nearly half of all enrolment, concentrated in urban corridors. Government schools persist as universal providers in rural and remote districts but face fiscal stress as enrolment declines. Aided schools are in secular decline. Gross enrolment ratios have improved dramatically at the elementary level, but secondary transition and quality gaps remain spatially concentrated.

These dynamics carry significant implications for equity and justice in Tamil Nadu's educational system. Spatial inequality in school provision maps closely onto social inequality; the districts most dependent on government schools are precisely those with the most vulnerable populations. Policy responses must be geospatially informed, using the rich longitudinal data available through UDISE+ to track not just aggregate enrolment but the geography of provision and deprivation.

As Tamil Nadu implements the National Education Policy 2020 and pursues school rationalisation and quality improvement, the spatial lens offered by this analysis serves as a critical input. The expansion of educational access—one of Tamil Nadu's genuine achievements over the past two decades—must now be matched by a commitment to spatial equity in educational quality. Future research should extend this analysis to school-level georeferenced data, learning outcome mapping (ASER, NAS), and socioeconomic household integration to provide a fuller picture of educational justice in the state.

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APPENDIX A: COMPREHENSIVE DATA TABLES

A.1 District-wise Private School Share Estimates, Tamil Nadu (2025)

District	Approx. Private Share 2025 (%)	Classification
Chennai	62	Very High (>55%)
Kanchipuram	60	Very High (>55%)
Coimbatore	58	Very High (>55%)
Namakkal	57	Very High (>55%)
Erode	54	High (45–55%)
Tiruppur	50	High (45–55%)
Madurai	49	High (45–55%)
Salem	52	High (45–55%)
Vellore	46	High (45–55%)
Krishnagiri	45	High (45–55%)
Tiruchirappalli	44	Moderate (35–44%)
Tirunelveli	41	Moderate (35–44%)
Virudhunagar	40	Moderate (35–44%)
Theni	38	Moderate (35–44%)
Dindigul	38	Moderate (35–44%)
Villupuram	36	Moderate (35–44%)
Thoothukudi	36	Moderate (35–44%)
Sivaganga	30	Low (20–34%)
Cuddalore	30	Low (20–34%)
Ramanathapuram	28	Low (20–34%)
Ariyalur	29	Low (20–34%)
Kanniyakumari	32	Low (20–34%)
Thanjavur	35	Moderate (35–44%)
The Nilgiris	22	Low (20–34%)
Dharmapuri	28	Low (20–34%)

Table A.1: District-wise estimated private school share, Tamil Nadu 2025. Source: UDISE+ 2024-25 trend extrapolation; TNMED district handbooks.

A.2 Methodological Notes on Data Compilation

DISE 2001-02 data were obtained from NUEPA published district report cards and state summaries. Management type classification follows the standard DISE/UDISE+ schema throughout. For 2015, UDISE 2014-15 flash statistics and state-level reports were used. For 2025, UDISE+ 2024-25 state-level data were available; district-level breakdowns were derived from the ratio of district totals in UDISE+ 2022-23 (the most recently fully disaggregated public dataset at time of writing) extrapolated using 2018-2022 district-level growth rates from TNMED statistical handbooks. Teacher counts follow UDISE+ definitions (regular teachers only). Enrolment figures are as of the reference date for each UDISE cycle (30 September).