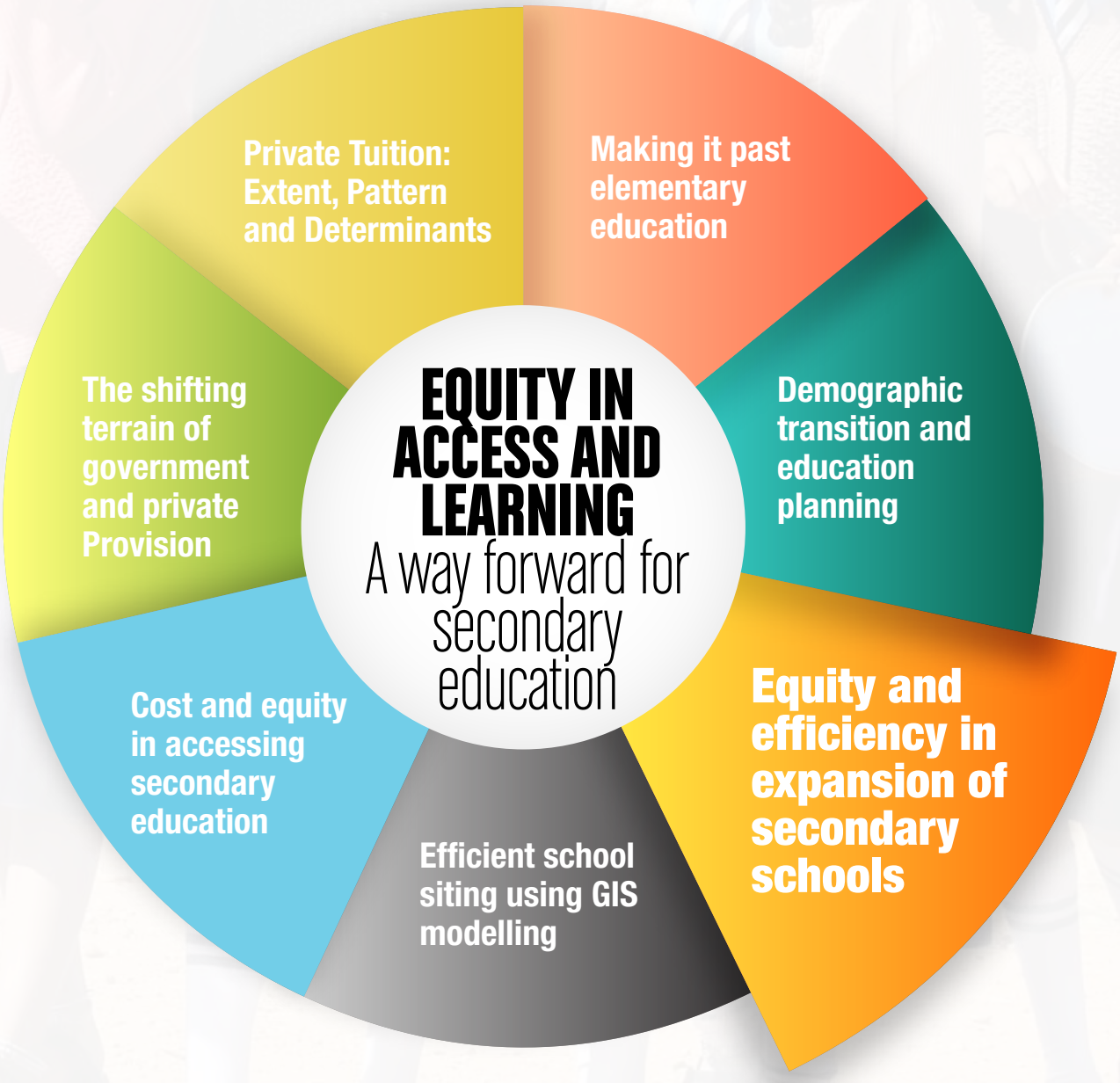
MHRD | Government of India
Ministry of Human Resource Development

RESEARCH REPORT

Equity and Efficiency in Expansion of Secondary Schools



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RMSA-TCA
Rashtriya Madhyamik Shiksha Abhiyan
Technical Cooperation Agency

Preface

This document is one of a series of seven research reports which has been prepared to accompany the single consolidated recommendation report *Equity in Access and Learning: A Way Forward for Secondary Education in India*. The research reports are intended to be of interest to planners, managers and policy makers, as well as to academics involved in development of policies and plans for secondary education. In addition to these reports, a research priority framework and research quality assessment framework has also been developed to take this research agenda forward.

The research programme was developed by the Rashtriya Madhyamik Shiksha Abhiyan-Technical Cooperation Agency (RMSA-TCA) in discussion with National University of Educational Planning and Administration and the Ministry of Human Resource Development (MHRD). The research was developed to respond to concerns expressed in the Joint Review Missions (JRM) to strengthen the evidence base for diagnosis of issues arising during the implementation of RMSA, and to inform policy dialogues on options that could increase access, efficiency, effectiveness, and equity.

The research focuses on the issue of growth of small secondary schools, with enrolments below 150 pupils, and its impact on equity, effectiveness and efficiency. The evidence suggests that new capacity has been concentrated in small schools many of which do not have a full complement of qualified teachers; where costs per student are unsustainably high; and academic performance is problematic.

The eight research reports in this series are as follow:

Research Report 0: ***(Consolidation)***	**Equity in Access and Learning: A Way Forward for Secondary Education**
Research Report 1:	**Making it Past Elementary Education**
Research Report 2:	**Demographic Transition and Education Planning**
Research Report 3:	**Equity and Efficiency in Expansion of Secondary Schools**
Research Report 4:	**Efficient School Siting using GIS Modelling**
Research Report 5:	**Cost and Equity in Accessing Secondary Education**
Research Report 6 :	**The Shifting Terrain of Government and Private Provision**
Research Report 7:	**Private Tuition: Extent, Pattern and Determinants**

RMSA TECHNICAL COOPERATION AGENCY

EQUITY AND EFFICIENCY IN EXPANSION OF SECONDARY SCHOOLS

OCTOBER, 2015

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Note on Documentary Series

A series of documents has been produced by RMSA Technical Cooperation Agency for the Government of India's programme to make good quality secondary education available, accessible and affordable to all young persons in the age group of 14-18 years.

The documentary series is arranged as follows:

RMSATCA 0	Programme Management Reports and Documents
RMSATCA 1	National Achievement Survey (Reports and Documents for Thematic Area 1)
RMSATCA 2	Teacher Management and Development (Reports and Documents for Thematic Area)
RMSATCA 3	School Standards, Evaluation and Development (Reports and Documents for Thematic Area 3)
RMSATCA 4	Data Management and Use (Reports and Documents for Thematic Area 4)
RMSATCA 5	Results Focused Planning (Reports and Documents for Thematic Area 5)
RMSATCA 6	Research (Reports and Documents for Thematic Area 6)
RMSATCA 7	Communication and Knowledge Management (Reports and Documents for Thematic Area 7)

Disclaimer

List of Acronyms

Acronym	Details
AISES	All India School Education Survey
BRIC	Brazil, Russia, India, China
CABE	Central Advisory Board of Education
GDP	Gross Domestic Product
GER	Gross Enrolment Rate
KV	Kendriya Vidyalaya
MHRD	Ministry of Human Resource Development
NER	Net Enrolment Rate
NSS	National Sample Survey
NV	Navodaya Vidyalaya
OBC	Other Backward Caste
PTR	Pupil Teacher Ratio
RMSA	Rashtriya Madhyamik Shiksha Abhiyan
SC	Scheduled Caste
SCR	Student Classroom Ratio
SGDP	State Gross Domestic Product
ST	Scheduled Tribe
TCA	Technical Cooperation Agency
UDISE	Unified District Information System for Education

Table of Contents

List of Tables and Figures

Executive Summary

Rashtriya Madhyamik Shiksha Abhiyan (RMSA) is the Government of India's Centrally Sponsored Scheme (CSS) to achieve universal secondary education. The aim is to make good quality education available, accessible and affordable to all young people in the age group 14-16 years (grades 9 and 10). This research report explores how equity, efficiency and effectiveness have been changing as new investment flows into expanding access and improving completion rates through to grade 10. It has a special focus on school size. This has emerged as a critical issue for planning in the reports of the Joint Review Missions (JRM) of RMSA and in the 12th Five Year Plan.

This paper utilises Unified District Information System for Education (U-DISE) for the year 2012-13 and 2013-14 with the sample is restricted to Secondary schools, which spans grades 9-10. For the purpose of analysis small schools are defined as those having secondary enrolment less than 150. All schools have been divided in seventeen categories determined by grade 9 and grade 10 enrolment with smallest category having total secondary enrolment up to 25 and the largest enrolments of 400+. The aim is to understand patterns of expansion of secondary education with the focus on growth of small schools and its implications for equity, efficiency and effectiveness.

The analysis suggest that much has been achieved but there is still a long way to go to ensure that all children have access to schools of appropriate quality. Patterns of growth have resulted in large numbers of small secondary schools (those with enrolment below 150 in grade 9 and grade 10) and a high proportion of small standalone schools. Schools with less than 150 students in grades 9 and 10 make up more than 70% of all schools in more than 20 out of 35 States. Only seven States have less than 50% small schools. Schools with enrolments below 100 have on average pupil teacher ratios of only 8:1. Small schools can cost more than three times as much to operate in terms of costs per child than schools with more than 300 students. Only 35% of small schools have a full complement of trained teachers in the four core subjects, and the smaller the school the greater the number of general teachers without a qualification in a specialism.

There is some evidence that larger schools achieve better results on Board examinations though this is not always the case. Small schools may be justified for reasons of geography, social group, and population density and may enhance equity if they provide access to excluded groups. However, because of their high costs and the difficulties of ensuring quality and performance they may not be the most efficient and effective solution to expanded access.

This research study arrives at several key findings, all with implications for policy and planning. From the analysis we note that:

- Participation rates in secondary school have increased over the RMSA period from around a GER of 60% to GER of 72%. Drop out in grade 8 and below remains substantial and results in about 40% of children failing to reach grade 9. The averages conceal wide variations between and within states.
- The participation rates of boys and girls in secondary school are approaching parity. This does not mean that there are similar numbers enrolled since there are up to 15% more boys in the school age population in some states. Scheduled Tribes are likely to be in smaller schools than other groups.

- The proportion of private schools at secondary level has grown from 28% to 40% and the proportion of government schools has fallen from 52% to 43%. There is a limit of household affordability that means that most future growth in provision is likely to be in fee free government schools. Private schools may also attract students from public schools and create imbalances in supply.
- The size of secondary schools has been falling in some states and continuing to increase in others with falls most common in the higher enrolment states. Some states have oversized schools with over 1000 students.
- The numbers of small secondary schools (defined as those serving fewer than 150 pupils) has remained at high levels, accounting for more than 60% of all schools, and much more in some states. Many of the schools opened recently are small with 35% of schools opened since 2011 having under 25 pupils. Many new schools are stand-alone, serving only grades 9 and 10, and thus will have difficulties in becoming efficient.
- Small schools are concentrated in some states more than others and in parts of some states. About 20% of the districts nationally have just about 4% of small schools whereas around 63% of the small schools were found to be concentrated in 40% of the districts
- In one typical area in Assam where GIS mapping exists there are a very large numbers of schools (e.g. 12 schools in one 5 kilometre-radius area) close together, and this is not justified by the density of the school-aged population in this area thus resulting in only 50% utilisation of classroom capacity.
- Pupil teacher ratios increase with school size over a wide range and are less than 8 for the smallest schools with enrolments below 100 and over 45:1 in schools with enrolments over 400. Private schools tend to have higher PTRs. Class sizes vary from under 20 to over 70 and are largest in government schools and are closely related to school size and largest in the largest schools.
- Many schools do not have a full complement of trained teachers in the four core subjects. Over 30% of the smallest government schools are found to have all of the required core subject teachers1 as compared to 45% of schools with 400 or more pupils. Only 30% of private schools have all core teachers independent of their size.
- Only 2% of the smallest government schools had a science laboratory, computer laboratory, library and functional computer. The proportion increased to over 10% in the case of the largest schools. Stand-alone schools had fewer facilities than composite schools.
- Small school cannot provide enough teaching to employ specialist teachers fully. If staffed according to the norms teachers will only have 25% of a full workload.
- Recurrent costs per child applying the norms for RMSA vary from approximately INR 14,000 in schools with enrolments of 300 or more, to INR 16,000 for enrolments of around 200, and over INR 20,000 for enrolments of 100. In the smallest schools, with enrolments of 25 or less in grades 9 and 10, costs per child would exceed INR 100,000. Actual costs from school census data mirror these costs with a slightly flatter profile.
- Larger schools with over 300 enrolled are more than five times as efficient in translating inputs (as indicated by number of teachers per student, the number of classroom per student, toilets per student

[1] Core subject teachers are: Mathematics, English, Regional Language and Social Science

and core facilities per student) into outputs (the pass percentage on the grade 10 examination) than are small schools with below 50 enrolled.

- Larger composite schools achieve better examination results than small ones but there is little effect of size on the results of stand-alone schools. STs perform better in smaller schools whereas SCs perform better in larger schools.
- The number of 6 year olds in India is expected to decline from almost 25 million in 2011 to almost 17 million in 2025, or by more than 30%. This declining trend is consistent across all case study states which will witness a sharp drop in the age 6 population until 2017 after which the decline slows. The population of children aged 14 and 15 (secondary school age) is likely to increase from almost 51 million to 55 million between 2012 and 2015 before declining to under 39 million by 2025.
- Expanded capacity needs to be profiled against demand otherwise there is a risk of overshoot as more places are created and the school age population starts to fall. This will happen at different rates in different locations.

The evidence suggests that growth of small schools and the resourcing needs of schools have not been managed in an efficient manner. Student capacity has been largely concentrated in small schools many of which do not have a full complement of qualified teachers or the ability to teach the full curriculum; costs per student in such schools are unsustainably high; and academic performance in the smallest schools is problematic. Under the norms for resourcing schools there is no carefully calibrated differentiation on how to address the small school issue. These schools may call for modified curricula and pedagogies to deal with real-world situations where it is impracticable to equip and staff a very small school in the same way as a large school with all of the required facilities and infrastructure.

If India is to catch up with China and the other BRIC countries which already enrol most children up to grade 10 it will need to revisit how best to locate new capacity and allocate resources efficiently and effectively. There is an opportunity to take advantage of the demographic dividend created by a falling population of school aged children. It will become easier to reach enrolment targets as the population of secondary age children will begin to fall. However, there are risks that without a new strategy the number of small schools will continue to proliferate. The problem is further compounded by the fact that the numbers of private schools and their share of all enrolments have been growing. Adherence to siting norms may be inefficient if these do not take into account patterns of effective demand for different types of school, and recognise that affordability will exclude the poorest children from attending private secondary schools. If small schools are established in poor communities with small enrolments and are poorly resourced, then the result may be that these already marginalised communities are receiving a sub-standard education, thus furthering inequity.

1. Introduction

Rashtriya Madhyamik Shiksha Abhiyan (RMSA) is the Government of India's Centrally Sponsored Scheme (CSS) to achieve universal secondary education. The aim is to make good quality education available, accessible and affordable to all young people in the age group 14-16 years (grades 9 and 10). This research report explores how equity, efficiency and effectiveness have been changing as new investment flows into expanding access and improving completion rates through to grade 10. It has a special focus on school size. This has emerged as a critical issue for planning in the first report of the Joint Review Mission (JRM) of RMSA which noted that:

> "Across all states the 5 km school upgrading rule was identified to be insufficiently sensitive to respond to local need. In many instances it was leading to the creation of small schools which did not achieve economies of scale and had little hope of delivering effective utilization of neither teacher nor instructional resources – e.g. the value of providing a fully functioning lab in a small school which will be unable to attract and retain a qualified science teacher is questionable."[2]

The concern for the impact of small schools is noted in the 12th National Plan:

> "About one-half of rural schools are government funded. Secondary and higher secondary schools must be viable and large enough to benefit from investments on quality. The fact is that it is much harder to have good quality education in very small schools with few teachers" (21:104)[3].

The fifth Joint Review Mission of RMSA reiterated the concerns about small schools in 2015.

> "However, the new schools that have been established have tended to be small in terms of the number of pupils. Small schools find harder to offer a full range of curriculum options – both general and vocational – to students. In the siting of secondary schools, therefore, consideration should be given to increasing the average size of schools".

This research study seeks to throw light on existing patterns of access and participation in secondary schools nationally and, highlights key issues and offers analytic insight highly relevant for sector planning. The research explores patterns of growth in access to secondary schools and identifies a range of key issues that require consideration in managing the transition towards universal participation up to grade 10. These issues are concerned with the implications for sustainable growth of small secondary schools with enrolments below 150 pupils, and the impact on equity, effectiveness and efficiency of policy and practice on resource allocation.

This research report has ten parts. First it discusses the historical development of policies that shaped growth and influence school size. Second, it provides patterns of expansion of secondary education and a rationale for why the issues that surround small secondary schools are important. The third section identifies the research questions that organise the presentation of research insights, and research methods and the characteristics of the data. Sections four to nine provide detail insights from the data in terms of access, effectiveness, efficiency and equity including evidence on demographic changes and disposition of population and schools in the study district. The final section collates issues for policy dialogue that point to ways forward.

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[2] 3rd JRM Aide Memoire (January 2014) p16

[3] Quoted in 1st JRM Aide Memoire (Jan 2013) p18

2. Background to Secondary Education Expansion

States have responsibility for most of the secondary schools operating in India with only a small percentage (approximately 5000 KVs and 1200 NVs) falling directly under the central government. Provision is shaped by norms and standards periodically promulgated at different administrative levels. The first Secondary Education Commission (1952-53) recommended using the optimum size of school and class as a criteria to establish new secondary schools. It concluded that in any class a minimum of 30 and a maximum of 40 students should be enrolled and that total enrolments in a secondary school should average 500 with a maximum of 750. However in subsequent policy documents this was replaced by distance-based norms to shape expanded access to secondary schooling. The concept of distance is not straight forward however, with various conceptualisations used, including the time travelled (First AISES[4] 1957, CABE[5] 2005), social distance taking into account community affinities (RMSA 2009; MHRD[6] 2009), and the distance measured in kilometres.

In the post-independence period the first distance related guideline for planning secondary school location was determined under the first All India School Education Survey (First AISES; 1957, II: 09), with this norm fluctuating in the following decades in various documents between five and eight kilometres. The First AISES highlighted the unplanned nature of secondary school expansion up to that point (First AISES; II:10). In order to better guide the expansion of secondary education in rural areas, a norm of five miles from population centres of 5,000 people or more was proposed. The norm would entail schools of a 'reasonable size' covering a maximum of 80 square miles each.

The Education Commission (1964-66) raised concerns about the uneconomic institutions at secondary level, and recommended a working rule to establish a secondary school serving a radius of 5 to 7 miles with population coverage of 10,000 to 15,000 (NCERT 1979; VII:48). While in the first and second AISES the distance norm for access to secondary schools was kept at five miles and was later changed to 5 kilometres in the third AISES (Chapter-VII:49). The Fourth AISES (1978), however, used 5 mile norm for ensuring access to secondary education (Pratichi Institute, 2013) suggesting lack of consistency in policy.

The Education Commission of 1964-66 also emphasised proper planning of secondary school location. Small and uneconomic schools were to be avoided and measures taken for consolidation. The problem of overcrowded classrooms especially in urban areas as a result of expansion of secondary education was taken into consideration. The optimal size of not more than twenty or twenty five pupils, as suggested by theorists, was not considered to be evidence based. Since larger class sizes were unavoidable, the Commission fixed an upper limit to the class size, i.e. maximum limit (45) to limit the difficulties of teaching large classes (Education Commission 1964-66: 432).

The CABE report in 2005 on Universalization of Secondary Education reiterated and emphasised the suggestion of Education Commission (1964-66), that quantitative expansion should promote social justice and equity a reduce social exclusions from secondary school. The Board argued that the norms were

[4] AISES- All India School Education Survey

[5] CABE- Central Advisory Board of Education

[6] MHRD- Ministry of Human Resource Development

formulated during the 1950s and needed revision to reflect development especially the expected quantum jump in demand consequent upon the projected progress of SSA. Partly as a result the 11th Five Year Plan (2007-12), recognised the wide inter and intra State variation in participation and committed the GoI to the universalization of secondary education. CABE cautioned that norm should not be implemented uniformly and blindly, and complex realities cannot be over simplified into a simple national distance norm of five kilometres. CABE favoured large and efficient schools which have quality and are likely to be located in urban and semi urban areas where road connectivity and transportation is developed. Distance norms need modulation in relatively remote areas, difficult and inaccessible terrain (CABE 2005:47). The new distance norm proposed was a secondary school within 5 km and a higher secondary school within 7–8 km of every habitation.

Table 1: Schools Siting Norms under Different Policies

Policy/Programme	Distance Norms	Revision Recommended
Secondary Education Commission 1952-53	Five miles	30 students per teacher and 40 students per class
First AISES 1957	Five miles	Schools for habitations of 5,000
Education Commission 1964-66	Five to seven miles	Upwards revision of distance and population limits for new schools
Third AISES(1973)	Five Km	Undertake Education Commission's recommendation of Five to seven miles
Fourth AISES	Eight Km (Five Miles)	
CABE 2005	Distance norm rationalised	Recommended revision of the distance norm and rationalising it.
11th Five Year Plan	Five Km	
RMSA 2009	Five Km	12th FYP 2012-17, Reasonable distance of five to eight Km

Source: Review of policy documents

The CABE emphasised the importance of school mapping to inform decision about "establishing new schools, upgrading elementary schools and lateral expansion of classrooms and facilities in the existing secondary schools"(Page 46). The expansion had to be accomplished through three different strategies depending upon the situation. These were:

a. Setting up new schools where no secondary school exists in the defined habitation,
b. Upgrading elementary schools into high schools by adding extra classrooms and other facilities, and
c. Providing additional classrooms and other related facilities in the existing secondary schools to accommodate more students.

The financial implications of the three strategies were significantly different. The most expensive is setting up new school and least expensive is providing marginal support to the existing secondary schools for enhancing intake capacities. A few states e.g. Karnataka, have taken a policy decision to upgrade all elementary schools to high schools in a phased manner.

The 11th FYP marked the launch of Rashtriya Madhyamik Shiksha Abhiyan (RMSA). The RMSA framework reiterated the mixed strategy of expanding existing secondary schools and building new ones where this was necessary for the viability of the schools in terms of enrolments and cost effectiveness (RMSA 2009).

The 12th FYP Plan reaffirmed these commitments and highlighted options for enhancing the use of existing facilities in the public and private sector. Options to increase utilisation rates were considered along with advocacy for of "Model schools" derived from JNVs and KVs. However, the detailed specification of these remains under development and it is not clear what Model Schools are currently functioning.

The RMSA framework provides three cases under which the national norms for school establishment and location can be relaxed:

Case 1: In the case of special situation e.g. SC, ST, Minority, LWE Affected Districts and Educational Backward Blocks to short cut economic and social barriers

- Non-availability of High school facility within the distance of 5 km.
- At least 50 children enrolled in class 8 of feeder UPSs within catchment area to warrant 2 section schools.

Case 2: In the case of special situations e.g. Hilly/ Difficult Terrain/ River (Natural/ physical Barriers)

- Non-availability of High school facility within the distance of 3 km.
- At least 50 and 25 children should be enrolled in class 8 of feeder UPSs within catchment area to warrant 2 sections and 1 section school respectively.

Case 3: In the case of special situations e.g. difficult terrain and low density of population in the State (North East Region / HP / J&K / Uttarakhand) and international border areas to address school specific/ habitation specific barriers.

- Non-availability of High school facility within the distance of 5 km or as per State specific norm
- At least 50 and 25 children should be enrolled in class 8 of feeder UPSs within catchment area to warrant 2 sections and 1 section school respectively.

In the 12th FYP the public sector is directed to open schools in un-served and hard to reach areas as a priority. In these areas procuring the land is not a constraint. Second shift schools in urban slums and thickly populated areas were identified as a possible option to increase capacity (12th FYP, chapter 21). The 12th Plan also discussed extensively the issue of insufficient enrolments in rural schools and the problem of quality education in small and barely viable schools at secondary and higher secondary levels (12th FYP;21:72). The RMSA framework has continued with the national norm of 5 KM distance for opening of new secondary schools with variations between States.

2.1 Application of Provision Norms

Despite recommendations for flexibility and tailoring of the norm to local conditions under the RMSA framework, States have been implementing the norm of five kilometres as set out under RMSA without modification to suit the local context (MHRD 2009), and yet often this is seen to miss achieving the goal of equitable access. In Jammu and Kashmir the five kilometres norm is applied uniformly across the State. However in a study by Wali (2012) on RMSA access in the district Baramulla, it was found that, despite RMSA guidelines for States which have physically difficult, hard to access geographical terrains should not apply the norm in a uniform fashion, for Baramulla district and in Kashmir in general, the norm stands

unrevised. This has had negative implications for both efficiency and equitable access to the secondary school system, resulting in poor retention and transition rates (Wali, 2012).

In West Bengal there are documented examples of secondary schools being more often provided in richer villages and communities, with severe disparity overall when considering provision across villages. The study elaborated on the discrimination in provision of secondary schools in areas with predominant Adivasi or Muslim populations which were not provided with sufficient school places. Specifically in predominantly Muslim areas of the State, while the distance norm may have been applied, the density of the population was not met with sufficient provision, resulting in overcrowding. And while only eight percent of West Bengal's population has to travel more than five kilometres to access a secondary school, those that do have to travel sometimes significantly further tend to be those that are poor and marginalised, often found to be geographically remote and rural (Pratichi Institute, 2013).

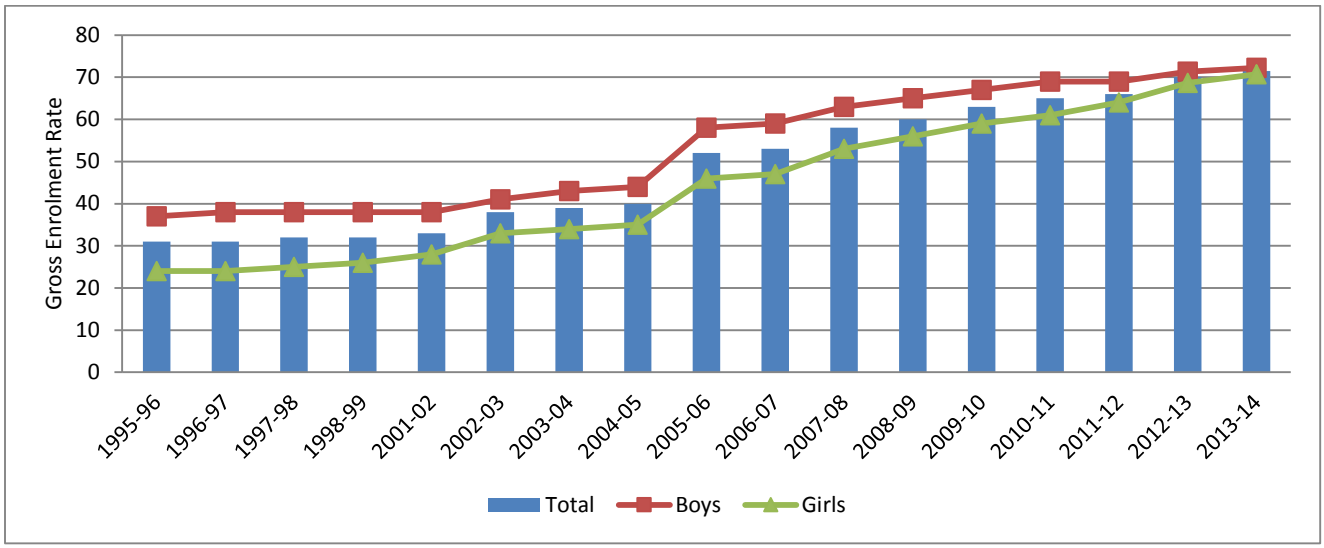
Delhi is one State which has taken note of the RMSA framework but altered it for local conditions, with the Delhi Directorate of Education creating a norm of ensuring access to a secondary school within three kilometres of every habitation. Other states with considerable issues such as challenging terrain or situations of conflict have not altered the norms; and yet despite the norm, it is the case that many underserved, disadvantaged populations may be located at greater distances from secondary school opportunities (Mukhopadhyay & Sahoo, 2014; Wali, 2012; Pratichi Institute, 2013). As noted in the examples above, it is found that areas with more traditionally advantaged populations are favoured over districts with more caste and religious plurality (Chaudhary, 2007 cited in Biswal, 2011). It was highlighted in the CABE report (2005) that expanding access to secondary school places has the potential both to promote social justice but also to damage it, if not carried out in the right way.

These developments lead to the conclusion that distance norms used to locate schools are insufficiently sensitive to issues of demography, topography and geography. These vary considerably across States within India. While the norms make it appear simple to approve or reject plans for news schools and expansion of places in existing schools, they generate risks for efficient resource allocation and for educational and financial sustainability. If the norms are applied rigidly they may reduce the scope for local decision-making and variation according to particular social, geographical, political and local community needs. There are many aspects to this. In some locations, time needed to travel to school may be more important than distance, particularly in difficult terrains (mountains, rivers, forests). In others, costs of travel will be more relevant than distance. And in more densely populated areas new schools may be needed within 5 Km of existing schools if they are not to become oversize. On the other hand without some method of guiding decisions on school location and discouraging inefficient practices patterns of provision will not maximise gains from the resources made available. The implications of norms and their modification for equity, efficiency and effectiveness need to be kept under review.

3. The Patterns of Expansion of Secondary Education in India

India's progress in expanding access to secondary education has been substantial, with the gross enrolment ratio (GER) for both boys and girls having improved considerably. However, despite increasing participation of girls in secondary education their overall participation remains lower than that of boys in most states, though the gap in GER between boys and girls has declined considerably. The GER for boys has increased from 37% in 1995-96 to 72% in 2013-14. In the same period the GER of girls increased from 24% to around 70%. The gender parity index for the GER increased from 0.65 in 1995-96 to nearly 1 in 2013-14 (figure 1). Girls' actual enrolment still lags behind boys partly because there are significantly fewer girls in the population, an issue not reflected in the GER which is calculated based on the existing number of school-aged girls in the population, rather than the number that there should be if female infanticide and sex-selective abortion were not serious continuing issues in India.

Figure 1: Growth in gross enrolment ratio by gender



Source: Selected Education Statistics various years

Patterns of enrolment across India are shown in figure 2. As many as 27 million children are enrolled in grade 1. By grade 5 the total number enrolled is similar to the number of children aged 10 years in the population indicated by the purple line with square markers. Above this grade level there are fewer children enrolled than there are in the relevant age group. By grade 8 the transition to secondary school enrolments have fallen to about 20 million. While over the period from 2000 to 2010 enrolments have grown at every grade level, the rate of dropout, which is indicated by the slope of the graph below, has remained significant. The enrolment curves do become flatter, meaning that more students are staying in the system as time has progressed, and there has been a decline in grade 1 enrolments over the years from 34 million in 2004-05 to 27 million in 2013-14.

Figure 2: Enrolment by grade 2004-05 to 2013-14-All India

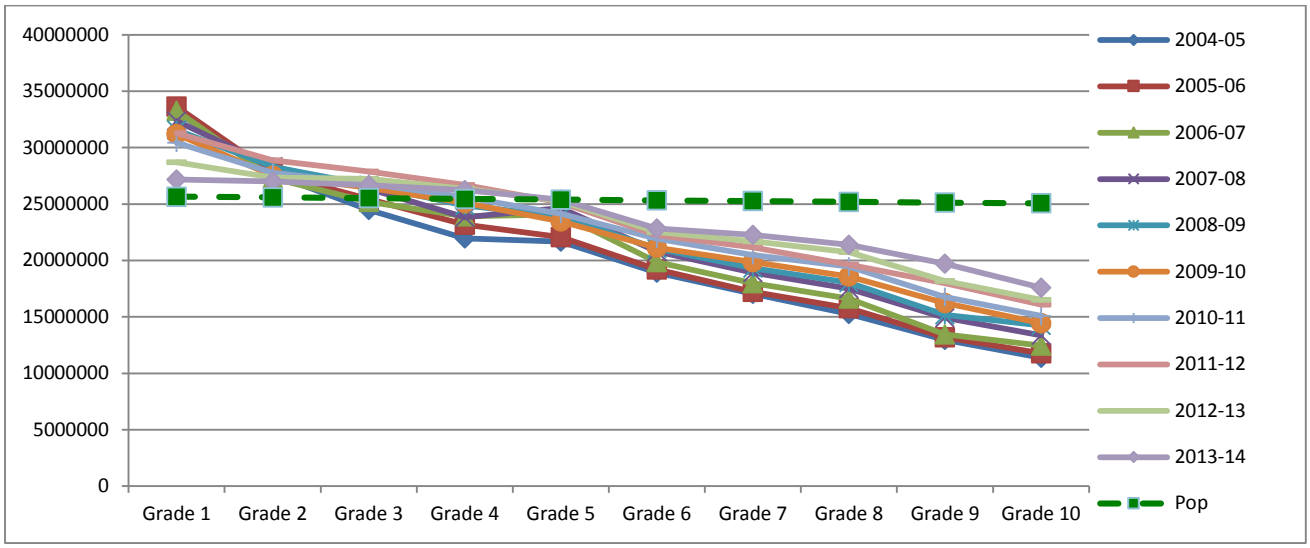
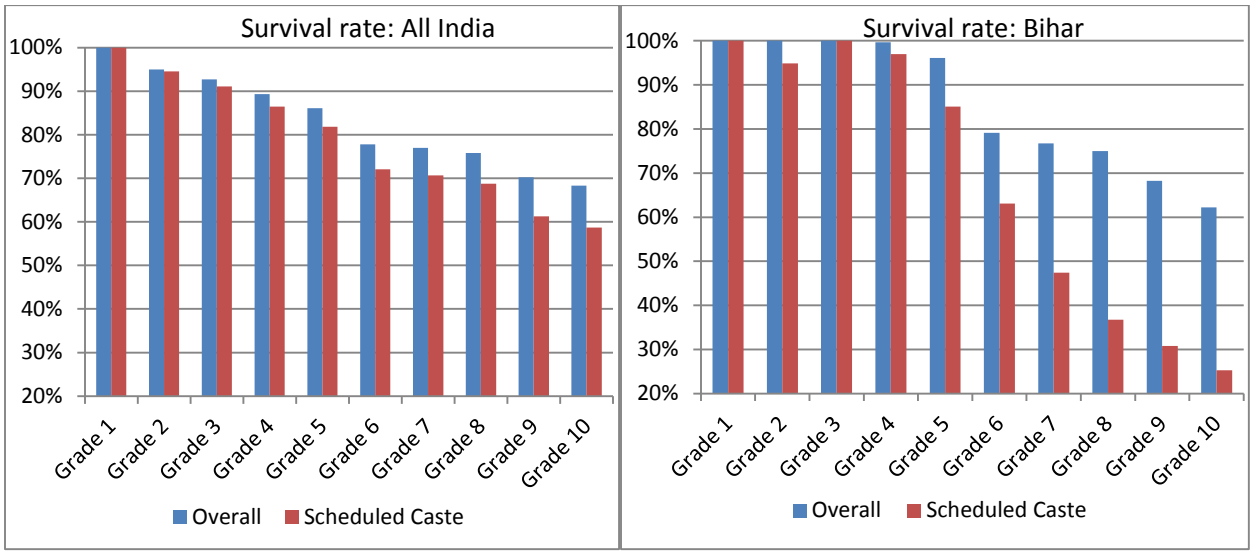


Figure 3: Survival rates- All India and Bihar

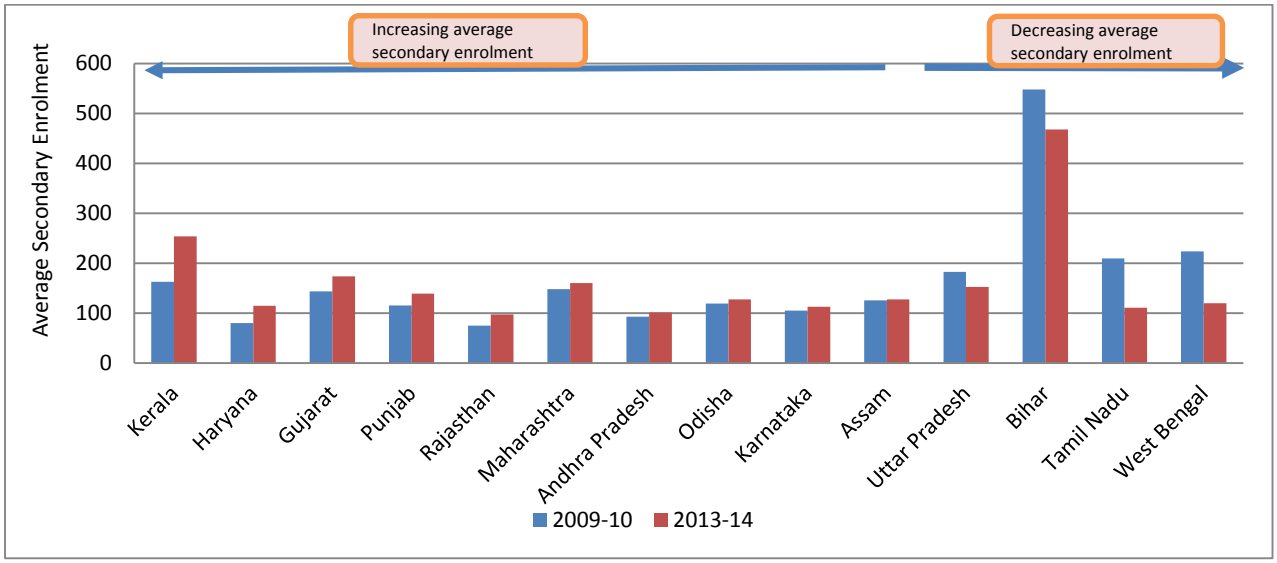


These patterns of enrolment are highly aggregated and therefore do not reflect patterns that differ greatly between states and social groups within states. They are also blind to important sources of inequality. As shown in figure 3, the survival rates to grades 9 and 10 are lower for scheduled caste children and even lower for scheduled caste girls. A clear message from the data is that most of the new demand yet to come for secondary education will come from marginalised groups previously unlikely to complete elementary education. The particular needs of these groups, who are likely to require greater support than more privileged learners, will need to be addressed if expanded enrolment is not to result in higher levels of drop out and failure to complete grades 9 and 10.

Between 2009-10 and 2013-14, average size of government secondary schools across the country increased from 140 to 165 (figure 4). However average school size declined in four major states: Bihar, Tamil Nadu, Uttar Pradesh and West Bengal. In case of Tamil Nadu and West Bengal, average secondary

enrolment in the government schools halved from 210 to 111 and 224 to 120, respectively. Nine out of fifteen major states have average secondary enrolment less than 150 (Annex 1).

Figure 4: Average secondary enrolment in government schools

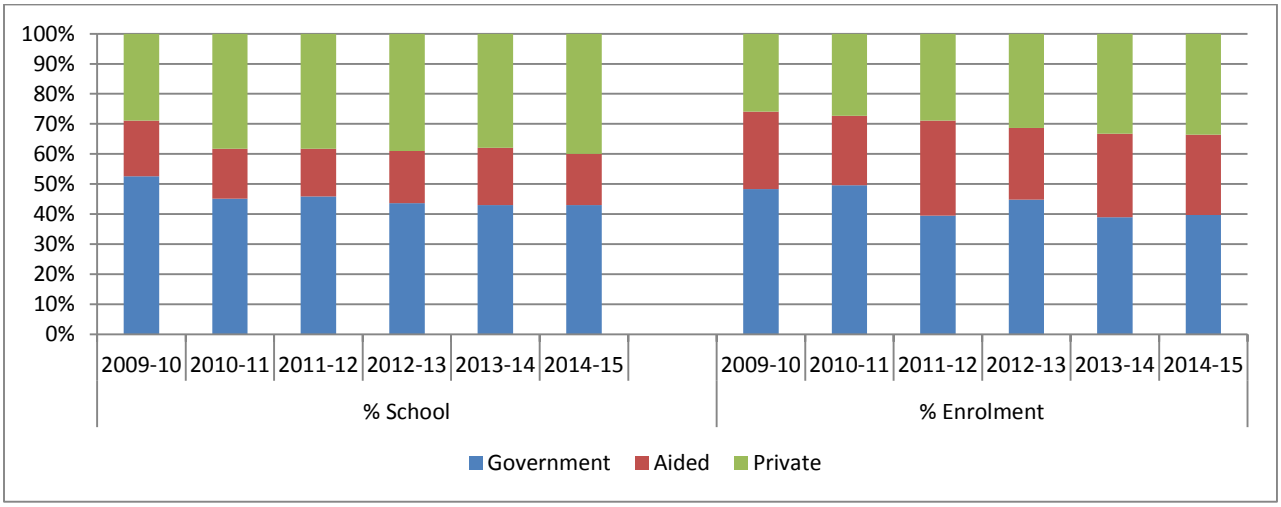


3.1 The Roles of Different School Management Types in the Expansion of Secondary Education

While overall expansion of enrolments is a significant development, it is important to understand what kind of schools are attracting new secondary school goers. Administrative data show considerable increases in children entering secondary school since the start of RMSA, however much of this increase does not appear to be due to government policies to expand provision of secondary education. While absolute numbers of government schools and pupils in government schools are expanding, the percentage shares in government schools have decreased significantly since 2009. Figure 5 shows a stagnant proportion of private aided schools. However there has been significant growth of private (unaided) schools (from 28.9% of all schools in 2009 to 40% currently) and pupils in these schools (from 25.9% to 33.5% of pupils). Government schools now account for 43% of all schools (down from 52.6% in 2009), and 39.7% of pupils (down from 48.3%). The proportions vary over a wide range between states.

The data shows clearly that the private sector share at the secondary level is increasing. This issue should be factored into government plans for continuing expansion under RMSA, but at the present time it is not taken into account. It is highly likely that new and expanding private provision takes in those better-off pupils whose families would prefer to avoid the less-advantaged young people who will not be able to afford private provision. This means a great challenge to government planning and to teachers in serving the needs of those left in government schools, who are likely to face the greatest learning challenges with little support available in the home. One possible implication of a growing private sector is proliferation of small government secondary schools serving poorer sections of society. There is a limit to private school growth the ceiling of which is determined by affordability (Lewin 2006). It is likely that participation in private schools supported by fee will plateau and it is unlikely to exceed 40% of the total secondary enrolment.

Figure 5: Percentage distribution of numbers of schools and enrolments by school management type



3.2 Emerging Issues

RMSA was developed to increase enrolment in secondary education towards universal participation and reduce disparities in access and quality between different groups. Currently no more than 60% of children complete this level of school successfully across all of India. Less than half of all 17 year olds graduate from grade 10 in most of the high population Northern States. Amongst those from scheduled tribes and castes and from other educationally marginalised groups who are especially disadvantaged the progression and completion rates can be much lower, and may fall below 25%. The RMSA strategy to improve access and achievement is to focus on infrastructure development to increase capacity and make provision for qualified teachers to be deployed to ensure that all children have local access to schools of appropriate quality. This requires school upgradation through building additional classrooms and extending elementary schools to include secondary grades. New schools may need to be built where there is currently no provision. Additional capacity needs to be supported by the recruitment and deployment of teachers in ways which are efficient, effective and equitable and which utilise scarce resources and maximise access at affordable costs. Expanded access is being achieved at the same time that the population of school age children is falling. Demographic transition to low growth has occurred in about half the States and will happen over the next decade in the remainder. Where there is full enrolment school rolls will start to fall. Less capacity will be needed in future than would have been the case with higher fertility rates. We consider each of these dimensions briefly below using findings from this research study.

High proportions of small schools have an impact on ***efficiency*** and are relatively expensive with costs per child that may be triple or more those in larger schools. Schools with less than 50 students in grades 9 and 10 make up more than 30% of all schools in more than 40% of the States. Over 85% of States have less than 50 students in grade 11 and 12 on average. Only five States have less than 50% small schools if the threshold is set at enrolments of 150 in secondary. The range is from 92% in Mizoram to 12% in Bihar. Some but not all these schools may be grades 6-10 and 6-12 schools with other grades which and share

teachers across primary and secondary grades, but not the case in many composite[7] schools. But others are small stand-alone schools attempting to teach a full range of secondary subjects with scarce resources. Schools with enrolments below 100 have on average pupil teacher ratio of only 8:1 and are therefore over staffed if they have small enrolments below 100 and 6 or more teachers.

One measure of ***effectiveness*** is achievement. Examination results in Board assessments show a wide variation in levels of achievement between schools and wide dispersion within schools. In a typical State about 11% of schools have a pass rate below 25%, and 35% below 50%, indicating large numbers are failing to reach minimum levels of competence on Board examinations. This is indicative that effectiveness is an issue that needs to be carefully monitored. Pass rates at State level vary from 45% to over 85%. There are risks with expanded access. Levels of achievement may fall more than would be expected as an unselected group of students begins to reach grade 9. If schools with small enrolments also have poor examination results they may be especially inefficient since they will also have high costs. Replicating underperforming institutions will waste resources. It is therefore important to explore school attributes associated with patterns of achievement in different types of school in order to plan efficiently.

Effective secondary schools depend on teachers qualified in core subjects who are motivated and rarely absent. Only 35% of small schools have a full complement of trained teachers in the four core subjects, and the smaller the school the greater the number of general teachers without a qualification in a specialism. Composite schools are more likely to have specialist teachers and consistently achieve higher pass rates in Board examinations.

Most enrolment at secondary level is urban but most of the population is rural and poorer than the urban population. This raises issues about how ***equity*** is addressed during the expansion of secondary schooling. RMSA must support the growth of access to secondary schools in rural areas. The majority of increased participation to meet RMSA targets will be in rural schools located further than existing secondary schools from large population centres. It is not clear what the implications of this will be. It is possible that average distance to travel to school may increase. If it does not, schools will be small. Though there is no simple association of distance and attendance in current data, and surveys do not show a strong association of drop out with distance travelled in self-reported data, this may be because most of those asked are within a 5 km distance from the secondary schools they attend. Those with further to travel may already have been excluded from participating. As children from lower population density areas are enrolled this may change.

Public schools enrol most of the children from the lowest quintile of household income, but only 23% of the richest. Private aided schools account for 11% of the poorest and 34% of the richest and private schools only 9% of the poorest and over 39% of the richest. Participation is related to the affordability of attendance which itself is related to fee levels and other cost in relation to household income. This is another dimension of *equity* linked to wealth rather than location. Expanded access will enrol children from lower quintiles of household income. The last 20% of enrolment to meet RMSA targets for enrolment ratios will be mostly from households below the poverty line. The general implication is clear. Attendance

[7] Composite schools have elementary school grades as well as secondary grades on the same school site. Teaching staff may be separate between elementary and secondary sections or may teach at both levels.

must be fee free and direct costs to households below the poverty line must be minimised. Above the poverty line participation is likely to be rationed by price. It is therefore important to consider the price of attendance at different types of secondary schools and compare this to patterns of expenditure in different quintiles of household income. Small schools have higher costs. If they are to reach the poorest these costs cannot be passed on the households.

The participation of girls in secondary education has increased since the 1990s but still varies widely from State to State. Large disparities remain in some States. Thus Bihar (58% boys), Gujarat (59% boys, MP (62% boys), Rajasthan (61% boys), and UP (58% boys) have many more boys than girls enrolled in grades 9 and 10. In contrast Tamil Nadu (51% boys), Kerala (51% boys), Karnataka (51% boys), Meghalaya (49% boys), and Mizoram (50% boys) are close to gender parity. The patterns are complex and vary with location and social group. ***Gender equity*** remains an issue in relation to enrolment, especially for the poorest. In some States it is also an issue in terms of the numbers of girls in the child population as a result of selective abortion and infanticide. Where gendered differences are greatest where enrolments are lowest and where there is likely to be a greater density of small schools. Amongst some communities where there is competition for household resources to support secondary attendance, preferences may favour supporting the costs of attendance of boys. Conversely in some local labour markets the opportunity costs for boys are greater than for girls and they may therefore drop out more frequently. Small schools in small communities may reflect locally gendered practices on exclusion.

Demographic transition to lower fertility and smaller cohorts of school age children is a reality in the South of India and in many urban areas. This can lead to the oversupply of schools in areas where the numbers of school age children are falling. A 5% a year reduction in fertility will result in about 40% fewer children in the school system over a ten year period. Migration can change demand for school places dramatically. Migrant parents may be accompanied by children, and some children migrate without their parents. Urban migration has been accelerating and may lead to falling enrolments in rural sending areas. Changing patterns of demand for schooling and improved transport infrastructure can lead to greater willingness to travel in search of higher quality schooling and this may reduce effective demand for secondary schooling in rural areas.

4. Research Questions, Definitions and Methodology

The questions that underlie this research seek to profile existing patterns of participation in secondary schools nationally and in a selection of States to highlight key issues and offer analytic insight. The main research questions can grouped into four clusters that provide the scaffolding for the subsequent sections that report the results of data analysis. These are:

Access

- What are the current patterns of enrolment and participation in different types of secondary school in different States?
- How have patterns of enrolment changed over the period 2009-2013 and how have the number of small schools changed?
- What role have non-state providers been playing in ensuring achievement of RMSA goals?
- Where are small schools located?
- How does the concentration of small schools vary within States?

Equity in Provision

- What are patterns of resource allocation in small schools and how different are patterns of resource allocation when compared to larger schools?
- Are small schools receiving similar resourcing as they larger counterparts?
- Are small school more or less equitable in terms of enrolment of SCs, STs and OBCs?

Efficiency

- What are the patterns of cost per student in relation to school size based on PTRs for different States?
- How efficiently can small schools delivery curriculum?
- How does schools efficiency in converting resources into outputs vary with school size?

Effectiveness

- How do small schools perform on Board examinations?
- How do examination results vary with school size?
- What are the main determinants of performance in Board examination, and how does it vary for children from different social groups?

School size is likely to be related to distance to school. The relationships between school size and distance will be explored in a subsequent study using data from the RMSA/TCA survey. This will also capture changing patterns of participation in relation to household income and social status and will give insight into patterns of transition.

4.1 Defining Small Schools

Secondary schools vary widely in size across India from less than 25 students to more than 3,000. Conventionally size is primarily defined by enrolments though other measures can be used[8]. Clarity and consistency are needed in discussing the analytic and policy issues that surround school size. This research report adopts the conventional indicator of school size determined by enrolments.

Primary schools with five grades each of which has 40 children will enrol 200 children. Policy at primary level has favoured schools in every village with the result that many such schools enrol less than 100 students and in nine states more than 40% of primary schools enrol fewer than 50 students. Upper primary schools have three grades and may or may not be combined with primary schools. Eight grade elementary schools with 40 students in each grade enrol 320 students. A simple classification of primary schools would label those with enrolments below 100 very small, 100- 150 small, 150- 400 within the normal range, 400 – 700 as large, and any with enrolment more than 700 as very large. Some judgement is needed in applying these categories to separate primary and upper primary schools, and to full range elementary schools, and composite schools including secondary grades.

Standalone secondary schools have only two grades. They are permitted to open with as few as 50 children in a class group suggesting a minimum school size of 100 enrolled (or as few as 50 in two classes in difficult terrain or exceptional situations). These schools will be very small and unlikely to be able to deliver a full secondary curriculum efficiently. A secondary school with 40 enrolled in each of two classes in each grade would enrol 160 and this is likely to be the smallest size of school that can deliver the curriculum effectively. This is still a small institution which would carry relatively high fixed costs and a more realistic enrolment target for free standing secondary schools is likely to be at least 240 with three classes in each grade. It is widely accepted that secondary schools need to be larger than primary schools because of the increased autonomy of learners, the need for specialist teachers and facilities, and the ability of students to travel longer distances to school. There are also thresholds of cost effectiveness that suggest costs per student fall with increased size as detailed elsewhere in this report. For these reasons we define very small secondary schools as enrolling fewer than 100 students, small schools as having fewer than 150 enrolled, schools with more than 150 but less than 450 as normal range schools, those with 450-1000 as large schools and those with more than 1000 as very large schools.

It is important to remember that learning may be determined more by the size of the teaching group rather than the size of the school. Small schools can have large or small classes. A single section school with 120 enrolled will have large classes of 60. Large schools may also have large classes, especially where the school size is the result of surplus demand. Large class groups reduce the number of teaching periods that need to be taught and classes may be combined to reduce teacher workloads. The relationship

[8] For example:

- the number of classes in the entry grade e.g. a two class entry school will have two teaching groups in grade 9
- the number of teachers rather than the number of children enrolled
- the physical space occupied by schools in terms of buildings and land

between pupil teacher ratio and class teacher ratio determines teacher workloads and the intensity of the interaction of teachers with pupils. Small schools can be organised to be more or less efficiently if staffing and curriculum are designed for this purpose. Any classification of teaching group size is arbitrary since pedagogies vary and learning tasks differ. Classrooms in India are generally constructed to accommodate 25-40 children. The teaching groups smaller than 25 can be regarded as small and above 40 as large.

4.2 Datasets, Methods of Analysis and Limitation

4.2.1 Dataset

This paper utilises Unified District Information System for Education (U-DISE) for the year 2012-13 and 2013-14. U-DISE is a school census based Education Management Information System (EMIS), deployed throughout India for all elementary and secondary schools. The U-DISE data, provides information pertaining to the several dimension of school resources; physical, human and academic resources. The sample is restricted to Secondary schools, which spans grades 9-10. For the purpose of analysis schools have been divided in seventeen categories determined by grade 9 and grade 10 enrolment with smallest category having total secondary enrolment up to 25 and the largest enrolments of 400+. First run analysis is descriptive and identifies patterns associated with schools size. Where possible further analysis seeks deeper insight into how patterns have been changing and identifies possible causes and future directions of travel. Specific analyses are described in the relevant sections. Two particular analyses are concerned with the special distribution of small schools using a Location Quotient which captures a measure of concentration relative to national averages, and a regression using OLS to explore school examination results in relation to school size.

4.2.2 Methodology

Estimation of Concentration of small schools: Location Quotient

The estimation of Location Quotient for small school is based on UDISE 2013-14 data. The concentration index is a ratio that captures the prevalence of attribute of interest in particular geographical location. The major advantage of this index is that it can indicate which geographical location needs detailed attention in terms of particular attribute. In the present context, our interest is to identify locations where small schools are concentrated. To find out the concentration of small schools we employed following formula;

$$LQ_{ns} = \left(\frac{X_{ns}}{\sum_1^S X_{ns}} \Big/ \frac{\sum_1^N X_{ns}}{\sum_1^S \sum_1^N X_{ns}} \right)$$

Where Xns is the share of region in particular type of school (S is the type of school; large and small; N is the region). This first part is the ratio of total number of school of particular type; large or small to the total number of schools in a particular district. The second part is the ratio of total number of school of particular type; large or small in India to the total number of schools in India.

- If LQ>1, this indicates a higher concentration of the small schools in district, compared to India as a whole;

- If LQ =1, the district has a share of the small schools in accordance with India; and
- If LQ<1, the district has less concentration of small schools compared to overall average.

School size and effectiveness

The determination of school size can be said to be closely tied to policies of expansion of access and quality of education. In this paper we try to capture the effect of school size on pass percentages by employing ordinary least square regression with pass percentage in Board exams as the main dependent variable. A set of control variables were introduced to isolate effects of the schools sizes. Separate analysis were performed for scheduled caste and scheduled tribe children. It is our understanding that participation in a particular school is not an exogenous variable but a decision dependent on various socio-economic factors. This selection affect needs to be adjusted however the information in the current dataset is limited to perform such analysis. Therefore, our intention is not to arrive at any causal relationship between school sizes and pass percentage but to understand the direction of relationship.

Other Limitations

The data available is from different rounds of U-DISE. It is therefore cross-sectional rather than the longitudinal and it is clear that year-on-year comparisons are affected by differences in response rates and the reliability of Data entry returns. We have no way of knowing the extent to which these results of analysis that we have used internal consistency checks and tested findings for plausibility with state level officials. U-DISE does not contain data on attendance in relation to distance and it's anticipated that some insight into this relationship will be available from analysis of survey data subsequently.

5. Growth of Small Schools

This study delineates 'small schools' as those secondary sections (grades 9 and 10) with fewer than 150 pupils. To analyse patterns of school size, 17 school size categories were constructed with the smallest being schools having enrolments of up to 25 pupils, and then in increments of 25 students. In addition, all schools were divided into four categories based on the year of establishment: established before 1951; 1951-2000; 2001-2011 and 2012 onwards (during the RMSA period).

Figure 6: Percentage of Small Schools by Management and Year

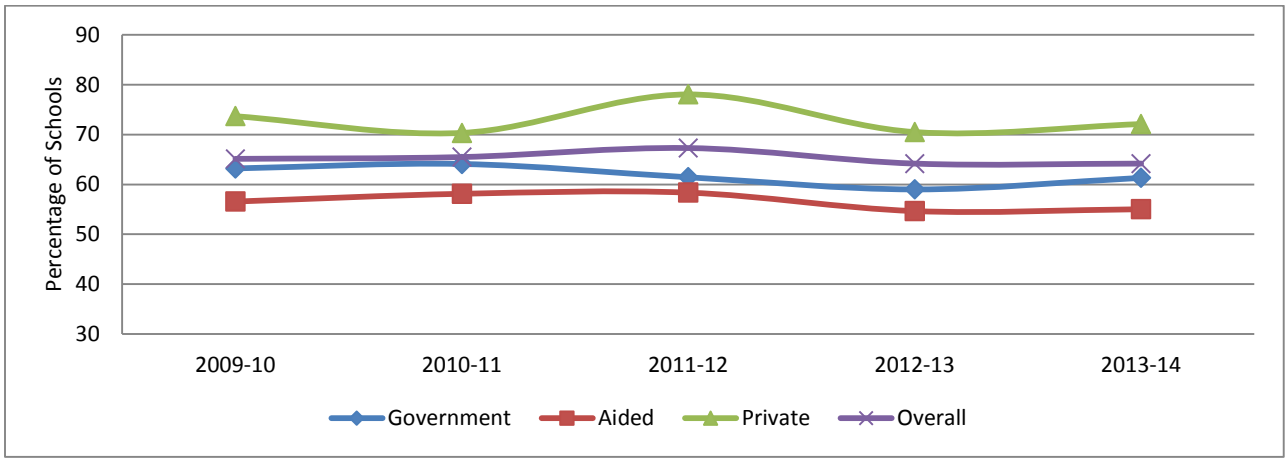
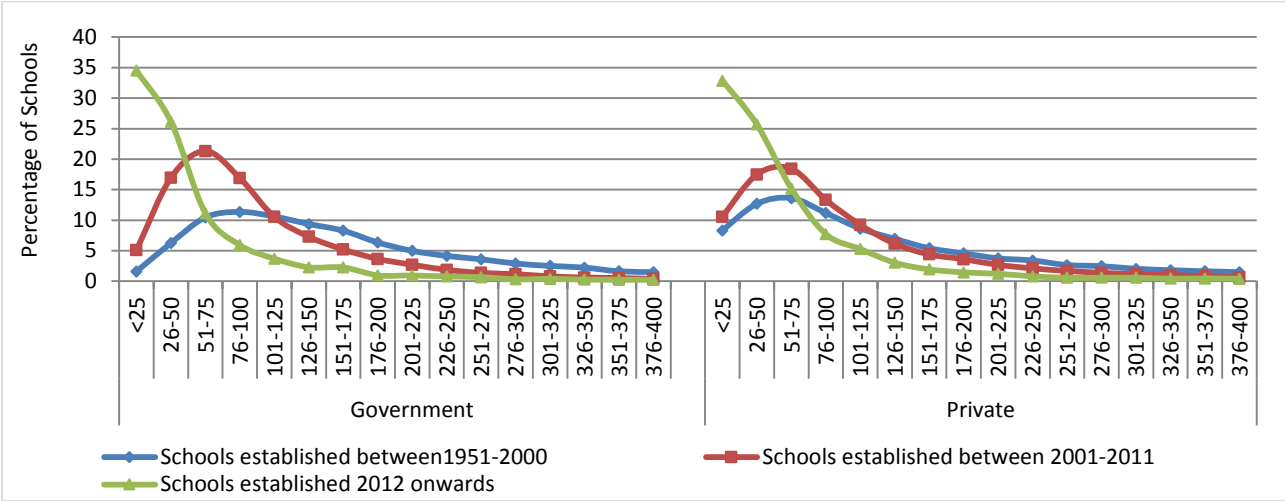


Figure 6 shows that a large number of schools are small, with private schools consistently smaller than other types of school. In the last two years the number of small schools declined marginally and the share of small government schools has declined from 64 percent in 2009-10 to 61 percent in 2013-13. Small private schools have declined from 73% to 72%. However, it is still the case that in most Indian states, excluding Bihar, Uttar Pradesh (UP), West Bengal and Jharkhand, the share of small schools in the total number is greater than 50 percent.

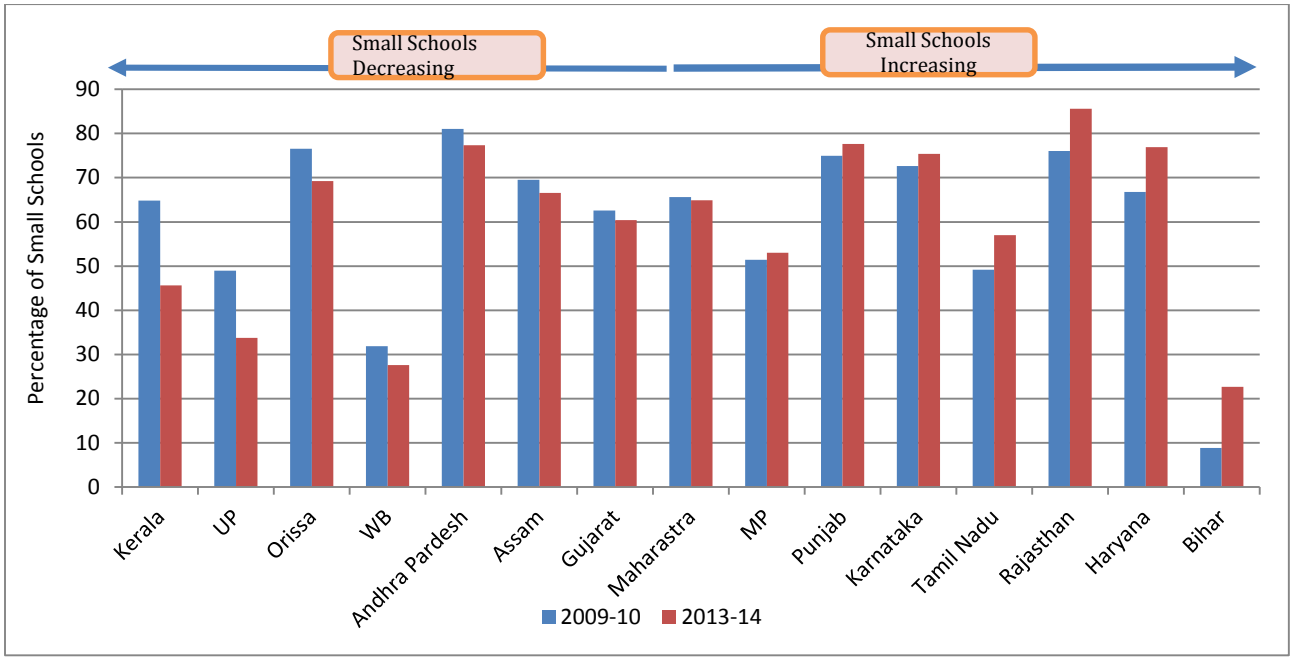
Figure 7: Distribution of schools by size and year of recognition



The distribution of schools by size and management grouped into when the schools were founded using current enrolment data is shown in figure 7. The schools founded in the earliest period tend to be larger and vice versa. Nearly 35% of all government schools established since 2011 fall into the smallest size category. This data suggests that during the period of RMSA there has been an upsurge of small schools under all management types, with the percentage of government schools in the smallest category (enrolment below 25) being 1.6% in case of schools opened between 1951 and 2000 and 35% in the most recently opened schools.

The share of small schools for fifteen major India states for 2009-10 and 2013-14 is shown in figure 8. The share of small schools increased in some of the large states such as Tamil Nadu, Karnataka, Madhya Pradesh, Bihar, Rajasthan and Punjab during the RMSA period. The percentage of small schools in Tamil Nadu increased from 49% in 2009-10 to 57% in 2013-14. Tamil Nadu is one of the biggest recipients of RMSA funding. There was a decline in the percentage of small schools in some of the large states like Uttar Pradesh (UP) and West Bengal but the changes were small and most schools remain small. The most dramatic increase was observed in the case of Bihar. This is not the direct result of RMSA since Bihar receives relatively little funding under the programme, though it is influenced by the national targets set and norms used for school location etc. The increase is from a small base and may reflect greater efforts to reach previously out of school children. It is not surprising that schools that only exist for two years are smaller than those that exist for the previous 10 years and the average enrolment in these newly established schools may go up with improvement in grade progression at the primary level. The share of total enrolment in small schools also increased in these states.

Figure 8: Percentage of schools with school size below RMSA norm by States



Despite recommendation under different policy frameworks including RMSA, an increasing proportion of schools have been established as standalone. A standalone school offers only secondary grades 9 and 10. Figure 9 shows that the proportion of government schools being established which are standalone schools

increased after 2001. While 14% of schools opened between 1951-2000 were standalone this number increase to almost 21% after 2011. The increase is likely to have been the result of State-level decisions to favour small schools.

Figure 9: Composite and Standalone schools by year of establishment

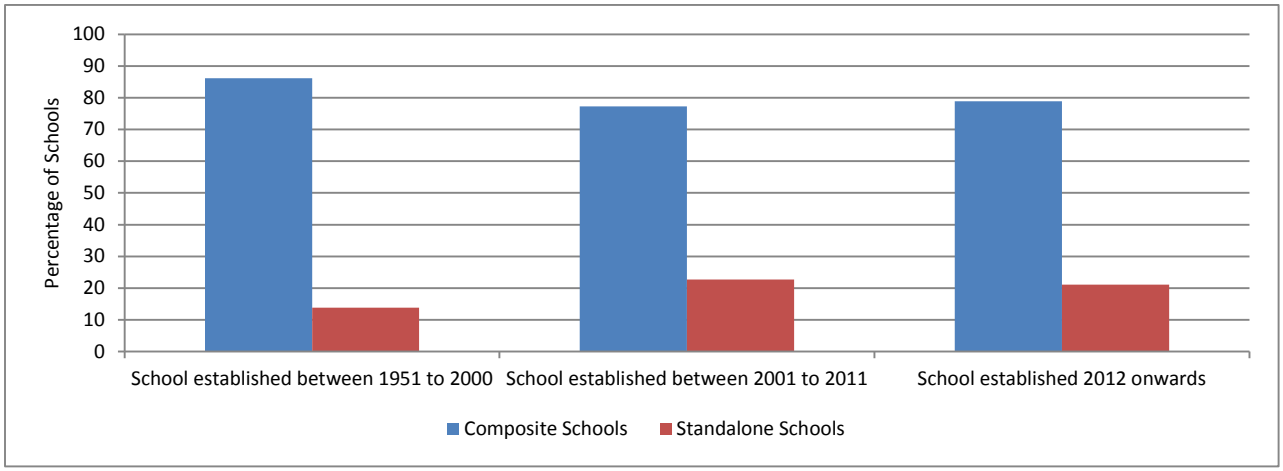
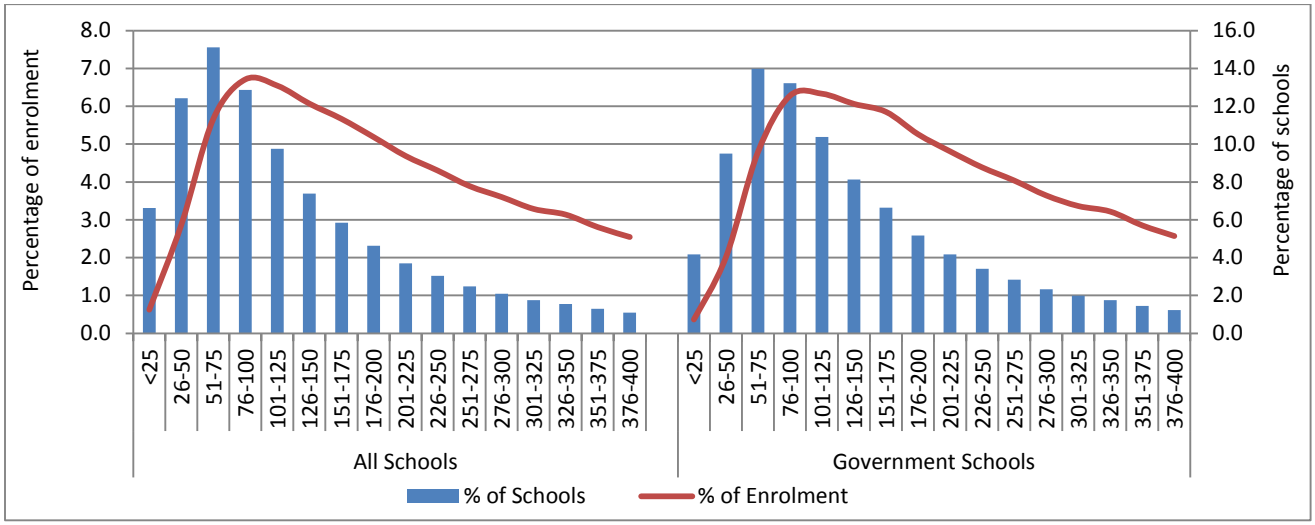


Figure 10 shows the distribution of schools by size and their corresponding share in enrolment. It is observed that there is high percentage of small schools with fewer shares in total enrolment. The cumulative total of the schools with enrolment size below 150 is about 63% in case of all schools and 59% for government schools. On the other hand the enrolment shares in these schools are 30% and 26% for all schools and government schools respectively. There are around 6.6% government schools that are in the smallest school category (those smaller than 25) however their enrolment share in the total is less than 1% where as 8.3% largest schools have enrolment share greater that 32%.

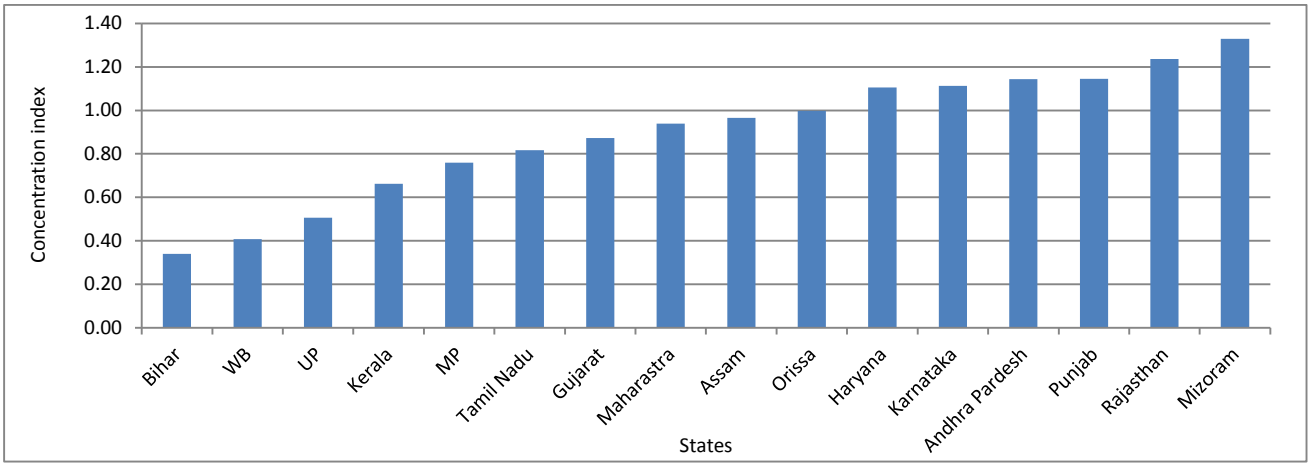
Figure 10: Distribution of school and enrolment by school size



5.1 Concentration of Small Schools

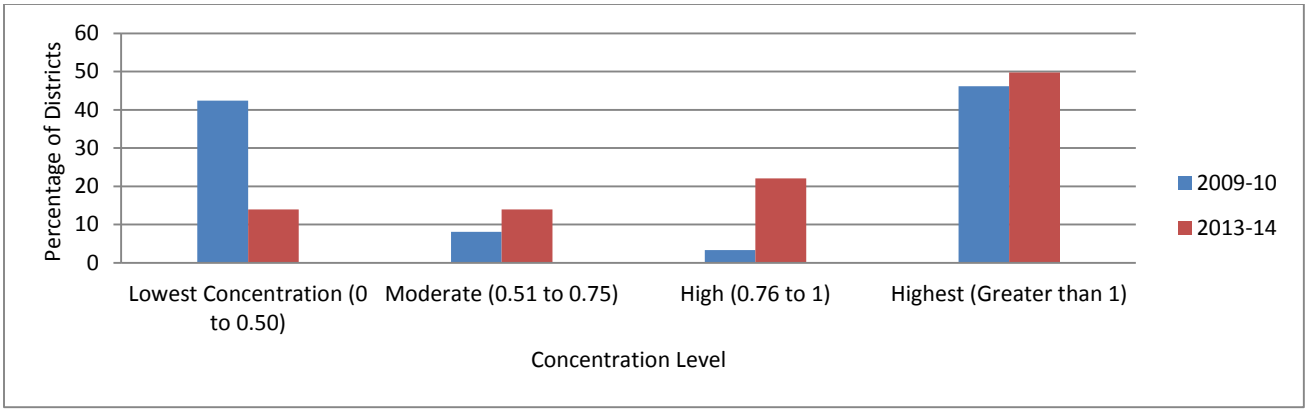
The availability and distribution of schools is crucial for the successful implementation of programme for universalisation of secondary education in India. Enhanced access to secondary education is in part is dependent upon how effectively the educational resources are utilised. The distribution of resources to schools of different size can have implications for equity, efficiency and effectiveness and sustainable access to secondary education. Small schools have higher fixed costs and may also have higher costs per student and thus can result in unbalanced patterns of investment whereby spending is skewed towards small schools. The spatial distribution of schools with different sizes varies between states.

Figure 11: Concentration of small schools by State



The pattern of spatial concentration of small schools in figure 11 shows that on an average States with a higher density of population have a lower concentration of small schools when compared to States with a relatively low density of population. For example, Bihar and UP are the Sates with lowest concentration of small schools. Most of the higher concentration areas for small schools are in case the north eastern States. Concentration of small schools can result as an outcome of several factors but can largely be attributed to decisions made by respective State governments regarding the expansion of access to secondary education. These will respond to demand arising from increasing graduates from grade 8, population growth as a result of high fertility and/or migration, and commitments to reach higher enrolment rates.

Figure 12: Distribution of districts by level of concentration of small schools



The figure 12 presents the concentration of small schools at the district level State specific changes in the concentration of small schools is presented in Annex 2. The distribution of districts by proportion of small schools reveals that about 20% of the districts have just about 4% of small schools whereas around 63% of the small schools were found to be concentrated in 40% of the districts. This is important if it means that further growth in participation is likely to be in districts which already have many small schools.

Table 2: Percentage distribution of districts by level of concentration of small schools

	Percentage of district	PTR	SCR
Lowest Concentration (0 to 0.50)	14.0	21.4	24
Moderate (0.51 to 0.75)	14.0	22.8	26
High (0.76 to 1)	22.1	19.1	32
Highest (Greater than 1)	49.8	17.0	33
Overall	100.0	17.9	32

Within States small schools are typically concentrated in some districts and not others thus localising the issues within the State. Specifically, the analysis shows there is a greater concentration of small schools in rural areas due to low population density and higher dropout levels through elementary school. The analysis of concentration index at the district level reveals some interesting insights. There are about 14% of districts with lowest concentration of small schools as against the highest concentration in 49% of districts in India (Table 2). The corresponding numbers for PTR and SCR reveal that the districts with highest concentration of small schools have lowest PTR and districts with lowest concentration of small schools have the lowest SCR. The pattern of PTR and SCR suggests that cost of providing secondary schools in these districts is much higher than the average.

6. School Size and Equity

The normative framework adopted under RMSA means that provisioning of resources like the number of classrooms and teachers in schools is directly related to the school size. As the size of schools increases, the demand for additional resources also increases. All schools need a minimum level of resources independent of size because of their fixed costs and minimum service obligations. Efficiency is related to size and a sufficient number of students. Effective implementation of educational process may also depend on a minimum schools size to justify the deployment of specialist teachers.

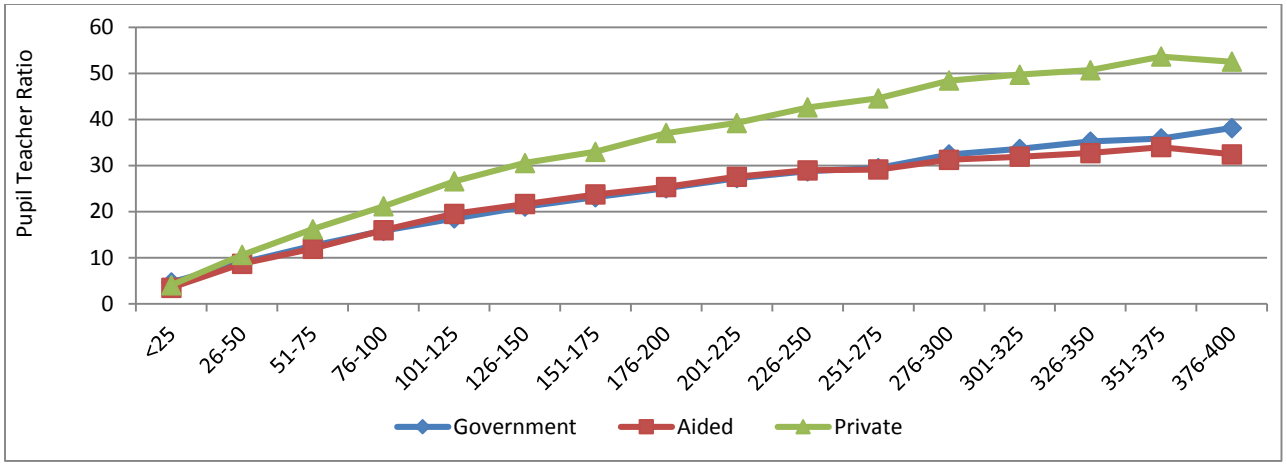
6.1 School Size and Equity in Resource Distribution

Policy favours expanding and upgrading existing schools rather than increasing the number of standalone schools. The data indicates that small standalone schools have remained a large proportion of total provision. Though small standalone schools may promote equity they come at a price. Firstly, it is extremely challenging to ensure that small schools in villages are staffed efficiently with average PTRs and all of the core subject teachers required and essential facilities. Secondly, if these basic requirements of high-quality education are fulfilled, it is certain to be at an unsustainably high unit cost, with low utilisation of trained teachers. In practice small schools are highly unlikely to be well-resourced and this may be inequitable.

Teachers

Small schools have favourable staffing compared to larger schools. Figure 13 shows the skewed distribution of teachers across school sizes up to school size 400. The PTR in the smallest government schools is less than 10, while it averages around 40 in schools having 400 or more pupils. The PTR gap widens between government and private schools with the increase in the size of the school. PTR in the largest size private schools is above 50. The distribution is unfair and skews resources to small schools.

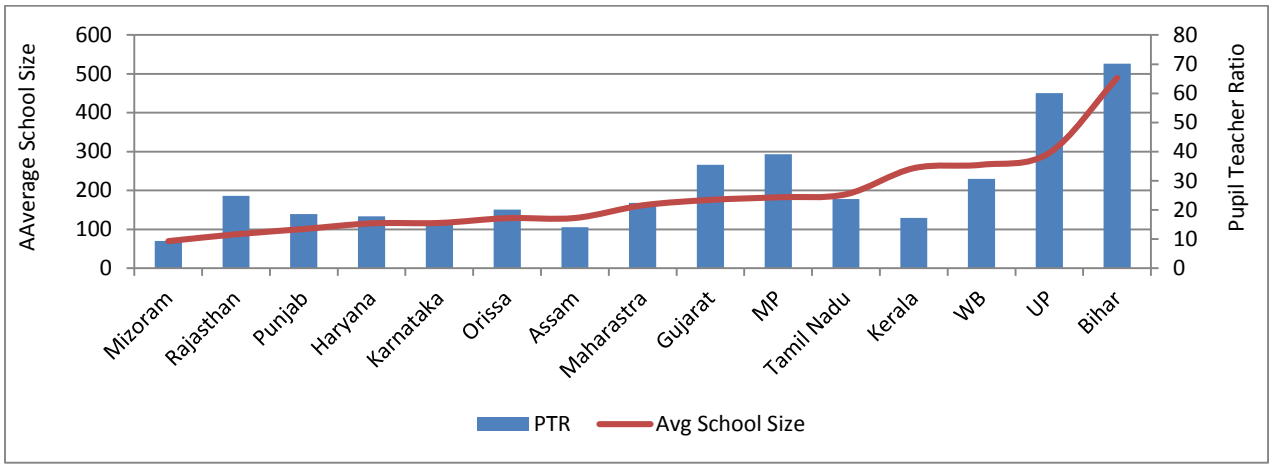
Figure 13: Pupil teacher ratio by school management



As can be seen in figure 14 the pupil teacher ratio and average school size follow similar pattern; PTR increases with the increase in the average school size. This also indicates the inconsistency between the norms for PTR and SCR. In the majority of the States PTR is found to be as per or below RMSA norm, only

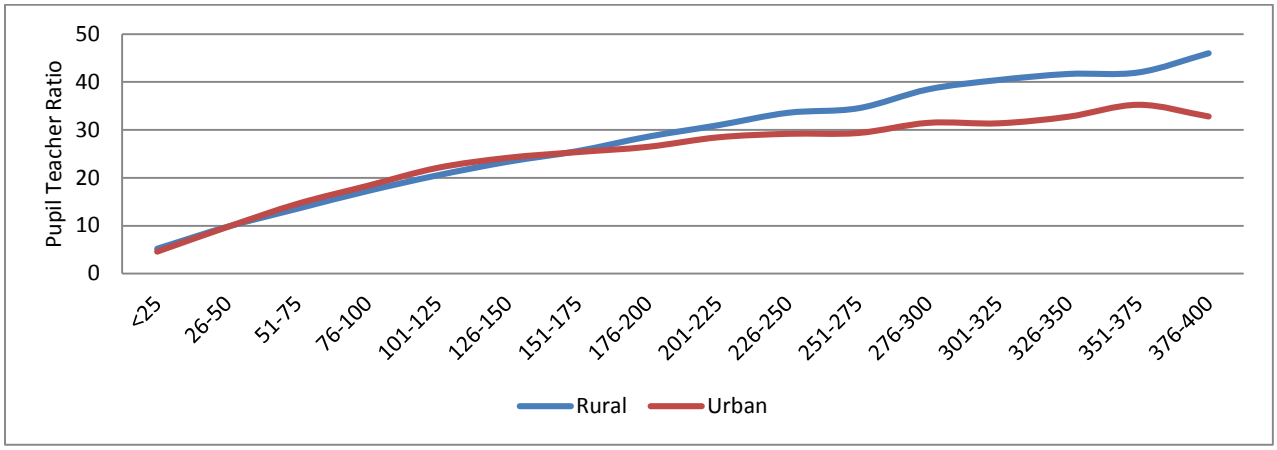
in backward States like MP, UP and Bihar the PTR is found to be higher (Annex 3-4). Mizoram has the lowest average school size and PTR. It is observed that irrespective of management and school type the PTR is much lower in schools with enrolment size less than 25. The PTR in standalone schools are relatively lower compared to composite schools and increases with increase in enrolment size. It suggests that standalone schools are not cost efficient at lower enrolment levels and have effectiveness concern at higher enrolment levels. Small schools do have the small PTR, but these schools lack subject specific teachers.

Figure 14: PTR and average school size by States



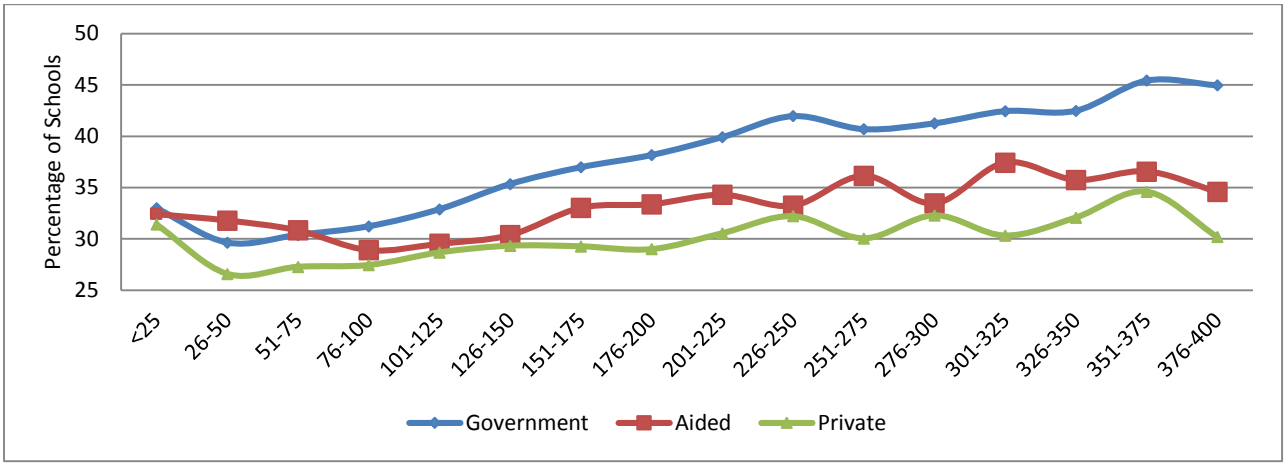
PTR on rural and urban schools are similar up to enrolments of 200. The rural urban gap widens above this level in favour of urban schools (figure 15). The gap between rural and urban PTR in smallest school category was negligible and it increases to 13 points in case of largest schools with rural schools having higher PTR.

Figure 15: Pupil teacher ratio by school size and location



In terms of availability of core subject teachers, just over 30% of the smallest government schools are found to have all of the required core subject teachers[9] as compared to 45% of schools with 400 or more pupils (figure 16). There difference is insignificant on this issues for schools established before or after the start of the RMSA period. Once again percentage of private schools with all core teachers is lower and indifferent to school size. The difference in percentage of schools with core subject teacher is also visible between school types and location. The percentage of schools with smallest class size found to have a larger number of general teachers compared to schools with large class size in both composite and standalone schools. The percentages of specialised subject teachers were found to be higher in composite schools. Similar differences between composite schools and standalone schools were observed within government schools as well. Urban small schools were found to have relatively higher percentage of specialised subject teachers compared to rural schools in all management type of schools.

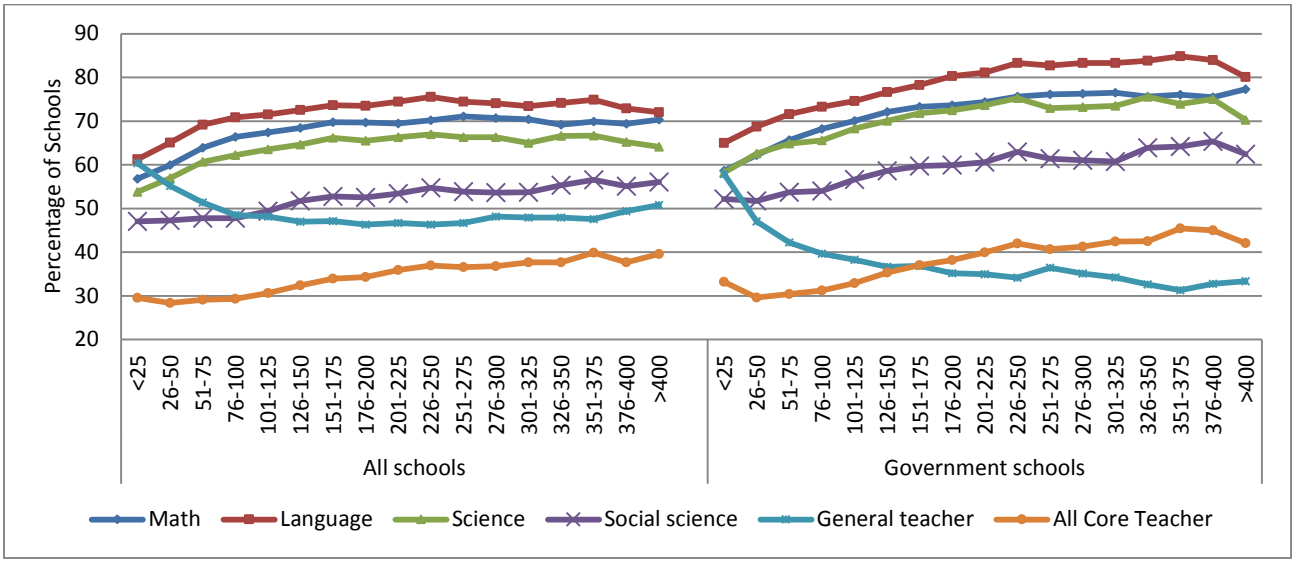
Figure 16: Percentage of schools with four core subject teacher



While small schools have a very low pupil teacher ratio, a large number of these teachers happen to be general subject teachers (figure 17). Almost 60% teachers in the small schools happen to be general teachers as compared to 33% in case of largest schools. In case of subject specific teachers, larger schools have higher percentage of subject teacher across all four core subject areas. No significant differences were observed in cases of different schools with different management categories. State specific variations are presented in annex 5-6.

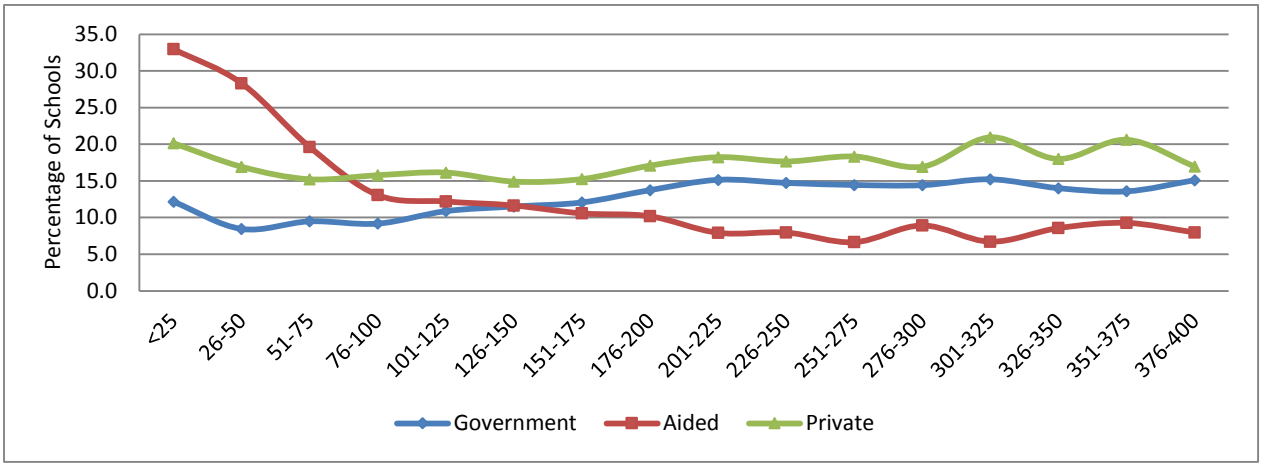
[9] Core subject teachers are: Mathematics, English, Regional Language and Social Science

Figure 17: Percentage of schools with subject specific teacher



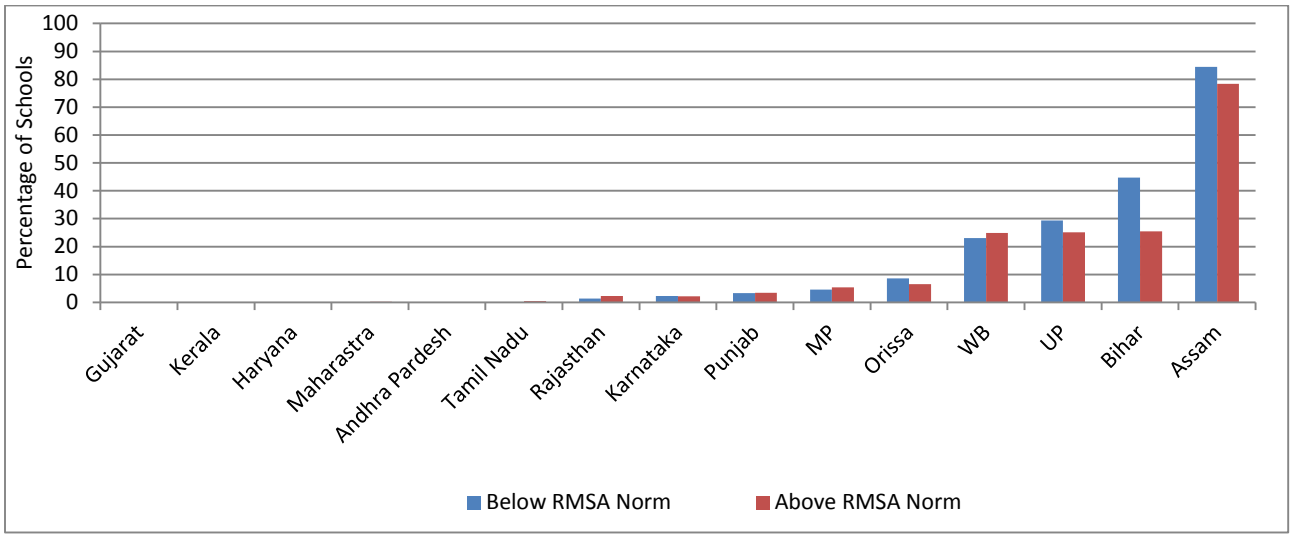
There is only a marginal difference in the shares of teachers without any professional qualifications, with the smallest government schools having nearly 12% while the largest schools have 14% unqualified teachers (figure 18). For schools established during RMSA, this share increases from 12% in the smallest schools to 33% for schools with between 201 and 225 pupils, before dropping to 18% in the largest schools category. There is a significant difference in employment of teachers with no professional qualification between schools by management categories. Percentage of private schools having teachers with no professional qualification ranges from 17%-20% between different enrolment size categories.

Figure 18: Percentage of schools having teachers with no professional qualification



In some States percentage of teachers with no professional qualification is higher in schools with enrolment size below RMSA norm (figure 19). Assam has the highest percentage of teachers without any professional qualification followed by Bihar. If looked at from the point of school management, government schools have a smaller percentage of teachers without professional qualification compared all schools. State specific information is provided in annex 7-8.

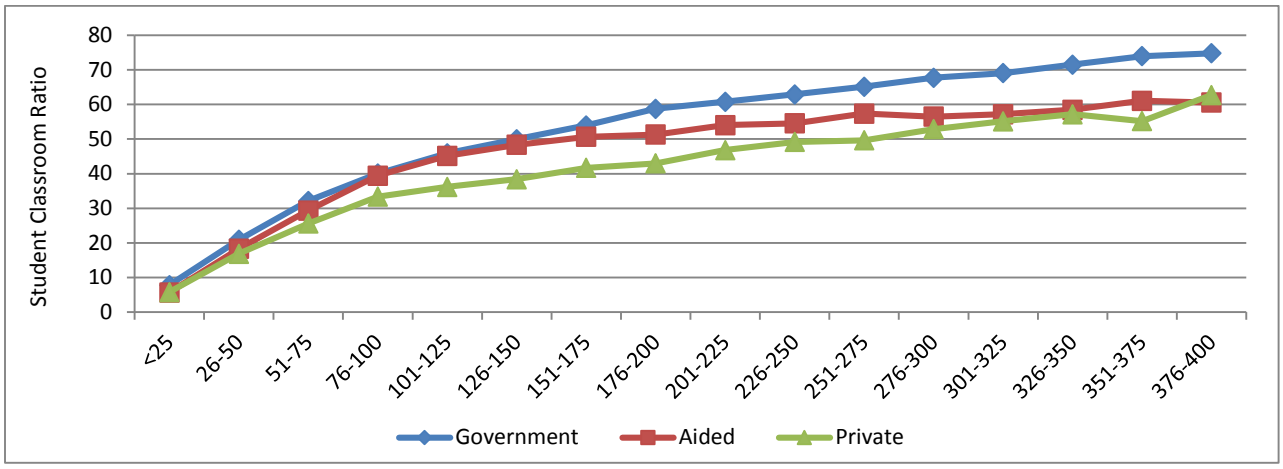
Figure 19: Percentage of teachers with no professional qualification: Government schools



Classroom

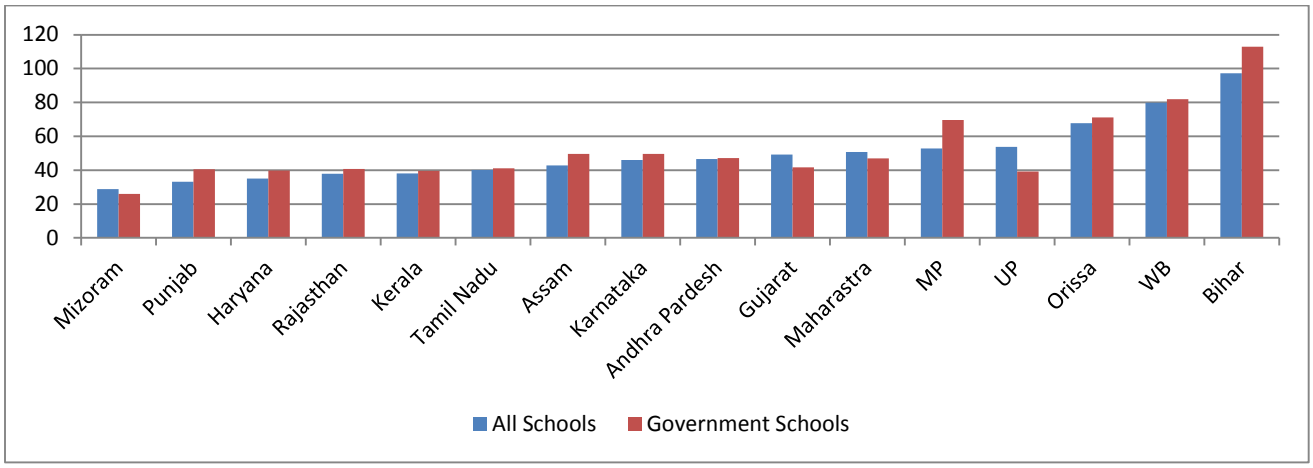
Similar patterns exist when it comes to resourcing of schools in terms of classrooms, as shown in figure 20. The student classroom ratio (SCR) is found to increase along with enrolment size. The ratio in the smallest schools is less than 10 and exceeds above 70 in schools over 400. The SCR is observed to be significantly higher in government schools than in private schools with difference of 12 in largest school category.

Figure 20: Student classroom ratio by school management



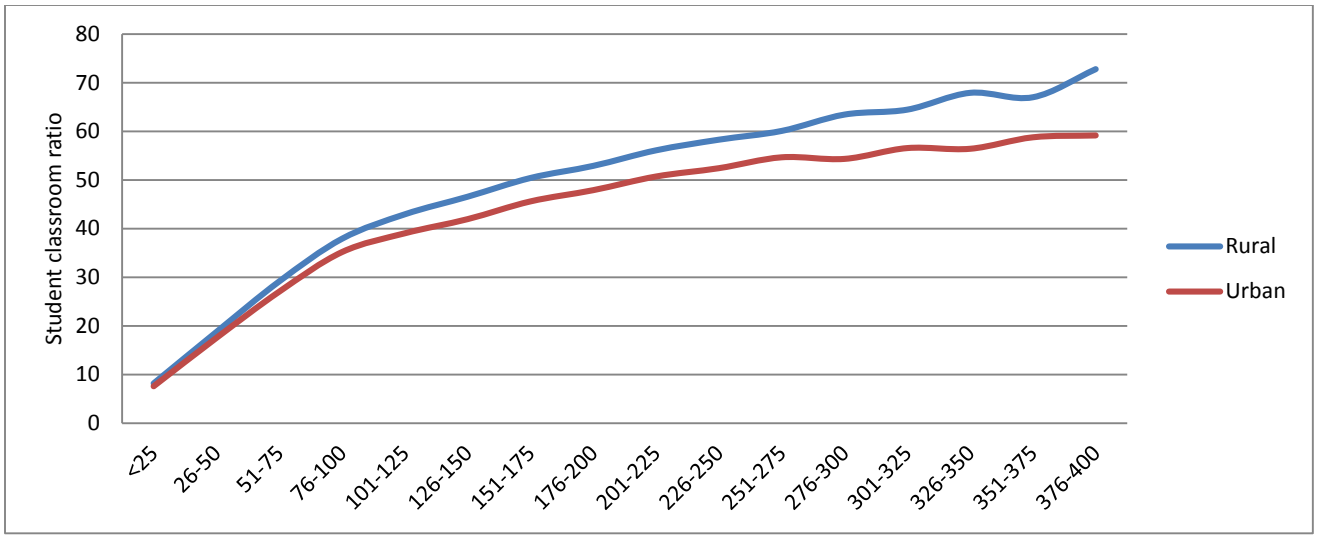
The smallest SCR was found in Mizoram with the SCR value of well below RMSA norm (figure 21). On the other side in backward States like MP, UP, Orissa and Bihar, the SCR is well above RMSA norm. In Bihar the SCR is observed to be as high as 113 in government schools. Such pattern indicates that required number of classrooms have not been built in backward States with the increase in the secondary enrolment (annex 9-10).

Figure 21: Student classroom ratio by states and school management



The lower class size was observed in schools with low enrolment size in both rural and urban areas. However, the difference in the SCR was found to widen with the increase in the school size. The SCR in government schools in rural area was found to be 92 against 69 in urban area (figure 22). This also indicates towards inequitable expansion of school between rural and urban area. The pattern of SCR can have serious implications for effectiveness. Higher SCR would mean overcrowded classrooms that in turn can pose serious pedagogical challenges.

Figure 22: Student classroom ration by school size and school location



Facilities

The availability of four core facilities i.e. Science laboratory, computer laboratory, library and functional computer for children is positively related to the size of the school irrespective of the year of establishment, and with being part of a composite school (figure 23). While around 2% of the smallest government schools had these facilities, it increases to over 10% in the case of the largest schools. The gap in availability of these facilities between composite and standalone schools is around 6 percentage

points and increases marginally with schools size. The variation in availability of these facilities by the size of the school is minimal in the case of stand-alone schools, and fewer schools constructed during RMSA have these core facilities. Greater percentage of private schools have these core facilities as compared to government schools across all sizes categories.

Figure 23: Percentage of schools with four core facilities by schools management

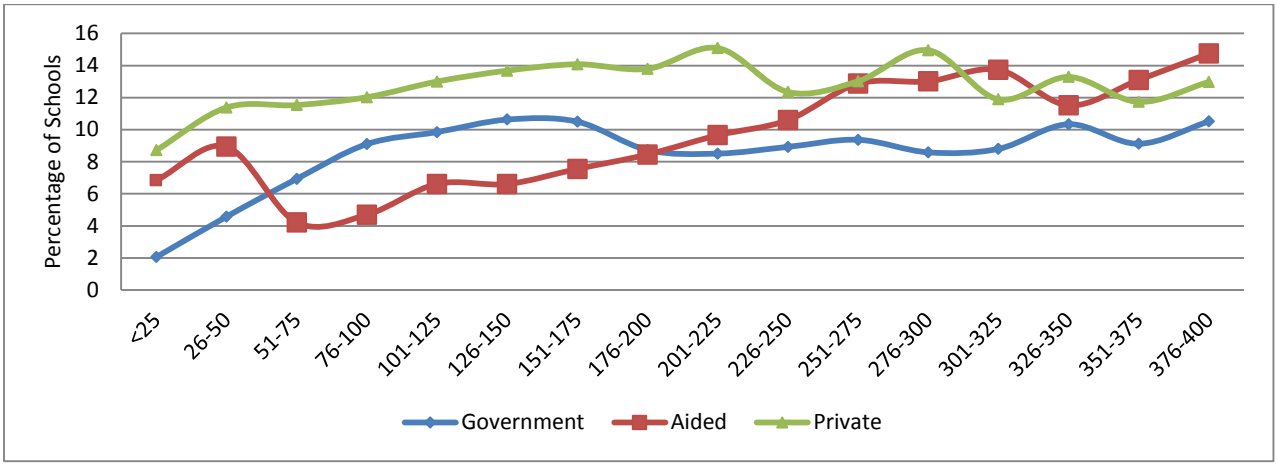
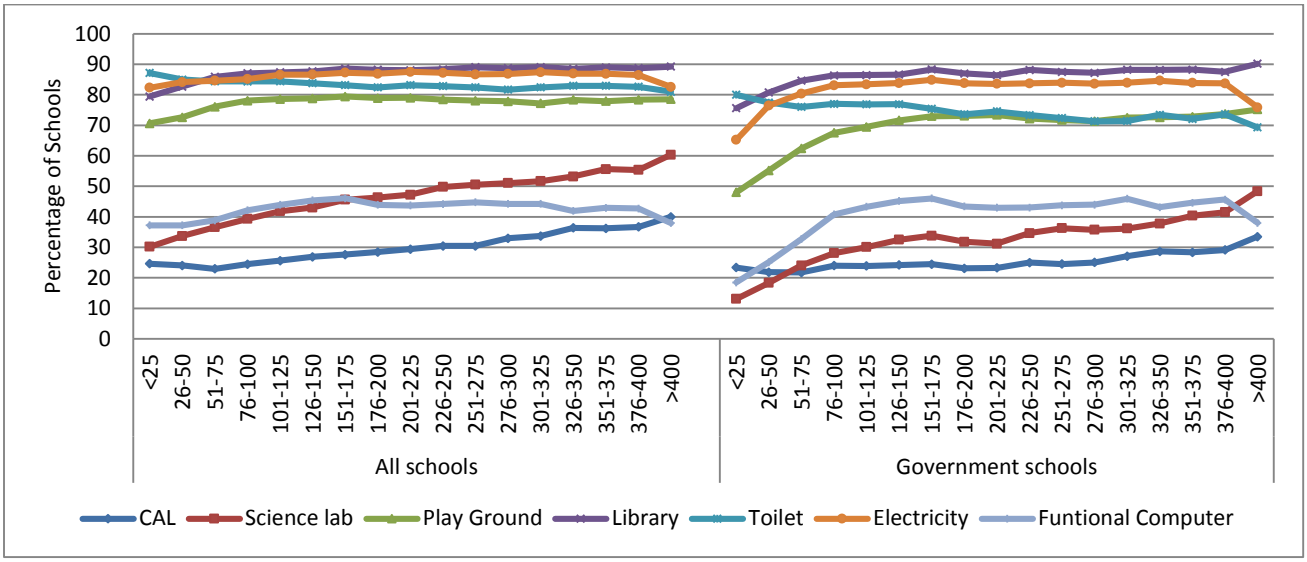


Figure 24 presents the provision facilities in schools by different size and management. It is observed that the provisions of resources in small schools are less when compared to that of large schools. The percentages of government schools with provision of these resources are even lower in small size schools. The difference between large and small schools by the management type is also evident with respect to the provision of computer aided learning, functional computer and play ground. The percentage of small schools with the provision of computer aided learning is 22% as against 37% large schools. Similar difference was observed for other resources and the differences were observed between government and all schools. There is significant difference in the provision of science lab by school size; 31% of small schools have science lab as compared to 56% of large schools. The difference in the provision of science lab between small schools and large schools was found to be quite stark in government schools. The percentage of small schools with science lab was about 13% and whereas there were about 48% of large schools with the provision of science lab under government management type.

Figure 24: Provision of all seven facilities by school management and size

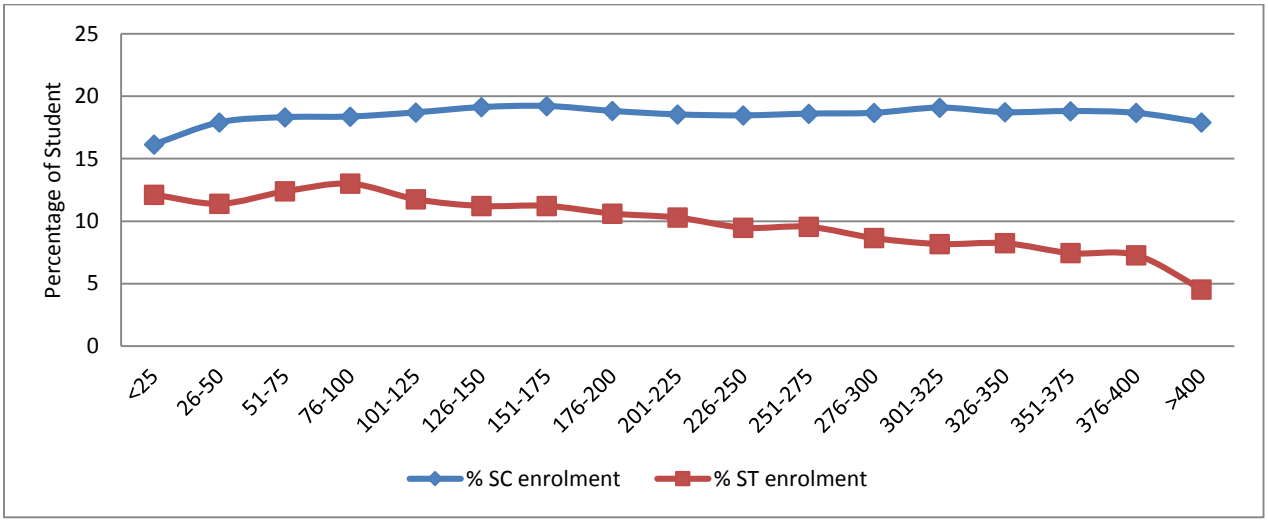


Three conclusions can be draws from this in terms of the provision of resources. First, it is observed that on an average small schools have lower resources compared to large size schools irrespective of management and school type. Second the difference in the provision of resources is much higher in case of government schools. Third, the difference is quite stark in terms of the provision of the resources between composite and standalone schools.

6.2 Participation of SC and ST in Small Schools

Enrolment share of students by their caste grouping is presented in figure 25. Although there is no clear association between caste and schools size for SCs, the ST population is more likely to be in smaller schools. This is also verified from the analysis of concentration index of enrolment in small and large schools by caste category.

Figure 25: Enrolment by caste category and school size



School participation by different social origin is an important aspect to look at in the context of school size. This is important particularly if the school size is related to provisioning of resources and learning outcome. Table 3 presents the concentration index of enrolment by caste category and small and large schools. It is observed that SCs and STs have higher concentration in small schools compared to large schools, whereas the OBC and General Caste categories have higher concentration in large schools compared to that of small schools. The message is clear that children from marginalised groups are concentrated in small schools that are generally poorly resourced thus magnifying inequity.

Table 3: Concentration of enrolment by caste category in small and large schools

Caste category	Concentration Index Small Schools	Concentration Index: Large Schools
SC	1.09	0.96
ST	1.29	0.89
OBC	0.95	1.02
General	0.86	1.05

7. School Size and Efficiency

Key arguments around school size relate to achieving economies of scale[10] (Akerhielm 1995, Harris 2007, Garrett, et al., 2004, Newman, et al., 2006), however the evidence from the literature on developed countries is not conclusive (Garrett et al., 2004, Newman et al., 2006). Small and large schools are subject to various degrees of economies or diseconomies of scale, leading to mixed conclusions regarding efficiency or otherwise (Garrett, et al., 2004). Secondary education is more demanding to deliver than lower levels of schooling: the cost of delivering an extensive curriculum through specialist teachers and more extensive infrastructure and facilities is necessarily greater. The question of scale economies is especially relevant at this level, in the interest of ensuring efficient use of resources.

This research paper provides evidence using three different aspects of efficiency, in relation to school size. These include: instructional efficiency which is related to the use of teacher time, cost efficiency which is related to per student costs of constructing and operating a secondary school, and input-output efficiency i.e. how efficiently schools convert their resources into academic achievement.

7.1 School Size and Instructional Efficiency

This sub-section uses the Common Board for Secondary Education (CBSE) guidelines to determine implications of school size on instructional efficiency. The Common Board for Secondary Education (CBSE) provides curriculum guidelines that determine how learning is organised and generates teacher's workloads. It is necessary to discuss the guidelines issued by the CBSE to understand how school size affects the delivery of the curriculum and the utilisation of teachers. These specify that each week there should be 48 teaching periods, with eight periods a day of 40 minutes (45 minutes for the first and fifth periods) totalling 410 minutes or 6 hours and 50 minutes a week. Recommended teaching time is distributed across eleven subject areas as indicated below. 36 periods are allocated to core CBSE subjects I Language I and II, Maths, Science and Social Science (table 4). The results in each of these subjects are aggregated and averaged to generate an overall grade that is used for selection to higher level programmes.

Conditions of CBSE affiliation include maintaining a teacher-student ratio of no more than 1:30, ensuring every teacher works at least 1200 hours a year on teaching and planning, and suggesting teachers a minimum of 30 periods a week. The recommended allocations of lesson time and teaching time are in excess of those found in some OECD countries[11].

The CBSE curriculum and examination raises a number of issues with implications for expanded secondary school access and service delivery, especially in small schools.

[10]Scale economies occur when the cost of enrolling an additional student (referred to as the marginal cost) is lower than the average cost at that point, thereby resulting in the average cost declining as enrolments expand.

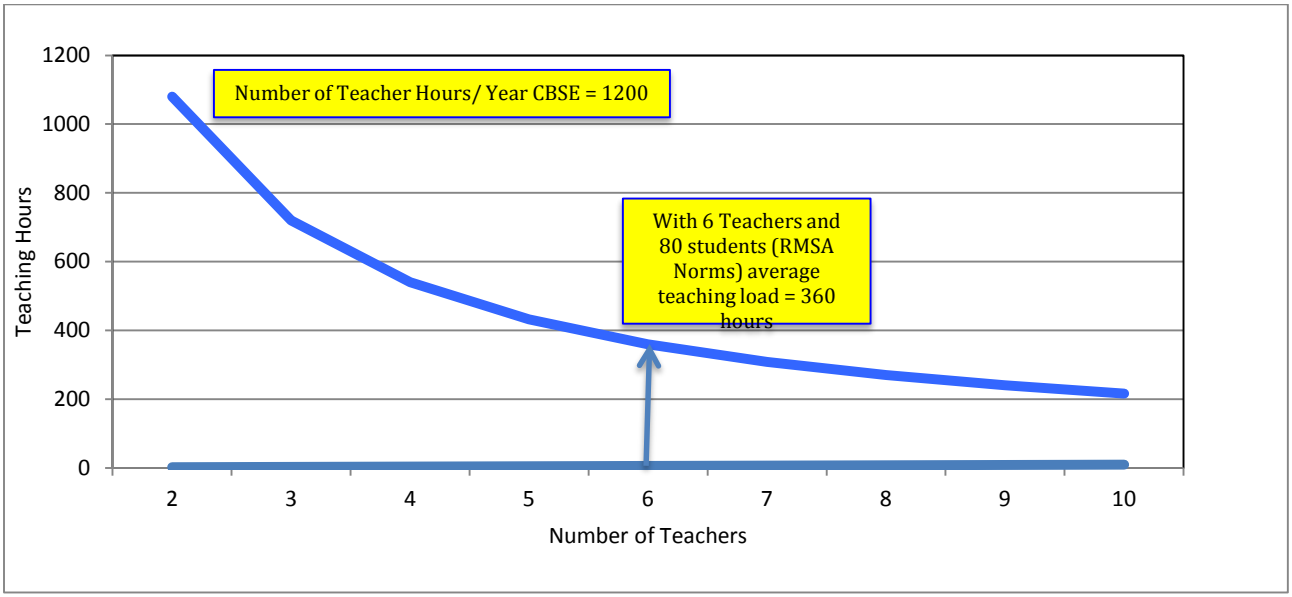
[11] These guidelines are equivalent to about 35 hours a week of class time and 22 hours of teaching time per teacher. This can be compared to about 24 hours a week of class time and 19 hours of teaching time per teacher in the United Kingdom.

Table 4: CBSE Curriculum Guidelines

Sl	Subject	Number of periods for theory classes	Number of periods for activity classes	Total Number of periods
1	Language-I	6	01	7
2	Language-II	5	01	6
3	Mathematics	6	01(Maths Lab)	7
4	Science	6	02(Lab)	8
5	Social Sciences	7	01	8
6	Work Education	----	2	2
7	Art Education	-----	2	2
8	Physical and Health Education	-----	3	3
9	Co-Curricular Activities	-----	2	2
10	Life Skills*	-----	1	1
11	Values Education and Gender Sensitivity*	-----	1	1
12	Library	-----	1	1
Total				**48**

Staffing norms and standards provide for every school to have minimum of six teachers. In a secondary school with one class in grade 9 and one class in grade 10 there are 48 x 2 = 96 classroom teaching periods a week. This is an average of 16 periods a week or just over three 40 minute periods a day if the teaching is evenly shared. With this staffing and workload teachers would only complete about 360 hours of teaching a year, or only 30% of a full workload. This is illustrated in figure 26.

Figure 26: Maximum teaching loads in a 2 class secondary school with 80-100 students



Source: Author

The pupil teacher ratio in a six teacher, two class school with 80 students is about 13:1. This is much less than the 30:1 guideline of the CBSE. Some subjects are likely to require specialist teachers e.g. Hindi, English, Mathematics, and Science. If these teachers only teach their own subject they will have very light workloads of only 12 periods a week or 2.4 periods a day.

Specialized school facilities are likely to be underutilized in small schools. A science laboratory in schools with two classes would only be used for 4 periods a week, and a mathematics lab for 2 periods a week if the CBSE curriculum is followed. Other specialist rooms would also be underutilized – e.g. computer room, art room and library.

In very small schools it may be impossible to provide a full complement of trained and qualified teachers in core subjects. This is both because of the costs of deploying staff inefficiently and because small schools may be unattractive postings that fail to attract motivated teachers who make career investments in developing small schools.

In addition small schools may not provide the most constructive environment for newly qualified teachers to consolidate skills acquired from teacher education. Smallness hampers mentorship and may result in new teachers working in schools where few colleagues are full qualified and opportunities for professional development are limited.

There is no variant of the CBSE curriculum that is designed for use in a multi-grade pedagogic environment. This is an option that could enhance the delivery of the curriculum at affordable costs in the smallest schools.

Lastly the CBSE curriculum was designed primarily for academically inclined students aspiring to continue their education to higher levels. The profile of subject choices reflects this expectation and CBSE signals this as a high stakes selection examination designed to discriminate reliably on academic achievement between candidates. Universalisation of access to secondary education means that all children will experience the secondary school curriculum which may need differentiation if it is to reflect the aspirations and capabilities of an unselected group of students.

There are a range of other curriculum issues that will shape RMSA over the next decade. Many of them have implications for the structure of the school system and the pattern of expansion that will be most efficient and effective.

The issues include:

- Optimizing the mix of expanded capacity between new schools and additional classes in existing schools
- Reducing the number of small secondary schools where this can be achieved without undermining access and attendance
- Differentiating the curriculum to respond to a wider range of student capabilities, preferences and aspirations
- Considering the advantages and disadvantages of different school types (stand alone and consolidated, public and private, academic and vocational etc.)
- Developing learning material suited to the new population of students
- Determining whether new technologies for learning are cost effective when independently evaluated against measurable learning gains
- Establishing how best to teach science and technology in small and resource poor schools

- Curriculum reform that reflects commitment to more equitable opportunities to learn for marginalized social groups
- Cost effective design, development and distribution of learning materials usable in small schools
- Public assessment systems that are fit for purpose and benefit those who fail as well as those who pass and which do not disadvantage those from small schools.

The most fundamental curriculum issues for RMSA have two dimensions. The first relates to differentiation and tracking in grades 9 and 10. Following a common curriculum which is the same for all students at this level may challenge those with least capability and fail to challenge those with most capability. This is especially so in subjects that are cumulative like mathematics, or which benefit greatly from experiential context like English. There are also fundamental questions that relate to whether schools should track students into different ability groups, and whether there should be different curricula streams. More controversially students could be tracked into different types of schools with more or less academic and vocational and skill related programmes.

The second issue is to address the reality of the secondary school system and adapt the secondary school curriculum so it can be taught effectively under a wide range of circumstances. These include: resource poor schools with insufficient textbooks and no other learning materials, schools lacking full complement of specialist teachers, schools receiving students from grade 8 who fail to master the elementary school curriculum, small and very small schools, and large and very large schools. Expansion has been planned under RMSA on the assumption that CBSE and State level curricula can be taught effectively in all schools. This is unlikely to be the case given the wide range in conditions that will persist for some time. It is therefore important to invest in curriculum development designed to support new generations for students from less advantaged backgrounds, and respond to teachers' needs for curricula suited to circumstance.

7.2 Costs per Student and School Size

It is instructive to examine the efficiency levels that would result in the secondary school system if current RMSA norms and standards are applied to schools of varying sizes, as reflected in current data. RMSA resourcing and cost structures have been used to derive annual recurrent costs and the cost of establishing a secondary school. Figure 27 presents an existing estimated cost per student. This is derived using availability of existing infrastructure and teaching/non-teaching staff. As can be seen, existing annual per student recurrent cost is around INR 57,000 in case of smallest schools. This plateaus around INR 10,000 in case of large schools.

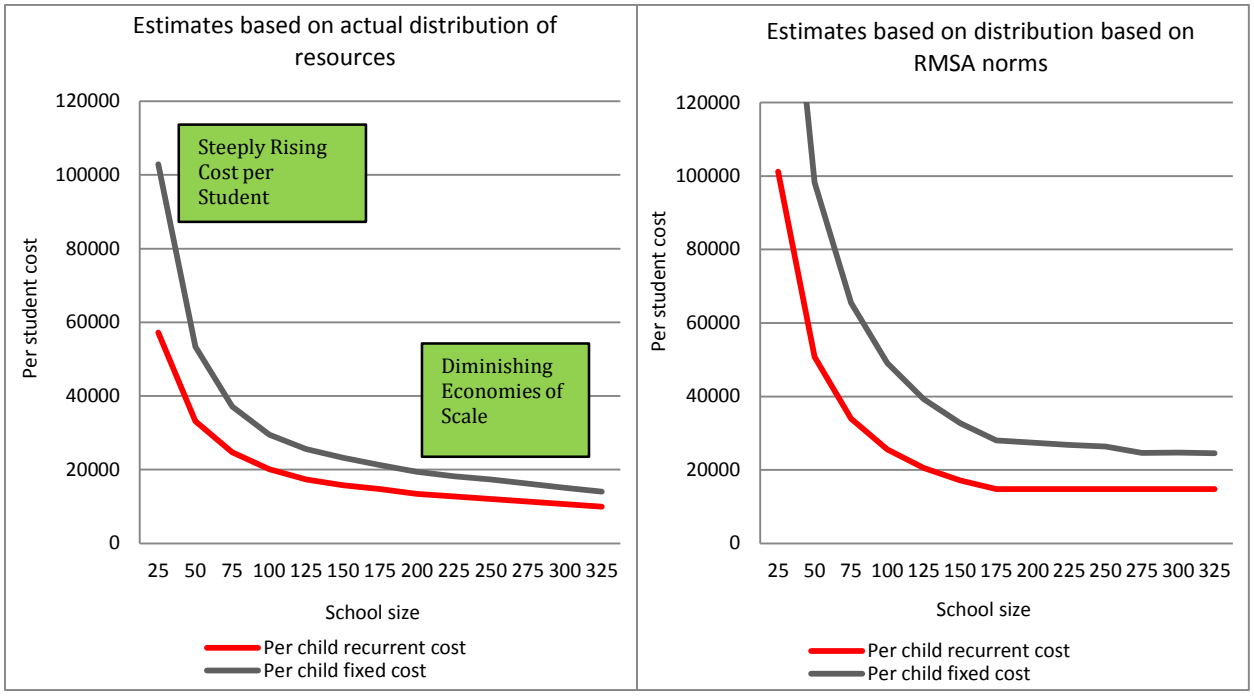
Application of the norms to all schools irrespective of size results in varying recurrent costs per child from approximately INR 14,000 in schools with enrolments of 300 or more, to INR 16,000 for enrolments of around 200, and over INR 20,000 for enrolments of 100. In the smallest schools, with enrolments of 25 or less in grades 9 and 10, costs per child would exceed INR 100,000.

Infrastructure costs for buildings and facilities would vary from approximately INR 23,000 per school place for schools with enrolments over 300, to INR 27,000 for enrolments of 200, and INR 49,000 for enrolments of 100. The smallest schools with enrolments below 25 would prove extremely expensive at INR 196,000

per place if they had the full complement of facilities. The capital costs of infrastructure are for setting up new capacity by building new schools and classrooms. These are not annual recurrent costs.

These estimates will vary for different locations in different States and for different school types and do not include the cost of purchasing land, where needed. They also assume that teachers are employed as regular government teachers on national pay scales and do not account for contract teachers and other variations in salaries from national guidelines.

Figure 27: The cost implications of applying all RMSA norms



The modelling suggests that schools built and staffed using the norms need to enroll at least 150 students and preferably over 300 if they are to be cost effective. The variation in costs per child is modest in this range, however below an enrolment of 150 the unit cost rises rapidly. Financing the annual recurrent costs is more likely to be a problem than financing infrastructure since the latter represents a one-off cost with subsequent maintenance and replacement costs spread over a long period of time.

More detailed modelling illustrates the implications of small concentrations of students in small schools (table 5). The costs of enrolling a fixed number of students can be modelled over 1 school, 3 schools, 6 schools and 12 schools of different sizes. In this model below 960 students are distributed across 24 classrooms located in different sized schools using RMSA norms and standards and realistic pricing. The result is that, for scenario 1 where all students are in the same school, the recurrent costs are INR 12,900 and fixed costs per student for infrastructure are approximately INR 16,500. These figures increase to INR 14,200 and INR 20,500 respectively if the students are spread across three equally sized schools, and to INR 16,100 and INR 30,052 when placed in six small schools with enrolments 160. If the schools are as small as 80 pupils each then the costs are much greater and reach INR 31,800 for recurrent costs INR 57,300 for infrastructure. In the final scenario of schools with just two classes of 20 pupils each, the costs escalate to INR 63,400 and INR 114,600.

The story is compelling, showing that cost efficiency is much greater with fewer small schools. For recurrent costs using the RMSA norms, secondary schools larger than an enrolment of 300 are cost efficient but below this level, costs per student rise rapidly. Very small schools are more than five times as expensive to run as larger schools.

Table 5: Scenarios of school size and per student cost

		Scenario 1		Scenario 2		Scenario 3		Scenario 4		Scenario 5	
		Large school		Medium school		Small school		Small school		Small school	
		960		320		160		80		40	
	Schools	1		3		6		12		24	
	Classrooms	24		24		24		24		24	
Annual recurrent costs											
Items	Cost/month)	Quantity	Total cost	Quantity	Total cost	Quantity	Total cost	Quantity	Total cost	Quantity	Total cost
Teachers	30000	32	11,400,000	31	11160000	30	10800000	60	21600000	120	43,200,000
Head teacher	30000	1	360,000	3	1080000	6	2160000	12	4320000	24	8,640,000
Lab assistant	15000	1	180,000	3	540000	6	1080000	12	2160000	24	4,320,000
Off assistant	15000	1	180,000	3	540000	6	1080000	12	2160000	24	4,320,000
Maintenance	357	960	342,720	960	342720	960	342720	960	342720	960	342,720
Total cost			12,462,720		13662720		15462720		30582720		60,822,720
Per student annual recurrent cost			12,982		14,232		16,107		31,857		63,357
					110%		124%		245%		488%
Fixed costs											
Items	Unit cost (lakhs)	Quantity	Total cost	Quantity	Total cost	Quantity	Total cost	Quantity	Total cost	Quantity	Total cost
Classrooms	5.63	24	13,512,000	24	13,512,000	30	16,890,000	60	33,780,000	120	67,560,000
Science lab	7.1	1	710,000	3	2,130,000	6	4,260,000	12	8,520,000	24	17,040,000
Computer room	5	1	500,000	3	1,500,000	6	3,000,000	12	6,000,000	24	12,000,000
Art room	5	1	500,000	3	1,500,000	6	3,000,000	12	6,000,000	24	12,000,000
Library	1	1	100,000	3	300,000	6	600,000	12	1,200,000	24	2,400,000
Toilet	1	5	500,000	6	600,000	8	800,000	12	1,200,000	24	2,400,000
Water	0.5	1	50,000	3	150,000	6	300,000	12	600,000	24	1,200,000
Total cost			15,872,000		19,692,000		28,850,000		57,300,000		114,600,000
Per student fixed cost			16,533		20,513		30,052		59,688		119,375

Another way of illustrating how costs escalate with a different mix of school sizes is to consider a school system with a 1000 schools (table 6). In this model existing staffing norms and salaries are applied to six different variants with salaries typical of some low enrolment states. In the first case (Model 1) 50% of secondary schools have enrolments below 50 in grades 9 and 10. The other cases decrease the number of small schools according to the thresholds shown in the table until no schools enrol less than 200 in grades 9 and 10 (Model 6).

Table 6: Hypothetical operation cost of small schools

Model	1	2	3	4	5	6
School Size	50% below 50	50% below 100	50% below 150	50% below 200	None below 100	None below 200
Number of schools	1000	1000	1000	1000	1000	1000
Number of students	130750	161500	195500	233000	243000	315000
Number of teachers	7052	7377	7933	8400	8400	10500
Average teacher's salary	25000	25000	25000	25000	25000	25000
Average PTR	17	20	23	27	29	30
Average number of teachers/school	7	7	8	8	8	11
Average cost per student INR	22073	17870	14762	12386	11877	9162
Cost for 10,000 students INR Lakhs	2,207	1,787	1,476	1,239	1,188	916
Number of students for 10,000,000 INR	453	560	677	807	842	1091
GDP per Capita (Bihar) INR	28000	28000	28000	28000	28000	28000
Salary as multiple of GDP Cap	10.7	10.7	10.7	10.7	10.7	10.7
Cost per Student as % GDP/cap	79%	64%	53%	44%	42%	33%

Source: Author's calculation

The model generates average costs per student which range from INR 22,073 to INR 9,162 INR. The cost for 10,000 students' ranges from INR 2,207 Lakhs to INR 916 Lakhs, and one Crore will finance between 453 and 1091 students depending on the model.

The system with no schools with enrolments below 200 (Model 6) would provide about 2.4 times as many students for the same cost as a system with 50% of schools with enrolments below 50. Teachers' salaries would represent about 10 times state GDP per capita and costs per student between 79% (Model 1) and 33% (Model 6) of State GDP per capita in a poor BIMARU state. In richer States salaries would be a smaller proportion of State GDP per capita depending on how much more teachers are paid in these States.

7.3 Input-Output Efficiency

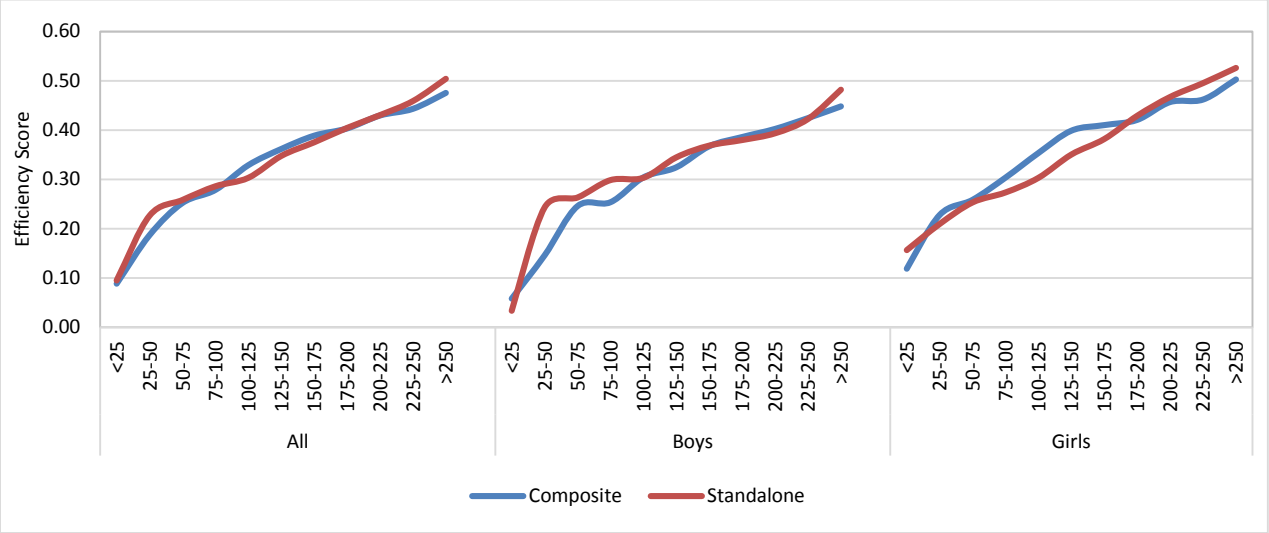
Large schools have the potential to realise cost savings, because these schools may use resources more efficiently, with the fixed costs spread over larger numbers of students as compared to small schools. However true cost effectiveness should also take into account positive learning outcomes rather than

simply the unit cost (Little, 2008). This sub-section presents evidence using Data Envelopment Analysis (DEA) to determine efficiency scores of schools in converting inputs (factors within the control of schools) into outputs (academic achievement) for different school size categories.

DEA determines efficiency frontiers for schools that achieve the highest output for a given level of inputs and then assigns efficiency scores to each school, comparing schools' output/input ratios to those of the most efficient schools. For this analysis we have used only discretionary inputs, i.e. those that are under the control of the school or education system. These include the number of teachers per student, the number of classroom per student, toilets per student and core facilities per student. The output (or education quality measure) used is the pass percentage on the grade 10 examination. A score of 0 would indicate the least efficient school while a score of 1 would mean the most efficient school.

The analysis of efficiency scores obtained using DEA indicates a positive linear relationship between efficiency scores and school size, as shown in figure 28. The average efficiency scores for the schools in the smallest category is under 0.1 and increase to around 0.5 in the case of the largest schools, meaning five times greater efficiency than for the smallest schools. This relationship holds in both the case of male and female students. There is no significant difference between stand-alone and composite schools. The key finding from this method of analysis is that increasing the size of secondary schools does appear to entail benefits from economies of scale and increased efficiency.

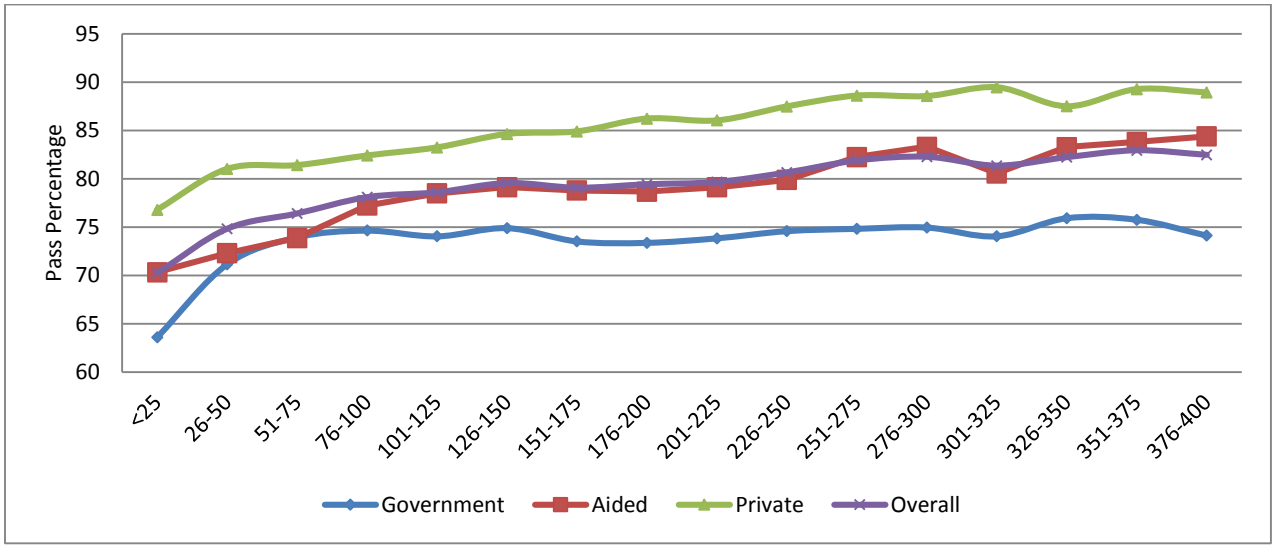
Figure 28: Efficiency of secondary schools by size, gender and school type



8. School Size and Effectiveness

There is some evidence in the literature that the size of both schools and classes is related to levels of learning for the pupils but this is not consistent and it is unknown how it might translate to different Indian contexts. In rural Pakistan, Bangladesh and Nepal there is a high incidence of small schools with low enrolments and low pupil-teacher ratios, and commensurately (very) low levels of learning (Lloyd, Mete, and Sathar, 2005; Pangeni, 2014; Asadullah and Chaudhury, 2013). At the opposite extreme, large class sizes can mean that teachers spend a disproportionate amount of classroom time attending to disciplinary issues to the detriment of their teaching (Pangeni, 2013). Some schools are overcrowded in terms of both class and overall school size. Chugh (2011) found that schools in the urban slums of Delhi were overcrowded with class sizes in excess of 40 pupils, which resulted in severely disrupted teaching with less time on task.

Figure 29: Pass percentage by school size and school type

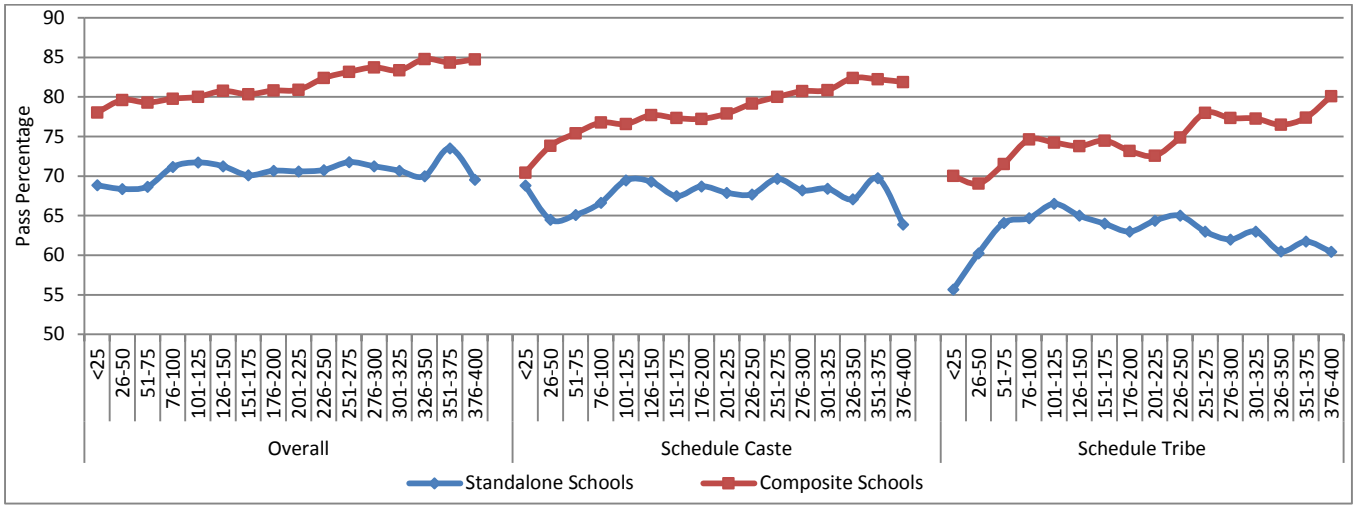


This paper measures school performance using the percentage of students who passed the Grade 10 Board examination for the year 2012-13. The pass percentage is found to have a positive linear relationship with performance across all social groups in composite schools but not in standalone schools (figure 29). The advantage of having a large school size is clear in the case of composite schools. The overall performance gap between these stand alone and composite schools was observed to be about 7 percentage points for the smallest school category increasing to 11 percentage points for largest school size category. The benefits of composite schools are observed even in the case of disadvantaged social groups, with both Scheduled Caste (SC) and Scheduled Tribe (ST) pupils performing substantially better than their peers in stand-alone schools (figure 30). Though schools size is related positively to performance for SCs there appears to be a negative relationship for STs.

The performance of private unaided schools is better than that of government and aided schools. However this comparison has no control for the selection effects that mean that private school children will be from more advantaged backgrounds. The average pass percentage in private school increases with the size of the school and it ranges from 77% in case of smallest schools to almost 89% in case of schools

in the enrolment category 376-400. There is almost certainly an interactive effect since successful private schools with high pass rates will attract more students and grow in size.

Figure 30: Pass percentage by school size, caste and school type



States can be grouped by the proportion of small schools and their examination pass rates into four clusters as shown in figure 31. The first category includes States which have pass percentages greater than the national average and also have a high proportion of large schools. The second category is of States which have pass percentage lower than national average and have large schools. In the third category are the States with pass percentage greater than national average with a high proportion of small schools. The fourth category has those States which have pass percentage lower than national average and high percentage of small schools. It can be inferred from figure 31 that the problem of low pass percentage with large schools is observed in fewer States than those with a high percentage of small schools and a pass percentage lower than the national average. We cannot conclude this relationship is causal without controlling for many other factors.

Figure 31: Distribution of State by school size and pass percentage

The relationship between school size and performance on Board examinations was also examined using ordinary least square regressions. The dependent variable is the pass percentage in Board examination. Three different models were setup: for all students, scheduled casted students and scheduled tribe students. Secondary school size and its squared was introduced along with school and context specific control variables. This relationship between the school size and performance in the Board examination holds for all three categories after controlling for school level variable, as shown in table 7. The coefficient of the square of school size is negatively significant implying that the advantage of having a large schools increases but at a decreasing rate. Being in private schools is associated with higher pass percentage as compared to being in either government or private aided schools. Similarly, being in composite schools results in higher pass percentage as against being in standalone secondary schools.

Table 7: Coefficients for pass percentage

Variables	**Standardised beta coefficient** (standard error in parenthesis)		
	All Children	**Scheduled Caste**	**Scheduled Tribe**
Secondary school size	**.097 (.001)***	**.057 (.002)***	**.056 (.004)***
Secondary school size squared	**-.038 (.000)***	**-.021 (.000)***	**-.027 (.000)***
Aided Schools	**-.152 (.220)***	**-.098 (.380)***	**-.070 (1.041)***
Government Schools	**-.236 (.197)***	**-.166 (.337)***	**-.087 (.910)***
Location (Rural =1)	.062 (.206)*	.046 (.357)*	-.005 (.962)
School type (Composite=1)	**.110 (.240)***	**.056 (.415)***	**.048 (1.052)***
Pupil teacher ratio	.007 (.002) **	007 (.002)	-.006 (.008)
Schools with all core subject teacher	.006 (.335)	.010 (.598)	.001 (1.672)
Teacher with below secondary qualification	-.002 (.004)	-.005 (.006)	-.004 (.016)
% of teacher without professional qualification	-.011 (.002)*	-.005 (.003)	-.022 (.015)*
Government School* all core subject teacher	-.001 (.404)	-.009 (.707)	002 (1.910)
Aided* all core subject teacher	-.005 (.420)	-.005 (.737)	. -.002 (1.951)
Student classroom Ratio	-.010 (.003)**	.000 (.004).	-.019 (.011)*
Number of book in Library	.028 (.000)*	-.001 (.001)	.014 (.000)**
Functional days	.001 (.001)	017 (.000)*	-.001 (.003)
Location*Enrolment	-.079 (.001)*	-.055 (.001)*	-.013 (.003)
Schools with all core facilities	.117 (.059)*	.067 (.102)*	.046 (.257)*
Number of Schools	*85,166*	*72,205*	*38,332*

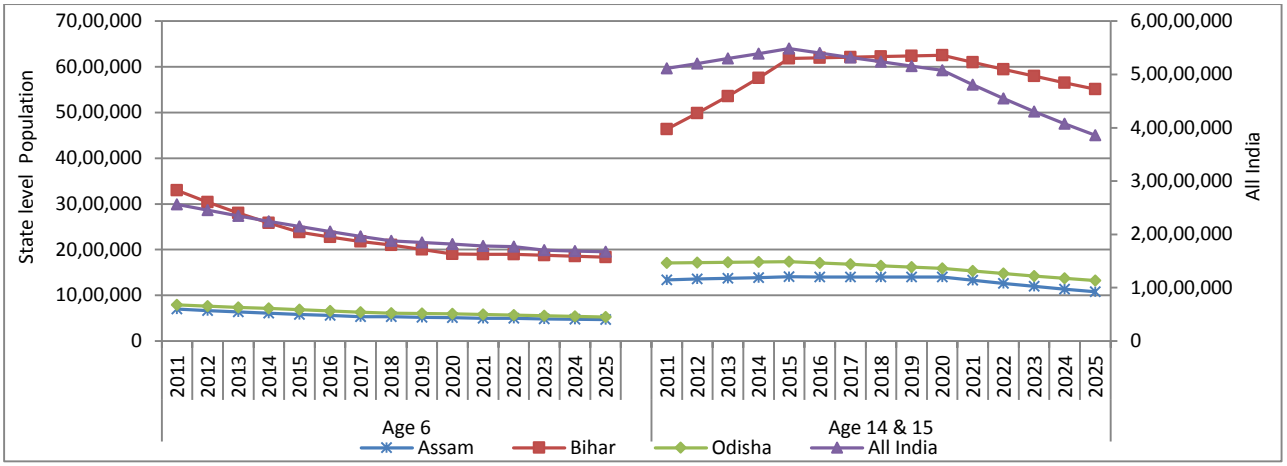
Significance at the 1% and 5%level is indicated with * and **, respectively.

9. Shifting Demographics and Their Implications for Capacity Utilisation

There is a changing demographic profile of many Indian States as a result of declining fertility rates and migration. The numbers of new entrants into the schooling system is declining, meaning reduced demand for secondary school places. These changes can result in higher unit costs if schools experience falling rolls with the same staffing, and therefore declining efficiency. In order to project what impact these shifting demographics are likely to have on future demand for secondary school places, a simulation model has been developed for three focus states: Assam, Bihar and Odisha.

As the first step, single-age population data was obtained for each state from the 2011 national census. A forward shifting method was then applied to project the population for future years. Thereafter variations in the internal efficiency rates was applied to project demand for secondary school places. This was then used to project teacher and classroom capacity utilisation rates. For these calculations, government schools were grouped into 17 groups based on numbers of enrolled pupils, and the average enrolment for each category was calculated. It was assumed that the distribution of schools by size and their average enrolment would remain constant during the projection period. This was used to estimate the number of schools in each enrolment category during the projection period. In order to study the implications of the current resourcing norms, each school was then (theoretically) equipped with teachers and classrooms in compliance with these norms. This was then plotted against demand for government schooling and the population of secondary school-aged children.

Figure 32: Projected age 6 and 14 & 15 population

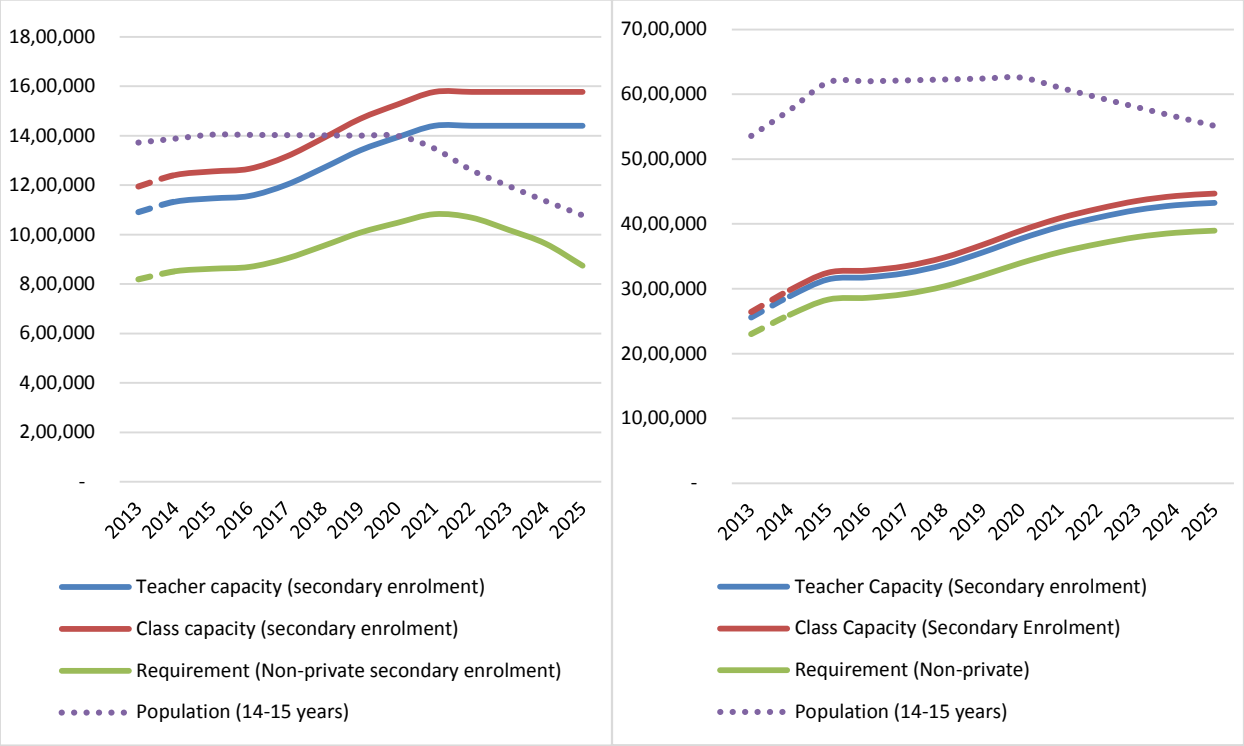


The age 6 population (school entry age) is expected to decline up to and beyond 2017, as shown in figure 33. The figure for children aged 6 years for all-India is expected to decline from almost 25 million in 2011 to almost 17 million in 2025, or by more than 30%. This declining trend is consistent across all case study states which are expected to continue to witness a sharp drop in the age 6 population until 2017 and a continuing but more moderate drop until 2025. In contrast the population of children aged 14 and 15 (secondary school age) is likely to increase from almost 51 million to 55 million between 2012 and 2015 before declining to under 39 million by 2025. This trend is similar across all study states where the total population of secondary school aged children in 2025 will be lower than it was in 2011. This demographic

transition from growth to contraction in the size of the age group has substantial medium term implications for planning in the secondary education sector as there will be fewer 14-15 year olds in ten years' time. This, and some growth in the interim period, must be anticipated in expansion plans for secondary education in order to avoid investment in capacity that will not be needed long term. The falling enrolments that will be experienced at the secondary level after 2020 could persist for two decades if the birth rate continues to fall as development takes place, as has been the case in China.

If the current pattern of distribution of schools by size continues, with RMSA norms applied, the system is likely to generate surplus teacher and classroom capacity. Figure 34 present projected teaching and classroom capacity in government schools in Assam and Bihar. Teacher/classroom capacity in a school is estimated by multiplying the total number of teachers/classrooms by the maximum permissible number of students under RMSA norms. The gap between teacher/classroom capacity and demand for government school places comprises the surplus capacity. The maximum capacity needed can be assumed to be fixed by the population of secondary school age children for each year.

Figure 33: School capacity utilization: Assam **School capacity utilization: Bihar**



By 2015, if all schools in Assam are resourced according to RMSA norms, the system will operate at 75% capacity in the case of teachers (meaning teachers teaching in very small classes and having small numbers of periods per week, as discussed above) and 69% in the case of classrooms. In short, at the present time Assam's secondary education system is already over-staffed and classrooms are under-utilised, with large numbers of small schools. On current trends, these utilisation rates will decline to under 67% and 61% respectively by 2025 - falling student numbers are making this situation of over-resourcing even worse, and the system less efficient. Even if all secondary school-aged children attend government schooling, the system will start to generate excess capacity from 2022 onwards.

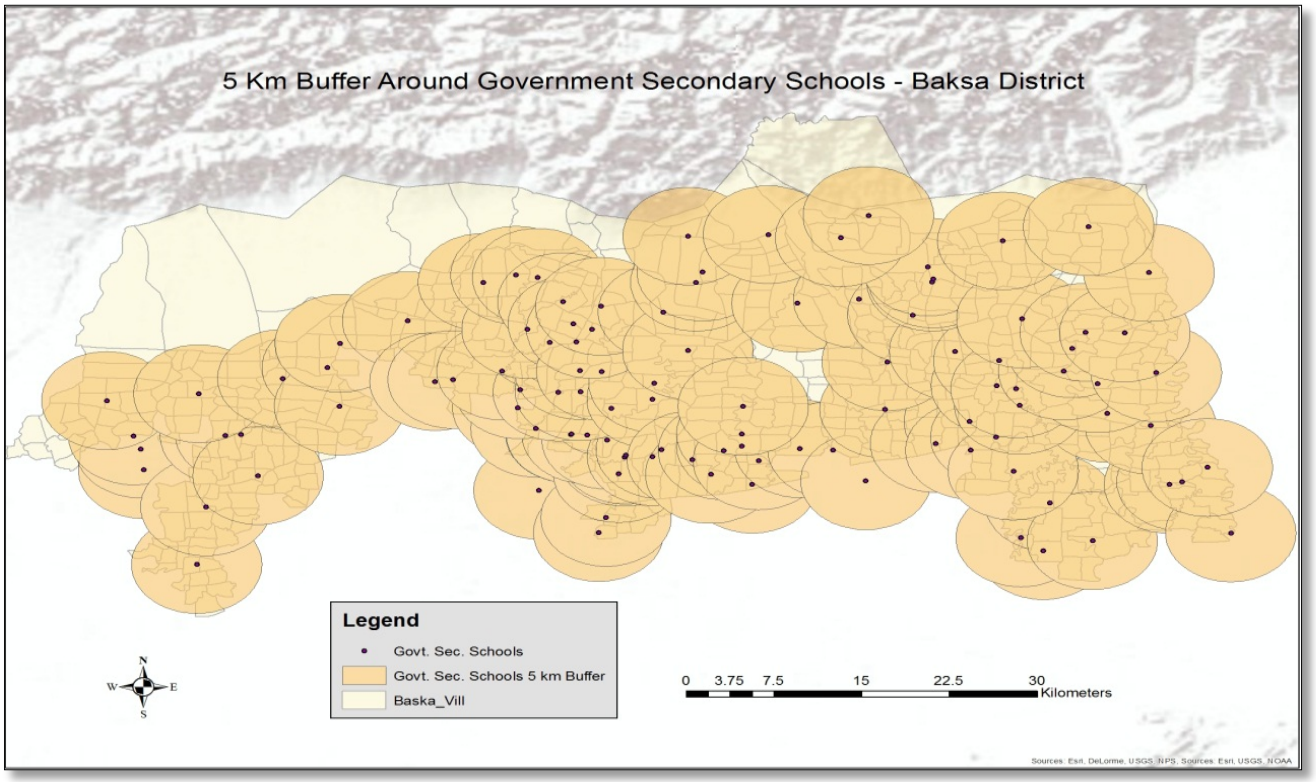
Similarly in the case of Bihar, if all small schools operated at a PTR of 30:1 then the gain in efficiency would be equivalent to additional capacity of approximately 125,000 places which would increase to 212,000 by 2025. This illustration draws attention to the need to anticipate future demand and not over-recruit teachers and build ultimately excessive numbers of classrooms. It provides an upper limit of what could be achieved in a perfectly efficient system, however assuming 100% occupancy of schools with no drop out is unrealistic. The invitation is to compare existing levels of utilisation with the upper limit and determine whether the system is becoming more or less efficient as a result of planned interventions. Greater efficiency will reduce costs per child and should increase effectiveness and the rate of progress towards enrolment targets.

10. Illustrating Patterns of Distribution of Small Schools and Capacity Utilisation

Geographical information system (GIS) analysis was undertaken in the purposively selected Baksa District of Assam to understand patterns of distribution of government secondary schools in relation to the distribution of school aged population and the resulting school sizes and capacity utilisation. The analysis utilises various data sources: school aged population data by village; schools' geographic coordinates; administrative layer files; and road and water body maps.

As the first step all government secondary schools were plotted on the district map, with 5 kilometres catchment areas drawn around them. The map (figure 34) indicates that there are overlapping catchment areas around nearly every government secondary school implying that the 5 kilometres rule has not been applied as intended. This may be warranted in some parts of Baksa where there is a higher density of villages (and therefore population). It points to the fact that 47 out of the 107 government secondary schools (43.9%) have an overlap of catchment areas at a 1 kilometre radius and further, 84 out of 107 government secondary schools (78.5%) have an overlap of catchment areas at a 2 kilometre radius.

Figure 34: Kilometres buffer around government secondary schools

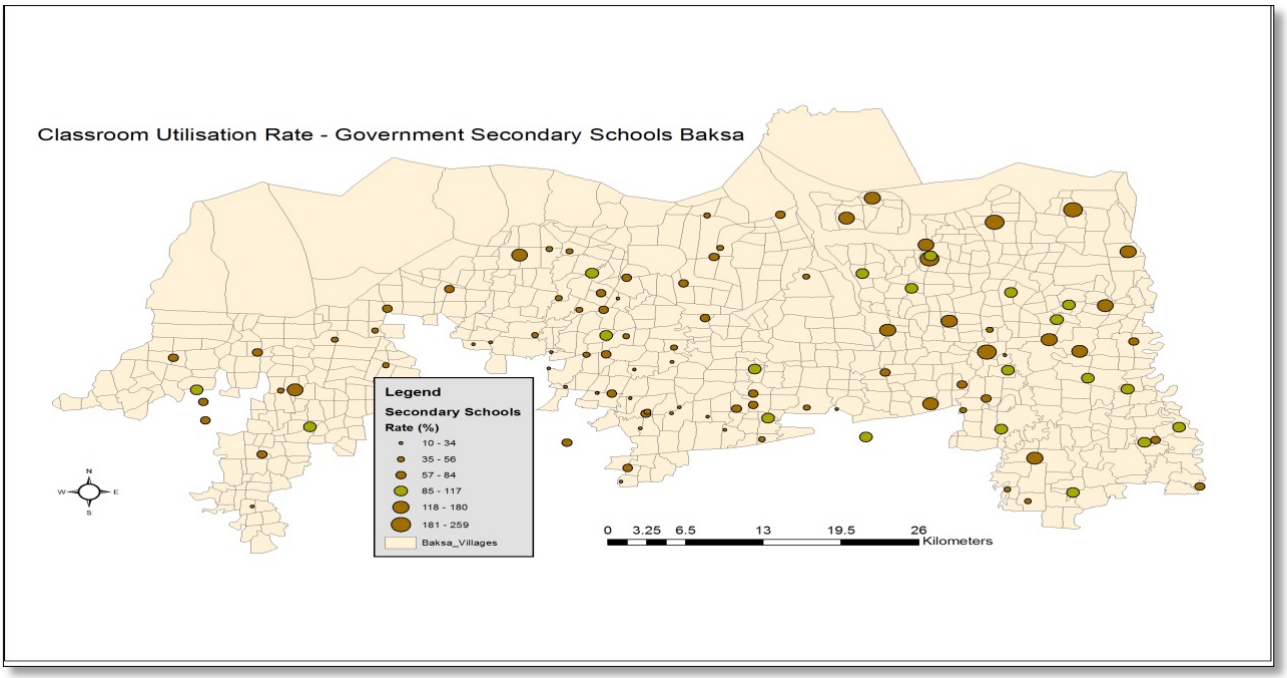


The geographical distribution of class utilisation rate (%) in government secondary schools is shown in figure 35. The Class utilisation rate[12] here is used as a measure of efficiency of a school. The figure above shows the larger the circle, the higher the rate of classroom utilisation and the better the efficiency of the school. Those schools with rates below 100% utilisation have low student enrolments and an excess of classroom capacity, indicating that these are less efficient schools.

The green circles represent those schools that have a rate between 85-117% utilisation - these are close to capacity or just over capacity. School with the two largest brown circles indicate schools with inadequate capacity relative to class size and are therefore in a state of overcrowding. Schools in the eastern part of Baksa are found to have rates over 180%, indicating seriously overcrowded classrooms.

Figure 36 presents the distribution of government secondary schools by size along with the distribution of secondary school aged population (age 14-15) by village. The larger the red circle, the higher the enrolment in a government secondary school, the darker the colour the higher the number of children aged 14-15 within that village.

Figure 35: Classroom utilisation rate: Government secondary schools



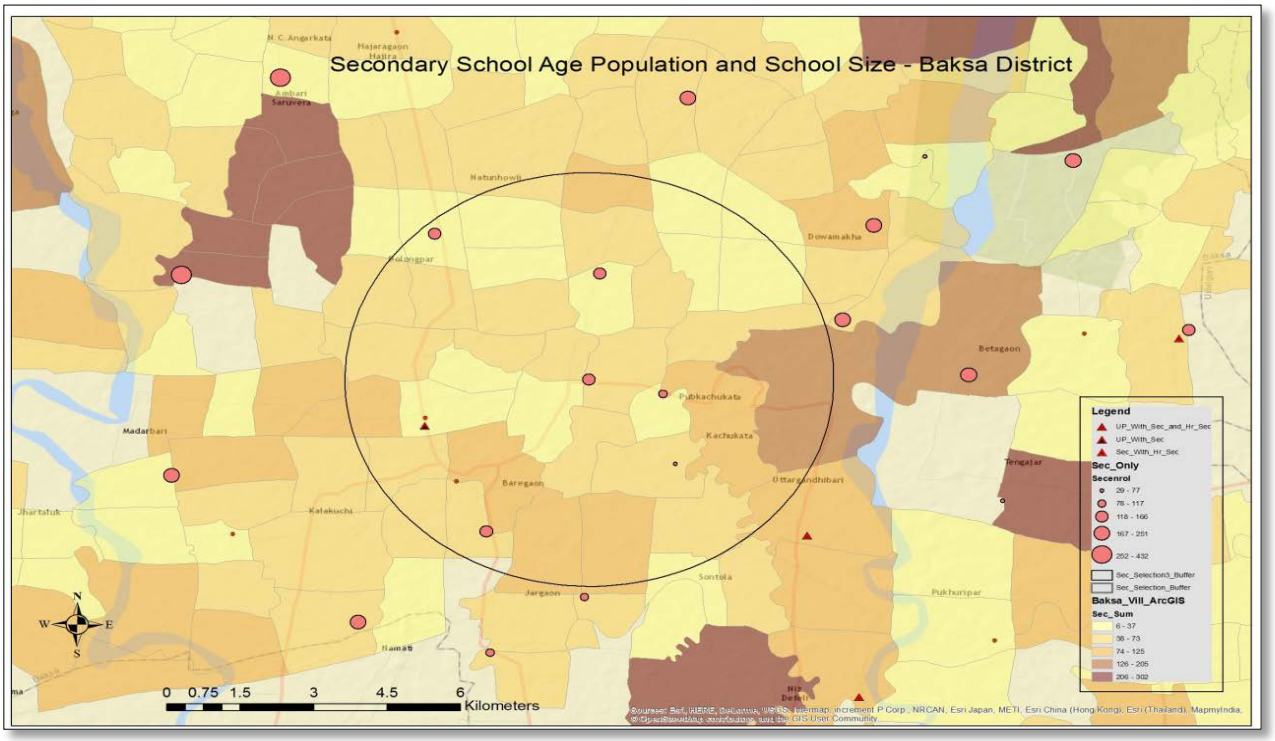
Within the purposively-selected 5 kilometre radius there are 12 government secondary schools with a total of 1,052 students and 53 classrooms, serving a total secondary school aged population of 1,093 with 8 out of the 12 secondary schools having enrolments between 29 and 77 students. The analysis here indicates excess capacity generated due to fewer students relative to the number of classrooms; the

[12]The Class utilisation rate calculated from UDISE 2013-2014 data: average students per classroom / capacity of a classroom (assumed to be 40 students per classroom).

average class size is thus roughly 20:1. The distribution suggests that total estimated classroom capacity is for 2,120 pupils (53 classroom x 40 students per classroom). Therefore the utilisation of capacity of secondary schools is only 49.6%. There are very small secondary schools located where there is very little demand for a secondary school, and there are small secondary schools located where there is slightly higher demand as indicated by the secondary school aged population.

Assam education department did not open any new government schools since 1970s instead it took over the schools that have been opened by the community members through a process called 'provicialisation'. The analysis clearly indicates that the provincialisation policy is insensitive to the distribution of existing government schools as well as to the demand of secondary education, as measured by the population of secondary schools age children. This possibly resulted in the proliferation of large number of small schools with high unutilised capacity.

Figure 36: Secondary school age population and school size



11. Conclusion

India has committed itself to increase enrolments in secondary school rapidly and close the gaps in participation between states and social groups. Much has been achieved but there is still a long way to go to ensure that all children have access to schools of appropriate quality. Recent Joint Review Missions have expressed concern that patterns of growth have resulted in large numbers of small secondary schools with enrolments below 150 and a high proportion of small standalone schools. Schools with less than 50 students in grades 9 and 10 make up more than 30% of all schools in more than 40% of the States. Only five States have less than 50% small schools. Schools with enrolments below 100 have on average pupil teacher ratios of only 8:1. Small schools can cost more than three times as much to operate in terms of costs per child than schools with more than 300 students. Only 35% of small schools have a full complement of trained teachers in the four core subjects, and the smaller the school the greater the number of general teachers without a qualification in a specialism.

11.1 Key Findings

This research study arrives at several key findings, all with implications for policy and planning. From the analysis we note that:

- Participation rates in secondary school have increased over the RMSA period from around a GER of 60% to GER of 75%. Dropout in grade 8 and below remains substantial and results in about 40% of children failing to reach grade 9.
- The participation rates of boys and girls in secondary school are approaching parity. This does not mean that there are similar numbers enrolled since there are up to 15% more boys in the school age population in some states. Scheduled Tribes are likely to be in smaller schools.
- The proportion of private schools at secondary level has grown from 28% to 40% and the proportion of government schools has fallen from 52% to 43%. There is a limit of affordability that means that most future growth in provision is likely to be in fee free government schools.
- The size of secondary schools has been falling in some states and continuing to increase in others with falls most common in the higher enrolment states. .
- The numbers of small secondary schools (defined as those serving fewer than 150 pupils) has remained at high levels, accounting for more than 60% of all schools, and much more in some states. Many of the schools opened recently are small with 35% of schools opened since 2011 having under 25 pupils. Many new schools are stand-alone, serving only grades 9 and 10, and thus will have difficulties in becoming efficient.
- Small schools are concentrated in some states more than others and in parts of some states. About 20% of the districts have just about 4% of small schools whereas around 63% of the small schools were found to be concentrated in 40% of the districts.
- Pupil teacher ratios increase with school size over a wide range and are less than 8 for the smallest schools with enrolments below 100 and over 45:1 in schools with enrolments over 400. Private schools tend to have higher PTRs. Class sizes vary from under 20 to over 70 and are largest in government schools and are closely related to school size and largest in the largest schools.

- Many schools do not have a full complement of trained teachers in the four core subjects. Over 30% of the smallest government schools are found to have all of the required core subject teachers13 as compared to 45% of schools with 400 or more pupils. Only 30% of private schools have all core teachers independent of their size.
- Only 2% of the smallest government schools had a science laboratory, computer laboratory, library and functional computer. The proportion increased to over 10% in the case of the largest schools. Stand-alone schools had fewer facilities than composite schools.
- Small school cannot provide enough teaching to fully employ specialist teachers. If staffed according to the norms teachers will only have 25% of a full workload.
- Recurrent costs per child applying the norms for RMSA vary from approximately INR 14,000 in schools with enrolments of 300 or more, to INR 16,000 for enrolments of around 200, and over INR 20,000 for enrolments of 100. In the smallest schools, with enrolments of 25 or less in grades 9 and 10, costs per child would exceed INR 100,000. Actual costs from school census data mirror these costs with a slightly flatter profile.
- Larger schools with over 300 enrolled are more than five times as efficient in translating inputs (as indicated by number of teachers per student, the number of classroom per student, toilets per student and core facilities per student) into outputs (the pass percentage on the grade 10 examination).
- Larger composite schools achieve better examination results but there is little effect of size on the results of stand-alone schools. STs perform better in smaller schools whereas SCs perform better in larger schools.
- The number of 6 year olds for all-India is expected to decline from almost 25 million in 2011 to almost 17 million in 2025, or by more than 30%. This declining trend is consistent across all case study states which will witness a sharp drop in the age 6 population until 2017. The population of children aged 14 and 15 (secondary school age) is likely to increase from almost 51 million to 55 million between 2012 and 2015 before declining to under 39 million by 2025.
- Expanded capacity needs to be profiled against demand otherwise there is a risk of overshoot as more places are created and the school age population starts to fall. This will happen at different rates in different locations.
- In one typical area in Assam there are a very large numbers of schools (e.g. 12 schools in one 5 kilometre-radius area) close together, and this is not justified by the density of the school-aged population in this area.

The evidence suggests that growth and the resource needs of small schools have not been managed in an efficient manner. The intention has been to provide a school within a very short distance of every habitation. However if schools are established in poor communities with small enrolments and are poorly resourced, then the result may be that these already marginalised communities are receiving a sub-standard education. These children often require more resources for learning and more effective schools. Paradoxically it may be inequitable if very small schools are left to struggle with very poor physical resourcing and under qualified staff. Under the norms for resourcing schools there is no carefully

[13] Core subject teachers are: Mathematics, English, Regional Language and Social Science

calibrated differentiation on how to address the small school issue. These schools may call for modified curricula and pedagogies to deal with real-world situations where it is impracticable to equip and staff a very small school in the same way as a large school with all of the required facilities and infrastructure, such as laboratories, libraries, computer rooms and other facilities.

It is clear that small schools are highly cost inefficient. If small schools were resourced according to the relevant norms, the unit cost per pupil in the smallest school category would be seven times that in schools of 400 pupils. Not only are such schools inefficient in terms of unit costs, but they are also inefficient in converting inputs into educational outcomes, as measured in this study by scores on Board examinations. Presently most schools are not in fact resourced according to norms, with more generalist teachers and worse facilities and resourcing than norms indicate. Unsurprisingly pupils in larger composite schools consistently and fairly significantly out-perform pupils in smaller schools. It is possible that there is some self-selection issue, with pupils from high income households and better socioeconomic backgrounds electing to go to larger schools. The positive effect on learning achievement of school size holds for SCs but not for STs. This may be because STs in large schools may have moved outside tribal areas and be distant from support in their own language etc. It is a key issue that while it may appear equitable to bring schools close to those who need them, this is only true if provision is of similar quality in schools of different sizes.

Government policies have aimed at increasing all young people's access to government provision. The numbers of private schools and their share of all enrolments have been growing, especially amongst children from higher income households. The rate of expansion has varied between states. Private for profit schools have increased faster than private-aided schools, which have stagnated. This has implications for government planners who need to take into account the growth in the un-planned private schools that are likely to be unevenly distributed and concentrated in relatively wealthy areas. Adherence to siting norms may be inefficient if these do not take into account patterns of effective demand for different types of school, and recognise that affordability will exclude the poorest children from attending private secondary schools.

The demographic transition currently taking place in some states, and soon to take place in others, has serious implications for planning and resourcing. By 2020 most states will witness a decline in the secondary school-aged population. There has been a significant reduction over the last decade in the numbers of children enrolled in primary grade one. In other states the secondary age group will continue to increase for the next five years and drop-off after that time. This means that planning for current demand could result in the generation of capacity that will ultimately be in excess of need. Medium term demand will be determined by demography, topography and the current stock of schools and classrooms.

The GIS modelling exercise presented demonstrates how schools are distributed in terms of their distance from one another. In a typical block in Assam there are areas with very large numbers of schools (e.g. 12 schools in one 5 kilometre-radius area) close together, and unnecessarily so when considering the density of the school-aged population in this area. It appears then that provision has not been based on actual need, with classes operating on average at 50% capacity. More use of GIS mapping can help to make better school siting decisions, taking into account natural barriers such as rivers and mountains.

11.2 Drivers of Small Schools

There are many factors which shape the distribution of schools. This results in varied patterns of concentration of schools in different districts. In some cases small schools have become more concentrated in particular districts. The norms and standards of RMSA are intended to determine the criteria used for new school location and for decisions to upgrade capacity in existing schools. RMSA-TCA fieldwork indicates that though there is widespread awareness of the norms and standards there are many other factors that are driving the development of small schools and patterns of spatial distribution of school size, with consequences for efficiency and effectiveness. School mapping shows this clearly and an illustration from Assam is provided to make the general point.

A short list of factors that can influence school location decisions and influence school size includes:

- Population density can shape the distribution of schools by size. Low density areas will have widely dispersed communities with relatively few school age children. Where communities are fragmented by social status and religious affiliation this may subdivide the population of school age children even in areas of higher population density.
- Geography and local topography determines travel times and accessibility as an overlay on distance to school. Secondary schools are generally larger than village primary schools and recruit students from a wider catchment area with several elementary schools. Travel times of much more than an hour to and from school may become exclusionary and can also have substantial costs so small schools may be favoured despite their higher costs per student.
- In some parts of India private fee paying schooling has been growing. Fee paying private schooling is more likely in middle and high income areas and may have the effect of hollowing out public school systems by attracting students from richer households out of public schools. This can leave public schools in periods of contraction that lead to becoming a small enrolment school.
- Demographic transition and migration are changing the number of school age children and where they are located. This is likely to have a considerable effect on demand for school places and additional teachers which will have long term implications for how capacity should be expanded and managed.
- Small schools when fully staffed according to the norms and standards cannot provide sufficient teaching to all teaching staff. This can create perverse incentives to restrict enrolments in order to minimise work load since salaries are not dependent on student numbers.

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Annexure 1: Average School Size- All Schools

	2009-10	2013-14
Andaman ad Nicobar	129	122
Andhra Pradesh	93*	102
Arunachal Pradesh	139	137
Assam	126*	128
Bihar	550	468
Chandigarh	189	245
Chhattisgarh	164*	162
Dadra Have	246	298
Daman Diu	162*	143
Delhi	282	322
Goa	79	121
Gujarat	151	174
Haryana	99	115
Himachal Pradesh	83*	84
Jammu Kashmir	94	84
Jharkhand	255	239
Karnataka	110	113
Kerala	164*	254
Lakshadweep	16	231
Maharashtra	151	160
Manipur	86	80
Meghalaya	75*	75
Mizoram	47	70
MP	154	182
Nagaland	80	84
Odisha	120	128
Punjab	115	139
Rajasthan	85	98
Sikkim	73	87
Tamil Nadu	215	111
Tripura	136*	190
Uttar Pradesh	189	153
Uttaranchal	124	284
West Bengal	229	120

Annexure 2: Concentration of Small Schools: All Schools

	2009-10	2013-14
Andaman ad Nicobar	0.97	0.99
Andhra Pradesh	1.24	1.14
Arunachal Pradesh	1.14	1.05
Assam	1.06	0.96
Bihar	0.09	0.34
Chandigarh	0.38	0.39
Chhattisgarh	0.87	0.82
Dadra Have	0.61	0.55
Daman Diu	0.76	0.70
Delhi	0.35	0.35
Goa	1.33	1.04
Gujarat	0.98	0.87
Haryana	1.21	1.11
Himachal Pradesh	1.33	1.22
Jammu Kashmir	1.25	1.25
Jharkhand	0.65	0.67
Karnataka	1.19	1.11
Kerala	0.99	0.66
Lakshadweep	1.08	0.33
Maharashtra	1.01	0.94
Manipur	1.29	1.23
Meghalaya	1.36	1.25
Mizoram	1.45	1.33
MP	0.93	0.76
Nagaland	1.32	1.21
Odisha	1.10	1.00
Punjab	1.11	1.15
Rajasthan	1.33	1.24
Sikkim	1.36	1.10
Tamil Nadu	0.75	0.82
Tripura	0.99	0.85
Uttar Pradesh	0.59	0.51
Uttaranchal	1.11	1.07
West Bengal	0.48	0.41

Annexure 3: Pupil Teacher Ratio

	0-25	26-50	51-75	76-100	101-125	126-150	151-175	176-200	201-225	226-250	251-275	276-300	301-325	326-350	351-375	376-400	>400
Andaman & Nicobar	6	11	14	15	14	22	18	14	22	22	20	16	15			44	26
Andhra Pradesh	5	12	16	19	21	22	23	24	25	27	26	27	28	28	29	30	37
Arunachal Pradesh	4	14	19	19	25	27	35	28	51	36	35	36	48	21		27	45
Assam	3	6	8	10	13	15	16	18	20	22	23	26	27	28	33	29	35
Bihar	1	11	21	25	29	32	39	35	40	45	43	46	49	46	45	62	108
Chandigarh	3	6	12	12	22	22	16	18	19	16	23	19	20	25	36	27	25
Chhattisgarh	7	17	26	32	38	42	46	56	61	66	72	82	83	89	85	83	99
Dadra & Nagar Haveli	10	10	13	28	22	30	18	31	31	29			21		38		33
Daman & Diu	4	13	8	14	12	20	16	25	30	24			18	32			
Delhi	3	8	12	12	26	17	18	21	28	28	22	39	27	28	41	35	33
Goa	3	7	11	13	14	14	16	18	17	20	15	16	17	17	23	17	19
Gujarat	6	16	22	28	34	37	43	42	44	46	50	49	46	51	52	50	52
Haryana	6	10	13	16	18	20	22	24	26	28	30	36	34	39	35	54	41
Himachal Pradesh	8	18	26	33	39	42	43	43	50	44	40	41	60	54	31	81	75
Jammu Kashmir	5	10	15	18	21	23	29	37	31	31	38	40	37	47	50	65	46
Jharkhand	7	31	50	54	64	70	78	67	83	74	83	81	100	86	109	78	156
Karnataka	3	8	11	14	17	20	21	24	26	28	26	29	30	33	31	31	36
Kerala	3	7	10	11	12	15	15	16	17	17	17	19	19	20	20	19	22
Lakshadweep			15			7	12	11	12				12	22		11	
Maharashtra	4	10	15	20	23	23	25	25	26	27	27	28	29	27	27	27	31
Manipur	3	7	11	16	21	24	27	28	27	31	29	28	39	32	50	36	46
Meghalaya	4	8	12	14	17	19	19	22	25	31	36	22	25	23	37	50	27
Mizoram	3	6	10	12	14	17	18	20	23	19	14			15		24	26
Madhya Pradesh	10	19	26	30	36	41	42	46	48	48	52	53	52	55	53	56	61
Nagaland	4	10	16	24	25	33	26	32	33	42	38	40	91	89	97	28	25
Orissa	5	10	15	16	20	25	28	30	35	34	39	40	38	45	54	52	45
Pondicherry	4	7	9	11	12	15	14	14	16	12	18	22	10	21	11	14	24
Punjab	9	17	21	21	22	22	24	25	24	24	24	23	27	25	25	25	28
Rajasthan	8	14	21	28	35	41	44	49	54	59	62	65	67	69	59	68	73
Sikkim	7	12	17	17	26	22	28	23	23	36	31	22	157	32	32	23	34
Tamil Nadu	5	9	14	19	23	25	26	28	29	30	29	29	30	29	32	31	34
Tripura	4	9	15	20	26	31	37	38	51	62	56	75	65	84	64	57	102
Uttar Pradesh	3	14	21	26	31	36	40	44	50	51	56	62	63	63	64	71	105
Uttaranchal	5	8	12	15	18	24	26	34	37	39	44	57	52	68	92	62	127
West Bengal	1	8	12	16	19	22	24	27	28	30	31	33	37	37	35	39	48

Annexure 4: Pupil Teacher Ratio-Government Schools

	0-25	26-50	51-75	76-100	101-125	126-150	151-175	176-200	201-225	226-250	251-275	276-300	301-325	326-350	351-375	376-400	>400
Andaman & Nicobar	6	11	14	18	13	22	18	14	18	22	20	16	15			44	26
Andhra Pradesh	4	9	13	16	17	18	20	21	21	23	21	23	23	23	21	26	25
Arunachal Pradesh	6	18	20	19	24	25	34	28	51	36	35	36	48	21		27	45
Assam	3	5	7	9	12	14	16	18	19	22	22	26	27	27	33	28	35
Bihar	2	15	27	28	39	44	52	45	47	56	52	52	62	58	58	71	117
Chandigarh				11	20	22	16	18	18	13	21	18	16	18	37	23	25
Chhattisgarh	24	29	33	34	39	42	48	56	65	69	73	91	87	92	87	101	110
Daman & Diu		13	8	13	12	20	15	14	18	24			26				
Delhi	2	8	14	17	37	15	14	18	27	30	19	38	24	31	32	64	32
Goa	2	5	9	11	15	12	14		45	13							
Gujarat	11	21	26	31	34	33	39	42	42	40	46	48	42	50	41	27	45
Haryana	3	6	8	11	12	14	16	17	18	19	21	21	22	25	23	20	29
Himachal Pradesh	8	19	28	35	43	43	47	49	50	48	44	49	60	74	23	81	67
Jammu Kashmir	4	9	13	16	20	21	28	32	32	33	36	38	44	44	47	45	71
Jharkhand	17	64	59	62	81	104	87	95	117	108	136	161	117	102	196	371	180
Karnataka	2	7	10	13	15	19	20	23	25	28	25	28	27	32	32	29	36
Kerala	4	8	10	12	12	15	16	17	19	17	17	18	18	21	21	21	23
Lakshadweep			15			7	12	11	12				12	22		11	
Maharashtra	10	15	18	22	23	23	26	25	24	25	26	25	33	24	26	35	30
Manipur	2	5	8	15	18	20	21	29	18	38	132	20	39	18			36
Meghalaya	5	8	12	13	19	15	17	15	13			11		15			
Mizoram	3	6	9	12	12	18	16	15	17	19	12			15		24	21
Madhya Pradesh	14	18	19	24	30	35	37	39	41	41	43	45	47	49	48	48	53
Nagaland	3	7	9	14	13	22	15	17	22	69	18	26		74	60	30	19
Orissa	6	12	20	21	22	26	30	32	36	33	38	41	40	44	52	49	40
Pondicherry		5	8	13	15	17	12	15	20	13	18	17	10	15	14	14	15
Punjab	9	16	20	19	21	22	22	23	21	22	23	20	25	23	23	23	22
Rajasthan	10	13	18	24	29	35	36	40	48	48	51	50	56	60	46	63	53
Sikkim	6	12	17	17	25	21	27	23	19	36	48		157	32	32	23	34
Tamil Nadu	6	10	14	19	24	25	27	28	28	28	27	26	26	27	28	27	27
Tripura	5	10	15	20	26	33	37	40	54	67	54	80	65	82	88	57	117
Uttar Pradesh	9	22	27	30	34	35	37	37	51	31	48	58	41	41	73	40	72
Uttaranchal	4	7	10	13	16	19	21	27	27	29	30	33	37	43	66	47	56
West Bengal	2	7	12	16	19	21	24	27	28	30	31	34	37	37	36	39	48

Annexure 5: Percentage of Schools with Core Subject teacher- All Schools

	0-25	26-50	51-75	76-100	101-125	126-150	151-175	176-200	201-225	226-250	251-275	276-300	301-325	326-350	351-375	376-400	>400
Andaman & Nicobar	17	16	28	38	63	20	71	100	67	0	0	100	100			0	100
Andhra Pradesh	47	38	39	42	45	47	51	52	57	60	58	59	73	65	64	55	62
Arunachal Pradesh	43	23	16	19	35	27	7	33	0	50	50	57	33	25		20	57
Assam	20	31	39	43	44	46	41	46	48	46	45	44	47	44	55	71	44
Bihar	48	42	38	36	32	39	30	28	24	25	26	20	21	24	20	13	19
Chandigarh	50	50	29	67	50	60	69	79	73	67	80	60	50	57	80	75	75
Chhattisgarh	32	31	28	28	31	34	30	33	35	35	37	33	36	34	35	26	33
Dadra & Nagar Haveli	50	0	50	33	67	33	0	100	100	67			100		100		92
Delhi	77	94	94	92	98	98	98	99	99	99	99	100	99	100	98	100	100
Goa	42	45	36	46	40	76	65	60	68	67	67	50	40	33	33	25	89
Gujarat	18	13	16	19	17	20	19	23	25	26	23	26	29	33	28	27	37
Haryana	49	50	57	56	59	58	56	60	57	62	59	64	55	58	63	67	65
Himachal Pradesh	33	26	22	19	18	17	23	25	27	24	52	29	30	22	50	60	25
Jammu Kashmir	13	13	16	17	20	24	21	23	31	30	33	50	20	21	29	0	24
Jharkhand	65	55	53	46	49	47	50	49	43	42	43	36	41	29	49	36	37
Karnataka	36	23	19	19	18	20	20	19	24	23	21	21	22	26	26	22	31
Kerala	33	31	32	31	37	41	46	42	47	51	54	56	61	59	60	67	69
Lakshadweep		0	0			0	100	0	0				33	50		100	
Maharashtra	30	28	33	33	36	37	42	43	41	43	44	43	48	47	53	47	59
Manipur	54	40	34	45	38	43	39	43	46	55	33	18	17	75	29	40	50
Meghalaya	37	40	44	41	50	34	54	45	35	36	29	60	100	80	0	0	67
Mizoram	86	74	70	78	79	74	85	70	100	100	100			100		100	80
Madhya Pradesh	52	48	52	53	56	58	58	57	58	62	62	62	61	56	60	67	67
Nagaland	63	46	48	62	53	55	72	63	55	33	67	100	100	60	25	80	50
Orissa	29	22	29	23	21	21	21	21	22	25	24	21	20	32	20	26	30
Pondicherry	46	41	54	48	74	53	78	71	75	100	64	75	100	83	75	100	73
Punjab	25	15	10	10	9	8	12	8	13	14	14	18	19	22	33	10	26
Rajasthan	26	19	16	12	13	13	13	12	14	14	16	11	10	14	17	19	19
Sikkim	24	43	19	24	12	27	25	33	60	25	0	100	0	0	0	25	0
Tamil Nadu	22	25	26	28	25	29	30	30	33	36	37	34	37	37	42	42	48
Tripura	28	18	13	10	20	7	22	19	15	12	12	11	18	21	29	13	18
Uttar Pradesh	47	24	25	23	24	24	24	24	24	24	21	26	21	23	26	21	27
Uttaranchal	41	49	50	57	57	53	53	50	53	50	50	39	58	40	50	50	46
West Bengal	24	26	21	21	23	24	27	23	28	25	25	30	29	29	34	33	33

Annexure 6: Percentage of Schools with Core Subject teacher- Government Schools

	0-25	26-50	51-75	76-100	101-125	126-150	151-175	176-200	201-225	226-250	251-275	276-300	301-325	326-350	351-375	376-400	>400
Andaman & Nicobar	9	13	31	43	71	20	71	100	100	0	0	100	100			0	100
Andhra Pradesh	55	38	41	44	49	53	56	58	64	68	69	73	86	80	80	75	84
Arunachal Pradesh	38	24	11	16	27	27	8	36	0	50	50	57	33	25		20	57
Assam	29	44	41	45	48	49	42	49	50	48	45	44	46	47	53	75	45
Bihar	50	40	38	33	36	41	30	30	21	26	23	16	15	23	22	9	19
Chandigarh	0		100	60	50	83	73	83	71	100	88	86	100	75	75	67	87
Chhattisgarh	50	35	32	30	31	36	32	35	34	37	36	37	35	35	35	27	31
Daman & Diu		67	50	75	100	100	100	100	100	50			50				
Delhi	75	90	100	100	100	97	100	100	100	100	100	100	100	100	100	100	100
Goa	67	56	47	55	0	86	67		0	100							
Gujarat	9	8	13	17	14	13	20	45	23	23	0	33	29	63	0	0	42
Haryana	57	69	75	73	73	76	72	79	73	76	84	82	79	80	93	100	91
Himachal Pradesh	21	22	19	18	16	17	23	26	26	24	50	30	50	14	0	60	40
Jammu Kashmir	17	16	19	21	22	26	26	26	35	26	37	47	19	33	20	0	0
Jharkhand	75	60	59	46	49	50	44	54	43	44	34	26	38	25	48	38	29
Karnataka	49	22	18	19	18	21	20	17	25	25	23	23	22	27	25	18	37
Kerala	25	38	39	31	32	51	45	43	49	55	51	65	52	54	44	72	68
Lakshadweep			0			0	100	0	0				33	50		100	
Maharashtra	58	33	27	29	36	36	44	45	46	53	33	50	50	42	50	57	58
Manipur	61	43	49	21	31	44	11	17	50	33	0	0	0	100			100
Meghalaya	83	29	25	57	60	25	50	0	50	0		100		100			
Mizoram	91	77	81	79	89	83	83	100	100	100	100			100		100	100
Madhya Pradesh	67	65	65	67	66	68	66	65	68	70	71	73	68	65	71	76	76
Nagaland	65	47	39	62	36	67	40	60	100	0	75	100		50	100	100	33
Orissa	31	19	29	20	20	19	21	19	20	24	23	18	18	30	19	24	26
Pondicherry	50	33	40	43	67	60	100	79	50	100	75	100	100	100	100	100	100
Punjab	77	6	7	5	7	6	5	5	7	12	3	11	16	17	22	8	21
Rajasthan	31	21	15	12	11	10	13	10	15	18	15	8	7	16	10	0	11
Sikkim	13	47	19	24	13	25	27	38	50	25	0		0	0	0	25	0
Tamil Nadu	21	29	28	31	24	31	29	33	36	38	39	33	42	46	47	49	58
Tripura	22	17	13	8	20	8	23	16	11	13	13	12	19	22	38	17	15
Uttar Pradesh	36	7	12	13	10	14	14	20	18	21	26	25	18	23	18	14	31
Uttaranchal	45	57	56	65	66	64	71	55	65	66	61	47	67	36	83	43	62
West Bengal	21	23	23	22	23	25	27	23	29	25	26	29	29	29	33	33	33

Annexure 7: Percentage of Schools Having Teachers with No Professional Qualification-All Schools

	0-25	26-50	51-75	76-100	101-125	126-150	151-175	176-200	201-225	226-250	251-275	276-300	301-325	326-350	351-375	376-400	>400
Andhra Pradesh	2	1	1	1	1	1	0	0	0	1	0	1	1	1	1	2	2
Arunachal Pradesh	52	42	32	26	30	42	42	27	27	18	24	9	5	22		24	22
Assam	89	89	91	88	86	84	82	83	79	83	81	80	82	78	77	84	79
Bihar	70	65	49	57	48	48	45	41	46	46	43	39	50	49	48	42	29
Chandigarh	0	5	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0
Chhattisgarh	74	73	55	45	37	37	34	33	30	32	36	34	30	28	35	27	28
Delhi	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gujarat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Haryana	1	1	1	1	0	1	0	0	0	0	1	0	1	1	1	2	0
Himachal Pradesh	2	1	2	1	2	2	3	6	1	3	3	5	13	0	13	0	0
Jammu Kashmir	17	24	22	18	20	19	20	21	26	23	22	19	20	22	0	17	11
Jharkhand	41	56	31	23	31	20	24	14	25	17	15	20	18	12	11	16	12
Karnataka	10	6	4	4	5	3	4	3	4	2	4	1	3	2	4	3	5
Kerala	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Lakshadweep			0			0	0	0	0				0	0		34	
Maharashtra	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Manipur	36	52	62	61	65	48	50	66	68	52	50	76	56	56	54	78	39
Meghalaya	87	77	68	62	54	58	46	36	49	55	33	33	51	24	50	100	0
Mizoram	83	69	60	54	48	52	45	28	50	43	54			9		50	39
Madhya Pradesh	46	44	36	24	21	17	16	14	14	13	11	10	13	11	13	8	10
Nagaland	64	66	65	73	73	51	60	60	67	89	72	52	71	89	100	58	68
Orissa	20	19	17	15	14	10	10	12	9	11	7	14	15	10	10	1	9
Pondicherry	1	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0
Punjab	18	13	7	4	5	5	5	5	5	4	6	6	4	6	3	3	6
Rajasthan	7	6	5	5	5	5	5	7	7	5	4	5	3	6	9	8	9
Tamil Nadu	2	1	1	1	1	1	3	1	2	1	2	1	1	1	1	1	1
Tripura	77	72	65	61	56	47	41	43	53	40	28	35	24	41	38	27	23
Uttar Pradesh	42	33	34	37	34	31	30	33	32	33	28	30	31	30	31	34	31
Uttaranchal	4	2	1	2	2	3	3	2	5	4	5	3	1	0	13	5	6
West Bengal	44	28	30	29	29	27	28	25	26	25	24	27	26	24	27	28	31

Annexure 8: Percentage of Schools Having Teachers with No professional Qualification- Government Schools

	0-25	26-50	51-75	76-100	101-125	126-150	151-175	176-200	201-225	226-250	251-275	276-300	301-325	326-350	351-375	376-400	>400
Andhra Pradesh	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Arunachal Pradesh	53	33	25	22	25	39	40	26	27	18	24	9	5	22		24	22
Assam	80	81	88	82	83	81	80	81	77	82	81	80	81	76	76	83	79
Bihar	51	51	39	51	37	26	23	27	28	35	25	18	34	27	29	31	23
Chandigarh				0	0	0	0	0	0	0	2	0	0	0	0	0	0
Chhattisgarh	30	36	25	25	24	25	26	28	24	28	30	29	27	24	32	26	21
Delhi	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Goa	17	0	5	0	0	10	21		0	0							
Gujarat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Haryana	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Himachal Pradesh	0	0	1	1	3	2	1	4	1	2	0	7	0	0	38	0	0
Jammu Kashmir	7	9	9	10	10	14	15	14	15	15	17	14	18	16	0	20	0
Jharkhand	9	20	10	8	10	4	7	1	5	17	4	0	9	4	9	0	5
Karnataka	6	3	3	2	3	2	4	2	1	1	3	1	3	2	1	0	2
Kerala	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lakshadweep			0			0	0	0	0				0	0		34	
Maharashtra	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0
Manipur	17	28	29	26	36	24	19	33	27	26	0	100	0	16			23
Meghalaya	89	32	0	11	33	38	39	55	28			31		0			
Mizoram	81	46	36	28	27	31	12	17	0	0	0			9		0	0
Madhya Pradesh	14	3	4	4	5	5	4	5	4	4	6	4	7	5	4	6	7
Nagaland	61	59	48	60	61	40	63	49	50	71	64	36		78	100	41	68
Orissa	9	9	7	7	7	5	5	5	5	8	5	5	6	11	6	1	5
Pondicherry		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Punjab	5	1	1	3	3	4	4	4	5	2	5	5	3	5	1	0	3
Rajasthan	2	1	2	1	2	2	3	2	1	1	2	5	0	0	2	3	10
Tamil Nadu	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	1	0
Tripura	76	69	66	59	56	40	40	49	50	36	25	38	21	42	32	24	28
Uttar Pradesh	41	20	18	15	25	32	19	23	21	44	12	18	27	11	26	52	20
Uttaranchal	2	1	1	1	1	1	1	1	4	4	2	2	0	0	0	4	3
West Bengal	22	18	24	26	26	26	26	22	25	24	23	25	25	23	26	26	29

Annexure 9: Student Classroom Ratio-All Schools

	0-25	26-50	51-75	76-100	101-125	126-150	151-175	176-200	201-225	226-250	251-275	276-300	301-325	326-350	351-375	376-400	>400
Andaman & Nicobar	10	18	25	29	28	32	31	33	40	36	43	28	32			65	53
Andhra Pradesh	8	24	36	47	52	55	59	61	65	64	64	68	68	67	73	72	84
Arunachal Pradesh	5	19	27	34	41	46	53	53	68	54	54	48	54	52		59	73
Assam	6	16	25	32	39	44	50	55	60	62	67	70	72	81	78	83	99
Bihar	2	13	24	39	40	45	50	53	65	67	63	64	70	70	67	80	129
Chandigarh	8	18	19	35	38	37	37	44	41	44	44	49	43	49	48	49	52
Chhattisgarh	8	19	31	44	51	57	60	65	70	68	73	77	80	80	80	77	85
Dadra & Nagar Haveli	10	22	28	36	40	43	46	46	48	46			53		53		54
Daman & Diu	10	22	28	43	28	34	43	46	35	44			46	44			
Delhi	4	16	25	32	31	34	37	38	38	38	42	42	46	44	45	47	56
Goa	6	16	30	36	36	38	40	46	43	42	45	46	48	44	43	51	50
Gujarat	6	18	28	38	47	52	50	50	51	57	59	59	58	60	61	62	65
Haryana	7	16	26	32	35	38	40	45	48	48	45	49	54	46	49	52	55
Himachal Pradesh	7	18	30	40	48	50	50	54	58	57	62	65	49	58	35	98	65
Jammu Kashmir	7	16	25	29	34	39	42	47	55	47	55	64	55	78	58	61	55
Jharkhand	5	27	33	42	48	53	72	67	64	75	67	80	75	85	97	100	120
Karnataka	6	20	31	40	48	55	58	64	63	70	66	71	72	79	80	73	92
Kerala	6	15	22	26	27	31	32	33	37	38	38	39	40	42	41	42	46
Lakshadweep			29			30	52	38	33				33	32		34	
Maharashtra	7	20	31	42	48	49	51	52	55	57	60	58	60	60	63	63	72
Manipur	5	16	24	32	41	46	44	57	58	57	56	56	58	65	60	47	69
Meghalaya	8	18	29	40	45	51	55	56	60	59	65	67	87	61	184	200	69
Mizoram	9	18	28	37	41	49	51	47	62	43	53			48		59	52
Madhya Pradesh	6	13	21	30	40	45	51	60	58	65	70	72	75	78	75	78	95
Nagaland	5	17	26	35	40	44	62	59	65	50	74	60	67	112	97	67	82
Orissa	11	25	44	52	59	72	82	88	95	95	106	108	105	106	105	96	118
Pondicherry	9	16	29	33	33	32	36	37	45	36	40	42	36	42	32	42	53
Punjab	7	18	28	33	36	38	43	42	45	45	49	50	49	47	48	50	58
Rajasthan	9	21	32	42	47	50	53	56	56	56	57	58	60	58	57	72	61
Sikkim	5	20	29	36	40	42	46	51	44	47	48	49	52	65	59	62	63
Tamil Nadu	7	18	29	34	35	37	38	40	41	43	43	43	43	45	44	46	50
Tripura	9	24	35	52	64	77	100	96	104	119	113	127	92	168	153	136	169
Uttar Pradesh	2	10	15	20	24	28	33	37	42	45	48	53	57	60	61	68	101
Uttaranchal	8	19	29	37	43	48	49	51	53	61	58	58	56	51	73	66	81
West Bengal	4	23	31	44	51	55	61	63	69	70	77	80	83	89	90	93	117

Annexure 10: Student Classroom Ratio-Government Schools

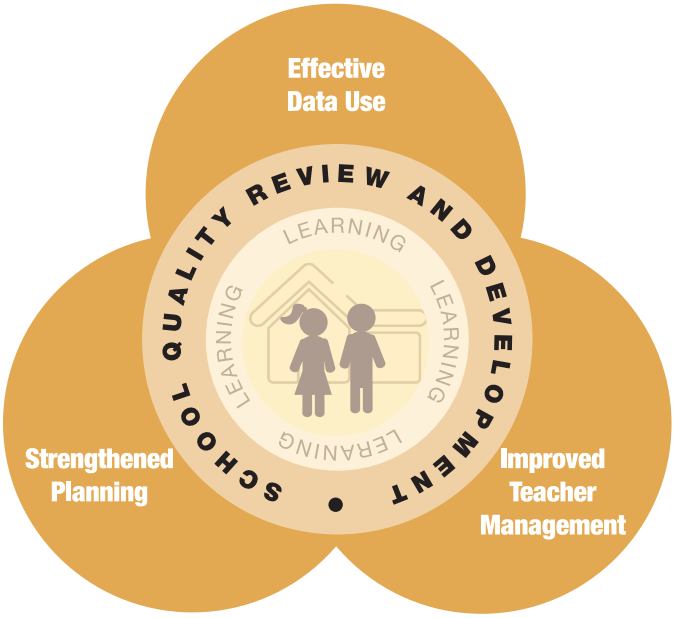
	0-25	26-50	51-75	76-100	101-125	126-150	151-175	176-200	201-225	226-250	251-275	276-300	301-325	326-350	351-375	376-400	>400
Andaman & Nicobar	10	19	26	31	27	32	31	33	34	36	43	28	32			65	53
Andhra Pradesh	7	24	35	45	51	52	57	61	59	60	59	64	59	64	69	66	69
Arunachal Pradesh	6	20	29	36	42	45	51	54	68	54	54	48	54	52		59	73
Assam	6	17	25	31	38	44	49	54	59	62	66	71	73	79	76	82	98
Bihar	2	18	28	43	49	55	58	65	74	81	68	68	74	75	77	83	137
Chandigarh			28	44	37	39	40	45	47	47	44	51	51	51	48	54	59
Chhattisgarh	12	34	39	52	56	62	62	68	72	70	77	83	83	84	82	80	89
Dadra & Nagar Haveli	8				35	40	46	46	43	48			53		53		55
Daman & Diu		22	33	43	28	34	41	45	51	44			44				
Delhi	2	16	25	27	29	35	38	38	37	36	42	41	48	45	47	50	60
Goa	7	13	29	32	34	39	34		38	32							
Gujarat	8	20	31	39	52	48	45	49	49	55	47	64	55	54	52	59	64
Haryana	10	21	29	35	37	40	43	50	49	50	53	54	58	50	60	60	73
Himachal Pradesh	10	21	32	42	52	55	54	58	61	67	66	73	64	66	60	98	88
Jammu Kashmir	8	17	27	31	36	40	46	51	60	52	62	68	70	91	59	75	88
Jharkhand	7	28	35	45	49	52	77	65	67	79	69	77	85	79	116	120	119
Karnataka	6	22	31	39	46	52	54	61	65	73	66	71	73	76	91	88	88
Kerala	8	17	26	28	28	36	33	38	38	38	38	36	44	41	43	41	46
Lakshadweep			29			30	52	38	33				33	32		34	
Maharashtra	8	21	32	42	47	47	46	52	54	55	53	50	65	55	64	61	75
Manipur	5	14	22	33	39	39	40	71	67	90	66	99	39	84			232
Meghalaya	12	22	40	39	43	42	53	58	35	39		44		56			
Mizoram	8	17	27	35	36	44	46	37	43	40	38			48		54	53
Madhya Pradesh	10	22	32	38	49	54	57	68	64	74	77	81	81	85	84	86	96
Nagaland	4	18	29	39	47	42	59	59	85	69	96	70		333	90	68	70
Orissa	11	28	48	53	59	69	79	87	87	87	106	112	100	109	104	100	111
Pondicherry	6	16	28	33	33	34	33	36	47	35	38	39	36	37	38	41	39
Punjab	6	21	31	34	37	40	44	46	49	49	52	52	54	51	66	56	65
Rajasthan	12	22	34	44	51	55	57	60	60	60	67	63	66	67	59	99	66
Sikkim	6	21	29	39	42	43	46	49	47	47	48		52	65	59	62	63
Tamil Nadu	11	23	32	38	39	39	41	42	43	43	43	43	42	44	45	46	46
Tripura	13	24	35	49	60	78	101	96	97	116	107	130	87	178	195	102	158
Uttar Pradesh	3	10	19	24	33	37	45	51	52	62	67	72	69	67	76	78	120
Uttaranchal	10	21	32	39	45	51	52	57	59	67	60	65	75	40	73	90	89
West Bengal	5	20	32	43	51	55	62	63	69	70	76	80	84	89	90	94	116

Annexure 11: Average Pass Percentage-All Schools

	0-25	26-50	51-75	76-100	101-125	126-150	151-175	176-200	201-225	226-250	251-275	276-300	301-325	326-350	351-375	376-400	>400
Andaman & Nicobar	100	100	100	99	99	99	99	99	98	99	100	99	99	100			100
Andhra Pradesh	91	91	87	87	88	82	80	85	82	77	83	67	80	72	86	89	81
Arunachal Pradesh	100	90	85	90	95	89	81	88	86	86	87	82		91	88		86
Assam	70	71	70	72	72	75	74	75	73	75	73	75	68	73	71	66	61
Bihar	73	79	78	78	73	72	79	76	77	74	75	77	75	76	75	72	73
Chandigarh		86	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Chhattisgarh	60	71	62	63	63	62	60	58	60	59	59	59	55	54	61	58	56
Dadra & Nagar Haveli		79	100	60	92	49	55	100	41	71		55	25	16	16		38
Daman & Diu				95	90		80		100	96		93	97	91			
Delhi		98	99	100	99	99	98	99	99	99	99	99	98	99	100	99	99
Goa	58	78	80	79	85	84	87	80	88	92	85	96	100		91	90	77
Gujarat	69	67	67	71	74	75	73	73	74	73	78	75	73	74	80	75	76
Haryana	72	74	71	69	66	68	65	63	67	74	71	77	61	65	76	70	67
Himachal Pradesh	70	74	73	70	69	66	62	63	65	59	56	36	73	55	54	49	74
Jammu Kashmir		50	53	15	44	20	16		24	78	24	49	32			100	21
Jharkhand	84	73	78	83	74	81	80	75	81	82	72	81	77	81	78	85	76
Karnataka	77	85	82	85	86	85	84	84	83	82	84	82	81	84	83	83	80
Kerala	98	99	97	98	98	99	96	97	98	98	95	98	94	96	97	96	94
Lakshadweep					87	95	97			99	68	41					
Maharashtra	78	79	78	81	81	81	80	80	80	83	83	83	82	84	84	86	85
Manipur	59	66	78	80	79	87	80	88	85	86	96	77	100	99	95		92
Meghalaya	61	68	70	75	74	73	78	82	80	63	80	85	96	100	8	91	97
Mizoram	45	59	70	76	75	80	97	85	77	79	78	79	66	90	100	99	99
Madhya Pradesh	67	66	65	68	67	67	65	60	62	66	63	60	59	55	61	57	53
Nagaland	62	64	66	78	71	72	60	89	82	88	51	100			36		29
Orissa	63	67	70	72	76	77	77	77	77	77	78	78	78	80	70	74	72
Pondicherry	97	97	97	96	95	96	91	88	89	95	88	88	98	86	94	88	98
Punjab	80	87	89	87	87	87	85	87	84	86	86	89	93	92	86	94	92
Rajasthan	66	68	71	70	70	70	67	67	70	68	70	71	71	70	69	66	76
Sikkim	94	96	98	95	97	97	98	98	79	92	97	99	99	100	100	100	
Tamil Nadu	90	93	92	90	90	88	88	87	87	86	87	86	86	86	86	84	88
Tripura	70	68	67	69	63	65	64	69	66	74	71	63	73	74	66	77	60
Uttar Pradesh	83	84	84	86	85	84	84	85	85	85	86	86	85	85	85	85	84
Uttaranchal	75	78	76	77	76	77	80	76	77	80	77	80	77	68	78	72	75
West Bengal	70	79	83	81	85	82	85	84	84	85	82	82	83	83	84	85	80

Annexure 12: Average Pass Percentage-Government Schools

	0-25	26-50	51-75	76-100	101-125	126-150	151-175	176-200	201-225	226-250	251-275	276-300	301-325	326-350	351-375	376-400	>400
Andaman & Nicobar	100	100	100	99	99	99	99	99	98	99	100	99	99	100			100
Andhra Pradesh	89	89	85	84	87	80	79	83	81	77	83	64		72	86	79	75
Arunachal Pradesh		87	79	86	95	88	81	86	86	86	87	82		91	88		86
Assam	71	73	73	76	77	79	76	77	77	76	75	75	70	73	72	66	61
Bihar	60	77	81	77	68	67	77	72	76	69	73	77	74	73	73	71	72
Chhattisgarh	54	60	48	54	57	56	57	55	57	56	56	57	52	51	55	54	53
Dadra & Nagar Haveli				13	100	10	55		41	57		55	25	16	16		31
Daman & Diu				95	90		80			96		93		91			
Delhi		100	99	100	100	99	100	99	98	99	99	99	97	100	100	100	99
Goa	72	82	69	71	93	87	47		87								
Gujarat	52	54	58	67	69	67	70	65	63	62	80	51	45	52	59	50	61
Haryana	73	63	52	49	46	49	41	38	49	53	45	38	41	37	26	10	36
Himachal Pradesh	71	71	70	67	66	63	59	57	59	58	52	36	56	41	45	36	59
Jammu Kashmir		50	53	15	44	20	16		24	78	24	49	32			100	21
Jharkhand	79	60	70	81	68	77	75	66	72	74	61	69	60	72	69	81	72
Karnataka	71	86	87	87	85	84	82	80	79	80	78	80	76	80	74	75	70
Kerala	96	98	95	96	98	98	96	97	96	96	92	97	89	97	95	94	93
Lakshadweep					87	95	97			99	68	41					
Maharashtra	37	71	70	69	69	70	71	64	65	75	79	76	72	75	69	80	68
Manipur	53	61	66	75	52	85	55	99	68	69	99	17	100	98	95		
Meghalaya		93	98	79	95	89		80	99	100		82	96				
Mizoram	36	53	62	75	68	77		75	67	80	80	59	66	90			100
Madhya Pradesh	73	63	62	67	65	65	64	59	63	63	59	57	55	53	55	52	52
Nagaland	51	48	59	68	36	100	76	78	73		37				36		29
Orissa	59	65	71	74	77	78	76	78	77	75	77	78	76	81	70	75	74
Pondicherry		93	92	94	89	95	88	84	87	94	88	80	97	88	94	88	94
Punjab	87	84	86	82	84	84	83	83	80	81	83	87	89	86	81	78	88
Rajasthan	56	61	65	64	63	64	60	58	59	60	57	58	59	59	56	41	55
Sikkim	94	95	98	95	97	99	98	98	79	92	97	99	99	100	100	100	
Tamil Nadu	83	88	87	86	85	84	83	81	81	81	81	80	81	81	80	77	81
Tripura	61	64	66	66	62	62	59	67	63	71	68	61	73	71	43	70	60
Uttar Pradesh	77	79	84	85	80	81	84	83	82	88	86	89	86	86	88	83	85
Uttaranchal	73	76	75	75	74	75	75	74	69	75	75	70	71	66	79	69	68
West Bengal	66	77	82	79	85	82	85	84	84	85	83	82	84	83	84	85	80



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