

# Resource requirements for Right to Education (RTE): Normative and the Real

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## Resource requirements for Right to Education (RTE): Normative and the Real<sup>1</sup>

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### Abstract

The paper examines the issue of resource adequacy for Right to Education (RTE) by estimating the resource requirement for universalization of elementary education across twelve Indian States. Using RTE norms as the base, a framework for estimating school and system level resource requirements is laid down. Apart from the official norms, framing of the normative must necessarily take into account the present structure of schools including the pattern of enrolment in government schools vis-à-vis private schools, existing infrastructure in these schools, school size etc. Database of school-level information has been used for the purpose. Actual budgetary expenditure presents the distance from the normative.

The results indicate that even with minimal norms, there is a vast amount of under-spending by governments. Except in the case of Tamil Nadu, the required expenditure per student is short of the normative requirement. In States like Bihar, Jharkhand, Orissa and Madhya Pradesh, not only is the requirement many times the present levels of expenditure, the burden of additional requirement falls disproportionately on these poorer States. The present set of policy interventions and inter-governmental resource sharing arrangements fail to adequately address the specific resource needs of these States for fulfilling the basic entitlement.

**Key Words:** Right to Education, universalization, expenditure, resource requirement, adequacy

**JEL Classification codes:** I22, H52

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## 1. Introduction

The Right of Children to Free and Compulsory Education (RTE) Act, 2009, guarantees that every child between 6-14 years of age has a right to full-time elementary education of satisfactory and equitable quality in a formal school which fulfills certain essential norms and standards. With the major responsibility lying with the government - Centre, States, and local bodies - implementation of the Act depends crucially on provision of public resources. Sub-clause 7(2) in Chapter III of the RTE Act says that the Central Government shall prepare the estimates of capital and recurring expenditure for the implementation of the Act. Regrettably, this has been construed as a one-time necessity rather than a continual one. The last estimate of financial requirements for universalization goes back to 2009-10, around the time when the Act came into being (CABE, 2009/10). From our interactions with officials of the Union Ministry of Human Resource Development, it was evident that recently, no attempts have been made to look at the resource requirements issue in an overall sense.

The main reason, why the issue has received scant attention in the recent years, is the growing evidence that the governments do not have the capacity for utilization of resources. Since the absorptive capacity is limited, it is perceived that the resource envelop does not matter. Many of the lagging States, where most of the deficit is concentrated, have shown a track record of under-spending (though the situation has improved somewhat over the years). Attention has almost completely shifted to governance mechanisms for better outcomes. In our understanding, this is an erroneous view of things. To substitute the problem of resource requirement and planning with the problems of implementation may not be the correct approach. Underutilization of resources is an issue of implementation that cannot be conflated with the need for resources. Rather, implementation must be an intrinsic part of the design of the plan as Sukhamoy Chakravarty (1987) argues. A good plan not only derives paths to achieve the desired target but also sketches behavioural patterns that can lead the system to the set target. There can be a number of reasons for implementation failure, that are in no way related to the lack of demand, such as time lag in which planning authority responds, lack of motivation or capacity of the agencies through which planning authorities implement plans, poor understanding of the current structure of the system, deficient coordination between the actors involved, etc. The inability of State institutions to spend, thus is not an indication that resources are not needed. In fact, the gap between the approval of Sarva Shiksha Abhiyan (SSA) programme's Annual Work Plan and Budget (AWP&B) and actual allocations on the programme decided by the Ministry of Finance clearly shows that a significant part of the resource needs are still unmet, and demand far exceeds supply.<sup>2</sup>

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<sup>2</sup> Accountability Initiative's Budget Brief notes the wide gap between budgets approved by the Ministry of Human Resource Development (MHRD) and the actual allocation made by the GoI. In FY 2013-14 there was a 54 per cent gap between the approved SSA budget and the actual allocations made by GoI. In FY 2015-16 the approved SSA budget increased by 12 per cent from INR 56,529 crore in FY 2014-15 to INR 63,408 crore in FY 2015-16. Consequently, the gap between the approved budget and GoI allocations was even higher. In FY 2015-16, GoI allocations accounted for only 35 per cent of the total

While the issue of resource requirements has thus been largely sidelined in the recent years, there have been arguments challenging the financial feasibility of universalization of elementary education through public resources. Jain and Dholakia (2009) demonstrate that even an allocation of 6% of GDP to the education budget will not be sufficient to fund universal school education if the reliance is wholly or even primarily on government school system. This is in sharp contrast to the estimates given by “Expert Group Report on Financial Requirements for Making Elementary Education a Fundamental Right” (Tapas Majumdar Committee, GoI, 1999). The authors go on to suggest that the only way to meet the RTE obligation is to rely on low-cost private schools or non-formal educational centres – a proposal that turns the spirit of RTE on its head.

### **The present study**

This paper is part of a larger attempt to revisit the issues around resource requirements for elementary education. Without undermining the importance of efficiency of public spending, we seek to highlight that resource requirements and adequacy remain important research subjects. We argue that careful estimates of resource requirement and planning at various levels hold the key to successful implementation. Whereas the RTE is a central legislation, it has played out differently in different States. It is well documented that there exist huge differences in public spending on schooling per student across States (see CBGA, 2016a). It would be interesting to see what a national norm applied at the school level would mean in terms of physical and financial requirements for each State. For 12 States/UTs resource requirements of elementary education are estimated after taking into account the specificities of their schooling structures and the current patterns in enrolments. School is the relevant unit here as all planning must begin at school. The feasibility question, however, requires a broader aggregate. What is the total requirement as a proportion of States’ GSDP? What is the per student expenditure required of the State and what are the present levels of spending? We attempt to estimate a normative frame of reference such that the adequacy issue can be meaningfully discussed.

The paper is organized as follows. The next section discusses the existing literature with a focus on the main approaches towards estimation of resource requirements. Section 3 lays down the methodology for estimation adopted in this paper and section 4 describes the data sets used for empirical estimation. For estimation of resource requirements, assumptions on unit costs and various other parameters are crucial. These are discussed in some detail in Section 5. Section 6 discusses the main results of the paper, followed by limitations of the exercise in Section 7. The last section brings in the macro policy perspective.

The results indicate that even with minimal norms, there is vast amount of underspending per student. Except in the case of Tamil Nadu, the required expenditure per student is short of the normative requirement. Interestingly, the recurrent requirement per student varies from State to State depending on the patterns of enrolment, even though the same

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approved budget. Geetha Rani (2016) uses the gap between approval and allocation as an indicator of adequacy.

norms are applied. In States like Bihar, Jharkhand, Orissa and Madhya Pradesh, not only is the total requirement double or thrice the present levels of expenditure, from the feasibility perspective the burden of additional requirement falls disproportionately on these States with low overall incomes. The present set of policy interventions and inter-governmental resource sharing arrangements fail to adequately address the specific resource needs of these States for fulfilling the basic entitlement of elementary education.

## 2. Review of Literature

The issue of public resource for education and its normative dimensions were systematically studied in the Report of the Education Commission, 1966 (also known as Kothari Commission). The Commission asked “what should be the total level of financial support for education at all levels to ensure achievement of national goals and rapid advancement of national economy, cohesion and security?” For a time horizon of 20 years beginning in the mid-1960s, the magnitude of resources *available* for educational development was estimated. National income (at 1965-66 prices) was posited to grow by 6 percent per annum between 1965 and 1985. The increase in educational expenditure was to be at 10 percent per annum under the premise that in early stages of educational development, the rate of growth of educational expenditure ought to be approximately twice the rate of growth of national income. As a share of national income, the above would imply an increase from 2.9 percent in 1965-66 to 6 percent by 1985-86. The assumption of 10 percent annual growth in public spending on education was embedded in the experience of those times. The years after Independence, 1951 to 1965, the end of the third Plan period was the period of rapid expansion of educational expenditure. Total educational expenditure represented 1.2 percent of national income in 1951. It rose to 2.9 percent at the end of the third Plan, an increase of 142 percent in 15 years. The rise in educational expenditure was 1.6 times the rate of growth of enrolment. If one were to think of the overall resources available for education as a function of two variables: ability (the national income per head of the population) and effort (the proportion of national income allocated to education), effort had increased at more than twice the rate of ability.

Once the available resources had been so determined, it had to be divided between the different stages of education. The available resources, allocations across stages and population growth together determined the per pupil expenditure at every stage. The per pupil expenditure so derived had to be consistent with the cost per pupil calculated from the expression “ $a(1+r)/t$ ” where (a) is average salary per teacher (a); (t) is the pupil-teacher ratio (PTR); and (r) is the expenditure on all non-teacher costs expressed as a percentage of the average salary of a teacher. It is noteworthy that despite the higher allocations per pupil, the Commission warned that balancing various priorities would be a tightrope walk. For instance, in the primary classes, the PTR would have to be raised from 38 in 1965-66 to 50 in 1975-76 by the adoption of three-hour session system. “This is inescapable if a living wage is to be given to the primary teachers. If smaller classes are considered desirable, either additional funds will

have to be found or the rate of expansion will have to be deliberately slowed down. The average class size would automatically decline as the birth rate of the population declines. The class size will result in 30-35 (p.481).”

The trajectory of educational investment did not turn out to be the same as envisaged by the Education Commission. Public expenditure on education hovered around 3-4 percent of Gross National Product (GNP). Universalization was still far-off when the Saikia Committee (GoI, 1997), comprising of state education ministers submitted its report. Unlike the Kothari Commission, later studies began with the requirement question and then worked out the ways in which resources could be made available. The Saikia Committee applied the then existing per student government expenditure of INR 948 to the estimated 63 million out of school children. The Committee also added a factor of 20 percent to the cost for improvement of quality and environment of school education to be provided. Over and above the prevailing levels of expenditures on elementary education, the Committee estimated a fund requirement of INR 40,000 crores during the IX<sup>th</sup> Plan period (see Jha et al., 2008 for a detailed discussion).

The Expert Group Report on Financial Requirements for Making Elementary Education a Fundamental Right (Tapas Majumdar Committee or TMC) came in 1999. This report was a trend-setter in estimation methodology with all subsequent reports adopting the Tapas Majumdar Committee framework. It took into account the schooling inputs available in all States and calculated the additional requirements in case of each schooling input. Then based on the unit costs for the inputs, the magnitude of additional financial resources required for universalization of elementary education was calculated. TMC changed the approach completely to costing by different activity components. Costing by activity components was to contribute to greater transparency and internal efficiency. This would enable activity-wise audit and facilitate a process of feedback and resource allocation. Given its importance, the main features of TMC approach are discussed in detail in the present paper.

Jha et al. (2008) note that the norms suggested by TMC were relatively more adequate compared to the Saikia Committee. One of the most important norms suggested was a pupil-teacher norm of 30:1 to be achieved gradually over a ten-year period. A provision of at least two teachers in primary schools (PS), and a minimum of three teachers and a headmaster in every upper primary school (UPS) was made. It laid down the norm of one classroom per teacher.

TMC estimated the cost of formal schooling for all children and rejected the assumption that only the cheaper variants of non-formal or part-time education needed to be provided for the millions of children who have remained out of school. On teachers, similarly the Committee observed that “in very remote and backward regions para-teachers may play a useful role in the short-run, in promoting higher school attendance. However, in the long run there is no substitute to fully qualified and properly paid teachers.”

To bridge the gap between the existing situation and a situation where the Age-specific enrolment reaches 100 percent (the first target for universalization) reliance was to be on government schools. The Report noted “the group could not accept the suggestion that profit-

seeking private enterprise would be attracted in the foreseeable future in a substantial way to the schooling of the vast number of underprivileged children of India who have never been to school." Thus the gap had to be essentially bridged through public resources.

Besides the direct school related and student-related expenditures (such as Teacher salaries, teacher support material and aids, construction of school, provision of school equipment etc.). TMC explicitly brought in the elements of support and accountability structures that was needed for a well-functioning school system. For instance, it took a comprehensive view of the academic support structure comprising of District Institute of Education & Training (DIETs), Block Resource Centres (BRCs) and Cluster Resource Centres (CRCs) which needed both capital and recurrent expenditures to be established. Similarly, community-based monitoring and supervision and research were accounted separately.

The States were divided into two groups, depending on their net enrolment rates. For lower net enrolment States, the timeframe for universalization was kept longer compared to other groups of States. This assumption along with gradual decline in PTR meant that the projected expenditures over the ten-year period would rise gradually. The subsequent Central Advisory Board on Education (CABE) reports (GoI, 2005 and GoI, 2009) used the same approach as the TMC report but assumed shorter time horizons for universalization and for the teacher gaps to close in brief time span. They came up with a expenditure pattern that was front loaded involving sudden rise in expenditures rather than a gradual one. Some of the other norms used by TMC were also diluted.

A few years preceding the TMC report, another study on investment requirements for universalization by Ramachandran et al. (1997) had brought in a fresh way of looking at the resource requirement issue. At the time, the Ninth Finance Commission had put forth estimates of unit cost function for primary education by regressing the per student expenditure on primary education on enrolment rate, PTR, teacher salaries and price differentials across States. Tilak and Kar (1994) estimated a bivariate cost function with enrolment as the explanatory variable. Again, the main criticism of the method was in the use of past trends in expenditure to project for the future. Ramachandran et al. (1997) note that "using past expenditures as a proxy for costs cannot give anything more than estimates for existing standards of services." Instead, the authors adapted a method used by Colclough and Lewin (1992) to the Indian scenario. Colclough and Lewin had designed a simulation model to estimate the costs of achieving universal primary education in developing countries of the world over a period of 15 years starting from the year 1990. An enrolment transition sheet to document the enrolments in all grades and in all levels of the school system in every year was created as a first step. In the second step, a unit cost spreadsheet was constructed to document the recurrent costs per child enrolled and capital costs per new classroom at different levels of the schooling. In the third step, enrolment transition spreadsheet was integrated with the unit cost spreadsheet to obtain the total recurrent and capital cost.

Ramachandran et al. (1997) estimated investment requirement for universalization of primary education in India across States. The three steps outlined in Colclough were repli-



cated but with a difference. Moving away from the then prevailing practice of using the average existing per child expenditure derived from macro public expenditure data as the norm (such as in Saikia Committee Report), the authors used the interview method to establish the normative per child expenditure. Based on an interview with the education minister of the government of West Bengal, the major heads of investment in primary schooling and amount to be invested under each head to provide quality schooling were identified. The PTR was again taken as 30. Capital costs for children not attending school - effectively the out of school children - was assumed to be double that of children who were attending schools. While new schools were required for children who were outside the schooling system, there was need to upgrade the infrastructure in existing schools. Recurrent costs were assumed to be uniform for children already in school and the potential entrants or the out-of-school children. The other important difference that Ramachandran et al. brought in was in the use of data on children attending as opposed to children enrolled. Based on NSSO's data on the school attendance rate for 1987-88, the expected number of in-school and out of school children in the year 1995 was estimated. The total requirement so computed was then pitted against the existing expenditure to obtain the additional expenditure required for universalization with quality.

The above discussion summarizes the main approaches to estimate the resource requirements for universalization of primary/elementary education found in the literature. In the years around 2009/10 when the RTE came into being, two studies – one by CBGA (2012) and the other by Jain & Dholakia (2009) - brought up the resource requirement issue in different but interesting ways. MHRD had proposed an amount of INR 1.82 lakh crores over a period of 5 years from 2010 to meet the requirement of quality education following the RTE act.<sup>3</sup> These figures were broadly derived in CABE, 2009 (GoI, 2009a) using the methodology proposed by TMC. Based on these estimates, CBGA (2012) calculated that along with the existing levels of spending, the additional spending of INR 36600 crores approximately every year would mean a total expenditure of INR 1,40,000 crores annually. Translated to per school spending it amounted to INR 22 lakhs. For a norm, the authors held the Kendriya Vidyalayas (KVs) as the model school since they have been providing the most satisfactory level of education among all the existing government-funded institutions. The existing spending per Kendriya Vidyalaya at elementary level was estimated at INR 1.02 crores. The authors brought out that the government proposed to spend only about one-fifth of what it spent KVs and the gap in spending amount to around INR 80 lakhs per school.

Jain and Dholakia (2009) used the framework of Education Commission (1966) to explore the feasibility questions surrounding the implementation of RTE. Assuming a 9 percent overall economic growth (at constant prices) and 6 percent of GDP devoted to education of which 2/3<sup>rd</sup> is to be spent on school education, the absolute amount of resources available for school education (upto secondary stage) was worked out. Per child allocation of resources derived were then placed in an equation, a variant of the one used by Education Commission (1966) to see what kind of teachers' salary and PTR are consistent with the level of per child

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<sup>3</sup> Source: Minutes of Meeting of State Education Secretaries, 28-30 January, 2010.



allocation. Characteristics of public sector salary structure, required PTR of 30 and an assumption of 35 percent of expenditure devoted to non-teacher costs are the other parameters used. The authors concluded that 6 percent of GDP as education budget cannot give a starting salary to PS teachers at the beginning of their careers higher than INR 3443 per month while a secondary school teacher cannot expect to earn more than INR 4132 per month as gross salary in the year 2006. Against these budget constrained levels of feasible salary, the 6<sup>th</sup> Central Pay Commission awarded salary scales were 285 percent higher in 2006. The authors then look at the alternative to pursue the goal of universal coverage through PPP in which low-cost private providers of school education who pay much lower teacher salary, cover a significant part of school education. While the proposals contained in the paper have faced huge criticism, the assumptions underlying the exercise have not been examined closely.<sup>4</sup>

### 3. Framework and Methodology

In view of the literature and current legal framework, a methodology for estimation of resource requirement has been evolved. The norms for most important inputs into schooling are defined by the RTE Act, 2009. Every school has to comply with the RTE norms and it is not enough that the pupil teacher ratio norm or students to classroom norm is satisfied overall for the state or district or even block. The analysis of requirements must, therefore, begin at the institution of school. In addition, the systemic costs such as academic support comprising of district institutes, BRCs and CRCs etc. need to be factored in. Tapas Majumdar Committee had clearly established that a well-functioning school requires a robust system to support it and paid significant attention to account for the costs of such a system.

In the following method, the costs are divided into capital cost and recurrent cost. Unlike recurrent cost, estimates of capital cost need to account for the existing infrastructure in place in each school in order to arrive at investment requirements. The detailed methodology is outlined below.

#### Methodology

The objective is to estimate the resource requirements for quality elementary education for all.

$$TotalRequirement(TR) \equiv RequiredCapitalCost(RC) + RequiredRecurrentCost(RR) \quad (1)$$

#### (i) Required Capital Cost

Classrooms are the primary need of any school on the infrastructure front. The use of classroom as a unit for estimating the capital requirement brings in the lumpiness of such investments. Required capital cost is obtained by adding cost for building new classrooms

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<sup>4</sup> See Sarangapani (2009), Ramachandran (2009).

including head teacher rooms (denoted as TC), the upgradation cost of the existing classrooms (denoted as TU), cost of infrastructure such as library, toilets, drinking water, kitchen shed, boundary wall and ramp (denoted by INFRA) and other one-time investment requirements such as on computers (OTH).

$$RC \equiv \frac{1}{t} * (TC + INFRA) + TU + OTH \quad \dots\dots\dots (2)$$

Cost to build new classrooms as well as other infrastructure has been distributed evenly across t years where t takes into account the years required to fill the gaps in classrooms etc. The other two components of capital cost have to be borne in the current year.

As per the RTE norm, there should be at least one classroom for one teacher and an office-cum-store-cum-head teacher's room in each school. Let C denote the additional classrooms required, then

$$C \equiv \sum_j (CR_j - CE_j) \quad \dots\dots\dots (3)$$

for  $CR_j > CE_j$ .

Where,  $CR_j$  and  $CE_j$  are the number of required and existing classrooms, respectively, in the  $j^{\text{th}}$  school. j denotes the government schools; government incurs capital cost only for government schools and not aided schools. Note that the summation is only over the schools where required classroom exceeds the number of existing classrooms. Identification of these schools is important. Since, classrooms are fixed assets schools having surplus classrooms cannot mitigate the needs of additional classrooms in other schools.

Unit costs for classrooms are of two kinds. Classrooms may be constructed in existing schools ( $U_{c1}$  is the unit cost) or be a part of a new school ( $U_{c2}$  is the unit cost). The unit costs are different for the two cases. The latter set of classrooms would have to factor in costs of other infrastructure such as head teacher room, toilets, drinking water facilities, library etc. Unit cost for head teacher room is assumed to be same as unit cost for classrooms in existing schools. Assuming p is the ratio of additional classrooms in new schools to total additional classrooms required, we obtain the capital cost to build new classrooms and head teacher rooms as follows:

$$TC \equiv (1 - p) * C * U_{c1} + p * C * U_{c2} \quad \dots\dots\dots (4)$$

Existing classrooms requiring upgradation are of two types – those that require major repairs and others that require minor repairs. Unit costs of both type of upgradation are different too. Suppose  $C_{maj}$  and  $C_{min}$  denote the numbers of classrooms requiring major repairs and minor repairs and  $U_{maj}$  and  $U_{min}$  are the corresponding unit costs then upgradation cost of existing classrooms (TU) is obtained by:

$$TU \equiv C_{maj} * U_{maj} + C_{min} * U_{min} \quad \dots\dots\dots (5)$$

Other infrastructure (INFRA) deficits have been estimated similarly for the existing government schools, as in equation 3, and multiplied with the respective unit costs.

**(ii) Required recurrent cost**

Since government is not only required to spend adequate amounts on schools but must also spend well in order to operate, monitor and manage the entire school education system, required recurrent cost is obtained as:

$$\text{Required recurrent cost (RR)} \equiv \text{Required recurrent cost at school level (RR}^{school}) + \text{Required recurrent cost at system level (RR}^{system}) \dots\dots\dots (6)$$

School-level recurrent cost has been divided under six heads in view of the fact that considerable resources need to be allotted under each of the head and any lesser disaggregation might result in lack of focus and shortage of resources. Therefore,

$$\text{RR}^{school} \equiv \text{Teachers' Salary (TS)} + \text{Teachers' Professional Development (TD)} + \text{Students' Entitlements (SE)} + \text{Operation, Administration and Maintenance cost (SG)} + \text{Mainstreaming of Out of School Children (OSC)} + \text{Inclusive education for Children with Special Needs (CWSN)} \dots\dots\dots (7)$$

There is a primary difference between the estimation of required capital cost and required recurrent cost. While estimating the former, costing has been done on the additional infrastructure required which is the gap between the existing and the total required infrastructure; whereas estimation of the later involves costing of the total requirement.

Based on RTE norms, four types of teachers are required at the elementary level. They are teachers teaching at primary level, teachers teaching at upper primary level, head teachers and part-time instructors. For upto sixty children admitted in a primary school, there has to be two teachers. Between 61-90 students there should be three teachers and between 91-120 students, there should be four teachers. Between 121-200 students there should be 5 teachers and for above 150 students, the primary school must also have a head teacher. In the upper primary school (UPS) there should be atleast one teacher each for (i) science and mathematics; (ii) social studies; (iii) languages and one teacher for every 35 students. For UPS with above 100 enrolment, teacher requirement includes a head teacher and three part-time instructors for (i) Art education; (ii) Health and Physical Education and (iii) Work Education. These norms apply to every school.

To generalize, teachers required in the  $i^{th}$  school is a function of enrolment in that school and the required PTR corresponding to the enrolment. Total teacher required are a sum of teachers required in every school. Suppose  $T_i$  is the number of teachers (including head teachers and part-time instructors) required in the  $i^{th}$  school,  $E_i$  is the enrolment in  $i^{th}$  school,  $R_{PTR}$  is the required pupil teacher ratio as per the RTE norm.  $N$  is the number of government schools including private-aided schools,  $T$  is the total teachers (including head teachers & part-time instructors) required in government including aided schools. Then,

$$\left. \begin{aligned}
 T_i &= f(E_i, RPTR) \\
 &\text{and} \\
 T &\equiv \sum_{i=1}^N T_i
 \end{aligned} \right\} \dots\dots\dots (8)$$

For financial estimates, it would be useful to distinguish between teachers who *are to be* recruited in order to meet the RTE norms and others who are already working and hence have a certain work experience, though both are a part of total teacher requirement. The former are termed as new teachers  $T_{new}$ , whereas  $T_{exis}$  are the existing set of teachers. Salaries of both the existing and the new teachers lie on the same pay scale but in different positions. Those who are to be recruited  $T_{new}$  will get the starting salary on the pay scale. Teachers' salary is obtained by multiplying the number of teachers of each type with their respective unit cost. The unit costs are assumed to be same for existing and new to be recruited head teachers since usually the teachers become head teacher at the middle of their career. Since currently there are hardly any part-time instructors working in schools, all the required part-time instructors are assumed to receive an uniform salary.

$$T_{new} \equiv T - T_{exis} \dots\dots\dots (9)$$

$$TS \equiv T_{exis} * U_{ts}^{exis} + T_{new} * U_{ts}^{new} \dots\dots\dots (10)$$

where  $U_{ts}^{exis}$  and  $U_{ts}^{new}$  are the unit costs for teachers' salary of the existing and the new teachers respectively.

Resource requirement for professional development of teachers include in-service training for the existing teachers and all the head teachers and pre-service training for the new to be recruited teachers in the government including aided schools.

$$TD \equiv T_{exis} * U_{td}^{exis} + T_{new} * U_{td}^{new} \dots\dots\dots (11)$$

where  $U_{td}^{exis}$  and  $U_{td}^{new}$  are the unit costs for teachers' professional development of the existing and the new teachers respectively.

Students enrolled at elementary level in the government schools are entitled to textbooks and uniforms as part of the free education entitlement.<sup>5</sup> In addition, children enrolled at elementary level are to receive mid-day meals (MDMs) in all elementary government as well as private-aided schools as per the National Food Security Act, 2013. Resource requirement for students' entitlements thus obtained by

$$SE \equiv \sum_{i=1}^N E_i * U_{se} \dots\dots\dots (12)$$

where  $U_{se}$  is the unit cost vector for students' entitlements having three components-unit cost for textbook, uniform and MDM.

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<sup>5</sup> Students in aided school though entitled to textbook are not entitled to uniforms.

For operation and maintenance, each government (including aided) school is provisioned with grants of different types (see section 5 for details). If  $U_{sg}$  is the unit cost for school grant, the required cost for school grants is as follows

$$SG \equiv N * U_{sg} \dots\dots\dots (13)$$

Universalization of elementary education involves bringing out of school children within the fold of schooling system. A two-tier mechanism exists for mainstreaming out of school children, in general, though some children might be admitted directly in schools. In the first tier, out of school children are enrolled in a bridge course; in the second tier they are absorbed in school. Let  $M$  be the number of out of school children,  $U_{OSC}^b$  is the unit cost for bridge course for out of school children and  $U_{OSC}^{as}$  is the unit cost of absorbing an out of school child in school. Resource required for mainstreaming out of school children is obtained by:

$$OSC \equiv M * U_{OSC}^b + q * M * U_{OSC}^{as} \dots\dots\dots (14)$$

where  $q$  is the percentage of out of school children absorbed in school in the present year, and  $U_{OSC}^{as}$  is endogenously determined as the recurrent cost per enrolled child in school.

$$U_{OSC}^{as} = (RR - OSC) / \sum_{i=1}^N E_i \dots\dots\dots (15)$$

RTE act recommends meaningful and quality education for every child with special needs (CWSN) irrespective of their kind, category and degree of disabilities. Unit costs of intervention for CWSN is applied to their share in population.

$$CWSN \equiv w_i * E_i * U_{cwsn} \dots\dots\dots (16)$$

where  $w_i$  is the percentage of CWSN children in the  $i^{th}$  school and  $U_{cwsn}$  is the corresponding unit cost.

Next, the components of required recurrent cost at system level ( $RR^{system}$ ) are specified. It comprises of cost for academic support (AS) and management cost (MC).

$$RR^{system} \equiv AS + MC \dots\dots\dots (17)$$

Institutions like Block Resource Centres (BRCs), Cluster Resource Centres (CRCs) and District Institute for Education and Trainings (DIETs) have been established all over the India to provide academic support to the elementary education system. These centres are responsible for training, monitoring and inspecting schools in respective blocks, clusters and districts. Resource requirement for academic support is estimated as follows:

$$AS \equiv I * U_{as} \dots\dots\dots (18)$$

where  $I$  is the vector of institutions and  $U_{as}$  is the vector of unit costs of institutions.

Management cost is expressed as a percentage of the recurrent cost.

$$MC \equiv p' * (RR^{school} + AS) \dots\dots\dots (19)$$

where  $p'$  is the percentage of the required recurrent cost needed for management.

Finally, the additional resource requirement for universalization of elementary education is obtained by deducting actual expenditure on elementary education from total requirement.

$$Additional\ Requirement\ (AR) \equiv Total\ Requirement\ (TR) - Actual\ Expenditure\ (AE) \dots\dots\dots (20)$$

The key variables required to estimate the total and the additional requirement are number of government and private-aided school, enrolment in government and private-aided schools, additional classrooms (including head teacher rooms) required in government school, classrooms requiring repairs in government school, teachers required in the government and aided schools and the existing teachers, number of institutions (BRCs, CRCs & DI-ETs) for academic support and actual expenditure on education. The above variables along with their respective unit costs are used to arrive at the total and additional requirement.

## 4. Data Description

### 4.1 School-level Data

The basic source of data used in this study is the District Information System for Education (DISE). DISE was an initiative taken under the District Primary Education Programme during mid-1990s to have detailed information on school education in India. It is the most comprehensive data set on school education currently available in India both in terms of its coverage (sample and the variables) and the level of disaggregation. School is the unit of collecting data in DISE and it covers all the schools under Department of Education, Tribal or Social Welfare Department, Local body, Private-Aided and Private-Unaided.<sup>6</sup> The data is first collected at the schools, next it goes to the CRC coordinators and then to the BRC coordinators. BRC coordinators submit the information to the district offices from where it finally reaches to the State Project Offices (SPO) of SSA. As per design, the accuracy of data is supposedly tested at every level from CRC coordinators to the SPO offices. It is mandatory for all the States to verify the DISE data sample by an external monitoring agency on a 5 percent sample bias. Since the DISE data is collected from every registered school in the country it is free from sampling error and with availability of data at every cluster, blocks, districts and States it is closer to the population data.

The primary reason for adopting DISE as the basic source of data in our study is that the data collection method in DISE takes school as a unit. Consideration of such a micro unit

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<sup>6</sup> In 2015-16 DISE covered as many as 1.45 million elementary schools in 680 districts across 36 States & UTs.



enables researchers to look into the infrastructure and the working of the system at the highest degree of disaggregation. Aggregate level data can be used only to provide the net picture in physical and human infrastructure. Net figures understate the actual situation as deficits are offset by surpluses. In the context of the present study, it is more important to have data on actual deficits rather than net deficits. For the estimation of capital expenditure requirement, net figure is erroneous since the schools having surplus classrooms cannot mitigate the needs of additional classrooms in other schools. Similarly, teacher requirement derived from PTR norm applied at the school level would be very different from the results obtained from PTR norms applied to the state/district level data.

Easy accessibility of unit level data is another attractive feature of the DISE dataset. However, there are limitations as well. One important limitation is its self-reporting format. DISE data has been criticized for overstating the enrolment figures. There are cases even in 2015-16, where the enrolment data from DISE exceeds the projected population figures for the State. This has implications for calculations of out of school children. Over the years, DISE has tried to correct these problems. According to MHRD officials, DISE enrolment data in 2015-16 has been corrected for overstatements. This has been done through tackling double enrolment by issuing unique number to the children.

## 4.2 Public Expenditure Data

Data on actual expenditure on elementary education is compiled from the state budget documents and Finance Accounts of the States for 2015-16. Budgetary expenditure on elementary education is divided into revenue and capital expenditure. The major head and sub-major head corresponding to revenue expenditure are 2202-01 (revenue expenditure on elementary education within the major head general education), while the relevant expenditure on capital account is given in 4202-01-202. Until recently, funds allocated on several Centrally Sponsored Schemes (CSSs) were transferred directly to state implementation societies bypassing state budgets. Only the States' matching shares were reflected in the State budget, whereas, the central shares had to be added separately. By 2015-16, the mechanism of central transfers had changed from off-budget to one where the funds are channeled through the State budget. Thus, funds for SSA the flagship CSS and the vehicle for implementation of RTE are reflected fully in the recent State budgets.

Expenditure on mid-day meal scheme (MDMS), another CSS has been accounted differently across different States. In some States, it is included under 2202-01. In some other States, it occurs under the major head 2236 (Nutrition) such as in Delhi and Tamil Nadu. Where the Scheme is administered by Rural Development Department, it occurs under the major head 2515 (other rural development programme). At times the accounting classification has little relation to the department/ministry which administers the MDM programme or how it is administered. In Jharkhand and Delhi, the MDM is run by school education department. In Jharkhand it is a part of 2202-01 whereas in Delhi it figures under the head 2236 (Nutrition). In Karnataka, the MDM programme is subsumed under the grants-in-aid to local bodies under 2202-01 which are bifurcated in the State budget not by functional heads but

by districts. This arbitrariness of accounting is one reason why researchers often fail to explicitly include MDM expenditures as part of elementary education expenditure. Dongre and Kapur (2016) add the major heads 2202-01 and 4202-01-201 to obtain the elementary education expenditures for all major States. However, their figures are not strictly comparable as MDM is included in 2202-01 in certain States and not included in others.

A portion of the expenditure on elementary education incurred by departments such as social welfare departments are accounted separately in the budget. Department for Welfare of Scheduled Castes, Scheduled Tribes and OBCs allocate funds to schools education that are not captured under 2202-01. Instead they are booked under the major head 2225 (01/02/03-277), welfare of scheduled castes, scheduled tribes and other backward classes. It is difficult, however, to bifurcate this spending into elementary education and expenditures on other levels of education. For example, expenditures on Hostel for SC boys, Hostel for SC girls, Merit Scholarship to SC/ST/OBC and minority students class I to XII are difficult to truncate. In view of this problem, CBGA (2016b) in their detailed study of state budgets include the expenditure by departments other than the school education department as part of school education budget but not in elementary education expenditure. Given our focus on elementary education, we have also followed the same practice. As a result, there might be an underestimation of actual expenditures, the extent of underestimation varying across States. In Delhi, the proportion of spending under minor head 277 (MH: 2225) is only 0.17 percent of expenditure on 2202-01; the corresponding figure for Madhya Pradesh is 9.79 percent in 2015-16.

Expenditure booked under the revenue expenditure heads has been used in this paper to proximate actual recurrent expenditure. Budgetary classification of revenue and capital expenditure doesn't truly reflect recurrent and non-recurrent expenditure respectively and most of the capital expenditure is booked under revenue expenditure head. As a result, expenditure on revenue account (capital account) might be overstated (understated). This doesn't impact the total expenditures though.

### 4.3 Sample of States

A sample of 12 States has been chosen. This includes 10 major States, one special category State (Uttarakhand) and one Union territory (Delhi). All the eight Empowered Action Group States - Bihar, Jharkhand, Uttar Pradesh, Uttarakhand, Rajasthan, Madhya Pradesh, Chhattisgarh and Odisha are part of the study. Besides, three of the better-performing States in educational indicators - Tamil Nadu, Maharashtra and Karnataka - have been selected. Delhi is also among the better-performing one. In the recent years, the government of Delhi has ostensibly focused its attention on school education. It would be interesting to see the status in Delhi through the lens of resource requirements.

## 5. Assumptions for Estimation

Assumptions used for estimation are as follows:

**1. Estimates of Out of School Children:** Out of school children are the segment of the population in the age group 6-13+ who are currently out of the schooling system i.e. either dropped out of the system or never been enrolled. In order to obtain estimates of out of school children, NSSO data is primarily used. NSSO in its special educational rounds collects similar information from households on enrolment and participation, among other things.

First, the currently not attending children in the age-group 6-13 + is obtained for each state using the latest NSSO round survey household level data, 2014-15. This includes children who have never attended as well as attended but not currently attending, i.e., children who have dropped out. But some of these students are still enrolled and thus must be subtracted to obtain the out of school children in 6-13+ age group.

Next, the ratio of out of school children in 6-13+ age group to total elementary enrolment (say, ROSCENR) is worked out for each state. This ratio obtained from NSSO data, would allow us to bring the out of school children on the same base as DISE enrolment data. As most of our analysis is based on DISE data and NSSO is the most reliable source for estimates of OSC, this method combining the best of two sources was devised.<sup>7</sup>

Final estimates of OSC in 6-13+ age group are obtained by multiplying ROSCENR with DISE elementary enrolment figures. We assume that the ROSCENR for 2014-15 applies to 2015-16. One advantage of this method is that it does not involve the use of projected population, unlike in methods that are based on subtracting age specific enrolment from projected population.<sup>8</sup> We assume that the out of school children will be accommodated in the government school system. It is unlikely that the existing out of school children including children who dropped out can afford fee charging private schools. All the OSC will be given bridge course in 2015-16. Further, 90 percent of children taking the bridge course are assumed to avail of the non-residential facility, while the remaining take a residential bridge course. The unit costs are higher for the residential facility compared to non-residential facility. Following

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<sup>7</sup> There are essentially two main methods of estimating the out of school children (OSC). Administrative data sources, like the DISE, gives the age specific enrolment rate. The other source of information are the household surveys/population census which asks questions related to children enrolled and attending educational institutions. Age-specific enrolment and attendance rate is thus obtained from these sources. A detailed comparison of the methodology and estimations of various estimates at the all-India level is found in UNESCO-UNICEF's "Estimating the number of out of School children – Methodological problems and alternative approaches" (2016). The authors find that no estimate is free from biases. Census underestimates the attendance rate, while the same calculated from SRI-IMRB data are very high.. The authors suggest that U-DISE has an obvious advantage as it is collected systematically every year; unit-level data is also available on request. An elaborate system of data collection, data verification and data analysis is already in place. Along with NSSO, it can be an important source of information for out of school population.

<sup>8</sup> For 2011, we found that "Population projection for India and States, 2001-2026" published by Registrar General of India (2006) largely underestimated the true population figure.

the bridge course, half of the students are enrolled into schools the same year, whereas the remaining half are enrolled in the following year. This is because the timing and duration of the bridge course is likely to be different. Per child recurrent cost applies on school admission.

**2 Unit costs:** Unit costs are reported in detail in Appendix Table A1. While the RTE defines the physical norms, the unit costs are taken from SSA and other sources. Based on quantification of the SSA and other available norms, a cost sheet for running a school was shared by Azim Premji Foundation (APF). Appendix Table A1 builds on that information. The costs reported proximate the government rates. The costs quoted by APF have been corroborated from other sources. For instance, unit cost for classroom assumed at INR 9 lakhs including furnishing is based on calculations of the covered area and per square feet construction rates. These are found to be roughly comparable to plinth area rates given by Central Public Works Department. We have used the definition adopted by DISE for upgradation costs. Upgradation costs are of two types: major repair and minor repairs. According to the DISE instructions to the school if the amount required for the repairs is lesser than INR 5000 it should be considered as minor repair or else a major repair. Unit cost for minor and major repairs have been assumed to be INR 5000 and INR 30,000 respectively.<sup>9</sup>

The unit costs for teachers' professional development are based on the SSA guidelines. Unit cost for MDM is decided based on the government-defined food norms, food grains cost supplied by the Food Corporation of India and the latest government-defined cooking costs. For other entitlements at the elementary level, comprising of textbooks and uniforms, SSA norms have been followed. All these heads need higher per unit spending, but we have stuck to the existing government rates. Similarly, current SSA norm of INR 7,500 per annum towards school maintenance grant and school development grant of INR 5,000 or INR 7,000 per annum depending on whether the school is primary or upper primary are used. Field experience says and the MHRD officials agree that the government schools are poorly maintained and current SSA norm is abysmally low.

System-level norms are based on latest AWP&B of SSA and 12th Plan Working Group document. Number of personnel in BRCs and CRCs accord with the SSA design. District Institutes of Education and Training (DIETs) are assumed to be staffed with 19 faculty and 10 other staff members.<sup>10</sup>

Management costs are the other part of system level costs. As per the SSA's AWP&B reports there are four distinct components of management cost. They are REMS (research, evaluation, monitoring, and supervision), management cost at State project office (SPO) and District project office (DPO), training of the members of school management committee (SMC) and PRI members, and community mobilisation. Many practitioners have spoken

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<sup>9</sup> Roof repairs are the major repairs in the school context, whereas the minor repairs include plastering, flooring etc. The repairs do not include cosmetic works like white washing, painting, glass fittings.

<sup>10</sup> The Guidelines suggested in the 'Pink Book' (Government of India, 1989) speaks of 24 faculty members for DIETs.

about the low emphasis on management-related activities and the need for higher allocations.<sup>11</sup> Management cost is expressed here as a percentage of the other recurrent cost as larger schooling system not only requires high recurrent cost but also involves greater management activities. We consider management cost as 4 percent of the other recurrent cost, a norm followed by CABE (2005). As a percentage, it is smaller than the SSA norm of 6 percent. However, since we are considering a proportion of the total recurrent cost and not SSA costs alone, the absolute amount would be much larger.

Finally, the unit cost for out of school children (OSC) comprises of bridge course: residential at INR 20000 and non-residential at INR 3000. Following the bridge course, OSC are inducted into the school system, wherein the unit costs converge with the per student unit costs in a school following RTE norms.

**3. Teacher's salary:** Since the 1990s, many States went in for low-cost schooling options in order to meet the education for all objectives. Several State governments recruited teachers at very low salaries, often on precarious terms. Across time, there has been an improvement in their position. Agitation by teachers, which diverted a lot of their energy, being one contributory factor. However, there still exists a bewildering variety of teachers in most States. Even within what is considered regular appointment, there may be many kinds of teachers. States also use contract teachers/para-teachers/guest teachers. In the mushrooming low-cost private school sector, the market rate for teachers is depressed while there is no systematic consistent benchmark followed in State-run schools. RTE leaves it to the States to formulate their own rules and terms of recruitment. How does one obtain a benchmark for teacher's salary?

Tamil Nadu is considered a well-performing State in terms of educational indicators. We have used the pay structure of PRT/JBT (Primary teacher/ teacher with junior basic training) in Tamil Nadu as a benchmark for teachers' salary.<sup>12</sup> Teacher's salary in Tamil Nadu is in the Pay Scale INR 5200-20200 plus 2800 (Grade Pay). We have assumed this common pay scale across States (see Appendix Table A1). Grade pay for UPS teachers is higher compared to primary teachers. New to-be-appointed teachers are at the beginning of the scale whereas the salary corresponding to the average years of service of existing teachers has been used for existing teachers in a State. In other words, the data on mean years of elementary teachers is derived and mapped on to the pay scale to obtain the salary structure. Including allowances, the average figure ranges between INR 25200 to 31000 for existing PS teachers and INR 26500 to INR 32600 for existing UPS teachers.<sup>13</sup> Salary at the beginning of the scale is INR 19300 and INR 20300 for PS and UPS teacher, respectively.

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<sup>11</sup> CBGA (2016b) reports that most of the States spend less than 1% of SSA budgets on community mobilization and SMC/PRI training in the year 2013-14 and 2014-15.

<sup>12</sup> Maharashtra also has the same pay scale as Tamil Nadu.

<sup>13</sup> Salaries of teachers in State Government schools are lower by 13% vis-à-vis those in Central Government schools. This difference is due to the non-applicability of Transport Allowance (TA), Dearness Allowance (DA) on TA and the different calculation of National Pension Scheme (NPS) for State Government school teachers.

A few further points on this issue: (a) There can be variations across States in teacher's salary depending on the cost of living. That is the only tenable logic for variation in teacher's salary across States. Since we did not find much variation in actual dearness allowance across States, we have assumed away this difference; (b) We have not related teacher's salary to the fiscal capacity of the State. If we accept the principle of equal pay for equal work, different terms of employment cannot be defended; (c) In looking for a norm, we could have also looked at Kendriya Vidyalaya in the Pay Band of 9300-34800, which is obviously higher, for comparable qualifications. To what extent the higher scales are necessary to attract talent into the teaching profession needs to be tempered with concerns over equity. In fact many Indian States have higher pay scales than what we have assumed. This may be a hindrance for the equal pay principle. Recall that Education Commission had spoken of living wages for teachers. Very high scales would mean privileging a few over the majority.

**4 Capital Accounting:** We assume that capital costs (other than on major and minor repair) are spread across four years. Tapas Majumdar Committee had used the projection period of 10 years to spread the capital cost. With RTE in effect since 2010, a four-year period is reasonable time-span to bridge the existing gap in capacity. Regular practices for capital accounting such as the straight line amortization method has not been adopted here. The main reason being that the government uses cash-based accounting method. Since one of our main objective is to draw a comparison between the requirements and actual expenditure, we simply distribute the necessary capital expenditure on new construction across four years. Expenditure on repairs, major and minor, need to be met in the current financial year.

**5. Reimbursement Expenditure:** Under Section 12, the RTE Act lays down that private-unaided schools shall admit is class I at least 25 percent of the strength of that class children belonging to weaker section and disadvantaged group in the neighbourhood and provide free and compulsory elementary education till its completion. Such schools will be "reimbursed expenditure so incurred by it to the extent of per child expenditure incurred by the State, or the actual amount charged from the child, whichever is less...". The maximum unit cost for reimbursement in 2015-16 is thus per child recurrent expenditure on elementary education by the respective States in 2014-15 ( $PCE_{t-1}$ ).<sup>14</sup> We assume that  $PCE_{t-1}$  applies to half of the existing students enrolled under this provision of the RTE Act. For the remaining, a unit reimbursement cost of  $0.5PCE_{t-1}$  is taken. This would take into account the high fee charging private schools as well as the many low-cost private schools to which the lower income groups send their children.

**6. New schools:** Additional classrooms required to build in new school are assumed at 5 percent of the total additional classrooms required. Therefore,  $p$  in equation (4) is equal to 0.05. The requirement for new schools would be in cases where the land for extension of the school building is not available and neither construction of additional storey feasible. New

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<sup>14</sup> Though the RTE Act mentions per child expenditure by the state for defining reimbursement norm – and we have adhered to that definition - the correct measure would be per student public expenditure.



schools will also address issues of access, where required. NSSO (2014) reports the data on access in terms of distance to schools. At the primary level, for about 94 percent of households, the distance to school is within 1 kilometer and for the upper-primary an equal proportion have access to schools within 3 kilometers. These are all-India estimates. Hence, an assumption of 5 percent is a tenable one.

## 6. Analysis of Results

### 6.1 Physical and Human Resource Requirement

Table 1 presents the key variables used in the methodology. The main observations are as follows:

- The presence of government schools still dominates in States such as Bihar (90 percent), Chhattisgarh (87 percent), Jharkhand and Orissa (85 percent), Madhya Pradesh (80 percent) and Uttarakhand (74 percent). In Rajasthan and Uttar Pradesh 65 percent of the total schools are government schools, which is closer to the share in better performing States - Tamil Nadu (65 percent), Maharashtra (64 percent), and Karnataka (68 percent). In Delhi, only 48 percent of schools are government schools.
- Significant presence of private-aided schools is seen in Maharashtra (21 percent), Tamil Nadu (15 percent), and Karnataka (10 percent). The percentage in Orissa is 7 percent and Delhi is 4 percent. Private-aided schools have a bearing on recurrent cost only, whereas, for government schools, provision has to be made both for capital and recurrent costs.<sup>15</sup>
- The share of enrolment in government schools is lower than the share in total number of schools for 10 of the 12 States. This accords with the stylized view that the enrolment per school in the government schools on an average is lower than in schools run by the private sector. Bihar and Delhi stand out. In Delhi, enrolment in government schools as a percentage of total enrolment is 53 percent, whereas government school as a percentage of total school is 48 percent (Row 4 and 1). As we will see later, this is reflected in the per child recurrent expenditure requirement.
- The highest percentage of out of school children (OSC) are recorded in Uttar Pradesh (12.3 percent), Bihar (9.9 percent), Rajasthan (9.3 percent), Madhya Pradesh (7.5 percent), Jharkhand (6.1 percent). Next come states such as Chhattisgarh (5.3 percent), Delhi (5.1 percent), Orissa (4.8 percent). Karnata has about 4 percent of 6-13 year olds who are out of school. The three states of Maharashtra (3.1 percent), Uttarakhand (1.5 percent) and Tamil Nadu (0.4 percent) have the lowest proportion of OSC among the 12 states.

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<sup>15</sup> Schools with positive elementary enrolment have been considered rather than all schools with elementary section. Due to the difference in definition, our figures differ from the ones reported in DISE analytical reports.

- Coming to the present levels of infrastructure, Bihar has a huge shortfall of classrooms, with the deficit as much as 75 percent of the existing classrooms in the government schools. Delhi (25 percent), Orissa (22 percent), and Rajasthan (16 percent) are the next three States with substantial gaps in classrooms required (Row 8). The deficit coexists with surplus classrooms in most States.

### **BOX 1: Lack of School Buildings**

DISE, 2015-16 data shows that Bihar has an alarming gap in classrooms and office cum store cum head teacher rooms. Around 10 percent of the government schools in Bihar report an absence of school building and in 1 percent of the government schools building is under construction. Number of students enrolled in such schools (with no classrooms) is 11.3 lakhs which is 5 percent of the total enrolment implying that around 11 lakhs children have to sit in open space to attend classes which automatically increases the number of absentees. 80 percent of such schools were established before 2010. Significant time has elapsed since their inception.

- The extent of classrooms requiring repair is the highest in Uttarakhand where 23 percent of existing classrooms require major repairs and another 19 percent need minor repairs. In another eight States between one-fourth to one-fifth of the classrooms need repair, minor or major. There seems to be serious deficit in office-cum-store-cum-head teacher's room across the States. Additional requirement is more than 200 percent of the existing rooms in Bihar and Orissa but also in Karnataka and Tamil Nadu the gap is as much as 199 percent and 177 percent of the existing rooms.<sup>16</sup> Other States running significant deficit are Chhattisgarh (120 percent), Madhya Pradesh (127 percent), Jharkhand (80 percent) and Maharashtra (55 percent). Our experience of rural schools matches with the data. Schools usually do not have a head teacher's room but use the verandah or a portion of it for the purpose. Appendix Table A2 describes the deficit in other school infrastructure such as library, toilets, drinking water, kitchen shed, boundary wall, ramp and playgrounds in government schools.
- Total teacher requirement in government schools (including private-aided) is around 8 lakh teachers in Bihar and Uttar Pradesh. The massive enrolments in these States get reflected in the teacher requirements. The figures are about 5.4 lakhs in Maharashtra, 4 lakhs in Madhya Pradesh on the higher end to about 50,000-55,000 teachers in Uttarakhand and Delhi. The proportion of teachers existing to teachers required shows that all States are below par vis-a-vis RTE norms (row 14). States like Delhi, Tamil Nadu, Uttarakhand and Chhattisgarh are closer to PTR requirement norms, whereas in Bihar (47.2), Jharkhand (56.4) and Uttar Pradesh (67.4) the existing as percentage of required teacher is low. The teacher gap is massive even by the minimal RTE norm. One definitional issue needs mention here. For figures on existing teachers, unit-level information on each teacher has been used. Only those teachers teaching in elementary grades, as against all teachers in a school with elementary

<sup>16</sup> A problem in data collection cannot be ruled out though. While the RTE mandates an office cum store cum HT's room the DISE question is limited to presence of HT's room.

grades have been included. Due to the difference in definition, our figures differ from the ones reported in DISE analytical reports.

- The last three rows define the academic support as specified by the SSA norm.

Overall, a stock-taking of physical and human resource requirement as per the RTE norm for every school indicates substantial infrastructural gaps and gaps in human resources with the gaps concentrated in some States.

## 6.2 Financial Requirements versus Actual Spending

Financial requirements calculated as recurrent and annualized capital costs are presented in Table 2. The preponderance of financial resource requirements in the two States of Uttar Pradesh and Bihar emerges clearly. In the two populous States of Uttar Pradesh and Bihar, high enrolment translates to higher teacher requirements and high recurrent cost. Bihar also has a substantial infrastructure deficit reflected in higher required capital cost. Total requirement in the two States of Uttar Pradesh and Bihar is in the range of INR 43,000 crores each for 2015-16. Maharashtra, the third highest in terms of total requirement, is behind by about INR 19,000 crores.

Note that most of the resource requirement is for recurrent costs (see column 4 in Table 2). Recurrent cost comprises of nearly 85 percent or more of the total requirement for most of the States, except Bihar, Orissa, Rajasthan, Madhya Pradesh where high infrastructure deficits persists. Thus, expenditure on elementary education must comprise overwhelmingly of recurrent expenditures.

For further analysis, we normalize the requirement and actual expenditure by

- (I) number of students; and**
- (II) income of the States.**

(I) Column 6 of Table 2 gives the recurrent requirement normalized by the number of students. The number of students here includes students in the government (including aided schools) and out of school children (wherever applicable) who are to be absorbed in the current year as per the assumptions. In calculating per student requirement, recurrent costs are the relevant variable. "Capital investments would benefit generations of students and not only the current batch of enrolments".<sup>17</sup> Recurrent cost matters when computing the cost per student in a given year. As seen from Table 2, per student required recurrent cost varies with the range extending from INR 13,998 (Delhi) to INR 25,938 (Uttarakhand). The large variability of required recurrent expenditure across States is no doubt puzzling. Per student required recurrent expenditure is variable across States though we began from the same unit costs.

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<sup>17</sup> We owe this point to a senior official of the Kendriya Vidyalaya Sangathan, New Delhi.

**Table 1: Physical and Human Resource Requirements: Selected Variables**

		BIH	CG	JH	KAR	MP	MAHA	OR	RAJ	TN	UP	UK	DEL
<b>SCHOOL</b>													
1	Govt schools as % of total schools	90.21	87.39	85.18	68.36	80.04	64.11	84.61	65.37	64.64	65.40	73.72	48.29
2	Pvt aided schools as % of total Schools	0.24	0.79	2.39	9.55	0.65	20.81	6.98	0.00	14.59	3.23	2.30	4.45
3	Total (1+2)	90.46	88.19	87.57	77.92	80.69	84.92	91.59	65.37	79.23	68.64	76.02	52.74
<b>ENROLMENT</b>													
4	Enrolment in govt schools as a % of total	91.85	73.04	72.03	50.39	61.68	36.61	79.08	50.37	39.94	48.05	42.47	53.29
5	Enrolment in pvt aided schools as % of total	0.30	1.39	4.35	11.51	0.78	38.27	4.46	0.00	20.24	5.50	4.00	3.43
6	Total (5+6)	92.15	74.43	76.38	61.90	62.46	74.88	83.54	50.37	60.18	53.55	46.48	56.72
<b>OUT of SCHOOL CHILDREN</b>													
7	Out of school children as a percentage of population	9.97	5.32	6.15	3.96	7.50	3.06	4.82	9.33	0.36	12.31	1.52	5.11
<b>INFRASTRUCTURE in Government Schools</b>													
8	Additional classrooms required as a % of existing classrooms	75.13	10.99	12.35	9.60	9.07	10.87	21.74	15.55	7.97	11.88	6.07	25.15
9	Surplus Classroom as % of existing classrooms	5.86	16.26	18.86	16.50	21.49	8.42	11.51	15.35	15.31	22.58	14.94	12.53
10	Classrooms requiring major repairs as % of existing classrooms	10.45	9.99	6.99	12.37	8.07	8.75	13.71	9.81	6.04	6.31	22.76	2.12
11	Classrooms requiring minor repairs as % of existing classrooms	11.70	14.31	5.79	13.46	15.28	8.41	13.27	15.81	7.96	15.22	19.24	4.32
12	Additional HT rooms required as % of existing HT room	232.06	120.42	80.40	198.67	127.41	55.05	203.14	68.24	176.73	13.04	41.25	3.77
<b>TEACHERS in Government (including aided) Schools</b>													
13	Required Teachers (P+UP) *	791614	160865	219619	273293	394530	542153	265214	318621	241690	810542	51124	54285
14	Existing Teachers as % of Required (P+UP)*	47.2	91.2	56.4	68.1	73.0	74.8	77.2	77.8	86.8	67.4	83.7	88.1
<b>ACADEMIC SUPPORT</b>													
15	Required Number of CRCs	4207	2531	2422	3175	6464	5136	3699	4032	2731	9791	1026	173
16	Number of BRCs	537	146	260	203	319	408	423	302	413	971	95	69
17	Number of DIETs	38	27	24	30	51	36	30	33	32	75	13	9

\*This refers to teacher requirement (including head teachers and part-time instructors) for the enrolled children.

BIH: Bihar; CG: Chhattisgarh; JH: Jharkhand; KAR: Karnataka; MP: Madhya Pradesh; OR: Orissa; RAJ: Rajasthan; TN: Tamil Nadu; UP: Uttar Pradesh; UK: Uttarakhand; DEL: Delhi

**Table 2: Total Requirement vis-à-vis actual Expenditure: Comparison of 12 States**

Name of the State	Recurrent cost (in INR Crores)	Annual Capital Cost (in INR Crores)	Total Requirement (in INR Crores)	Recurrent cost to total Requirement (in %)	Actual Total Expenditure (in INR Crores)	Per student required recurrent cost (in INR)*	Per student required cost (in INR)*	Per student actual expenditure (in INR)#	Actual total expenditure to total required cost (in %)	Total Requirement to GSDP (in %)	Additional Requirement to GSDP (in %)	Reimbursement to GSDP (in %)
	(1)	(2)	(3)	(4)=(1)/(3)	(5)	(6)	(7)	(8)	(9)=(5)/(3)	(10)	(11)	(12)
BIH	32745	10090	42834	76.4	12803	14348	18770	5929	29.9	11.2	7.9	0.0058
CG	7034	1276	8310	84.6	5341	20457	24168	16099	64.3	3.2	1.1	0.0202
JH	8844	1458	10301	85.9	4473	17067	19880	8979	43.4	4.5	2.5	0.0008
KAR	11940	1469	13409	89.0	9165	22382	25136	17751	68.4	1.3	0.4	0.0125
MP	18321	3811	22132	82.8	11502	21655	26160	14384	52.0	4.1	2.0	0.0838
MAHA	23668	1603	25270	93.7	19825	19319	20627	16502	78.5	1.3	0.3	0.0031
OR	10877	2589	13466	80.8	6148	19998	24758	11630	45.7	3.9	2.1	0.0007
RAJ	14658	3138	17796	82.4	10939	21554	26168	17600	61.5	2.6	1.0	0.0001
TN	9594	986	10580	90.7	11353	17211	18979	20427	107.3	0.9	0	0.0131
UP	37534	5341	42876	87.5	35791	17141	19581	18348	83.5	3.8	0.6	0.0014
UK	2097	344	2441	85.9	2303	25938	30197	28931	94.3	1.4	0.1	0.0262
DEL	2499	255	2754	90.8	-	13998	15425	-	-	0.5	-	0.0073

**Source:**

*Actual Expenditure:* Finance Accounts - 2015-16 and State Budgets

*GSDP:* Directorate of Economics & Statistics of respective State Governments, and for All-India Central Statistics Office

**Note:**

\*Per student cost is arrived at by dividing required cost by the number of in-school children in government (including aided) schools and out of school children to be absorbed in 2015-16.

#Per student actual expenditure is arrived at by dividing actual total expenditure by the number of children in government (including aided) schools.

The explanation is the following. Teacher salary being the largest constituent of the required recurrent cost, variation in the teacher salaries per student across States explains most if not the whole of the variation in the per student recurrent requirement (see Fig 1). Monthly salary of a teacher is assumed to be broadly the same across States, barring some variation based on average years of service of existing teachers. Variation in the teacher salaries per student can arise due to variation in the required pupil teacher ratio. RTE Act recommends teacher requirement in each school should be based on the enrolment in the school; but RTE norm is not scale neutral. Higher the number of students, more economical is the teacher requirement per student. For example, when primary enrolment in a school is up to 120 pupil teacher ratio as suggested by RTE act is 30; but when primary enrolment in a school is above 200 maximum pupil teacher ratio suggested by RTE act increases from 30 to 40. Another example of economies of scale is that the teacher requirement does not increase if primary enrolment increases from 61 to 90. One can think of teacher requirement as a step function which jumps up from one interval to another. Now, all States do not have uniform enrolments, with some States having preponderant presence of schools with large enrolments whereas others do not. We find State-specific patterns of enrolments with the mean enrolment per school ranging from 71.3 in Uttarakhand to 522.5 in Delhi (see Appendix fig. A1). Therefore, required PTR varies across States since enrolment per school varies across States. Higher is the enrolment per school higher is the required PTR, lower is the teacher salary per student and hence lower is the per student required recurrent cost. Figure 1 indicates the inverse relation between enrolment per school and the per student required recurrent cost implied in the present norms.

The next question is the distance between normative requirement and actual expenditure. Column 9 in Table 2 provides a comparison between total requirement and actual expenditure per student. Actual expenditure per student is based on budgetary data. In the discussion on budgetary data the difficulty in separating the recurrent and non-recurrent components in the actual expenditure was noted. The comparison with the actual, thus, is done using total requirement per student and actual expenditure per student.

Compared to the total requirement of public expenditure on elementary education in 2015-16, the actual expenditures are much lower in the backward States. Actual expenditure in Bihar is only about 30 percent of its requirement. Similarly, in Jharkhand and Orissa actual spending is 43 and 46 percent of their requirements. In Madhya Pradesh it is a little more than half (52 percent). The deficit persists but improves in case of Rajasthan and Chhattisgarh. These two States spent about 62 and 64 percent of their requirement, respectively, in 2015-16. Among the EAG States, Uttar Pradesh (84 percent) and Uttarakhand (94 percent) have the highest actual expenditure to total requirement.

On the other hand in Tamil Nadu, actual expenditure is 107 percent of the total requirement. Maharashtra and Karnataka have lower figures of 79 percent and 68 percent respectively. For Delhi, the actual expenditures have not been reported in Table 2. Schools run by the urban local bodies in Delhi constitute the major part of the primary enrolment. Part of the

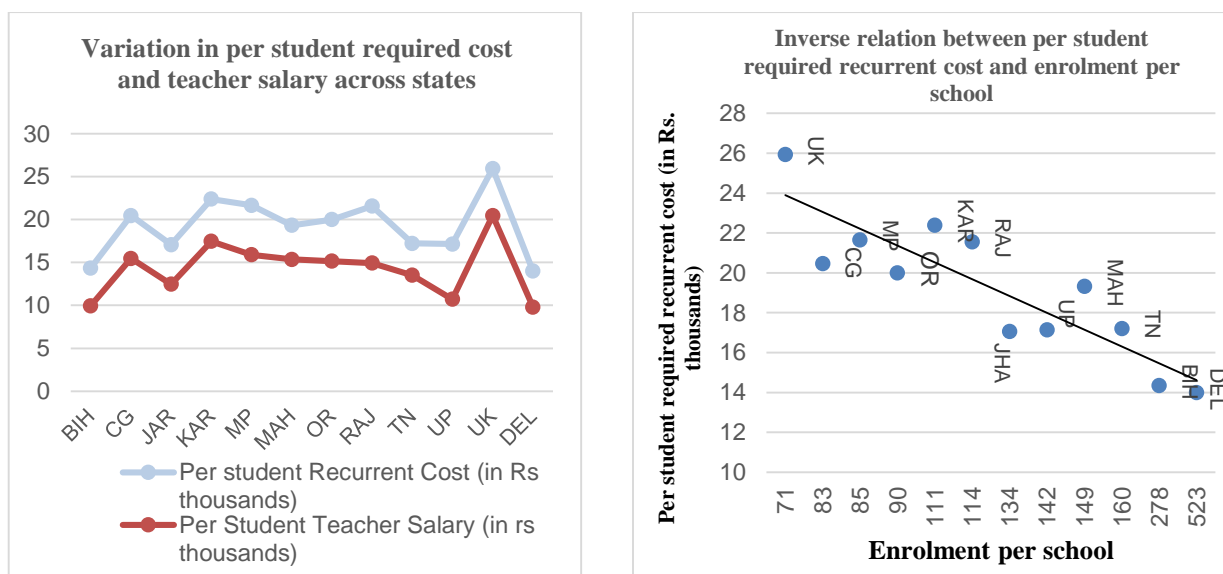


expenditure on municipal schools is reflected in the state budget, while the rest – financed out of own revenue – remains outside it. The municipal budgets do not follow the budgetary classification of state budget. For instance, pension and gratuity fall under education head in municipal budget whereas in the state budget it comes under a separate major head. This gives rise to problems of comparability. Further, the State-run schools in Delhi under the Directorate of Education being secondary schools with classes 6 to 12, they are accounted as part of secondary education expenditure in the State budget. It is difficult to obtain expenditure per student for Delhi in the manner in which it has been calculated for other states.

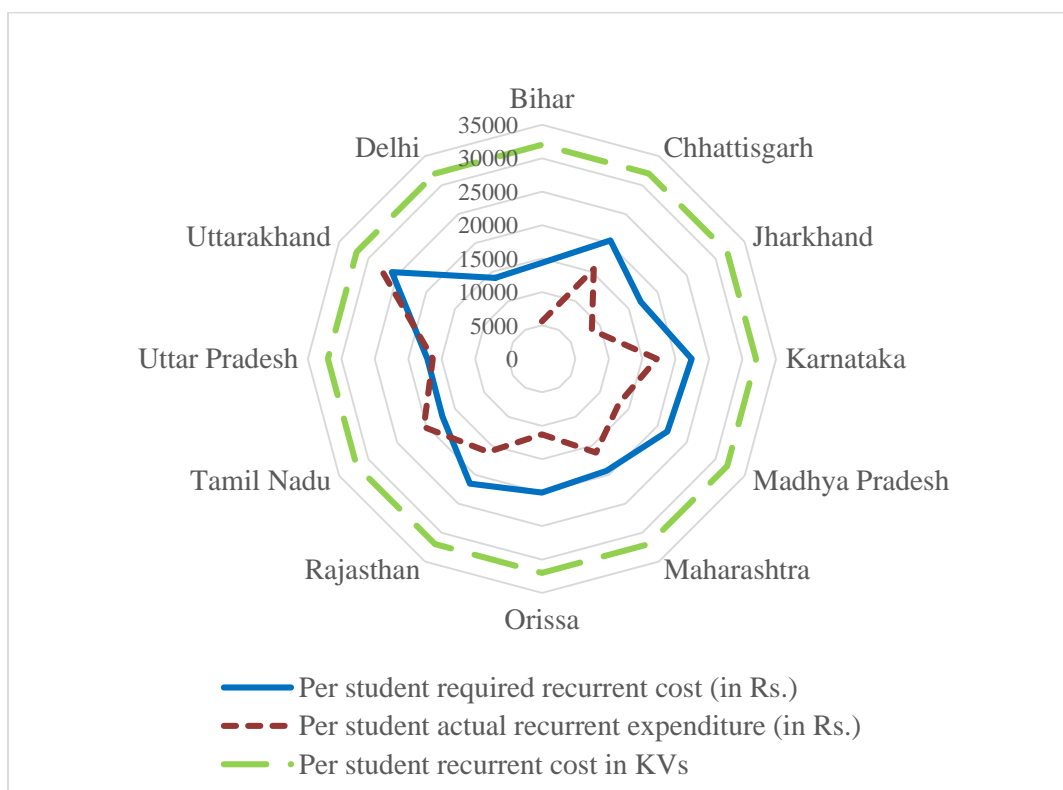
More research is needed to understand the reasons for the gap and every State would have its own story. One of the reasons for the relatively lower gap in Uttar Pradesh, for instance, is the larger relative share of children in private unaided sector. This automatically reduces the public investment requirement. The other likely reason is the higher pay scales of regular teachers in Uttar Pradesh, who draw a high salary. As we noted, many states have pay scales higher than the Tamil Nadu pay scale that we have used as a norm. These coexist with very low salaries and contractual arrangements of various kinds (see Box 2).

Two observations are in order here. (i) High share of actual expenditure to total requirement is not necessarily reflective of a better situation. This indicator has to be seen alongside the physical deficits given in Table 1 and Appendix Table A2. (ii) We know there exist substantial heterogeneity within the state sector schools. Model schools receive far greater allocations per student than other government schools. For comparison sake, per student actual expenditure has been obtained as a single number.

**Figure 1 : Variability in per student required cost across State**



**Figure 2: Comparison across per Student Required and Actual Expenditure**



The contour map (Figure 2) represents the comparison between required and actual expenditure across States. Per student actual expenditure lies well within the per student requirement. The larger the distance between the red and blue lines, greater is the gap. The green line shows the recurrent cost per student in Kendriya Vidyalaya in the year 2015-16. At INR 32,698 per student in 2015-16, the green line lies outside the other two lines by a large margin (except for Uttarakhand). Among other things, it indicates the minimum nature of norms laid down by RTE and considered in the present exercise.<sup>18</sup> A well-performing State like Tamil Nadu spends more per student in recurrent expenditure than what’s been derived as the requirement.<sup>19</sup>

<sup>18</sup> See <http://kvsangathan.nic.in/CostOfEducationPerStudent.aspx> (accessed on 1st Dec, 2016). Per student recurrent cost refers to an average cost per student in KV and is not restricted to elementary classes. It is computed by dividing the total recurrent expenditure at all levels in KV by total enrolments. Given the requirement of special subject teachers and other inputs in higher classes, the average per student recurrent cost might overstate to an extent the per student recurrent cost in elementary schools.

<sup>19</sup> Refer to Dreze and Sen (2013) on Tamil Nadu’s record of public services and its underlying reasons. The State has some of the best public services among all Indian States, comparable with Kerala and Himachal Pradesh. Active social policies have been pursued as a response to democratic politics and sustained organized pressure. The basic principle being facilities such as school education should be available to all on a non-discriminatory basis and preferably free of cost. The authors note that “these

II. Total requirement is next normalized by GSDP. The advantage of normalization with GSDP is that it factors in States' income, fiscal capacity and ability to finance the expenditures. States with lesser fiscal capacity can be identified and accordingly central transfer can be made to offset the fiscal disabilities. When States are at different levels of fiscal capacity, they can incur comparable levels of expenditures on social and physical infrastructure only when central transfers offset the fiscal disability of States with low fiscal capacity. We will return to this point in the discussion on policy.

Total requirement for elementary education normalized to GSDP, varies widely across States (see Col. 10 in Table 2). The variation is high and the range is wide. From a high of 11.2 percent of GSDP in Bihar, the total requirement for elementary education comes down to 0.5 percent of GSDP in Delhi. Total requirements as percentage of GSDP for other States in decreasing order are: Jharkhand (4.5 percent), Madhya Pradesh (4.1 percent), Orissa (3.9 percent), Uttar Pradesh (3.8 percent), Chhattisgarh (3.2 percent), Rajasthan (2.6 percent), Uttarakhand (1.4 percent), Karnataka (1.3 percent), Maharashtra (1.3 percent), and Tamil Nadu (0.9 percent). For States like Bihar with low GSDP and gaps in existing infrastructure and very high total requirement, it is a worse curse. Not only is the requirement high, the resource base is low. About 8 percent of GSDP needs to be spent additionally every year on elementary education at least for some years till infrastructure deficits are met and States' income base expands.

On the other hand, for a State like Delhi with high GSDP even though the gap might be significant, it can be met through 0.2 percent of GSDP. Richer States can bridge the gap much more easily. Other States with additional resource requirement as percentage of GSDP of less than 1 percent are: Uttarakhand (0.1 percent), Maharashtra (0.3 percent), Karnataka (0.4 percent), Uttar Pradesh (0.6 percent) and Rajasthan (1 percent). In the States of Chhattisgarh (1.1 percent) and Madhya Pradesh (2 percent), the additional requirement to GSDP is between 1 to 2 percent of GSDP, while 2 to 3 percent of GSDP is necessary for Orissa (2.1 percent) and Jharkhand (2.5 percent).

The calculation of requirement points to another interesting fact. It is fallacious to recommend a fixed percentage of GSDP for elementary education that applies equally for all States. The notion of 6 percent of GDP towards total educational expenditure (with roughly half of it devoted to elementary education) doesn't make sense as a sub-national target.

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efforts have been greatly facilitated by a functioning and comparatively efficient administration. The governments involved have delivered their services on traditional lines, and there has been little use of recently favoured short-cuts such as the use of para-teachers (rather than regular teachers), making conditional cash transfers, or reliance on school vouchers for private schools (rather than building government schools). The heroes in these successful efforts have been 'old-fashioned' public institutions – functioning schools, health centres, government offices, Gram Panchayats (village councils) and cooperatives. These traditional public institutions have left much room for private initiatives at a later stage of development, but they have laid the foundations of rapid progress in each of these cases."

Reimbursement to the private-aided schools against 25 percent of seats for children belonging to disadvantaged groups are an addition to the State's direct expenditure on education. Many States have not reported the eligible reimbursement amounts, nor declared the per child expenditure which is to be the basis for reimbursement (see PAB reports for 2015-16).

In the absence of proper benchmarks, the requirements for reimbursement was calculated but not clubbed with total requirement. The required reimbursement as percentage of GSDP (col. 12) is fairly small, one reason being a very small proportion of schools are providing admission under this provision of the Act.<sup>20</sup>

### 6.3 Required Composition of Spending

Table 3 gives the composition for estimates of recurrent requirement. The first six rows relate to school-level costs and the last two rows are system-level costs. Resource requirements for infrastructure are reflected in Table 2, and not included here. Depending on the extent of gap in infrastructure, one time investments need to be made. Unlike the capital requirement, composition of recurrent requirements do not diverge much across States. On an average, teachers' salary accounts for about 80 percent of the required recurrent cost.

The teacher training head essentially comprises of costs for training plus maintaining the institutions of training (academic support). The share of these components on an average are 0.9 percent and 2.8 percent respectively. Roughly, 3.5 percent of the required recurrent cost would need to be devoted to training and academic support, i.e. capacity building for teachers.

MDM accounts for another 7-8 percent of recurrent requirement, though in some States like Delhi and Bihar the share is around 10 percent. Again, this has to do with the bigger school size, which spreads teacher salary component amongst larger number of students, while MDM expenditure is fixed per student. Textbooks and uniforms constitute another 2-3 percent of recurrent requirement, bringing the share of entitlements to 10 percent in recurrent requirement for elementary education.

Operation and maintenance of schools accounts for only 0.8 percent of the recurrent requirement as per the present set of norms. This is one area where the norms are severely inadequate. Grants for operation and maintenance are very nominal and cover a whole lot of heads. School development grant is supposed to suffice for a whole lot of sundry activities for repair/replacement of equipment available in the school, purchase of library books, newspapers, blackboards, public address system, organization of academic debates and competitions, expenditure on the cleanliness of the school premises and purchase of dustbins, procurement of book shelves. It has been widely agreed that the amounts available to the school for operation and maintenance are not enough and any allocation on administrative head

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<sup>20</sup> Field reports from schools in Madhya Pradesh and Uttar Pradesh reveal very small amounts being reimbursed. There is a general laxity in implementation both on the part of the schools and the administration.

(such as on office person in schools where the number of students are large) is absent. It would be interesting to see what kind of additional expenditures are required if more reasonable norms are included.

Management cost of nearly 4 percent by assumption plays a crucial role in monitoring, supervision, planning, training of other functionaries, assessment, environment building and community mobilization - aspects of governance. It helps create the eco-system within which the school system functions.

The share of inclusive education in recurrent requirement is 1.8 percent on an average. It includes learning aids etc. for CWSN and expenditures for mainstreaming out of school children. There are no provisions for special educators either for CWSN or OSC in the present norms. Also, we have not taken into account special incentives and arrangements for SC/ST students and girl children, which would have pushed up the expenditures on inclusive education.

How does the actual composition of government expenditure compare with the normative composition? We have used CBGA's study for the comparison. CBGA (2016b) presents composition of school spending for ten of the twelve States (except Uttarakhand and Delhi).

Functional classification of expenditure has been worked out for 2015-16 (Budget estimate + Supplementary budget). This is proposed expenditure and not actual spending. The composition of spending refers to grades upto Class 12 and not only the elementary level. The heads of classification also differ from our categories and therefore are not strictly comparable (see Table 4). Some important patterns may still be noted.

Expenditure on teacher's salaries as part of the overall expenditure is much lower than what we have derived in our normative estimates. This is true especially in case of Bihar, Chhattisgarh, Jharkhand, and Orissa, but also in States such as Tamil Nadu. Exceptions are Uttar Pradesh and Rajasthan.

The share of proposed expenditure on trainings in overall expenditure is smaller than what the requirements demand. The teachers' training days reflects the underspending (refer to Box 2).

Amongst all the heads, the share of MDMs in actual expenditure is close to or higher than the requirement share for several States (Bihar, Chhattisgarh, Jharkhand, Karnataka, Madhya Pradesh and Orissa). It appears that MDM as an entitlement guaranteed by law has ensured that the scheme does take effect. In Maharashtra, Tamil Nadu, UP and Rajasthan, the share of MDM in expenditure is lower than the requirement share. These are States with significant presence of aided schools. In the calculation of requirement, we have considered MDMs as an entitlement for all the children enrolled in government including aided schools at the elementary level. It is quite likely that States are not implementing the programme in the aided schools.

**Table 3: Composition of Required Recurrent Cost (in percentages)**

Components	BIH	CG	JH	KAR	MP	MAH	OR	RAJ	TN	UP	UK	DEL	Average
Teachers' Salary <sup>1</sup>	77.79	80.39	78.69	82.23	80.62	82.21	79.61	80.38	78.99	77.95	80.79	77.25	79.74
Teachers' Training	1.01	0.77	1.04	0.94	0.79	0.85	0.95	0.87	0.93	0.91	0.98	0.71	0.90
Entitlements <sup>2</sup>	3.82	2.74	3.14	2.22	2.55	1.96	2.75	2.48	2.66	2.80	2.12	3.87	2.76
Mid-Day Meals	9.40	7.00	8.01	6.38	6.47	7.57	7.10	6.13	8.77	7.35	5.70	10.23	7.51
Operation, Administration and Maintenance at the school level <sup>3</sup>	0.42	0.83	0.83	0.90	0.81	0.70	0.98	0.94	0.75	0.60	1.11	0.20	0.76
Inclusive Education for Children <sup>4</sup>	2.30	1.48	1.64	1.27	2.27	0.98	1.23	2.98	0.52	4.03	0.59	1.97	1.77
Academic Support <sup>5</sup>	1.48	3.06	2.92	2.30	2.75	1.97	3.67	2.47	3.67	2.62	5.05	2.01	2.83
Management cost <sup>6</sup>	3.79	3.73	3.73	3.76	3.74	3.77	3.71	3.75	3.70	3.75	3.65	3.77	3.74
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>

**Source:** Own calculation

**Notes:** <sup>1</sup> Teacher salary includes salary of teachers <sup>2</sup> Entitlements include Uniforms and Text Books; <sup>3</sup> Operation, Administration and Maintenance includes school development grant, School maintenance grant; <sup>4</sup> Inclusive Education for Children includes non-teacher component for Out of school children and learning aids for CWSN.

<sup>5</sup> Academic support includes cost on BRCs, CRCs and DIETs; <sup>6</sup> Management cost includes Research Evaluation Monitoring and Supervision (REMS), School Management Committee (SMC), PRI training & Community mobilization

**Table 4: Composition of Expenditure (other than Infrastructure) in School Education Budget (in percentages)**

	BIH	CG	JH	KAR	MP	MAH	OR	RAJ	TN	UP	Average
Teachers' Salary	55.6	64.7	61.7	78.6	68.0	71.5	62.9	85.6	68.8	77.0	69.4
Teacher Training	1.7	0.6	0.5	0.5	0.2	0.4	0.3	0.3	0.3	0.3	0.5
Incentives	23.6	8.2	11.0	4.6	10.8	2.0	13.5	5.8	8.0	12.5	10.0
Inspection & Monitoring	0.6	0.0	1.0	0.0	0.0	0.5	1.4	0.9	1.2	0.4	0.6
Mid-day Meal	8.9	5.8	10.6	10.4	7.7	4.2	8.3	3.0	6.4	3.3	6.9
Others*	9.5	20.4	15.2	5.8	13.2	21.4	13.6	4.5	15.3	6.5	12.6

**Source:** Our calculation based on "CBGA, How have states designed their school education budgets?" 2016.

**Notes:** \* Others includes expenses on direction and administration (rent rate and taxes, water charge, electricity bills, miscellaneous charges, print and stationary, salaries on operation of ashram/hostels, grant in aid (non-salary), grant to local bodies (unspecified) and other expenditure



More than a-fifth of the expenditure on school education in Bihar is on incentives. The corresponding figures for Uttar Pradesh and Orissa are 12.5 percent and 13.5 percent. This is much higher than the average of ten States at 10 percent. Note that the average on entitlements (other than MDM) in recurrent requirement stood at 2.7 percent (Table 4). There is a basic difference between entitlements at the elementary level and incentives for school education. At the elementary level since public education is free, one needn't account for entitlements other than textbooks and uniforms. At the secondary level, there would be need for scholarships and other incentives. Even so, the differences across States show how the poorest States are spending a significant share of their already low budgets on incentives. A spate of measures to attract students through incentives without addressing structural issues towards educational improvements will not be sustainable in the long run. Incentives have played a role in attracting children to school and retaining them. The other pillars of school system need strengthening urgently.

**BOX 2: Underspensing On Teachers**

The most important input into schooling are the teachers and their position has been precarious in many states. Table 5 compiled from the PAB reports of SSA gives a sense of the terms of employment that exist in the public sector teaching profession across the 12 states. SSA teachers are only a sample of teachers in a state. In the absence of available information on teacher salaries across teacher types for the states, we have used this information. From para-teachers in Uttar Pradesh (@INR 3210), untrained teachers in Jharkhand (@INR 6841), contract teachers in Orissa (@INR 8892 per month) to regular teachers though not necessarily on scale, there are a large number of arrangements. In some cases, the salaries listed are lower than the minimum wages for a skilled labour in a state and far less than the living wage for teachers referred by Education Commission, 1966.

**Table 5: Monthly Salaries of in Position SSA Teachers at Primary Stage (INR)**

State	BIH	CG	JH	KAR	MP	MAH	OR	RAJ	UP	UK	TN	DEL
Existing (Contractual)							8892		3210	13000		23333
Existing (regular)	10500	12570 (20787)*		24833	20460			33000	30500	46000	23317	
Head Teacher					5000			33000	42000		36375	
Additional (Contractual)					5000		8891					
Additional (regular)	10500											
Para									3210			
TET qualified			7833									
Trained			7458									
Untrained			6841									
<b>Weighted Average**</b>	<b>10500</b>	<b>18488</b>	<b>7368</b>	<b>24833</b>	<b>15543</b>	<b>24200</b>	<b>8892</b>	<b>33000</b>	<b>10389</b>	<b>43034</b>	<b>23731</b>	<b>23333</b>

Source: SSA, PAB Reports, 2015-16. Figures for Uttar Pradesh are taken from 2014-15 PAB report.

\* Teacher's salary INR 20787 for those appointed before 2007-8, and INR 12570 for those appointed thereafter. Weighted average is calculated using the number of teachers working for that salary as weights.

Coexisting with the hierarchies in the teacher types and the low salaries are shortages in teachers. Madhya Pradesh MDG report, 2014-15 had highlighted the situation on teacher gaps: "the real time data on block-wise teacher recruitments and requirements in October 2014 shows that as per the RTE, 2009 norm there is a shortfall of a whopping 84,000 teachers in MP at the elementary school level....Further, the distribution of teacher shortage is very unequal." Shortfalls are higher in the poorer districts of the states Jhabua, Singrauli, Alirajpur, Mandla, Barwani, Chhatarpur, Tikamgarh, Shivpuri and Dhar. The report goes on to show the inverse correlation between teacher gaps and retention rate in the primary grades across the districts.

The third aspect relating to teachers is the training of existing teachers. DISE data shows 96 percent of existing teachers in government schools in MP do not have a minimum of 10 days of training in the year 2015-16. This scenario prevails in several states in India.

## 7. Limitations of the present approach and further work

There are elements of costs that have been ignored such that requirements may have been underestimated. In required recurrent costs, special incentives for SC/ST students have not been considered as we didn't come across clearly defined norms for the elementary level.<sup>21</sup> Similarly, special incentives for girls has not been taken into account. Financial provisions for children attending madrasas have not been included. Capital costs for inclusion of out of school children have not been taken into account. The states where the number of OSC are large, the school infrastructure even after meeting the present deficits, will not be adequate. Though aware of the limitation, in the absence of school mapping data, the capital expenditure for OSC could not be accounted for.

A measure of under-estimation would also creep in if the enrolment reported in DISE are under-estimates. However, this is unlikely to be the case for the state sector, which is the focus of our study. DISE does warn that schools under private management might not be full covered.<sup>22</sup> To the extent, out of school estimation method takes total elementary enrolment figures of DISE as base, there will be a degree of underestimation.

We have used uniform unit costs for capital assets, whereas the construction costs including the cost of material is likely to vary across states (and within states). In hilly states, the cost of construction would be higher, which we have not accounted for.

Finally, resource requirement is based on existing pattern of enrolment in the state schools, and not a normative standard. A more equitable composition of enrolment patterns across management types would have resulted in higher estimates of total requirements.

In the present methodology, we compared the estimated total requirement with the total existing expenditures. This method has both advantage and disadvantage. One important advantage of this method is that underspending implied in the hierarchies of teacher types within the state sector could be captured. The usual approach to calculate additional requirement by only costing the physical gaps would have neglected this element (CABE, 2005, 2009). The disadvantage springs from the presence of elements that are incomparable: there may be heads of expenditure that are a part of actual expenditure but not considered in requirement. A more meaningful and accurate comparison would be one along functional categories so that the sources of underspending can be pinned. The problem with such an exercise is that the budgetary classification is scheme-wise and to classify it functionally is very difficult, if not impossible.

In our further work, we propose to overcome some of these issues and extend the analysis to all States and UTs such that a macro-estimate for total and additional requirement can be drawn up. Projection of requirements across the medium term of 4-5 years can present a time path of requirements.

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<sup>21</sup> To the extent budgetary expenditure on 2225-01/02/03- 277 is not a part of the actual expenditure, this balances out.

<sup>22</sup> DISE State Report Card, 2015-16

We will also attempt to look at the financial implications of improved norms. Many of the norms of SSA are not in tune with reality as has been repeatedly felt. The norm for uniforms @ INR 400 for 2 sets is inadequate. Textbooks @ INR 150 or @ INR 250 for PS and UPS respectively is also inadequate. Except Uttar Pradesh which manages a print run at this cost because the volumes are very large, most other States find it difficult to cover the cost at this rate.<sup>23</sup> As for teacher professional development: residential induction training for new teachers for 30 days @ INR 200 per day is a conservative norm.<sup>24</sup> An exposure visit for teachers for exchange of ideas and experiences should be budgeted. Library grant is provided only once in a lifetime to schools. Maintenance grant is at a measly INR 10,000 annually which includes security, housekeeping, electricity, water, equipment and IT maintenance etc. If schools are to function reasonably well, revisions are required in present norms, which would raise the required expenditures.

While we have reported the results at the state level, this could have been analysed at greater levels of disaggregation - districts, blocks and clusters within a region. Disparities within a state would then get reflected. This would provide a clear blueprint of allocations required at every level. While strategic planning has to happen at the top, micro-planning is essential for successful implementation.

## 8. Policy Perspective

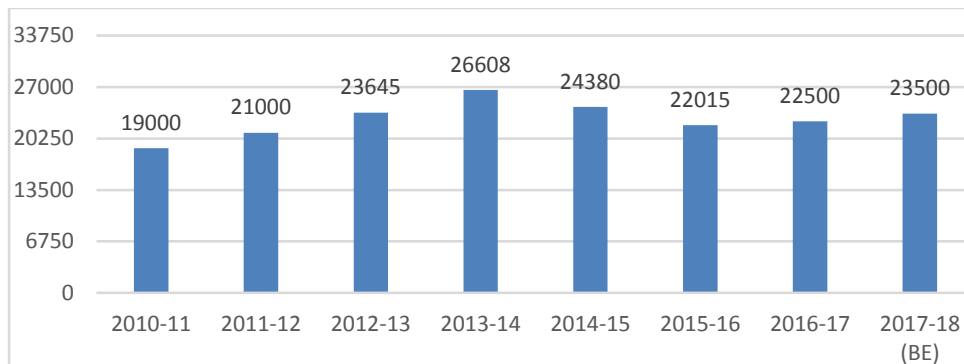
The empirical exercise has presented resource requirements for the 12 States using the set of norms defined in the RTE Act (and other available official documents). In the process, we laid down a normative frame of reference essential to judge financial adequacy. We found clear evidences of presence of substantial gaps and under-spending at present though the per student resource requirement estimated are in a reasonable range. Overall inadequacy of current levels of spending emerges unequivocally. The obvious implication of this finding is the need for higher allocations with due consideration for equity aspect as the deficit is clearly concentrated in the poorer States of India. Is the current policy space conducive to the pursuance of these goals? The following paragraphs provide an answer.

Major expenditure on education is incurred by the States, whereas the Centre's contribution is in the form of central schemes and CSSs. "Additionalities", as the latter are generally called, contribute less in terms of finances but make up important plan expenditures lending new direction to policy. SSA, the main vehicle for implementation of RTE is a CSS with sharing pattern of 60:40 (Centre:State) for general category States and 90:10 for Special Category States. Though not without shortcomings, SSA has played an important role in augmenting resources of the States and enabling expenditures on a range of inputs necessary for schooling.

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<sup>23</sup> Based on conversation with MHRD officials

<sup>24</sup> Based on feedback from APF field experience

**Figure 3: GOI allocations for SSA (INR Crores)**


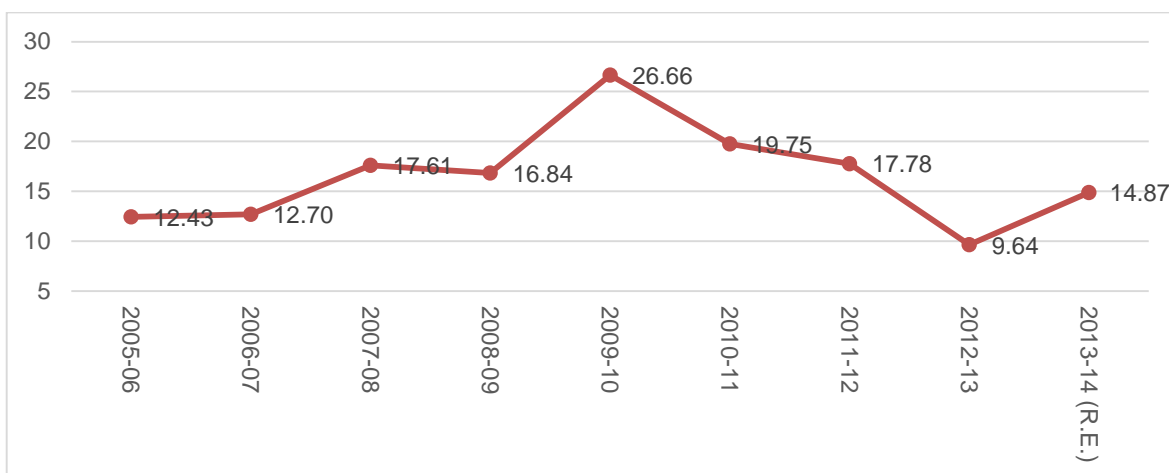
Source: Accountability Initiative

Figure 3 presents Government of India's allocation on SSA. SSA budget has stagnated and even declined after rising consistently between 2010-11 and 2013-14. In view of the requirement estimates, the trend is surprising. There are two important policy choices explaining the declining trend in allocations for SSA. CSSs are designed by central ministries and the imposition of unified design has been resented by many States (Sen, 2017). This is more so since the CSS like the SSA not only reduced funds available for the States (i.e. by slicing off a share from the divisible pool of Central taxes) but also by building in matching contribution reduce the funds available from their own revenues. Taking cognizance of this objection and to uphold the principles of fiscal federalism in general, the Fourteenth Finance Commission increased the share of tax devolution to States from the divisible pool of Central taxes and reduced the share of tied grants. The reduction in allocation under SSA, a tied transfer from Centre to States, draws on the logic of fiscal federalism. The second policy aspect has to do with the fiscal consolidation roadmap and the need to contain deficits. After a few years of relaxation following the global financial crisis, fiscal consolidation process was renewed in 2013-14. Fiscal targets were met through compression of grants in aid by the Centre to States, among other things. In the year, 2014-15, actual expenditures on all major flagship schemes, except Pradhan Mantri Gram Sadak Yojana (PMGSY) was lower than what was budgeted at the beginning of the year. These shortfalls helped the Union government meet the fiscal deficit targets, while maintaining the committed expenditures.<sup>25</sup>

Figure 4 shows the trend in growth of revenue expenditure on elementary education by States and union territories. This constitutes the bulk of the elementary education expenditure. The growth rate peaked in 2009-10 and declined thereafter. In 2012-13, the growth of nominal expenditure had decelerated to less than 10 percent. M/o HRD has not published data beyond 2013-14 (RE) making it impossible to comment on recent trends. One point is clear: there's been no systematic acceleration in expenditures with the enactment of Right to Education Act, 2009; deceleration is the likely trend.

<sup>25</sup> These issues came up in the first performance audit of FRBM compliance of the Union government.

**Fig 4: Annual Growth Rate of Elementary Education Expenditure (Revenue Account) by States & UTs\***



Note: Excludes Centre's contribution

Source: Analysis of Budgetary Expenditure on Education, MHRD (various issues).

Fiscal rules have tied the hands of the States, and in comparison to the union government, States have tried much harder to comply. Most States, including the poorest ones, are running a surplus on the revenue account (see Table 6). The measure of revenue surplus reflects the revenues that could have been spent on revenue expenditures such as hiring and training teachers etc. Chakraborty and Dash (2013) show through a panel regression analysis that fiscal targets under fiscal rule have been achieved through a cut in development spending by States. Without the central transfers, the state-level contraction in development spending would have been even higher to comply with the fiscal rule.

Given the framework of fiscal rules, it is highly uncertain how the changed structure proposed by the Fourteenth Finance Commission with enhanced untied resources will translate to allocation on education.<sup>26</sup> Especially, in States where the priorities accorded to education have been minimal, this could be a double whammy. Allocations on tied grants such as the SSA and MDM programme will stagnate, while the growth in States' own expenditure may also fall short. Unless the governments take note and actively prioritize, a scenario of slow growth of education spending, completely contrary to what is required, would be the most likely scenario.

<sup>26</sup> A small leeway has been accorded to States having a record of fiscal discipline by the 14<sup>th</sup> FC. States that have a debt-GSDP ratio of less than 25% and interest payments-revenue receipts ratio less than 10% in the previous two years will be eligible to raise their fiscal deficits by half a percentage point. If a state fulfils only one of the two conditions, it will be eligible to increase borrowing by a quarter of a percentage point above the 3% of GSDP limit.

**Table 6 : Revenue Deficit to GSDP (in percentage)**

	BIH	CG	JH	KAR	MP	MAH	OR	Raj	TN	UP	UK	DEL
2013-14	-1.9	0.4	-1.6	-0.1	-1.4	0.3	-1.2	0.2	0.2	-1.2	-0.9	-1.4
2014-15	-1.6	0.7	0.1	-0.1	-1.3	0.7	-1.8	0.5	0.6	-2.1	0.6	-1.2
2015-16*	-3	-0.9	-1.7	-0.2	-1.1	0.3	-3	0.9	1	-1.2	-0.2	-1.3
Average	-2.2	0.1	-1.1	-0.1	-1.3	0.4	-2	0.5	0.6	-1.5	-0.2	-1.3

Source: RBI, State Finances - A Study of Budgets, (various issues and state budgets).

\* Figures for Uttarakhand and Delhi are Revised Estimates.

We found that the concentration of required expenditure falls heavily on States such as Bihar, Jharkhand, Orissa, and Madhya Pradesh where incomes are low. For the other States such as Karnataka, Maharashtra, Delhi, Uttarakhand etc., the demands of universalization as per the RTE norms are not too high relative to their incomes. In fact, there is scope to raise revenue expenditures in States running surpluses on the revenue account to cover the gap. However, special provisions have to be made for some states. Bihar, in particular, requires special assistance to move towards universalization. Central transfers can play an important role in this regard. RTE Act lays down among the duties of the Central government to refer to the Finance Commission “to examine the need for additional resources to be provided to any State government so that the State government may provide its share of funds for carrying out the provisions of the Act.” (Chapter 3, Clause 7).

In the past, the 12<sup>th</sup> Finance Commission had recommended equalization grants towards equalization of educational expenditures across States, though the amount was small and had to cover the entire education sector. The 13<sup>th</sup> Finance Commission followed it up by grants to States for elementary education subject to a certain minimum growth of 8 percent in elementary education expenditure. An amount of roughly INR 24,000 crores was proposed. The objective of the grant in case of 13<sup>th</sup> Finance Commission was to support States in their transition to a financial sharing arrangement where the States shoulder a higher share of matching expenditure under SSA. The grant, however, would only be given if the growth of expenditure on elementary education was atleast 8 percent such that States had an incentive to raise spending. More recently, the 14<sup>th</sup> Finance Commission rather than improving the mechanism in favour of equalization, has not provided any specific purpose grant to States for education.<sup>27</sup> Ignoring the State-specific situations goes against the grain of equalization.

Equalization has been a sore point of SSA as well. Several researchers have noted that SSA treats the better-off States and the backward States equally (Sankar, 2007; and Geetha Rani, 2016). Except the north-eastern or special category States, all States are to provide

<sup>27</sup> Apparently, in the 14<sup>th</sup> FC award, States like Bihar have also received lower share of the total States share because the new formula for horizontal devolution attaches zero weight to fiscal discipline as against the 13<sup>th</sup> FC formula.



equal matching shares under SSA. Comparing the per-student expenditure, the Geetha Rani(2016) notes “Himachal Pradesh reported the highest per student expenditure of INR 18509 and Bihar spent INR 2684 in 2010-11. The increase in per-student cost additionally on account of SSA was INR 2668 in Himachal Pradesh, while the amount itself was the per student cost in Bihar! The additional per student cost that Bihar could reap was INR 1872.” (p. 346)

The issue of equalization needs immediate attention within SSA as well as in the overall framework of Centre-State finances. This is all the more pertinent when fiscal rules apply equally to States and even a poor State must contain and match its expenditure to its revenues. Careful strategic planning at the top to prioritize public expenditure on elementary education with due consideration to equalization needs to be worked out. Consultation and feedback between the Centre and States to address genuine concerns and correction for various design problems on matters of autonomy and equity are required. The turf battle between Centre and States has to be resolved in favour of the common goal of universalisation of elementary education.

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APPENDIX Table A1: Head-wise Unit Cost		
Recurring Cost (School level)		
Head	Expenditure Head	Unit Cost
Teacher's salary	Teacher Existing	Pay scale INR 5200-20200 with a grade pay of INR 2800 in primary school (PS)
		Pay scale INR 5200-20200 with a grade pay of INR 3200 in upper primary school (UPS)
	New Teacher	@INR 19300 per month(PS)
		@INR 20300 per month (UPS)
	Head Teacher's Salary	@INR 40000 per month
Part time Instructors	Three Part-time Instructors to teach Art education, Work education and Physical education at upper primary level @INR 16000 per month (UPS)	
Teacher Professional Development	Refreshers in-service training	10 days every year at the BRC level @INR 200 per day for all teachers in govt. including aided schools
	Cluster level meeting & peer group training session	1 day in every month for 10 months at the CRC level @INR 100 per day for all teachers in govt. including aided schools
	Induction training	30 days for new teacher @INR200 per day in govt. including aided school
	Teacher learning material	@INR 500 per year per teacher in govt including aided school
Student Support	MDM	@INR 6 per child per day (PS) for 200 working days in govt including aided school
		@INR 8 per child per day (UPS) for 240 working days in govt including aided school
	Uniforms	@INR 400 per child per year in govt school
	Textbooks	@INR 150 per child per year (PS) in govt including aided school
@INR 250 per child per year (UPS) in govt including aided school		
Operation, administration and maintenance	Maintenance Grant	@INR 7500 per year (separately for PS & UPS) for government including private-aided schools
	School Grants	@INR 5000 (primary) per year & @ INR 7000 (upper primary) & @ INR 12000 for elementary per year for govt. including private aided schools
Inclusive education for Children	Mainstreaming of Out of School Children	@INR 20,000 per child per year for residential training. @INR 6000 per child per year for non-residential training
	Inclusive education for Children with Special needs (CWSN)	@INR 3000/- per child per year

Recurring Cost (System level)		
Head	Expenditure Head	Unit Cost
<b>Academic Support through Cluster resource Centre (CRC)</b>	CRC coordinator (Monthly)	1 CRC coordinator per CRC @INR 35000 per month
	Furniture grant	@ INR 10000 per year per CRC
	Replacement of Furniture Grant	@ INR 2000 per year per CRC
	Contingency grant	@ INR 10000 per year per CRC
	Meeting, TA	@ INR 12000 per year per CRC
	TLM grant	@ INR 3000 per year per CRC
	Maintenance Grant	@ INR 2000 per year per CRC
<b>Academic Support through Block Resource Centre (BRC)</b>	BRC resource person (monthly)	6 resource person for subject specific training and 2 for training teachers to teach CWSN @ INR 35000 per month
	MIS coordinator (monthly)	1 MIS coordinator @INR 25000 per month
	Data entry operator (Monthly)	1 data entry operator @INR 10000 per month
	Accountant cum support staff (Monthly)	4 Accountant cum support staff @INR 12000 per month
	Furniture grant	@ INR 10000 per year per BRC
	Replacement of Furniture Grant	@ INR 20000 per year per BRC
	Contingency grant	@ INR 50000 per year per BRC
	Meeting, TA	@ INR 30000 per year per BRC
	TLM grant	@ INR 10000 per year per BRC
	Maintenance Grant	@ INR 10000 per year per BRC
<b>Academic Support through DIET</b>	Faculty	19 faculty @INR 45000 per month
	Other Staff	10 other staff @INR 12000 per month
	Contingency grant	@ INR 100000 per year per DIET
	Maintenance Grant	@ INR 20000 per year per DIET
	Meeting, TA	@ INR 30000 per year per DIET
<b>Management</b>	Management Cost includes Learning Enhancement Programme, Research Evaluation and Monitoring System, Community Mobilization, School Management Committee /PRI training and administrative costs . We are assuming management cost is 4 percent of the recurrent cost.	

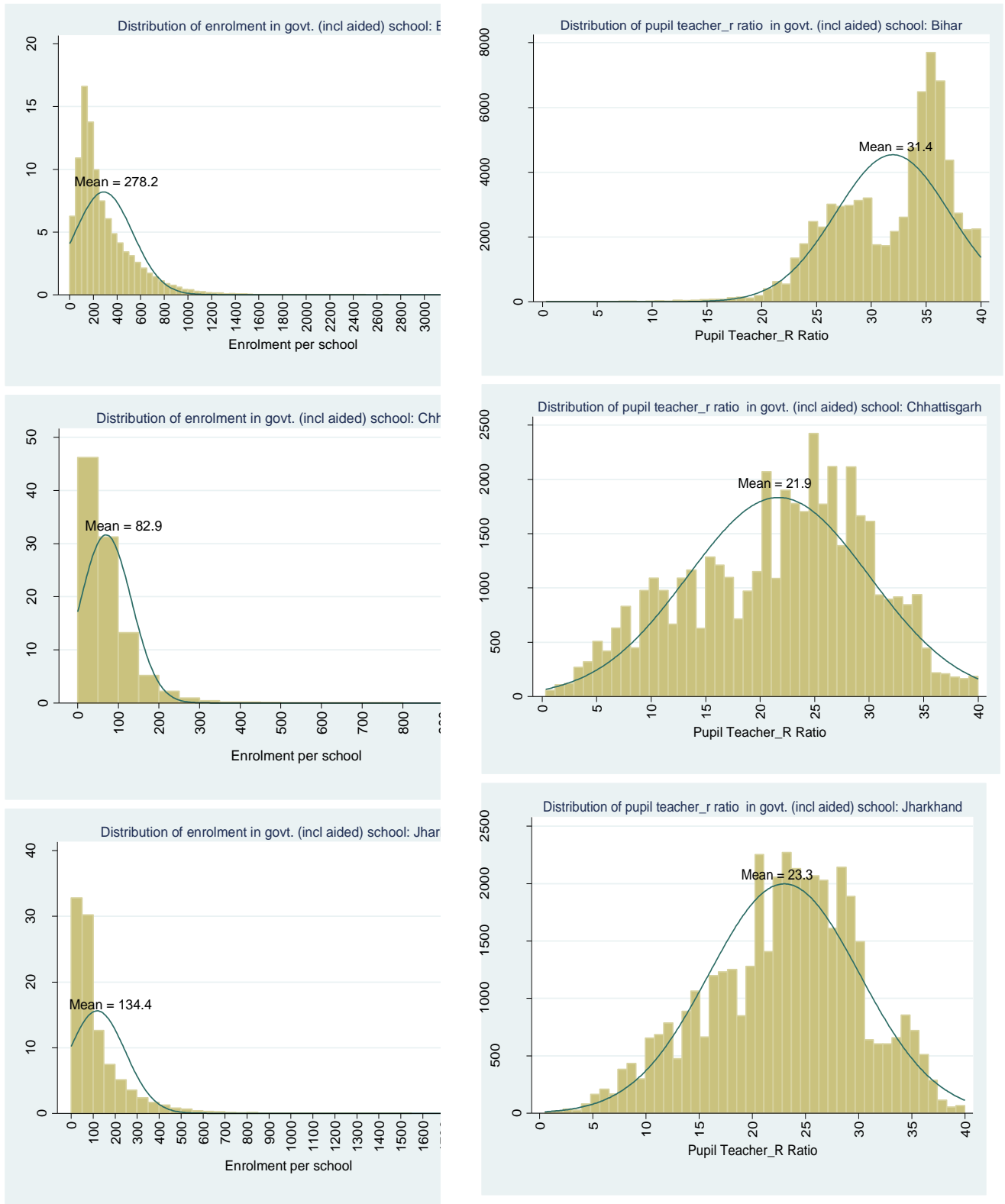
<b>Non-Recurring Cost</b>		
<b>Infrastructure cost</b>	Classrooms	500 sqft construction valued @ INR 1800 per sqft
	Classroom in New School	The new school consists of 8 classrooms, head teacher room, staff room each @500 sqft, Library @1250 sqft, 2 drinking water areas @15 sqft, Toilets @700 sqft. New schools receive one time teaching learning equipment grant @ INR 50000. Cost per classroom (incl the cost of the additional infrastructure) amounts to INR 2204950.
	Minor Repairs	@Rs 5000 per classroom requiring minor repair
	Major Repairs	@INR 30000 per classroom requiring major repair
	Library	1250 sqft construction valued @ INR 1800 per sqft
	Toilets (Boys & Girls separate)	350 sqft construction valued @ INR 1800 per sqft each for boys and girls
	Drinking Water Area	Two drinking water areas, each with 15 sqft construction valued @ INR 1800 per sqft
	Boundary Wall	860 sqft construction valued @ INR 260 per sqft
	Ramp with Rails	@ INR 32000 for 1:12 gradient and 1.6 meter width
<b>Innovative Education</b>	Computer Aided learning (CAL)	@INR 50 lakhs per district per year.

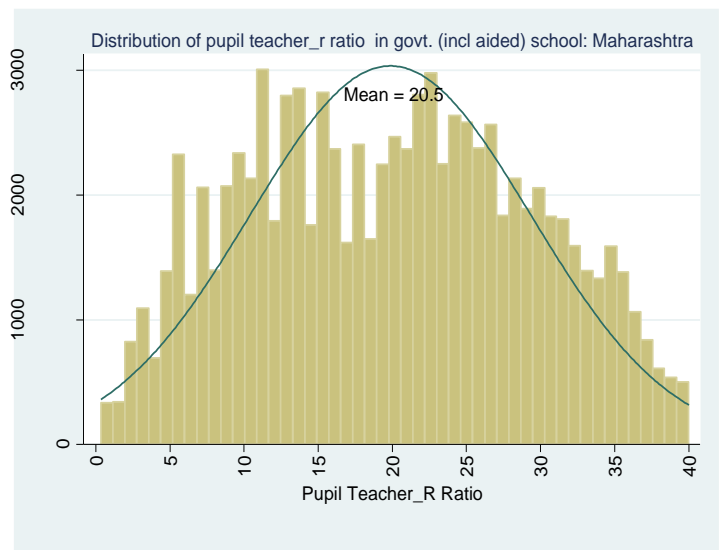
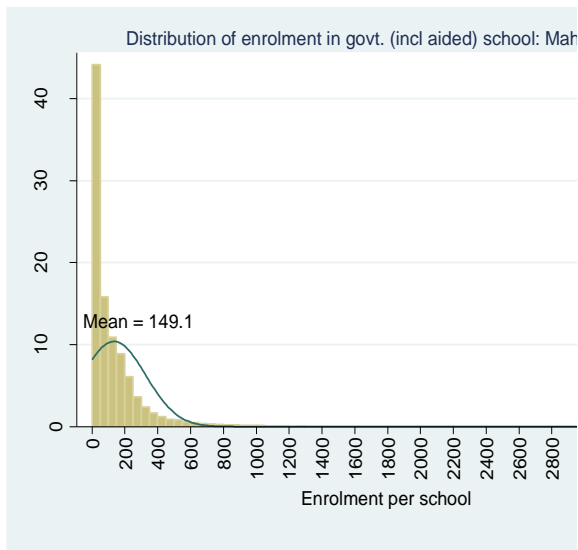
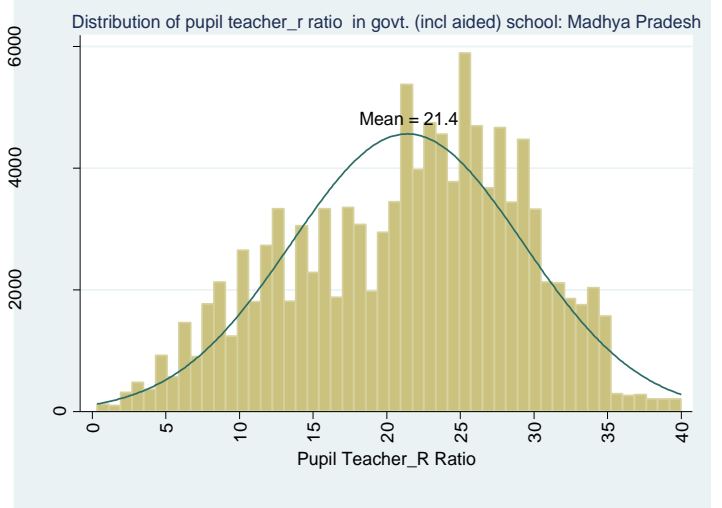
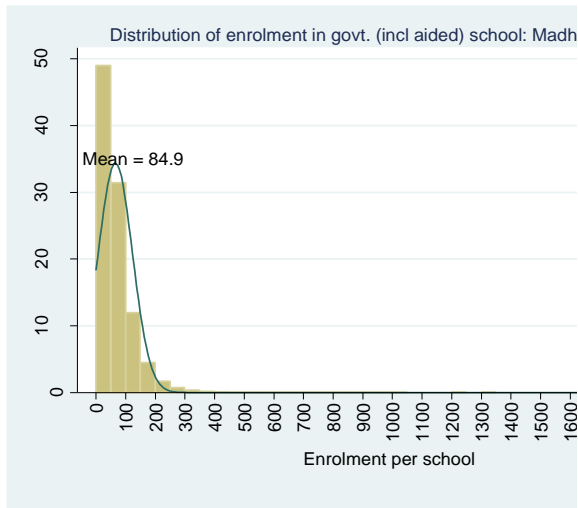
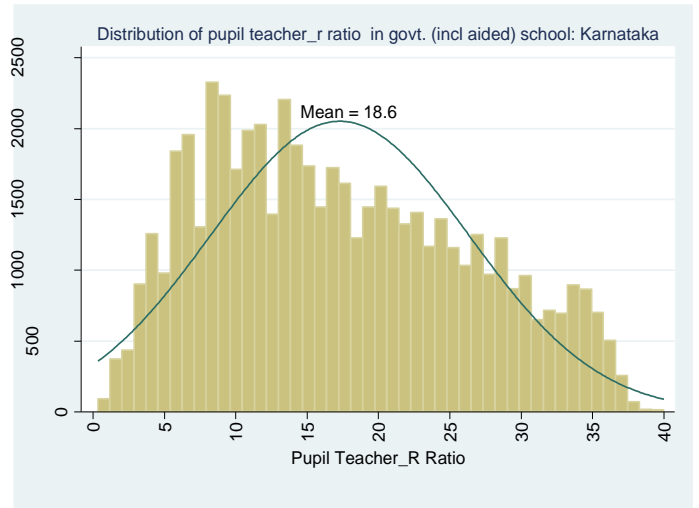
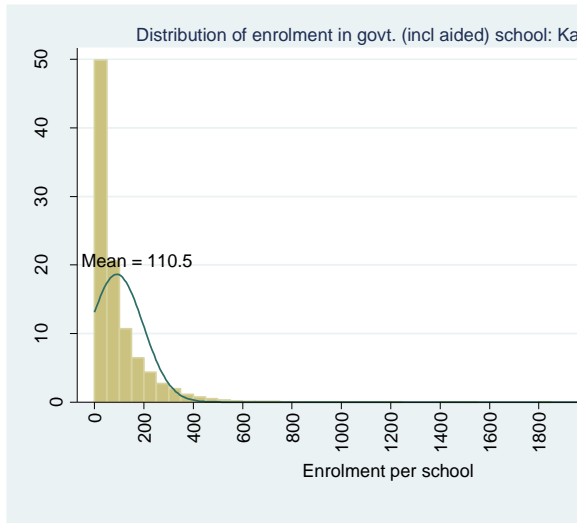
**APPENDIX Table A2: Physical Gap in Infrastructure in Government Schools**

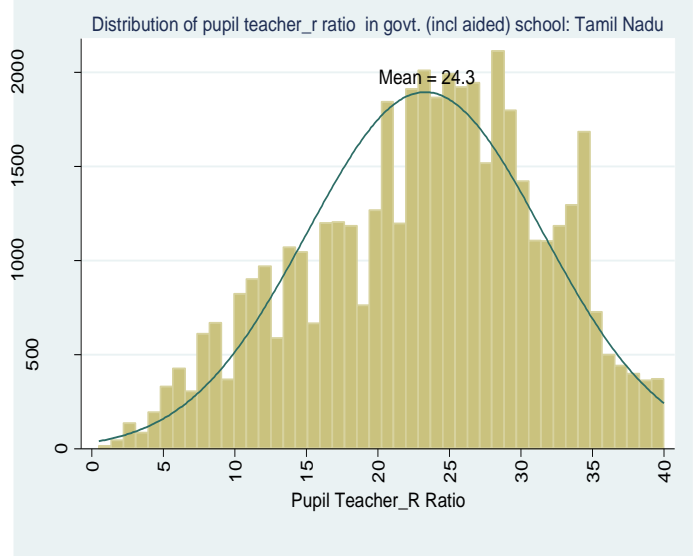
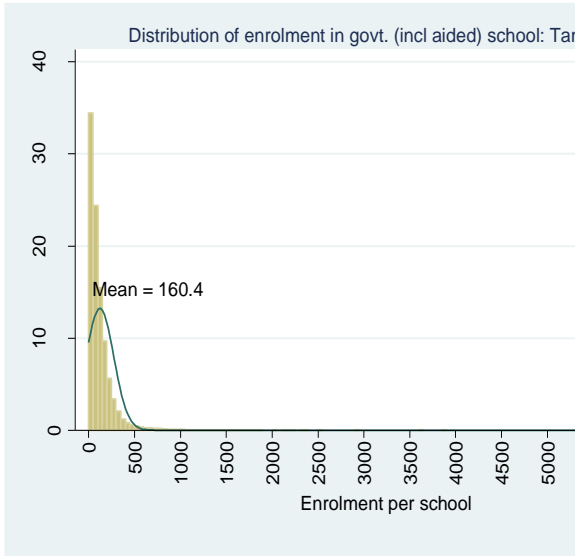
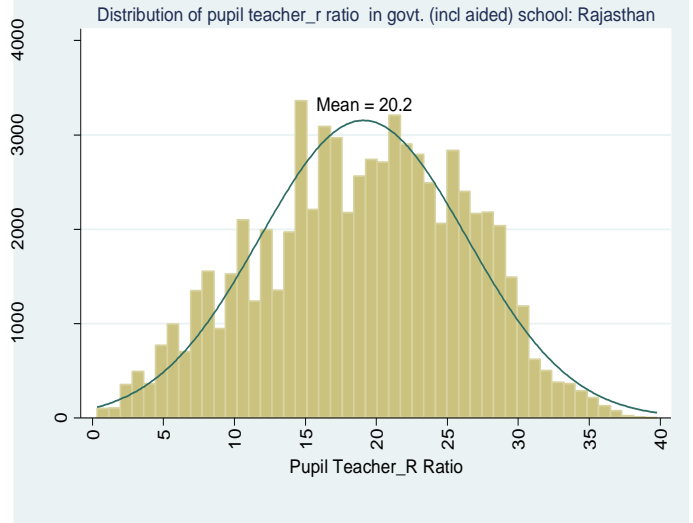
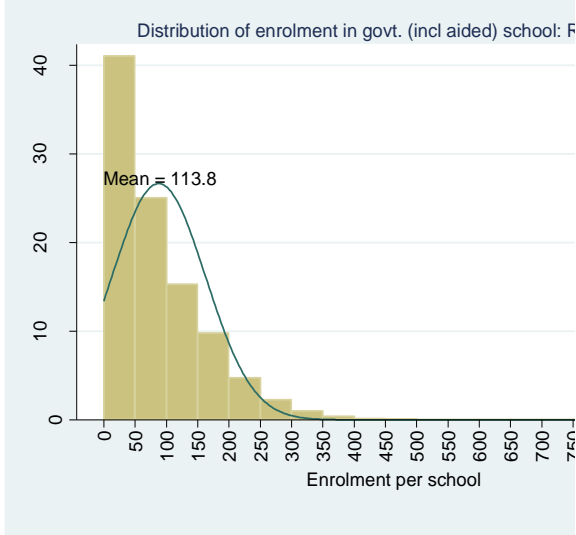
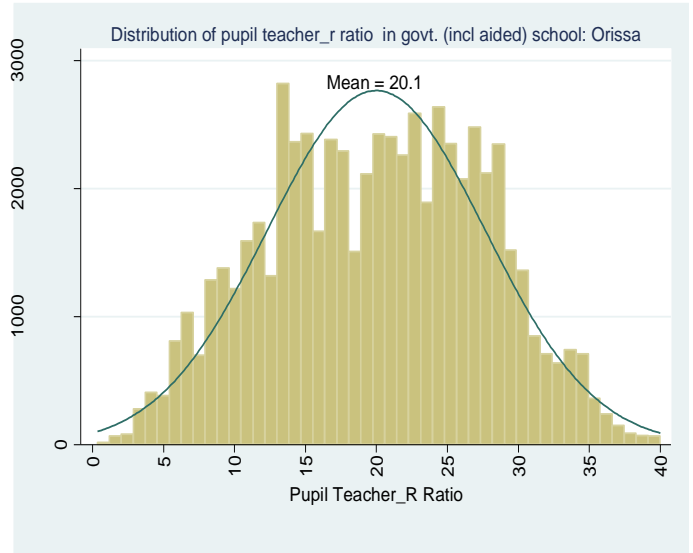
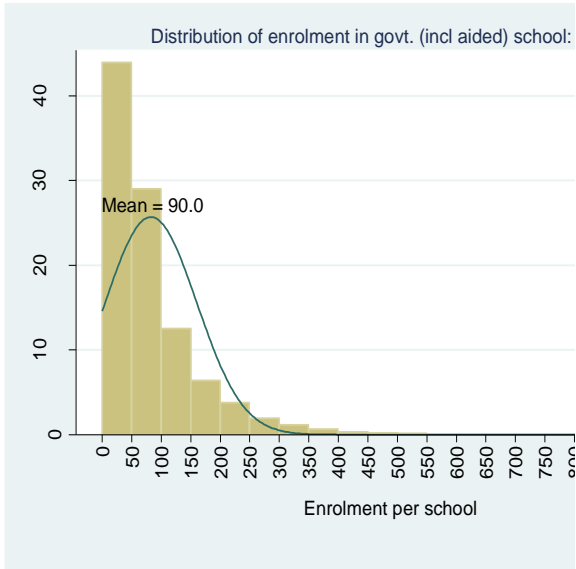
<b>Schools with Deficit in Infrastructure as % of existing government schools</b>	<b>BIH</b>	<b>CG</b>	<b>JH</b>	<b>KAR</b>	<b>MP</b>	<b>MAHA</b>	<b>OR</b>	<b>RAJ</b>	<b>TN</b>	<b>UP</b>	<b>UK</b>	<b>DEL</b>
Library	31.5	5.0	3.7	0.4	9.2	2.3	6.4	26.5	0.7	22.7	6.2	0.8
Toilet (Boys)	11.6	0.5	2.2	0.7	4.4	1.1	5.4	0.4	0.0	0.3	2.4	0.0
Toilet (Girls)	10.6	0.2	2.0	0.3	3.7	0.8	1.8	0.1	0.0	0.3	2.8	0.0
Drinking Water Facility	6.2	0.4	6.5	0.0	4.4	0.4	0.5	4.4	0.0	1.9	3.9	0.0
Kitchen Shed	30.6	10.3	23.4	1.8	16.9	6.9	18.8	13.5	2.2	12.6	7.1	-
Boundary Wall	49.8	36.7	75.5	21.8	64.2	22.0	31.4	19.4	24.4	35.7	17.6	0.1
Ramp	32.7	27.5	47.6	19.6	29.9	6.6	27.1	42.2	18.9	17.1	38.3	11.9
Playground	68.2	48.2	62.6	40.7	39.1	16.2	75.9	58.1	30.6	31.9	49.0	14.6

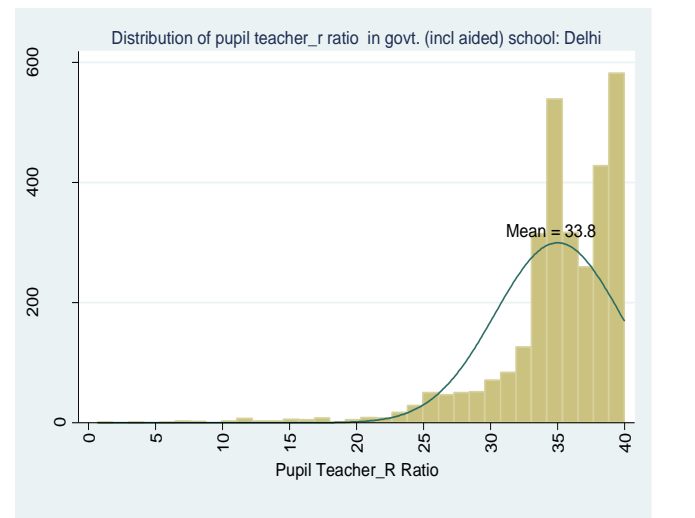
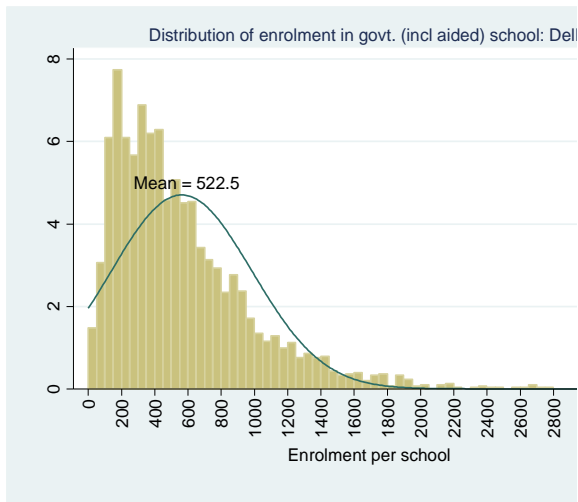
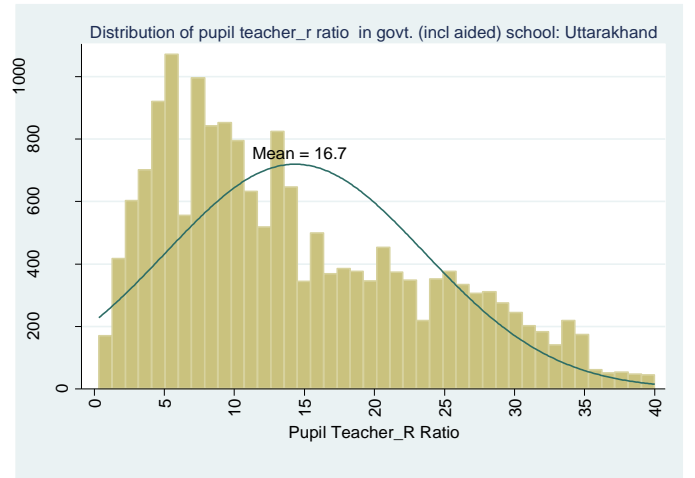
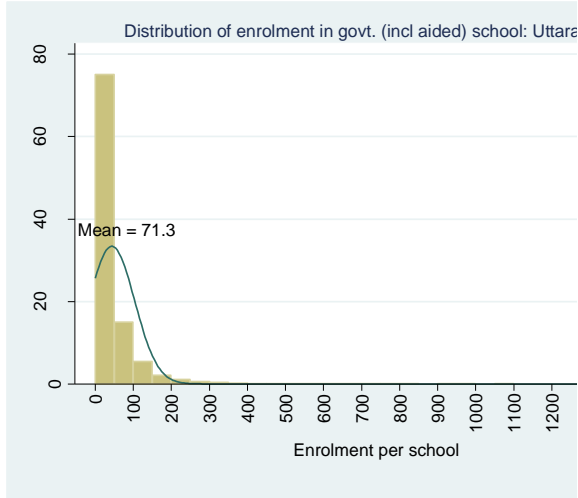
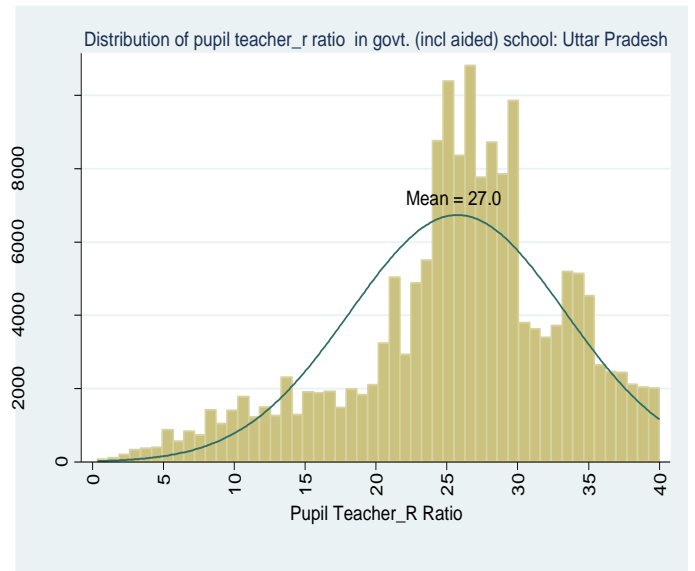
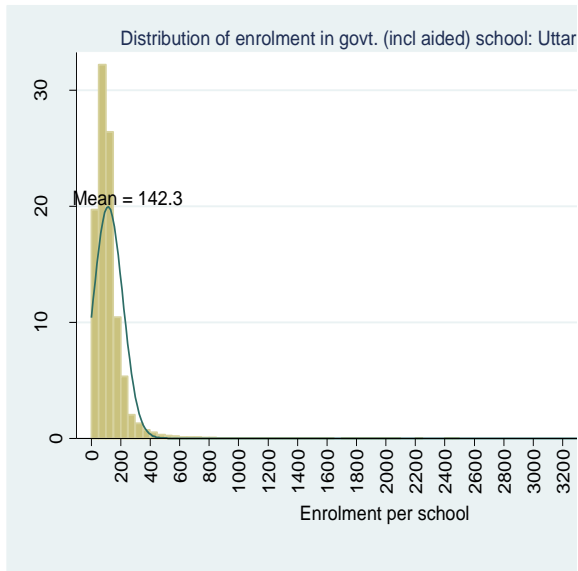


**Figure A1: Distribution of Enrolment and Required PTR in Government including Private-Aided Schools**









Source: DISE Unit level Data, 2015-16

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