

INDIA
RASHTRIYA MADHYAMIK SHIKSHA ABHIYAN (RMSA)

Seventh Joint Review Mission
April 11-23, 2016

Aide Memoire

Table of Contents

Acronyms.....	4
1. Introduction.....	8
2. Overview and Key Issues	10
3. Overall Progress towards RMSA Goals.....	15
Recommendations:.....	21
4. Quality of Secondary Education	22
Recommendations:.....	26
5. Thematic Area 1: Mathematics and Science Education in secondary classes...	32
Recommendations:.....	36
6. Thematic Area 2: ICT in Secondary Schools	37
Recommendations:.....	40
7. Thematic Area 3: Pending Civil Works	46
Recommendations:.....	50
8. Vocational Education in Secondary Schools.....	51
Concerns and Recommendations	53
9. Program Management	58
Recommendations (Financial Management):	62
Recommendations (Procurement):.....	65
10. Annex 1: Terms of Reference (ToR) the seventh RMSA JRM.....	66
11. Annex 2 – List of Seventh JRM members.....	70
12. Annex 3: State Reports.....	71

List of Figures

Figure 1: Progress against Six Key Indicators	17
Figure 2: Approximate distribution of learning performance in grade 10 by subject.....	28
Figure 3: Explanation of distribution and skewed distributions	28
Figure 4: Elements in conducting a robust achievement survey.....	29
Figure 5: Change in learning outcomes at each class, over time	30
Figure 6: Examining the growth in learning outcomes across classes by cohort	31
Figure 7: Changes in growth between classes over time.....	31
Figure 8: Availability of Mathematics and Science teachers in Secondary schools.....	35
Figure 9: ICT infrastructure in secondary schools.....	41
Figure 10: ICT Labs in secondary schools	41
Figure 11: Age-wise analysis of pending civil works	47

List of Tables

Table 1: Selected Metrics for Secondary Schools in 23 States/UTs	16
Table 2: Progress in civil construction of new schools (2009-10 to 2015-16)	46
Table 3: Status of civil works for strengthening government schools (2009-10 to 2015-16)	48
Table 4: Allocation, Releases and Progress (in INR Crores):.....	58
Table 5: Budget Allocation & Releases for RMSA, Girl's Hostel, ICT@Schools, IEDSS/IEDC and Vocationalisation of Secondary Education (in INR Crores):.....	58
Table 6: Spending against Program Components under RMSA in the last two Financial Years (in INR Lacs).....	59

Acronyms

AWP&B	Annual Work Plan and Budget
ASER	Annual Survey of Education Report
ATR	Action Taken Report
BE	Budget Estimates
BOOT	Build, Own, Operate and Transfer
BRC	Block Resource Centre
CAL	Computer Aided Learning
CBSE	Central Board of Secondary Education
CCE	Comprehensive and Continuous Evaluation
COBSE	Committee of Boards of Secondary Education
CTE	College of Teacher Education
CTET	Common Teacher Eligibility Test
CTS	Child Tracking Survey
CRC	Cluster Resource Centre
CWSN	Children with Special Needs
DCF	Data Capture Format
DFID	Department for International Development
DIET	District Institute of Education and Training
DISE	District Information System for Education
DP	Development Partner
DoSEL	Department of School Education & Literacy
DRG	District Resource Group
Ed.CIL	Educational Consultants India Limited
EMIS	Educational Management and Information System
EU	European Union
EVS	Environmental Science
FM&P	Financial Management and Procurement
GER	Gross Enrolment Ratio
GoI	Government of India
GIS	Geographic Information System
GPS	Global Positioning System
HR	Human Resource(s)
IASE	Institute for Advanced Studies in Education
ICT	Information Communication Technology
IDA	International Development Association
IEDSS	Integrated Education of the Disabled at Secondary Stage
IGNOU	Indira Gandhi National Open University
IPAI	Institute of Public Auditors of India
IRT	Item Response Theory

IIT	Indian Institute of Technology
IT	Information Technology
ITPDP	In-service Teacher Professional Development Programme
IT/ITeS	Information Technology/Information Technology-enabled Services
IUFR	Interim Unaudited Financial Report
JRM	Joint Review Mission
KGBV	Kasturba Gandhi Balika Vidyalaya
KRP	Key Resource Person
MCS	Model Cluster School
MHRD	Ministry of Human Resource Development
MI	Monitoring Institution
MIS	Management Information System
MS	Mahila Samakhya
MMER	Management, Monitoring, Evaluation and Research
NAS	National Achievement Survey
NCERT	National Council of Educational Research & Training
NCF	National Curriculum Framework
NCFTE	National Curriculum Framework for Teacher Education
NCTE	National Council for Teacher Education
NE	North East
NER	Net Enrolment Ratio
NGO	Non-Governmental Organisation
NIAR	National Institute of Administrative Research
NIC	National Informatics Centre
NLAS	National Learning Achievement Survey
NROER	National Repository of Open Educational Resources
NPE	National Policy of Education
NPEGEL	National Program for Education of Girls' at Elementary Level
NSQF	National Skills Qualification Framework
NUEPA	National University of Educational Planning & Administration
OBC	Other Backward Caste
OECD	Organisation for Economic Co-operation and Development
OOSC	Out of School Children
PAB	Project Approval Board
PGT	Post Graduate Teacher
PISA	Programme for International Student Assessment
PMIS	Project Management Information System
PRI	Panchayati Raj Institutions
PSSCIVE	Pandit Sunderlal Sharma Central Institute of Vocational Education
PTA	Parent Teacher Association
PTR	Pupil Teacher Ratio

QMT	Quality Monitoring Tool
RCI	Rehabilitation Council of India
REMS	Research, Evaluation, Monitoring and Supervision
RIE	Regional Institute of Education
RMSA	Rashtriya Madhyamik Shiksha Abhiyan
RMG	Repair and Maintenance Grant
RP	Resource Person
RTE	Right to Education
SC	Scheduled Caste
SCERT	State Council for Educational Research and Training
SDP	School Development Plan
SEMIS	Secondary Education Management Information System
SES	Selected Educational Statistics
SFD	Special Focus Districts
SFG	Special Focus Groups
SIEMAT	State Institute for Educational Management and Training
SLAS	State Level Achievement Survey
SMC	School Management Committee
SMDC	School Management and Development Committee
SOR	Schedule of Rates
SPO	State Project Office
SPD	State Project Director
SRP	State Resource Person
SSA	Sarva Shiksha Abhiyan
SSHE	School Sanitation and Hygiene Education
ST	Scheduled Tribe
TCF	Technical Cooperation Fund
TE	Teacher Education
TET	Teacher Eligibility Test
TGT	Trained Graduate Teacher
TLE	Teacher Learning Equipment
TLM	Teaching Learning Material
TOR	Terms of Reference
TSC	Total Sanitation Campaign
TSG	Technical Support Group
UAM	Universal Active Mathematics
UC	Utilization Certificate
UEE	Universal Elementary Education
UDISE	Unified District Information System for Education
UPS	Upper Primary School
UT	Union Territory

VE	Vocational Education
VEC	Village Education Committee
VER	Village Education Register
WSDP	Whole School Development Plan

Introduction

- 1.1. Rashtriya Madhyamik Shiksha Abhiyan (RMSA) is a Programme of the Government of India, implemented in partnership with the State Governments with the main objective to make secondary education of good quality available, accessible and affordable to all young persons. The scheme seeks to enhance enrolment in classes IX and X by providing a secondary school within a reasonable distance of every habitation, to improve quality of education imparted at secondary level by ensuring all secondary schools conform to prescribed/ standard norms, to remove gender, socio-economic and disability barriers and to achieve universal access to secondary level education by 2017, i.e. by the end of the 12th Five Year Plan.
- 1.2. RMSA was launched in 2009, funded through national resources (central government + state government) and now has tied up for external funding by Development Partners (DP) – World Bank’s International Development Association (IDA), United Kingdom’s – Department of International Development (DFID) and European Union (EU). As part of the agreement for external aid from the DPs which came into effect in November, 2012, the Joint Review Mission (JRM) is to be conducted every six months in the months of January and July/August each year. The January Mission undertakes to visits States, while the July/August mission is a desk review.
- 1.3. This is the Seventh Joint Review Mission (JRM) of Rashtriya Madhyamik Shiksha Abhiyan and was held from April 11-23, 2016. The Mission was a field Mission to review the status of progress and to also consider issues related to programme planning, implementation, monitoring and evaluation, including financial management/procurement, capacity of States with respect to programme objectives. The states visited were: Delhi, Maharashtra, Telangana, Tripura and Uttar Pradesh. The Terms of Reference (ToR) for the Mission and details of the Mission composition are attached as Annex 1. The Mission put special focus on:
 - Understanding quality of secondary education, with special focus on ICT and its use in enhancing student learning, use of ICT in teacher professional development and teacher training on use of ICT enabled learning.
 - Understanding quality of secondary education with special focus on maths and science curriculum, teaching-learning of maths and science, including availability of maths and science teachers, teacher training to enhance subject knowledge and pedagogy in these subjects.
 - Understanding the status of implementation of Vocational Education in secondary schools.
 - Understanding the status of outstanding civil works (including not yet started construction of school buildings), construction and availability of toilets and drinking water facilities.

- 1.4. The Mission would like to acknowledge the work done by teams in the Ministry of Human Resource Development (MHRD), the state governments of Delhi, Maharashtra, Telangana, Tripura and Uttar Pradesh, visited by the Joint Review Mission (JRM), Technical Support Group (TSG) and the detailed information made available to the Mission. In addition, the NAS team at National Council of Education Research and Training (NCERT), the UDISE team at the National University of Education Planning and Administration (NUEPA) and the DFID-funded Technical Cooperation Agency provided valuable inputs. The Mission has greatly benefited from the discussions and would like to put on record its gratitude to all the above mentioned.

Overview and Key Issues

- 2.1. The different segmental Shiksha Abhiyans are well conceived and earnestly enforced. The mission mode approach adopted has enabled good overall progress even in the face of serious resource constraints. The Madhyamik Shiksha Abhiyan, nevertheless, has had to bear with certain structural weaknesses. The gap in the sequential continuum between RMSA and RUSA can be seen as an infirmity having the potential to hamper consolidation of the achievements of the former. Exclusion of the Uchcharat Madhyamik stage of school education from the chain of mission mode approaches is inexplicable. The RMSA itself, though it has come to be an integral part of the Abhiyan chain, has developed its form through a piecemeal aggregation of component schemes. As a result, the Abhiyan cannot be seen as a cohesive package of mutually reinforcing Schemes. That only Government Schools were recognized for coverage initially and aided schools added later for few components has further minimized the impact of RMSA. It will be necessary for the Government to reckon with these infirmities if the high objectives enshrined in these Abhiyans have to be meaningfully realized.
- 2.2. It was in this backdrop that earlier JRMs had recommended a review of the structural and programme features of the different Abhiyans. More relevantly, the sixth JRM on RMSA had informally proposed a revised set of objectives for the RMSA. Because of its substantive significance, that proposal deserves to be reiterated for consideration.
 - 2.4.1. Another earlier recommendation that deserves to be reiterated is about reviewing the JRM structure and systems also. For this programme - feature to become an effective monitoring tool, the recommendation for its review must be taken up for consideration.
 - 2.4.2. The recommendation for reconstitution of the Mission Team with 1/3 of its composition changed annually will provide for the continuity of attention that will automatically promote consistency of consideration to issues.
- 2.3. Likewise, the recommendation for constitution of a Standing Sub-Committee will help promote even inter-mission continuity of attention to pending issues as also to participate in preparatory work for ensuing JRMs.
- 2.4. It is gratifying that the Government has accepted the recommendation to keep 'Quality' as a standing thematic item for consideration in all JRMs.
 - 2.4.1. It is necessary in this context to recognise that JRMs have to review the implementation (and impact) of the RMSA. In other words, only Abhiyan related issues have to be addressed and in their implementation perspective at that, JRMs cannot be expected to delve into a detailed exposition on basic academic propositions. It that is to be so, on the subject of 'Quality', JRMs cannot be expected to address the whole broad -spectrum of its aspects. A good deal of good work had been done on many aspects earlier. Aspects

- requiring attention must be identified and prioritized for rotational attention. (The Sub-Committee proposed can be of help in such items of work.)
- 2.4.2. What is equally important in this context is the need to streamline and strengthen the delivery process. The expert analyses and the operational guidelines formulated based thereon do not get properly or speedily disseminated. Even where they are disseminated, such instructions/guidelines are either not read or not understood or certainly not followed.
 - 2.4.3. It will be more meaningful, therefore, to equally sensitize and educate all field-level inspectors, institution –level academic supervisors and, class teachers instead of adding more and more instructions / guidelines on newer aspects.
 - 2.4.4. Even as the current systems operate, a new exercise should be launched to focus on the ‘class-room’ situation; ‘strengths’ and ‘weaknesses’ should be identified for planning corrective inputs based thereon.
 - 2.4.5. While flexibilities in the Systems are required to provide for local initiatives, it will be necessary to identify a ‘common core’ for attention everywhere.
 - 2.4.6. It will be useful to make an organised attempt to identify ‘best practices’ and innovative approaches. A compendium of such practices /approaches should be developed in each state after validation of their utility/ impact at their places of origin.
 - 2.4.7. Preparation (and circulation) of such compendiums should be ensured for promoting /facilitating wider adoption of such practices/ approaches.
 - 2.4.8. Academic supervisors of institutional/ class-room performance should be well familiarized with this process so that they give attention in particular to these aspects in their supervision of classroom performance.
 - 2.4.9. It is important in this context to recognise the significance of mutual reinforcement by programme-components. For example, the ICT scheme, besides educating students to learn with the help of computer applications, can also be of help to teachers in building-up their capacities.
 - 2.4.10. As has been described in detail in the section relating to ‘ICT’, the computers in the ICT lab can create subject-wise ‘resource folders’ to contain model video clips, other software , identified best practices’ to help teachers to strengthen their (subject) teaching skills.
 - 2.4.11. Some states have taken meaningful initiatives in this regard. But, it will be appropriate for the central government to lead the way for this purpose. The Kerala Government in particular is reported to have developed a useful programme (viz., State @ IT), its relevance and utility may be studied as recommended to us by I.I.T. (Mumbai).
- 2.5. The emphasis on improvement of subject teaching can no doubt be seen as an integral component of ‘Quality improvement’. But, in view of the special factors adversely

impacting subject-teaching in general, and science-mathematics teaching in particular, it is good to single out this issue for specific consideration.

- 2.5.1. Inadequacy per se of subject-teachers, their under-qualification, and lack of support material and / or support services for upgradation of professional competence are well known. But, giving them thematic attention will surely lead to introduction of specific remedial measures.
- 2.5.2. For dealing with inadequacy of subject teachers, it will be necessary to consider ways of coordinating the supply lines from Teacher Education Institutions. This coordination at present only regulates over supply. What is required is a way for augmenting supply lines of particular subjects.
- 2.5.3. Identification of science and mathematics as subject areas particularly afflicted by this malady is valid for various reasons. Students have been losing interest in these subjects and literally moving away to other streams. Ironically, whereas uninteresting methods of teaching have come to be cited as propelling this flight of enrolment, the teachers themselves have shown no particular keenness to hone their skills. These issues have been set out in detail later in the section concerned. But, they can at best sign post the actions required. The Government may have to appoint a Task Force to draw up a road-map of action and to be responsible for its implementation.
- 2.5.4. Given below are some specific suggestions towards setting the contours of an actionable project. It will be useful to recognise that structural and transactional (i.e., pedagogic) aspects will be more relevant than substantive academic aspects for this project.
 - (i) The downtrend can be traced to a failure to address the inadequacies of pre-service training thereby overloading the in-service programmes with avoidable burden. With the modifications recently introduced in graduate and post-graduate Teacher Education courses by the National Council of Teacher Education, the situation can be said to have considerably improved in terms of prescription of courses, curricula, and other norms and standards. But, a lot more has to be done to ensure their meaningful enforcement. Instructional quality in the Teacher Education Institutions must be rigorously enforced; and, Internship arrangements and practice – teaching facilities will need to be enormously expanded and honestly utilized.
 - (ii) There will be severe infrastructural and attitudinal limitations to speedy emergence of such a change. Until that can happen, therefore, alternative re-courses may have to be resorted to. One such can be to set up subject groups departments in the State Education Institutes (like SCERT) and require them to run a 6 month certification course exclusively on Class-room teaching of the subject concerned even for the graduates coming of the Teacher Education Institutions.

- (iii) It will be useful to setup State Resource Groups on different subjects to give overall guidance to implementation of this project.
- (iv) Teachers of excellence must be identified and prepared as Key Resource Persons (KRPs) to handle the mass in-service training courses
- (v) Course – content of in-service training should be based on a careful assessment of the ‘training needs’.
- (vi) The KRPs should be trained in assessment of such ‘training needs’.

2.5.5. Since subject-teaching at the secondary and senior secondary levels will need more of content-enrichment than pedagogies upgradation, involvement of faculty from the higher education sector will be crucial. It will be for the Department of School Education and Literacy (of MHRD) to liaise with the Department of Higher Education associate the UGC and AICTE and, develop a Framework of institutional Responsibility for the Universities /National Institutes /affiliated Colleges to discharge this responsibility.

- 2.6. Inclusion of ICT in the RMSA package has indeed been a good development. In the modern world, no education can be complete without education in computer application. But, two concerns continue to retard the impact of the scheme. Highlighting the BOOT model of the scheme, which in fact it may be, has adversely affected its implementation psychologically. The general perception has come to be that ICT in RMSA is a vendor installed, vendor driven and vendor directed programme. In real terms this means, the authorities and the school faculty have physically distanced and mentally shut themselves out from the scheme. Other than in exceptional cases, consequently, there is no intervention in or control over implementation of the scheme, including the instructional process and the evaluation methods, by the school-faculty. In this situation, this scheme cannot be said to have achieved anything so far. There is another weakness that has afflicted the ICT scheme. There is no clear statement about the exact purpose of the scheme and the process of its delivery. Is the scheme meant for helping the teachers to build-up their capacity; is it meant for helping students to learn on their own; have students to go to the Lab or can teachers take computer (and, attached projector) to the class; who will give theory lessons; how will qualification and experience of the Trainers be checked; who will set the question papers; who will evaluate the answer books; who will declare the result; etc., have not been specified. If the scheme has to stabilize, then, the purpose it has to serve and the process therefore have to be clearly set out.
- 2.7. The appointment of Monitoring Institutes (MIs) also can be seen to have many weaknesses. The number of schools allocated per Monitoring Institute is unrealistically large on average, 2 per day. In some cases, the Monitoring Institute is from another State. Taking this distance factor into account and the travel distance and time involved, the number institutions to be covered per day may work out to more than 2. The implication of this for the quality of monitoring work done will be self-evident. To aggravate matters, the schedule prescribed for reporting is so large that the Monitor will be left

with no time for any application of mind on any item of entry. That being so, Monitoring Institutions, selected for their professional standing and stature, get no scope to employ their expertise. Monitoring Institutes mainly just file mechanical reports; and, never get to know the use made of them. The Institutions reported upon also are not usually aware of the observations 'for' and 'against' them. The MIs give their reports only to the Government; and, it takes very long for the reports to reach the institutions.

2.8. After long decades of trial and failure, vocational education has at last been introduced in School education in an organised manner. Appreciably, in close coordination with *organizations* having domain-expertise, trades have been identified pragmatically and skill-levels have been settled expertly. The good start made can sustain and flourish if timely attention can be given to some issues as follows:

- (i) Vocational Education should be introduced in phases and more at locations where they are likely to succeed (e.g. near industrial clusters and urban areas in concentrated need of technical/skilled manpower).
- (ii) Involvement of the industry should be more transparent and prominent.
- (iii) Curriculum development should be in closer consultation with the industry.
- (iv) Addition of vocational course as a subject will necessitate dropping another subject currently in the course package. This contingency should be recognized and guidelines should be formulated for its handling.
- (v) A modified approach with greater attention to advance training of personnel is reported to have been developed by the Kerala Government. An objective examination of such an initiative to assess its efficiency will be useful.

Overall Progress towards RMSA Goals

Progress against key indicators

- 3.1. During each Mission, it is an expectation that an attempt will be made to examine progress against Key Programme Indicators. The 6th JRM benefited immensely from the release of 2014-15 U-DISE data, just before it commenced its work. However, U-DISE data incorporating the 2015-16 academic year have not yet been released – making it more challenging for the present JRM to add further meaningful comment.
- 3.2. A few remaining States have still to upload their 2015-16 to U-DISE, which is why a complete national picture for 2015-16 is not yet ready. However, NUEPA and the U-DISE Team officers have gone out of their way to provide additional helpful information, based on what is so far available. The Mission is very grateful for this. Specifically: NUEPA shared with the 6th JRM data to examine patterns and trends, up to 2015-16, for 23 States.
- 3.3. Before sharing some observations on our analysis of the data, it is important to caution against using these to draw deterministic conclusions. The intention is simply to provide the earliest tentative indications possible to help steer management in identifying where remaining priority support and interventions might best be channeled. In particular, it is important to stress that data for the 23 States do not include some large States such as Uttar Pradesh, Bihar, Madhya Pradesh, West Bengal, and Orissa. The eventual inclusion of data from these States may skew patterns considerably, and in all likelihood in a way that is detrimental to reported overall achievement, in view of the challenges these larger States face.
- 3.4. The range of data shared was sufficient to direct focus on seven of the key indicators that form part of the RMSA Results Framework. Table 1 below presents the overall data, for a four-academic-year period, in respect of:
 - Gross Enrolment Ratio
 - Girls per 100 Boys Enrolled in Secondary Schools
 - Scheduled Caste (SC) Girls per 100 SC Boys enrolled in Secondary Schools
 - Scheduled Tribe (ST) Girls per 100 ST Boys enrolled in Secondary Schools
 - The Percentage of Secondary Schools with 5 Subject Teachers
 - The Percentage of Teachers with a Professional Qualification (B.Ed / M.Ed. or equivalent)
- 3.5. It also explains the formulae used for calculations and provides some notes to explain the full nature of the data and how they have been derived.

Table 1: Selected Metrics for Secondary Schools in 23 States/UTs

Metrics for sec. schools in 23 states/UTs¹	2012-13	2013-14	2014-15	2015-16
GER (based on MHRD population projections) ^{2,3}	78.6%	82.8%	84.5%	85.6%
Girls per 100 Boys enrolled in sec. schools	83.53	83.34	83.71	83.92
SC Girls per 100 SC Boys enrolled in sec. schools	87.10	86.75	87.28	87.51
ST Girls per 100 ST Boys enrolled in sec. schools	85.76	87.28	88.31	88.77
Sec. schools with 5 subject teachers ⁵	10.1%	16.3%	15.8%	13.5% ⁶
Sec. teachers with B.Ed./M.Ed./equivalent degrees	79.1%	78.5%	79.5%	80.4%

Notes:

(1) States/UTs included are Andaman & Nicobar Islands, Chandigarh, Chhattisgarh, Dadra & Nagar Haveli, Daman & Diu, Delhi, Goa, Gujarat, Haryana, Himachal Pradesh, Jammu & Kashmir, Karnataka, Lakshadweep, Maharashtra, Manipur, Mizoram, Puducherry, Punjab, Rajasthan, Sikkim, Tamil Nadu, Tripura and Uttarakhand. Telangana has not been included because UDISE only records it as a separate state from 2014-15 onwards, and so earlier data is not available for the state.

(2) Sec .enrolment/Population in 14-15 yrs. age group

(3) Age-wise population projections are based on documents available on MHRD's website

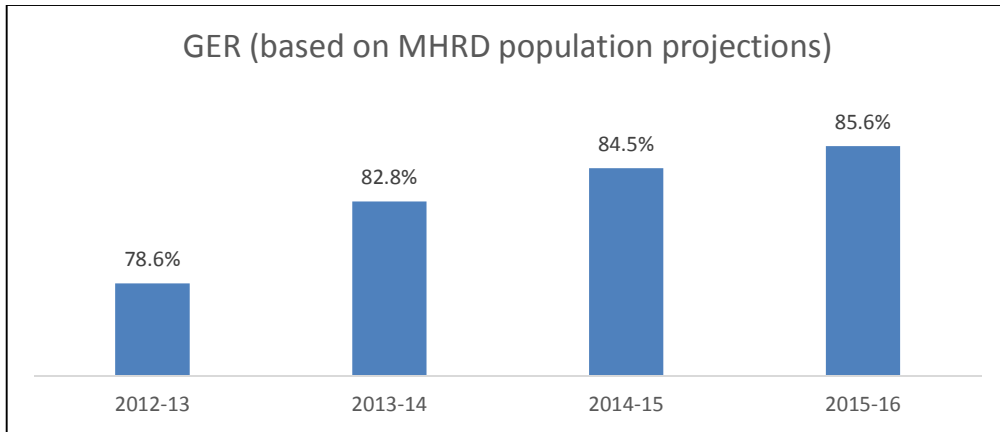
(4) Population for 14-15 yrs. age group has been projected forward from 2011 Census based on compounded annual growth rate of population between 2001-2011

(5) Schools with at least 1 teacher each for Maths, Science & Social Science, and at least 2 teachers for Language

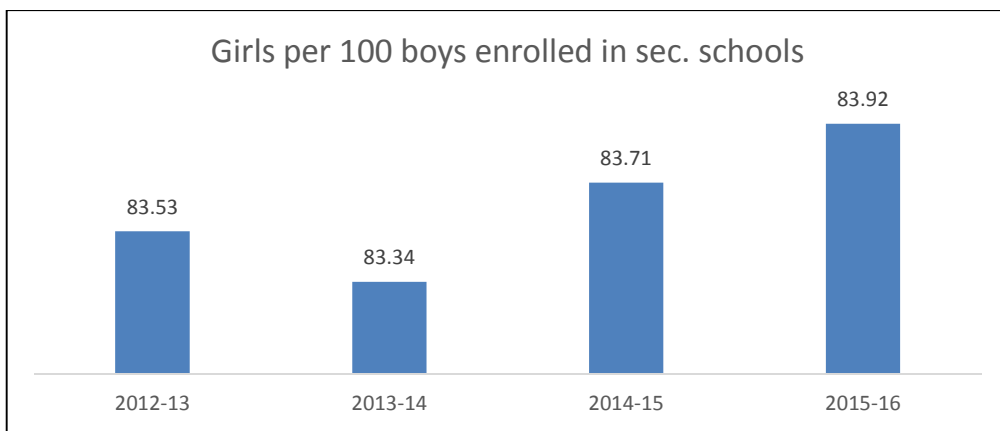
(6) No. of sec. schools for 2015-16 (denominator for percentage calculation) excludes an anomalous record of 29,488 sec. schools in Tamil Nadu under school type "3" and school mgmt "6" in the available UDISE file for 2015-16. For context on the exclusion, total sec. schools across all types and mgmt in TN in the preceding 3 years was less than 12,500, and no. of sec. schools of type "3" and mgmt "6" was less than 100.

Figure 1: Progress against Six Key Indicators

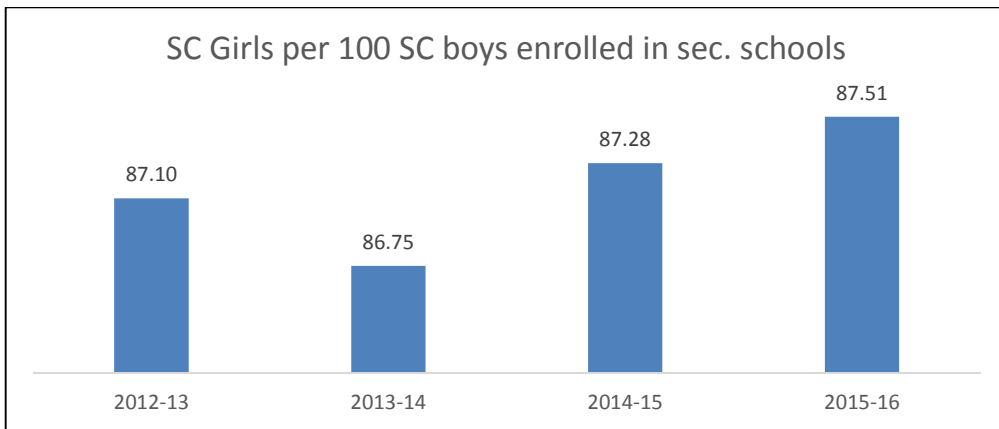
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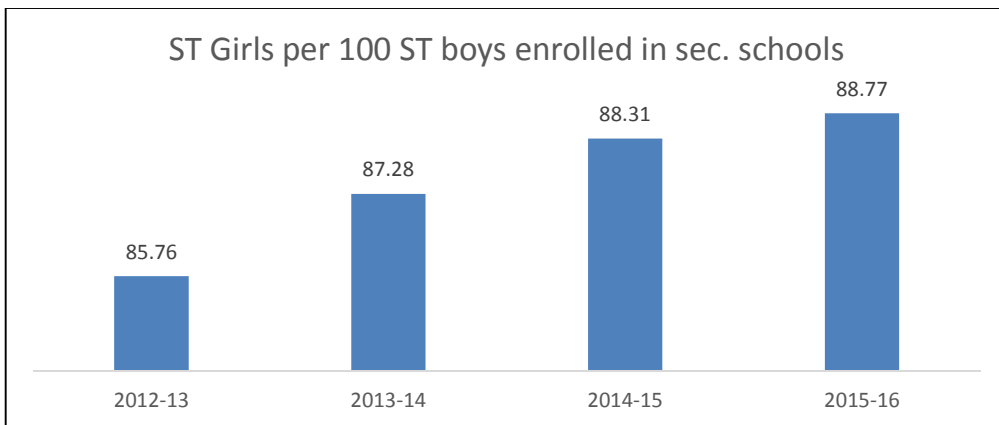
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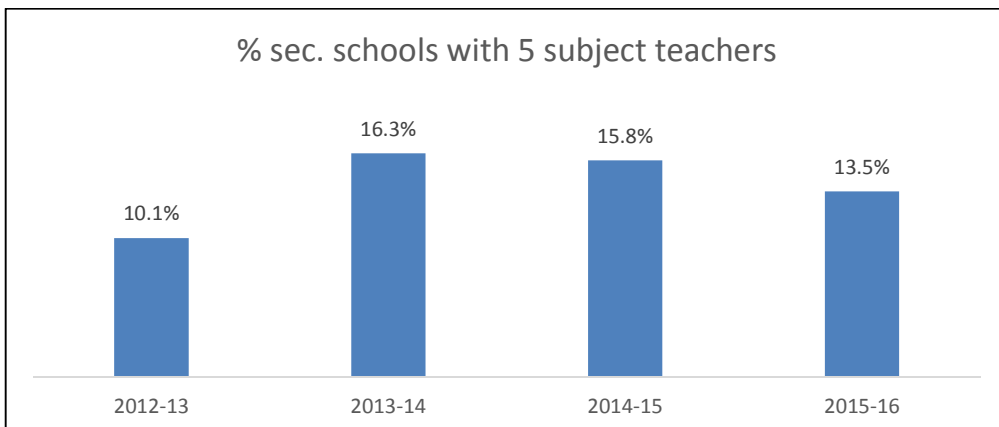
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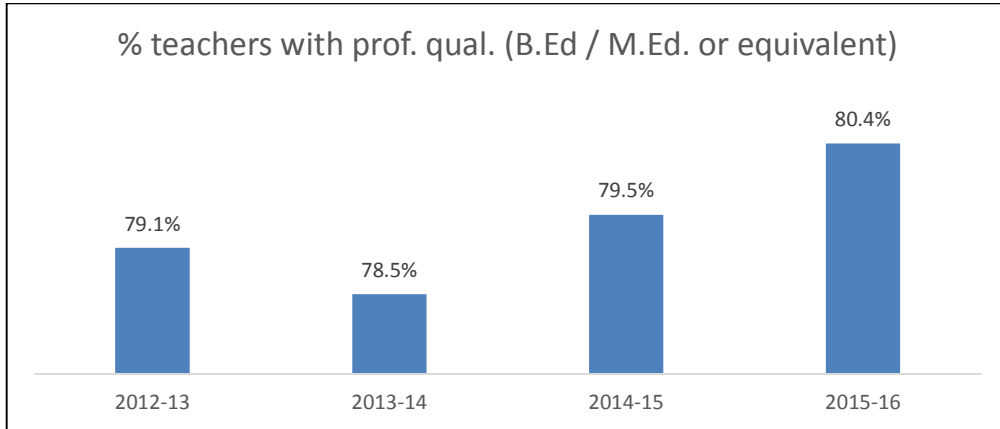
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- 3.6. Regarding Gross Enrolment Ratio, the 85.6% current status compares to a 58.5%, 2009-10, Results Framework Baseline at the commencement of RMSA. However, RMSA has since revised its target to achieve a GER of 90% by 2017 and this will be difficult to reach.
- 3.7. The currently achieved 83.92 'Girls per 100 Boys Enrolled in Secondary Schools', based on 2015-16, 23-State data, compares against an original Results Framework Baseline of 87. However, this may be explained by the number girls in the population and not be RMSA specific. Further reflection may be warranted in order to gain a better understanding of what seems to be happening and why.
- 3.8. The 87.51 Scheduled Caste (SC) Girls per 100 SC Boys enrolled in Secondary Schools extrapolated from 2015-16, 23-State data, compares against an original Results Framework Baseline of 75 for 2009-10. The 88.77 Scheduled Tribe (ST) Girls per 100 SC Boys enrolled in Secondary Schools extrapolated from 2015-16, 23-State data, compares against an original Results Framework Baseline of 70. For both SC and ST groups, this reflects pleasing progress.
- 3.9. The Percentage of Secondary Schools with all 5 Subject Teachers, we calculate, based on 2015-16, 23-State data, is 13.5%. This compares with an original baseline level of 21%. It is manifest that the proportional quality of staffing levels has been eroded by system expansion and this has massive implications for maintaining and further improving quality. However, a little more encouragingly, the Percentage of Teachers with a Professional Qualification (B.Ed / M.Ed. or equivalent) is estimated to stand at 84%, marginally up on the original 2009-10 baseline figure of 83%.

Development and use of data for planning and monitoring

- 3.10. **The UDISE database is considered as the official data source** for school level administrative data in the country. There is an impressive improvement in the expansion in the coverage of the data collected from schools. NUEPA has been refining the data capture format and the features available in the UDISE software over time. The UDISE data is utilized by the states/UTs to prepare Annual Work Plans and Budgets. The quality of the data collected from the schools helps in its utilization for planning and monitoring through well-defined indicators. It is equally important to use internationally accepted methodologies to calculate standard education indicators. The Sustainable Development Goals (SDGs) was adopted in November 2015 with 17 goals including SDG 4 on education by head of states. The SDG 4 covers from preprimary to tertiary level. The Inter-Agency and Expert Group on SDGs (IAEG-SDGs), of which India is a member, has put forward a proposal for global and thematic indicators to monitor SDG4. The UDISE should also be in line with these thematic and global indicators proposed for SDG4.
- 3.11. Every secondary school sends its UDISE data to the block and keeps a copy for its official records. In the states visited, JRM members noticed the display of school report cards on the school walls or in the school office in some schools.
- 3.12. The JRM observed some state initiatives and challenges during the state visits:
- 3.13. Due to various reasons some of the states have started parallel databases. For e. g. SARAL and SAMAGRA in Maharashtra and Madhya Pradesh respectively duplicating UDISE initiative especially to collect individual child level data and other variables, for which additional state resources (that are already scarce) are being allocated. As NUEPA has shared, there is provision and flexibility in the UDISE to include 25 open variables that can be used by states for their state specific needs. On the state visits, the JRM noted that the provision for the state variables is not being utilized well to its potential. It is necessary to make the state officials aware about the provision of the open variables and how the states can use them to serve their state needs. Additional financial and human resources will be required for NUEPA to add additional features in UDISE and to provide effective support address state needs.
- 3.14. For this, it is important to make UDISE the only one source, at the state and central levels, for school level administrative education statistics. As shared by NUEPA with the JRM, smaller states that are not able to afford separate servers can utilize the central server at NUEPA. Secondly, NUEPA will accept real time UDISE data directly from schools provided it adhering the 30th September reference date.
- 3.15. **There are some concerns about the reliability of the student enrolment data reported in the UDISE.** The JRM members found on some school visits that the enrolment reported in UDISE and at schools did not tally. In some cases the enrolment figures in the UDISE reports are much higher than the school records. The JRM team also noted a substantial variation in enrolment figures between grades 9 and 10. The

reason of high enrolment at grade 9 is due to high influx of class 8 students as explained by the states. At the same time many grade 9 repeaters are counted as new entrants instead of repeaters by some of the schools. It is suggested that to the extent possible data may be collected at individual student level using unique Adhaar number to eliminate inflated enrolment. In this context, the NUEPA team informed the JRM members that they have already developed online, semi-online and off-line applications for student database management information system which has been shared with more than 450 districts during four Regional and State-specific technical workshops organized by the UDISE team. The new features will be launched for the 2016-17 data collection. The new UDISE individual data collection system has a provision of using unique Adhaar number which will help to reduce the inflated enrolment significantly. The mission recommends that the existing offline UDISE must also continue in parallel till student database management information is successfully integrated and operational.

- 3.16. The 5% check of UDISE data is being conducted but with varying approaches in the states. Also, the use of the findings is limited and many of the officials interacted with were not aware about the exercise or the findings if it has been carried out.
- 3.17. There is need for much greater use of disaggregated UDISE data at the state, district and school levels for planning and monitoring. In the current situation, schools are not utilizing UDISE data while preparing School Development Plans and other micro planning exercises. The role of the school is limited to sending data to the upper administrative level (Block). There is no mechanism and capacity to utilize the data at school and block level. The data available at state level is used more on aggregate level, use of disaggregated data at state and district level is very low.
- 3.18. Triangulation of data from the UDISE, GIS and school mapping as well as a proper simulation considering demographic changes, terrain, feeder schools etc. is important to plan for school location and consolidating schools. The JRM noted that the UDISE, School Development Plans, School Mapping and GIS are being implemented in silos and are not complementing each other effectively.

Recommendations:

- Rec. 1:** Allocate adequate financial and human resources to national UDISE team to implement planned new initiatives including collecting individual child level data for improving quality and timeliness of data;
- Rec. 2:** Enhance the capacity of sub national officials at the state, block and school levels regularly to calculate, interpret and use education data and indicators for their planning and monitoring exercise by allocating earmarked resources;
- Rec. 3:** 5% UDISE data validation provision should be continued with standardized collecting and reporting formats and ensuring that the UDISE reported data is verified on the basis of spot checks in the schools and school records, and not just the UDISE Data Capture Formats.

Quality of Secondary Education

- 4.1. In order to enable access to good quality secondary education accessible and affordable to all in the age group of 14-18 years, the RMSA framework stresses on provision of required infrastructure (especially library, science and mathematics laboratories, computer lab); providing teachers in all the subjects – especially mathematics and science; remedial courses to enable students to reach class 9 level and review of the curriculum to meet the NCF 2005 norms. The RMSA framework also calls for the need to reform the examination system to move away from rote learning, adolescent education programme, school-level counselling and sensitization of the school head and teachers. The framework also emphasizes the importance of learning assessment in the school and periodic state level assessment to get an understanding of student learning levels so that it can feed into research on where students make mistakes, thereby influencing teacher support material and continuing professional development of teachers. In short, the approach of the RMSA framework to quality is fairly comprehensive and covers all dimensions – both inputs as well as outcomes.
- 4.2. The overarching observation of the 7th JRM is that implementation of the quality framework could be done in a more coordinated and cohesive manner and all aspects of quality get equal attention. While there are instances of good practices, the scale has been modest. The Telangana Government has implemented a comprehensive reform of curriculum, textbooks, continuous and comprehensive evaluation and examination system. However, its impact on learning is yet to be assessed. Teacher professional development remains a challenge in all the five states visited.

Critical aspects of quality that merit immediate attention

- 4.3. **Teacher availability:** Teacher availability, especially in science, mathematics and language remain a formidable challenge.
- State governments need to first recognize the problem, come to grips with both supply and demand of teachers and the situation with respect to specific subjects.
 - GIS mapping to locate schools that face severe shortages could help the government deploy teachers and also strategically use ICT to improve the quality of teaching.
 - Plan and manage pre-service teacher training with appropriate incentives for science and mathematics graduates to enroll in B. Ed.
 - Consider consolidating small schools to utilize teachers more effectively
- 4.4. **Diagnostic use of learning assessments to improve learning:** The JRM commends the work of NCERT and DfID funded TCA on the significant improvements in the presentation of NAS findings demonstrated in the NAS Class X report. The national technical report and state level report cards provide evidence on which well-targeted

remediation strategies could be developed. The JRM encourages the NAS team to further develop its approach of not just reporting of scores, but also share questions & performance level on those questions and attempt to offer possible strategy options and interventions to guide action. **Measuring alone is not enough – only with targeted action on the learning challenges identified will any progress be made.** A detailed overview of NAS progress, findings and future areas for development is provided in the Annexure (end of this chapter).

- 4.5. The **NAS Class X** findings reported to the JRM reveal: (a) The achievement levels of students at secondary stage fall well below expectations as determined by the grade 10 curriculum and (b) there is a skewed distribution of student performance with few students scoring in the upper two quintiles.
- 4.6. Key findings of NAS include: (a) Urban students are performing significantly better than rural students; (b) The students in private unaided schools performed marginally better than private aided and government schools; (c) Students from the general category and OBC category performed better than the SC and ST students (while there was no significant difference between average scores of students from SC and ST categories).
- 4.7. These findings suggest significant differences in the quality of education being offered to India's youth and a serious challenge to the goal of 'equity in learning'. Evidence suggests that targeted attention and resources focused at addressing the challenges of rural schools and SC and ST students are particularly required.
- 4.8. **Sustainability of high quality NAS:** Previous JRMs have highlighted the importance of developing institutional arrangements for sustaining a high-quality NAS. This includes properly archiving and disseminate the data (in a publically available manner vis UDISE) and the capacity to undertake comparative studies of NAS results over years to track progress in learning outcomes (i.e. not just the delivery of the standard cycles). Previous JRMs had encouraged the strengthening, with both financial and human resources, of the cell in NCERT which has led the NAS process to date. To date this has not happened. The Mission therefore encourages the MHRD to consider an alternative arrangement by which the NAS cell moves to a quality assurer and research unit and engage other institutions to undertake key aspects of test design, delivery, analysis, dissemination and follow up. In this alternative arrangement NCERT would commission the conduct of the NAS to an expert independent body. The Mission is agnostic to either of these arrangements, but urges that progress is made in the short term to secure the longer-term sustainability of the NAS programme. At a minimum, continue sample based assessments at the current frequency of every 2-3 years in grades 3,5,8,10. Care needs to be taken to preserve what has already been done - storing the data for easy retrieval, people succession plan, methodology captured on an internal repository, etc. In addition, sample test items with performance data needs to be publicly shared (of the non-anchor items) so that there is awareness, data is used for teacher training, curriculum development, teacher support material, etc. The JRM estimates that implementing these suggestions would involve approx Rs. 12-15 Crore per cycle and hence NAS should

- have annual funding of Rs. 24-30 Crore annually with team sizes of 25-40 people (assuming on an average 2 cycles are done each year).
- 4.9. **Utilizing the potential of the NAS data** Priority needs to be given to absorbing the data, understanding the analysis, widely disseminating the results down to the teacher, block, district and State level and using findings to create teacher support material and teacher training to improve learning levels. This will only occur with greater political attention and additional funding.
- 4.10. **State Level Achievement Surveys (SLAs):** It was mooted prior to this mission that the states conduct an annual census based State Learning Assessment Survey for every grade. If States are willing and interested to do more (increasing frequency and/or sample size) then this could be achieved by individual States through their SCERTs possibly using the NAS instruments, techniques, etc in addition to their own. This has the benefit of being consistent and allows for comparison of the results. The technical and financial capacity to undertake this would need to be procured by the States themselves.
- 4.11. **Assessments vs. Examinations:** It is important to understand the difference between the purpose of (a) Assessments with the primary purpose of it being diagnostic for data on systems performance and improvement compared to (b) Examinations which perform a screening function relating to individual performance (e.g. Class X). A NAS type Assessment - high quality, sample based diagnostic assessments - serves fundamentally a different purpose than the State Examinations and it is not desirable to combine the two. Conducting the NAS should not prevent the States to conduct their own examinations for screening purposes; but combining the two will lead to sub-optimal functions of both.
- 4.12. **Time-on-task and implications for teacher training and school monitoring:** Research has shown that time-on-task or time spent engaged in learning activities is a significant predictor of student academic achievement. MHRD asked the World Bank to organize a time-on-task study in secondary school classrooms with the objective of better understanding teachers' use of pedagogical practices, their use of teaching-learning materials and their understanding of common errors made by students. The study was conducted in a total of 150 classrooms across 3 districts each in Tamil Nadu and Madhya Pradesh; Class 10 classrooms in Modern Indian Language and Math were observed. Four videos of 30 minutes each assimilating teacher best practices were also created for use in teacher training.
- 4.13. The main findings from this study are: Instructional practice was mainly teacher-centric. On average, teachers spend about 60% of classroom time on lectures or instruction and assigning students classwork in Math classes. In Language classes, about 60% of the time is spent on these activities including reading aloud from the blackboard or textbook. Evidence of the use of other learning aids was observed to a very small extent and was limited to a couple of districts; and the use of ICT was not found. Finally, teachers were able to correctly identify student errors only about a third of the time on questions, which ranged from grade 5-9 materials.

- 4.14. This study highlights the need for further examination on the link between classroom practices and student outcomes. Teachers are spending substantial class time on instructional activities but results from the NAS indicate this is not leading to good enough student learning outcomes. Further, re-examining the content of teacher preparation and training programs to ensure content mastery among teachers will be crucial for teacher effectiveness and student learning. Finally, there were small but notable differences across districts in instructional practices; these differences could be the result of district-level processes for teacher recruitment and pre- and in-service training.
- 4.15. Effective use of available information, especially for diagnostic purposes and feed it into teacher professional development critically hinges on the institutional capacity of national (UDISE and NAS) and state institutions. The Mission found that these have large numbers of vacancies. Systematic plan to enhance the capability of nodal institutions in the states (SCERTs, RIEs, IASEs, DIETs) need to be addressed on a priority basis.

Comprehensive reform of curriculum, textbooks, professional development of teachers and examination system:

- 4.16. The mission found that while textbooks have been revised in several states, the approach has not been comprehensive and holistic. The accent on time-bound completion of topics continues with week-wise or month-wise regime of what should be taught and when. The mission noted that Telangana has recently done a comprehensive reform of curriculum, textbooks and examination system.
- 4.17. Classroom practices are influenced by examination system and the pattern of assessment influences. Any move from rote learning to competency oriented learning necessitates a reform of the examination system. Examination reform that focuses on scientific inquiry and logical reasoning could have a positive 'backwash' impact on classroom processes and teaching practices, and provide a measure of whether secondary school students are learning what they need to learn for the 21st Century world.

Ensure libraries, laboratories and computer labs are adequately stocked and used:

- 4.18. Libraries are either not available or rarely used if technically available in Tripura and Uttar Pradesh. However, in Telangana libraries seem to be used with students borrowing. Effective use of libraries through dedicated period in the school timetable and allowing children to take books of their choice to read supervised by their language teacher. This was not evident in all five states visited. Effective use of laboratories by provisioning for consumables from the annual school grant remains a challenge in all the five states. Effective use of computer laboratories where teachers are able to empower students to

use digital material to augment learning. This has been elaborated in the ICT section of this report.

- 4.19. In a well-functioning system children would arrive in a new grade with the required competence to handle grade specific material. However given that in India (with the no-detention policy till class 8) a large proportion of students reach class 9 without adequate preparation to cope with secondary stage curriculum. Therefore the positioning and **effectiveness of remedial courses** is important. This needs to be done before/after school as well as during school hours, if possible. Children could be grouped based on their assessments results and their level of understanding and efforts made to enable each one of them to reach the required level of knowledge and skills. This issue merits serious engagement at both MHRD and State Government levels.

Recommendations:

NAS related

Rec. 4: MHRD may prioritize investment in an effective NAS institutional arrangement using the current 3-year cycle, and the use of the NAS results rather than pursue annual census based SLAs.

Rec. 5: On the release of each NAS, MHRD may require every State to prepare a response and remediation strategy which address key issues identified as an integral part of the AWP&B process.

Overcoming systemic barriers to realizing the goals of RMSA

Rec. 6: Systematic plan to enhance the capability of nodal institutions in the states (SCERTs, RIEs, IASEs, DIETs) need to be addressed on a priority basis.

Rec. 7: Streamlining teacher recruitment processes to forestall legal tangles: Transparent teacher recruitment policies and systems (for example in Karnataka) is important to not only ensure timely recruitment but also enable the government to forestall legal problems and corresponding delays.

Annexure to Chapter 4: Observations and Future Direction for NAS

NAS Class X Findings

The national technical report and state level report cards provide powerful diagnostic evidence on which well targeted remediation strategies could be developed. **The JRM encourages the NAS team to further develop its approach of not just reporting but offering possible strategy options and interventions to guide action.** Measuring alone is not enough – only with targeted action on the learning challenges identified will any progress be made.

A number of key findings of the Class X report are selected for comment.

- 1. The achievement levels of students at secondary stage falls well below expectations as determined by the Class X curriculum in all five subject areas.** This is likely due to a combination of home and school factors but could also include an overloaded and unrealistic curriculum as Pritchett and Beatty have postulated¹.
- 2. The wide variance in learning outcome performance in all subjects between states, within states and between different social categories within states.** Key findings include:
 - Urban students are performing significantly better than rural students;
 - A clear hierarchy in performance between schools of different management types with private schools performing best, government aided less well, and government schools forming the majority of the lowest performing schools;
 - Students from the general category and OBC category performed better than the SC and ST students (while there was no significant difference between average scores of students from SC and ST categories).
- 3. The strongly skewed distribution of student performance with very few students scoring in the upper two quintiles (fig 2).** A systems approach requires interrogation of the spread of performance across population sets - be they schools, teachers or students. If we believe the challenge is not just equity of access but concurrently equity in learning we must take note of the shape of the performance distribution curve – how big is the tail of under-performance and what are the characteristics of the schools, students or teachers who populate it? A reliance on the ‘average’ or fixation with the ‘topper’ is not going to give us the granularity of data that enables us to raise performance for all while simultaneously reducing the within system performance gap. In essence the challenge is to both ‘raise the bar and close the gap’ i.e. (i) shift the distribution so it is skewed to the ‘right’ (ii) reduce the gap between the highest and lowest levels of performance (see **fig 3** for detail on performance distributions).

¹ See The Negative Consequences of Overambitious Curricula in Developing Countries.
<https://research.hks.harvard.edu/publications/getFile.aspx?id=834>

Figure 2: Approximate distribution of learning performance in grade 10 by subject

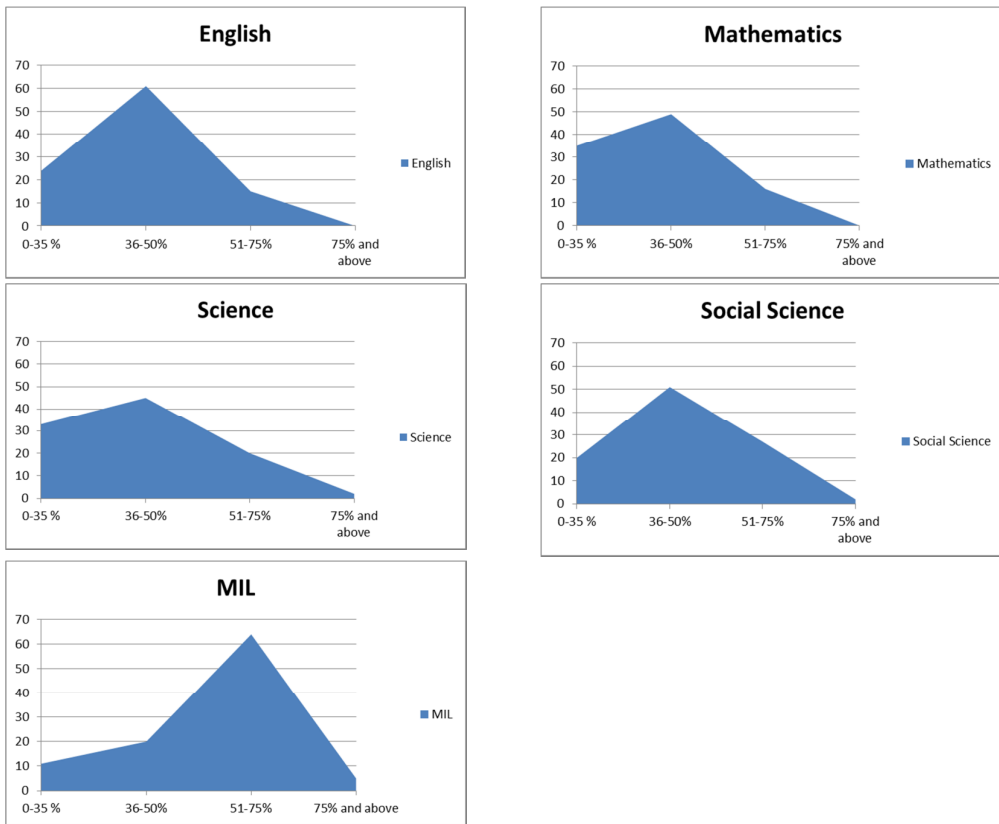
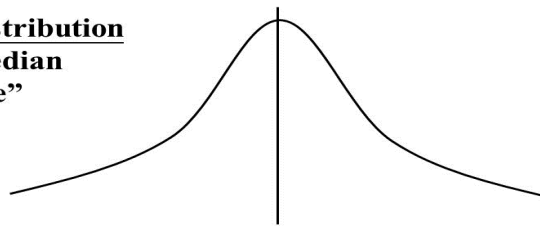


Figure 3: Explanation of distribution and skewed distributions

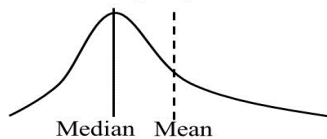
Normal Distribution
Mean = Median
“Bell Curve”



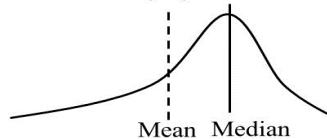
Mean + Median

Skewed data is described based on location of tail

Positively Skewed (Right)
“Mean is to Right of Median”



Negatively Skewed (Left)
“Mean is to Left of Median”



Technical Recommendations for NAS:

1. For ease of interpretation and meaningful analysis NAS should, for future editions, publish learning outcomes data in the form of distribution curves – this should be given both for overall national performance and also state wise performance (super-imposed on national performance).
2. NAS must clarify its use of the word ‘average’ – as is currently used ‘average’ performance is deemed to be the ‘mid-point’ (i.e. the 250 mark) on the 0-500 performance scale. This however is not the mean average of student. Average as commonly understood falls significantly below the 250 mark mid-point.

SLAs

Producing a robust achievement survey using the international standard IRT approach which ensures findings comparable over both time and geography is a highly technical and time consuming undertaking (**fig 4**). This is the approach now used by the NAS.

Figure 4: Elements in conducting a robust achievement survey

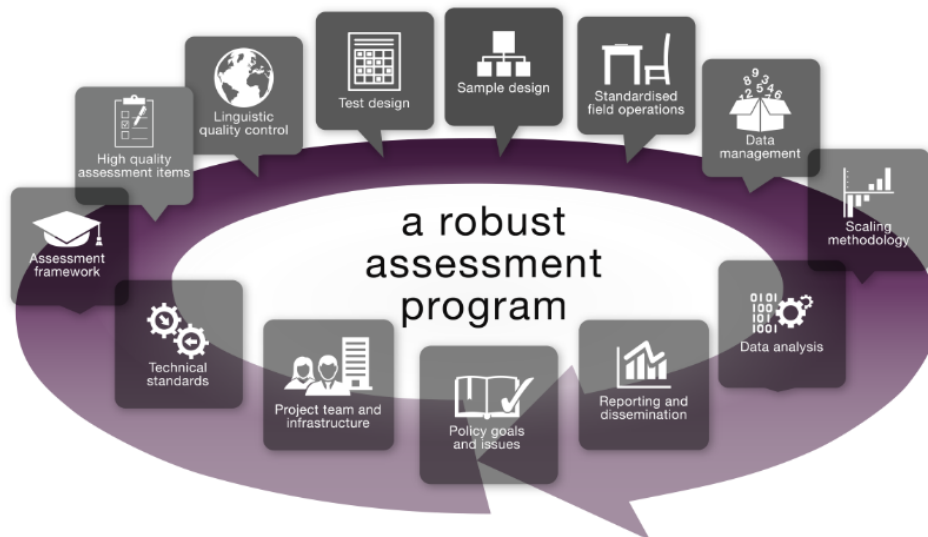


Image copyright Australian Council for Educational Research, sourced from www.acer.edu.au/gem/about/approach

It has been mooted prior to the mission that the states conduct an annual census based State Learning Assessment Survey for every grade. When put to State authorities there was little enthusiasm for this proposal on the grounds of a lack of funding, resources and need for the following reasons:

- **Technical** – many states do not have the capacity or resource to do and IRT based survey even at one grade – let alone take on census based SLAS in every grade for every student.
- **National Benchmark:** India needs a uniformly applied national benchmark that can be disaggregated by state level. Badly conducted SLAS could give false results and would not be comparable and would result in nugatory debates regarding the veracity of findings.
- **Cost/benefit:** Investing significant funds to undertake parallel SLAS at a time when there is limited evidence that the existing NAS diagnostic data is being used to inform remediation appears wasteful. SCERT and other State intellectual resources would be better deployed in mining findings of NAS data, devising remediation strategies and running impact evaluations to test their efficacy.
- **Disruption and high stakes nature of census based assessments:** In the same way as a doctor does not need to take all of one’s blood but only a sample to assess for ailments so it is not necessary to undertake census assessments to identify the glaring challenges facing Indian education. Moreover, the requirement that every student would be required to sit census based assessment can raise this to a ‘high stakes test’ while also causing major disruption to the educational calendar.

A critical question to ask is what additional value a census based assessment would add beyond NAS. The majority of countries around the world rely on diagnostic sample based NAS running on a 3 or 4 year cycle (such as now in operation in India) to provide health checks and inform course corrections for their education systems. Assuming competent delivery and analysis of test items on multi annual cycle it is possible to analyse many key aspects of learning outcome movement over time as seen below.

Figure 5: Change in learning outcomes at each class, over time

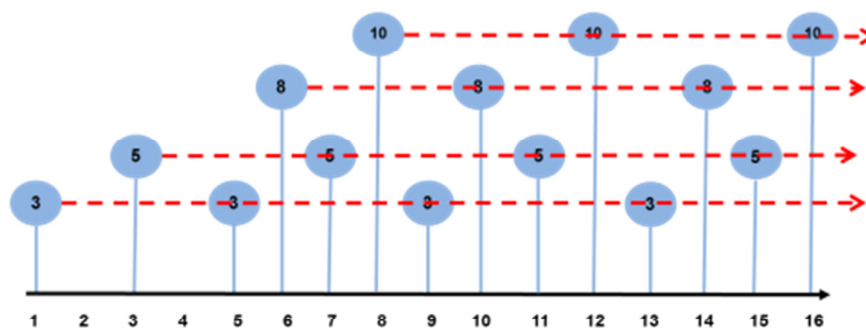


Figure 6: Examining the growth in learning outcomes across classes by cohort

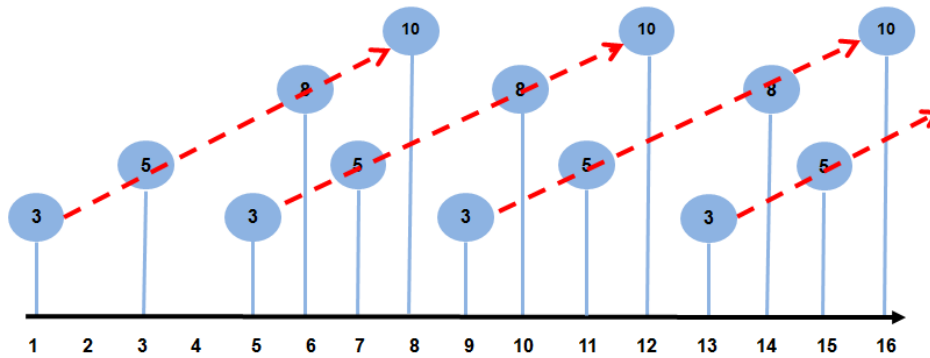
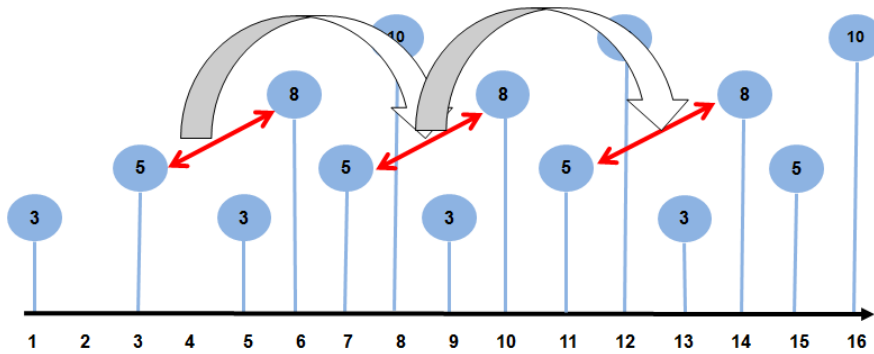


Figure 7: Changes in growth between classes over time



As the above shows with IRT based assessment it is not necessary to conduct a learning assessment every year to provide information on changes in learning outcome performance. It is however critical that (i) technical standards are consistently high (ii) that test items have sufficient range of difficulty to test all levels of performance and give accurate distributions (iii) that data is safely archived and retrievable and there is a competent body tasked with the multi data comparative analysis detailed above.

Thematic Area 1: Mathematics and Science Education in secondary classes

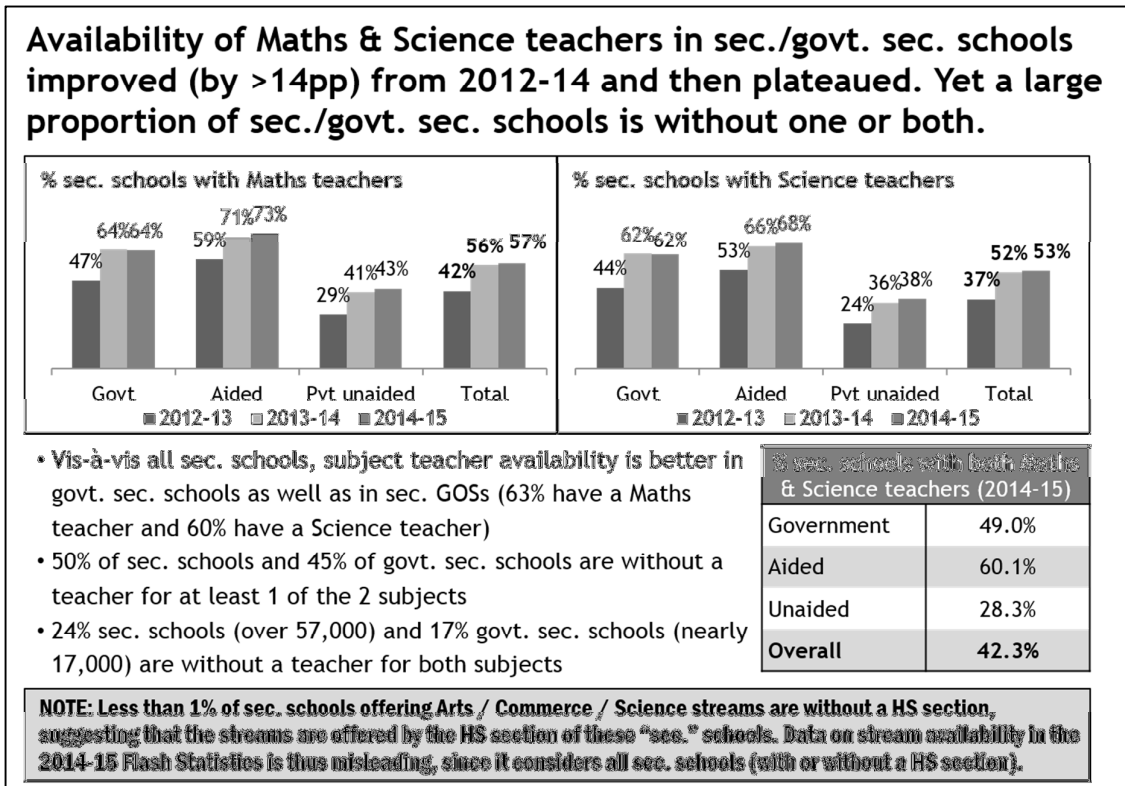
- 5.1. Science and Mathematics Education has been a priority area of RMSA under quality components. Since the launch of RMSA, many interventions have been provisioned in this area such as curriculum reform, development of teacher training modules, teacher training in science and mathematics, science exhibitions/fairs, etc. However, the implication from the National Achievement Survey for Class X, is that the majority of the states are below expected performance level in science and mathematics.
- 5.2. Good science and mathematics education requires that the curriculum and pedagogical practices are age appropriate and within the cognitive reach of the child. At the secondary stage, students should be engaged in learning Science and Mathematics as a composite discipline with hands on practical exposure. This requires that well qualified science and mathematics teachers are available in all the schools and also their continuous professional development. Since India faces a chronic shortage of well qualified subject specific teachers, ICT could be used as a viable supplementary tool for helping children learn Maths and Science in the presence (or absence) of the teacher. There is also a need for assessment to be in tune with the learner-centred approaches and for the examination system to encourage mathematical and scientific exploration and practice application.
- 5.3. **States/UTs have undertaken initiatives towards curriculum revision, teacher training and development of educational resources on mathematics and science:**
- Almost all the states have revised their curriculum including syllabi and textbooks at the secondary stage as per NCF 2005.
 - States like Gujarat, Maharashtra, Karnataka and Kerala have also developed e-content.
 - Teacher Training manuals prepared by the NCERT and the states/UTs are available.
 - Under RMSA, all the states/UTs have a provision for the 5-10 day training of secondary science and mathematics teachers teaching at the secondary stage. In 2015-16, training to 1,36,605 teachers (out of 3,31,526 teachers in government and government aided schools) was provided under RMSA converging this with Rashtriya Avishkar Abhiyan (RAA), a flagship programme launched recently by the GOI for promoting science and mathematics education in the country.
 - Other curricular activities such as science fairs, exhibitions, etc., were also conducted by the states/UTs at the district and the state levels. In 2015-16, 415 science fairs were conducted across the districts out of 559 approved. These activities have also been in convergence with the RAA. There is clearly scope for extending these non-formal learning opportunities.
- 5.4. **However, the findings of the National Achievement Survey for Class X indicate low student learning outcomes in science and mathematics:**

- In science, in 3 only States/UTs was the average performance significantly above the expected level (250), while 24 States/UTs performed significantly below. In 4 States/UTs there was no significant difference from the expected level observed. Among the five states, this JRM visited Maharashtra and Telangana are the states which are near national expectations, whereas Tripura and Delhi are far below. U.P. is not included in the NAS Summary Report.
 - In mathematics, in only 4 States/UTs was the average performance significantly above the expected level, while 21 States/ UTs performed significantly below. In 6 States/UTs there was no significant difference from the expected level observed. Among the five states, this JRM visited Maharashtra is close to the national expectations, and Telangana is above. Whereas Tripura and Delhi are far below. U.P. is not included in the NAS Summary Report. In the Social Category (OBC, SC, ST, Other), other category students performed better on average than OBC, SC, and ST students.
- 5.5. Interactions with students during the field visit also confirmed the need of improvement in the learning levels of students in classes IX and X - most did not have the fundamental basics that are needed in order to be able to tackle the secondary education curriculum. They also shared about not having done or seen experiments being carried out in laboratories or visiting the school library to refer to subject related books, issue books or even for reading literature and story books.
- 5.6. **The mathematics and science curriculum is transacted mostly through rote based and teacher-centric pedagogy.** During the school visits it was observed that teachers mostly resort to textbook based teaching as this is their only available resource. The textbooks for science and mathematics in most cases were found to be overloaded with information and most students find it hard to remain engaged with the content (except in Telangana where there was evidence of activity based teaching-learning and experiments conducted by students). Also, the chalk and talk pedagogy does not encourage inventiveness and creativity among students. This is also evidenced from NCERT's Curriculum Studies (2012-14) and Classroom Process Study (2014-15), conducted by the NCERT in five states: Uttar Pradesh, Meghalaya, Rajasthan, Kerala and Karnataka, and the Time on Task study recently conducted in Madhya Pradesh and Tamil Nadu. The problem of rote based learning needs to be addressed by reforming the examination system to focus more on improving fundamental concepts and their application in science and mathematics.
- 5.7. **For states that have revised their textbooks there is a need for the teachers to be oriented on the new pedagogies and content enrichment.** Building capacity of secondary stage teachers to transact revised textbooks and link that to continuous and comprehensive evaluation is urgently required. Telangana has undertaken curriculum reform revising its syllabi and textbooks and linking it with the implementation of CCE and teacher training and also with the change in typology of questions in the external examination. This may explain why the JRM observed more progressive classroom

practices were observed (and it would be valuable to see to what extent this is an explanation for the above expected performance on NAS X in mathematics).

- 5.8. **Science laboratories are minimally equipped and rarely used.** Despite the provisioning for science laboratories in each school under RMSA, the JRM found many schools either without a laboratory or one that had minimal equipment that had not been touched by students. This is likely partly explained by the lack of practical testing during the examination process. There is no point the RMSA Programme and the States providing resources for science laboratories if they remain unused.
- 5.9. **There is variation across schools in states regarding whether mathematics and science is a compulsory subject in secondary education.** In case of UP, girls in girls' schools and girls in co-educational schools are given an option to choose between math and home science, while boys have math as a compulsory subject. Agriculture and commerce are also offered as subject choices in some schools [need to clarify whether these are instead of mathematics and science].
- 5.10. **A major bottleneck in mathematics and science education is the huge teacher shortage in these subjects across states.** Teacher recruitment is not keeping pace with the expansion in schools and student enrolment in most states. There was improvement in availability of these subject teachers between 2012 and 14 but very little increase since then. Per the UDISE 2014-15 data, 42% of all government secondary schools (57% of all secondary schools) have math teachers and 37% of all government secondary schools (53% of all secondary schools) have science teachers leading to very high PTR (152:1 for math and 149:1 for science in government secondary schools). Furthermore, only 57% of math and 22% of science teachers teaching in secondary classes in all secondary schools have studied the subjects beyond higher secondary level. The figure below highlights the shortage of mathematics and science teachers. A better understanding is needed at the state level of the constraints they face in filling all the teacher vacancies: budget allocations (from RMSA and beyond), the number of new teachers being trained each year to teach mathematics and science, the allocation of teachers across existing schools and the presence of large numbers of small schools.

Figure 8: Availability of Mathematics and Science teachers in Secondary schools



Source: UDISE 2012-13, 2013-14, 2014-15 data

- 5.11. **Teacher Training in science and mathematics needs to shift away from didactic classroom pedagogy.** While it is important to focus on subject-specific training, it would be good if all the states design need-based training programmes integrating pedagogic practices— especially multiple pedagogies and ICT infused pedagogy. They may also initiate need based multi-level training programmes, so that teachers who have successfully completed the first level training programme can go for higher levels based on their need. Finally, training programs should be conscious of the differing academic background of teachers of mathematics and science and their own understanding of the subjects. Support from Regional Institutes of Education (RIE), NCERT, SCERTs and other Institutes may be sought for this.
- 5.12. Other approaches that could be adopted to improve the quality of mathematics and science teaching-learning practices:
- Subject group departments within State Institutes could be set up with the State Resource Groups concerned; and, be primarily responsible for teacher training. The State Institutes shall prepare Key Resource Persons (KRPs) and also train them in assessment of training needs.
 - While this is not strictly within the purview of RMSA; given the critical importance of adequate teachers in all the core subjects; a medium term-plan to enhance the availability

of math and science teachers could be facilitated by MRHD. Students pursuing a Bachelor's degree in mathematics and science could be counselled to consider teaching as a profession and colleges of education encouraged to admit more mathematics and science students into the B. Ed. programme.

- 5.13. Furthermore, the JRM wishes to highlight that teacher shortages in core subjects should be seen in the context of the large number of sanctioned teaching posts that remain unfilled, and, just as seriously, the inefficient deployment of the available teaching resource: with 'too many' teachers in some schools, in relation to student enrolment; and 'too few' teachers in others. This is even more inexcusable today with the strength of data evidence the system generates. This is a JRM concern that has remained a constant from the very first DPEP JRMs in the 1990s, through SSA, and again under RMSA. If a way forward had been found in 1990s, what is being achieved today would be so much greater. It will be a further developmental tragedy if another quarter of a century passes, with progress being retarded by the same constraints. Despite the enormous difficulty of addressing teacher shortages, a priority solutions must be found to overcome them, if RMSA investment is to be maximised.
- A small research team needs to be created at the State level (group of 5-10 of the best subject teachers) to solely focus on student misconceptions, difficult concepts and how to tackle these learning gaps, creating teacher resource material that helps teachers be aware of how their students think with suggestions on how this can be remediated in the classroom.
 - The innovations and the good work of teachers – especially in the classroom in science and mathematics– needs to be documented and disseminated. This would not only motivate the exemplary teachers and teaching-learning practices; but would also showcase the good work being done in government schools.
 - The availability of national level resources (like NROER, *e-pathashala*, e-content, laboratory manuals) or state level resources need to be disseminated in the schools through adequate mechanisms. This will encourage teachers to reach out when they require support or material.
 - Conduct a nationwide campaign on the importance of Maths and Science along the lines of *Swachh Bharat Abhiyaan* that helps all stakeholders take this up as an important subject.
 - A list of vetted / certified computer based programs that allow children to learn various Mathematical and Scientific concepts need to be provided to the states/UTs

Recommendations:

Rec. 8: States, as part of the AWP&B process, may wish to prepare plans to address the shortage of mathematics and science teachers identifying the main constraints in their context

Rec. 9: Conduct a study of classroom teaching practice so as to see link between the type of teaching used by teachers and the learning outcomes of children in science and mathematics, so as to be able to document and disseminate good teaching practice

Thematic Area 2: ICT in Secondary Schools

- 6.1. Few would disagree that real, inclusive growth in India depends on the extent to which we are able to provide quality education to all our citizens. Relevant use of technology will help to effectively solve India's problem of providing quality education at scale. ICT in education does not mean familiarization of ICT theory (as is the case now) instead; ICT needs to be used to provide guaranteed high quality subject-specific education to each child.
- 6.2. Taking into account findings from interactions with key stakeholders and visits to the field, together with a desire to further strengthen the implementation of ICT activities in RMSA going forward, the narrative within this Section is structured as follows:
 - ***“Where are we now?” Current State of ICT***
 - ***“Where do we want to be?” Clarity of purpose/use of ICT in RMSA***
 - ***“What do we have to do to get there?” Recommendations on ICT policy & efforts***
- 6.3. ***“Where are we now?” Current State of ICT:*** The JRM acknowledges the initiatives at the national level and a reflection on the status of ICT in the five visited States (Annexure, Appendix 2). There are a number of ICT related initiatives taking place at the national level: the social media campaign on Facebook, Twitter and YouTube; an ICT conference held in November 2015; the launch of the Saransh Portal aiming “to improve children’s education by enhancing interaction between schools as well as parents and providing data driven support”; the e-Pathshala “platform for showcasing and disseminating all educational e-resources, including textbooks, audio, video, periodicals and a variety of other print and non-print materials”; the launch of a web portal under Shaala Siddhi; and an IT based school management system under Shaala Darpan. A future JRM would benefit from taking a closer look at how these very recently launched administrative initiatives are helping in learning outcomes.
- 6.4. We also wish to recognize MHRD’s TESS-India initiative - a portal that makes Open Educational Resources (OER) freely available for download. It is aimed at both pre- and in-service teachers. The “units may be used for self-study, or mediated by teacher educators in a range of professional development contexts”. Subjects prioritised are Language and Literacy, Science, Maths, and English. Materials are both text and video based. Crucially, materials are also available in a range of Indian languages, as well as English. A study of usage and impact on learning outcomes is recommended.

6.5. Despite significant spending, ICT is massively underperforming its potential of being a viable and scalable solution to solve the problem of disparate and low learning levels. Reasons are both administrative and pedagogical:

- Administrative:
 - Lack of ownership on school's part in the BOOT 'Build, Own, Operate, and Transfer' model. The nomenclature has led to an unfortunate psychological mindset of lack of ownership. RMSA and school staff need to appreciate that they actually own the initiative from the outset, not at some later stage. Thus, Government and schools can and should be far more assertive and proactive in articulating what they want their service providers to deliver, to meet RMSA and school priorities. The providers should be answerable to Principals.
 - Lack of clarity in vision, approach, cost, responsibility and accountability.
 - Inattention to prerequisites – electricity, staff, software & hardware. Figure 1 shows that only 4% of government secondary schools meet a basic set of infrastructure criteria for ICT.
 - Lack of RMSA norm flexibility impedes State based localised initiatives.
 - Need for models that share cost – RMSA needs funding models that build in State based liability for recurrent expenditure / equipment replacement.
- Pedagogical
 - More emphasis on provisioning of hardware and not enough on effectiveness of the software used in terms of learning outcomes.
 - Development of learning solutions based on well researched methods and availability of such programs in Modern Indian Languages

6.6. **“Where Do We Want to Be?” Purpose of ICT:** Various forms of technology including radio, television, smart phones, computers and the Internet can help deploy successful solutions at scale. The setup of virtual classrooms or video-conferencing can be a powerful way to train a large number of teachers who may be geographically disperse.

6.7. In India, the situation is somewhat different from international western countries in 2 ways – first in a significant number of classrooms, specialist core subject teachers are not in place; second the teacher faces a very wide range of learning levels in her classroom – from students who are ready to take on advanced concepts in the subject to those who have not yet grasped the basics that are expected in several grade levels lower (their reading skill itself may be weak to absorb). In this context it is very difficult for the teacher to customize her teaching to meet the needs of each of her children. ICT, especially for learning the basics, is well-adapted to individualized learning and can be one means of addressing this challenge. Hence, we should not hold back and deny students the opportunity to make up for a missing teacher, by providing access to independent learning ICT opportunities. Students know how to use technology and this strength can be leveraged in such situations.

- 6.8. ICT should be used **both** for teachers and for students. ICT will help to shift pedagogy from being teacher centric (as noted in Time on Task study in Quality section) to learner centric. Further students should be able to learn from the software in the presence of any adult supervision (not necessarily an ICT trained teacher)
- a. Students:
 - i. ICT has proven solutions to help with basic concepts in Reading, Math and Science - and these are precisely the areas where students are struggling - even in Grade 9 & 10
 - ii. Given the variety in learning levels, styles, pace (e.g. slow learners, etc.) - personalized learning and intelligent tutoring systems are necessary – the diversity cannot be catered through virtual classrooms (ROT), digitized content via projectors, standardized videos, e-textbooks, etc.
 - iii. Many international best practices of using technology in education exist - further R&D to adapt to Indian context will enhance effectiveness
 - b. Subject Teachers:
 - i. Ownership and usage of smartphones has percolated to most teachers - can be leveraged to provide teacher training and support (e.g. TESS India)
 - ii. Infrastructure: While electricity and internet are recommended pre-requisites; off-grid alternatives such as solar and 4G connectivity allow progress to happen in parallel
- 6.9. **“What Do We Have to Do to Get There?” Recommendations for ICT:**
- c. States submit a state specific ICT strategy as part of the AWPB submission. The MHRD must provide states flexibility in terms of how they spend their budgets. In the AWPB, States need to provide a detailed strategy that addresses the following questions:
 - i. **Purpose:** What will ICT be used for? What will be achieved?
 - ii. **Execution:** What will be done to achieve the purpose/goal? How will it be implemented? By when? How will States deploy funding even if RMSA payments are delayed?
 - iii. **Ownership:** Who will do it? Who will be responsible? What is the States’ contribution regardless of RMSA contributions?
 - iv. **Analysis:** What are the yardsticks on which success will be measured? How will the benefits be assessed on those yardsticks? What will the scale-up decision depend on?
 - d. The technology is there – but rather than assuming that solutions exist, start at the pilot level, and then scale based on learnings from the pilot.
 - i. One area of focus could be research on an Intelligent Educational Software which may be described as a computer program that tries to teach a particular subject or topic or language using intelligence of one or more of these kinds: accurately determining the current level and/or specific difficulties of an individual student (e.g. reading comprehension in a particular language),

adjusting the pace of the instruction to optimally suit the individual student, altering the learning path based on the mistakes done by a particular student; and demonstrates measurably improved learning in students in that process. The software is aided by a presence of a human teacher but not critically dependent on the quality or the presence of the person.

- ii. Send a delegation consisting government, NGO and private sector players to see what other countries with similar resource envelopes are doing (e.g. Bangladesh, Vietnam, etc. - not Finland, S Korea, etc.).

Recommendations:

Rec. 10: The MHRD must ask States to submit a State specific ICT strategy (vision, execution, methodology, effectiveness measurement, etc.) as part of their AWP&B submission. The MHRD should provide States flexibility in terms of how they want to spend their ICT budgets.

Rec. 11: Provision for sufficient hardware for providing 1:1 ICT based remedial education in Language and Maths for students

Rec. 12: Setup a team of specialist teachers and commission research on high quality software that helps children learn fundamental concepts in Language, Maths & Science

Annexure to Chapter 6: ICT in Secondary Schools

Appendix 1: Availability of infrastructure in secondary schools

Figure 9: ICT infrastructure in secondary schools

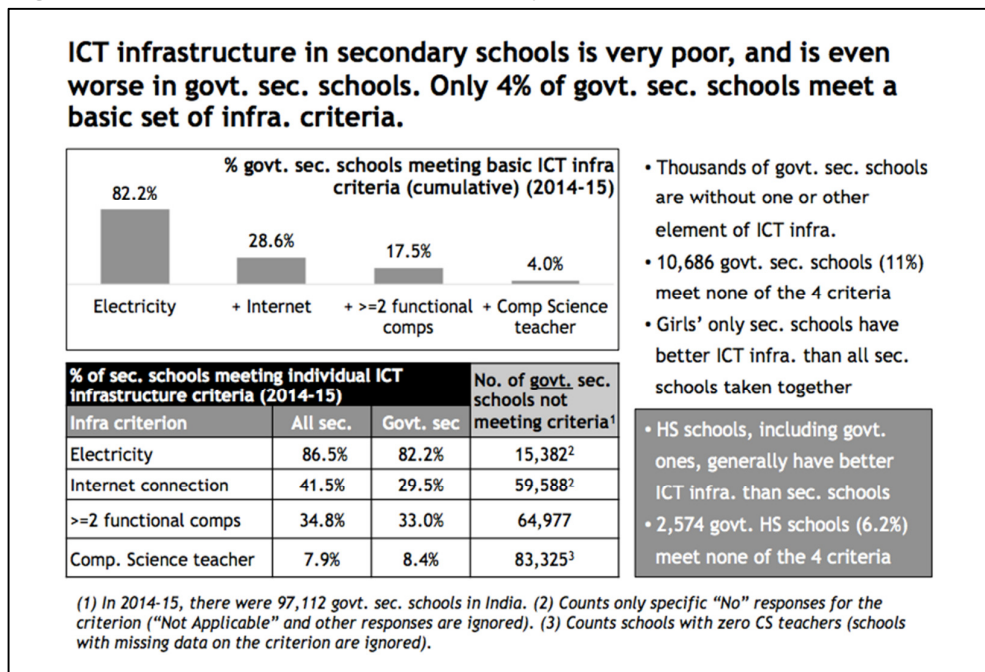
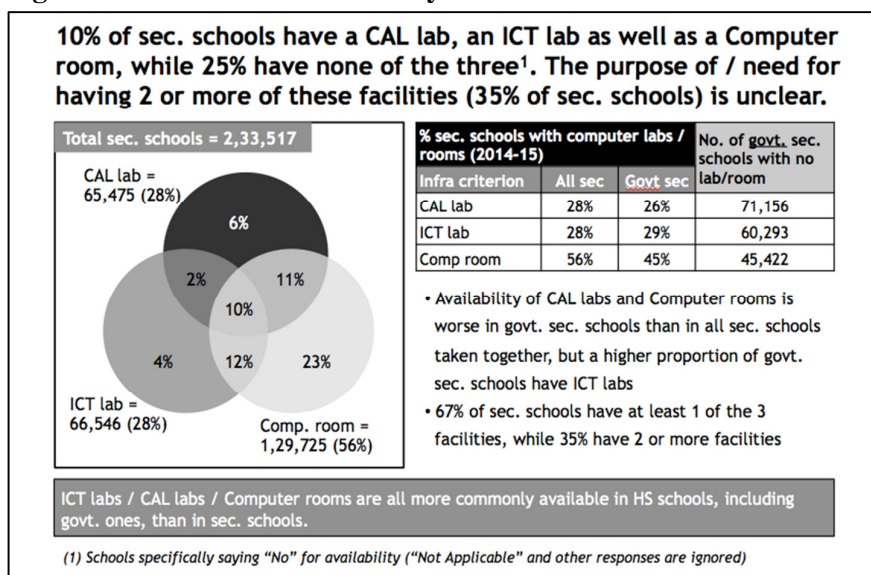


Figure 10: ICT Labs in secondary schools



Appendix 2: Current Situation, as Assessed in the 5 States Visited:

	UP	Maharashtra	Telangana	Tripura	Delhi
BOOT Model - # of schools (year started)	4000 (2009)	470 (2008) + 2356 (2009) + 4797 (2012)	2680 (2011)		1058 (2016)
BOOT provider		Many (incl. IL&FS)	NIIT		Telecommunications Consultants of India Limited
Hardware	10 computers + scanner	10 computers + 2 servers + 1 integrated projector	10 computers + generator	10 computers + projector	10 computers, printer, scanner, camera, etc.
Non-BOOT initiatives		Portable PC & Digital projector	Receive only terminals, CDs	EduSat, laptop + projector	
Course	Archaic ICT syllabus	Typing and Computer literacy	Typing and Computer literacy	No course material	Typing and Computer literacy
Software	Word, Paint		Word, Paint		
Electricity	Generally available	Generally available	Available	Shortage	Generally available
Internet	Non-existent	Many (problem in rural)	Non-existent	Non-existent	981 schools
Staffing	None	In BOOT model (staff turnover)		None	Positions approved;
Administrative	N/A	Teacher attendance (SMS, GPS, online login)			
Teacher use of smartphones	Majority	Widespread	Majority	Majority	Widespread
Other observations:					

- Certain states apart from the ones visited above have distributed laptops to 12th grade students, installed smartboards, projectors, digitized textbooks, put phonetic English on DVDs, interacting with Headmasters through interactive video-conferencing, conducting virtual classrooms (1 teacher in a studio transmitted live to many classrooms), etc. The mission is aware that Tamil Nadu has embraced ICT in education enthusiastically by implementing all of the initiatives listed above – It may offer lessons to learn from since there has been no evidence which of these have systematically improved learning outcomes at scale. Review of what technology is able to do (and not able to do) is a prerequisite before further investments are made.
- National Repository of Open Education Resources, e-pathshala, MOOCs, Subject specific resource folders containing videos of best practices for teachers (where internet is an issue) were also observed
- One promising area is use of technology for learning fundamental Reading, Math and Science through the use of personalized adaptive learning software.
- ICT theoretical curriculum is dated – with references to floppy disks, etc. which is not in line with modern computers and Internet. Despite students studying ICT (as a subject), recall of sites like Google, Wikipedia, etc. was very low.

Appendix 3: Additional Pointers for ICT Planning, Prioritization and Support

Education landscape: Below is a non-exhaustive list of the stakeholders, resources and purposes of ICT in Education – especially at the Grade 9-12 level. Within the below, recommended priority is to be given to teachers and students first – and other stakeholders would benefit from that as well.

Stakeholders	Devices	Purposes
Teachers	Mobile phone / smartphone	Teacher training - pedagogy
Students	Tablets / laptops	Teacher training - computer usage
SMDC	Desktops	Student learning - 1:1 / on-demand
Principal	Smartboards	Student learning - smartboard / projector
SCERT	Projectors	Security/Accountability/Monitoring - CCTV cameras
Equipment suppliers	Virtual classrooms /	
Parents	Satellite	Attendance - biometric, login
Citizens	Mobile science van	Assessments - online tests
MHRD	Smart card for students to track attendance/dropouts	Information - Kala Utsav, Watch cultural things
International Aid Agencies	Website for publishing results, complaints	
	Online grading of papers, use of OMRs, barcodes	
	Online school applications	

Additional parameters/constraints that could inform future prioritization and planning:

1. Purpose
2. Available budgets and other resources (staffing, space, electricity, internet, etc)
3. Vocational training
4. Class size, Urban/Rural
5. Physical security of assets (theft, etc)
6. Security (accessing certain sites, virus, etc)
7. Maintenance to ensure in working condition
8. Usage monitoring (biometric, internet, login based, etc)

Research evidence on various ICT methods:

1. Several studies show that when ICT is used for personalized learning it is really beneficial on learning outcomes. Notable among them are listed here:
 - an RCT impact evaluation done by J-PAL's Karthik Muralidharan; - shows children are learning ~250% more compared to a control group

- [Gates Foundation](#) report + http://www.rand.org/pubs/research_reports/RR1365.html - shows "students are making significantly greater gains in math and reading over the last two years than a virtual control group"
 - [American Institute for Research](#) paper on Personalized Learning
 - <https://www.povertyactionlab.org/scale-ups/teaching-right-level>
2. Other studies on use of ICT for other purposes
 - World Bank funded studies in Peru are [here](#)
 - and many more located [here](#)

Some Notional Examples of EdTech providers India –

1. [Zaya](#) (using technology for personalized learning - for teachers and students)
2. [Mindspark](#) (available in vernacular languages of Hindi & Gujarati in addition to English - for classes 1-10, teacher support, parent interface, etc)
3. [EkStep](#)
4. [Khan Academy](#) (US based, but has recently translated in Hindi and other languages)
5. [Avanti Fellows](#) (provide coaching to low-income grade 9-12 students to prepare for competitive exams - many of their students have gone to IITs)
6. Edutel, Sterlite Tech (virtual classrooms)

Source: (compiled from Central Square Foundation report on EdTech)

Thematic Area 3: Pending Civil Works

Construction of new schools

- 7.1. *Sanction of new schools:* Over a period of seven years (2009-10 to 2015-16), a total of 11,599 new schools have been approved under RMSA. Among the states and union territories, highest number of new schools has been sanctioned in Uttar Pradesh (1,504), followed by Madhya Pradesh (1,428), Chhattisgarh (1,357), Bihar (1,153), Tamil Nadu (1,096), Jharkhand (1,000), and Odisha (855). Together, these seven states represent 72 per cent of the new secondary schools approved until 31st March 2016. In contrast, Delhi, Maharashtra, Goa, A&N, D&N Haveli, and Lakshwadeep, have not got approval for establishing new secondary schools.
- 7.2. Out of 11,599 new schools, 9433 schools (81.3 per cent) got approval during 2009-10 to 2011-12 (*Table 1*). In 2012-13, no approval was given to construct new schools. Since 2013-14 (the year of integration) sanction of new schools has slowed down considerably, indicating a shift in focus of RMSA from expanding access (by setting up new schools) to improving quality and equity of secondary education.

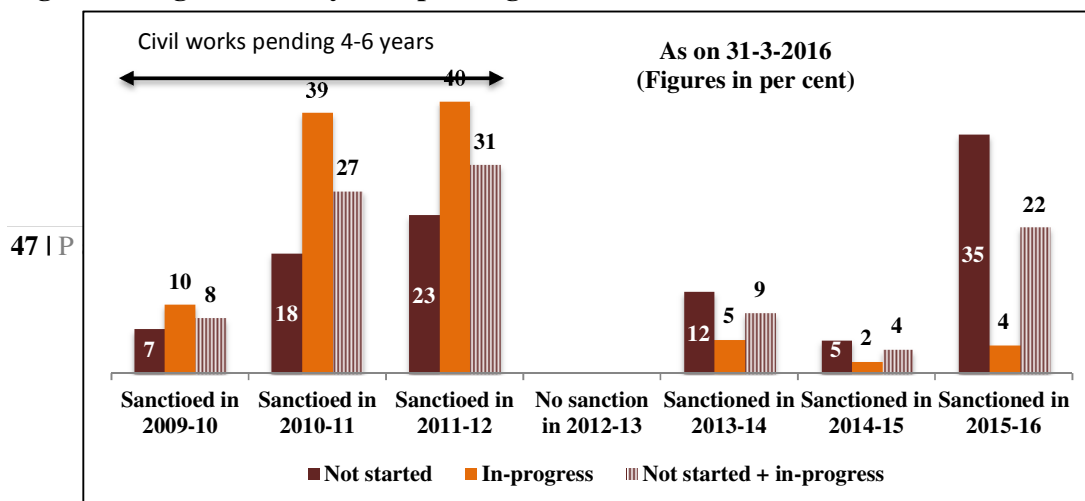
Table 2: Progress in civil construction of new schools (2009-10 to 2015-16)

Year	Number of new secondary schools				
	Sanctioned	Completed	In-progress	Not started	Surrendered by Karnataka*
2009-10	2,430	1,960	257	210	3
2010-11	3,232	1,679	973	568	12
2011-12	3,771	2,007	1,018	746	
2012-13	No sanction of new schools				
2013-14	578	38	127	385	28
2014-15	272	4	45	157	66
2015-16	1,316	37	106	1,128	45
Total	11,599	5,725	2,526	3,194	154
%	100.0	49.4	21.8	27.5	1.3
Source: MHRD data provided to the JRM					

* The surrendered schools have been approved in the current PAB at revised SOR.

- 7.3. Completion of civil construction: Against the sanction of 11,599 new schools, civil works have been completed for 5,725 schools (49.4 per cent) until 31st March 2016 (Table 2). As per U-DISE data of 2014-15, schools have not started in 321 newly constructed buildings (including 120 schools in Gujarat). This implies that out of 5,725 newly constructed schools, 5,404 schools have become functional. U-DISE data further shows that 5,98,855 students (approximately 6 lacs students) are enrolled in newly constructed secondary schools. Thus, average enrolment works out to be 111 students per school.
- 7.4. Pending civil works: Of the approved 11,599 new secondary schools, civil works are in progress for 2,526 schools (21.8 per cent), while works have not commenced for 3,194 schools (27.5 per cent). The states having more number of sanctioned schools where civil construction has not been undertaken are Bihar (637), Madhya Pradesh (546), Uttar Pradesh (516), Jharkhand (301), and J&K (266), Nagaland (168), and Odisha (148). The combined share of these seven states in the total number of new schools for which civil works not yet taken up is 80.8 per cent.
- 7.5. Many states/UTs could not take up construction of new schools since *schedule of rates* (SOR) were not revised to adjusted for price escalation. For undertaking civil works at unadjusted low SOR, the states were required to spend additional funds from their own sources, which they were not ready to do. Recognizing this problem, MHRD has advised the states to surrender pending civil works and seek fresh approval from PAB at revised SOR. Karnataka has surrendered civil construction of 154 schools (see Table 1 for year-wise break up) and got fresh approval at revised SOR. It is expected that many other states might have done the same thing. However, exact position will be known after PAB meetings are completed for all the states/UTs.
- 7.6. Age-wise analysis of pending civil works reveals the following. Of the 3,194 schools for which construction has not yet started, 48.3 per cent (1,542 schools) have been pending for 4 to 6 years (Figure 1). These works are likely to be surrendered and re-approved at revised SOR. Similarly, of the 2,526 schools for which works are in progress, 89.0 per cent (2,248 schools) are now pending for 4 to 6 years. This block of incomplete civil works pertaining to the period 2009-19 to 2011-12 have not moved since the states are not willing to spend additional funds to pay agencies at revised SOR. There is an urgent need to draw up state specific action plans to complete the long pending works-in-progress.

Figure 11: Age-wise analysis of pending civil works



7.7. *Some other concerns*: The Mission has noticed that even under normal circumstances completion of civil works of a new school may take longer period, two years or more from the date of release of first instalment payments to the agencies (*see the state report of Uttar Pradesh*). Another big concern is that on completion of civil works, the school building is generally handed over by the construction agency without proper 'completion certificate'.

Civil construction for strengthening existing government schools

7.8. *Construction of additional classrooms*: Till date 52,639 additional classrooms (ACRs) have been approved for the existing government schools (*Table 3*). Of the sanctioned number of ACRs, construction works have been completed for 27,518 classrooms (52.3 per cent), and works are in progress for another 7,952 classrooms (15.1 per cent). However, civil construction of 17,169 approved classrooms (32.6 per cent) has not yet taken up. Among the states/union territories, Bihar (5,279 classrooms), Tamil Nadu (2,833 classrooms), Andhra Pradesh (1,353 classrooms), and Jharkhand (1,263 classrooms) together account for about 62.5 per cent of the total ACRs for which civil construction has not been undertaken.

7.9. *Other construction works*: The civil works for strengthening the existing government secondary schools have progressed moderately (*Table 3*). Against the sanctioned numbers, civil works have been completed for 14,580 science labs (56.0 per cent), 10,685 computer rooms (48.7 per cent), 14,265 library rooms (52.1 per cent), and 16,179 art/craft rooms (51.4 per cent). About 15 to 17 per cent of the sanctioned numbers of the aforesaid facilities are in progress. However, civil works have not been taken up for 7,303 science labs (32.6 per cent), 8,061 computer rooms (36.8 per cent), 8,374 library rooms (30.6 per cent), and 10,459 art/craft rooms (33.2 per cent).

Table 3: Status of civil works for strengthening government schools (2009-10 to 2015-16)

Infrastructure/ facilities	Sanctioned	Completed		In-progress		Not started	
		Nos.	%	Nos.	%	Nos.	%
ACR	52,639	27,518	52.3	7,952	15.1	17,169	32.6
Science lab	26,028	14,580	56.0	4,145	15.9	7,303	28.1
Computer room	21,926	10,685	48.7	3,180	14.5	8,061	36.8
Library room	27,386	14,265	52.1	4,747	17.3	8,374	30.6
Art/craft room	31,460	16,179	51.4	4,822	15.3	10,459	33.2
Toilet block	19,392	19,392	100.0*	0	0.0	0	0.0
Drinking water	11,950	7,976	66.7	905	7.6	3,069	25.7

Source: MHRD data provided to the JRM

- JRM noted that in the state of Telangana, out of 1725 toilets sanctioned, only 27% of toilets are completed, in 24% work in progress and in 49% cases, the civil works not started.

- 7.10. The states/UTs have completed construction of all the 19,392 toilet blocks as approved under RMSA (Table 2). But similar kind of progress has not been noticed in the construction of drinking water facilities. Of the sanctioned number of 11,950 drinking water facilities, civil works have been completed for 7,976 water facilities (66.7 per cent). The works for 905 facilities (7.6 per cent) are in progress, while civil construction of 3,069 water facilities (25.7 per cent) have not been undertaken by the states/UTs.
- 7.11. It may be mentioned that many states are currently surrendering civil works not taken up for strengthening the existing government schools and seeking fresh approval from PAB at revised SOR.

Construction of girls' hostels

- 7.12. Under RMSA, hostels are provided for girls belonging to SC/ST/OBC and BPL families. Each educationally backward block (EBB) should have one girls' hostel. At present, there are 3,453 EBBs in the country against which 2,226 girls hostels (64.5 per cent) have been sanctioned. Of the sanctioned number, 981 hostels (44.1 per cent) have been completed, 664 hostels (29.8 per cent) are in progress, and civil works for the remaining 581 sanctioned hostels (26.1 per cent) have not been undertaken. The major states where civil construction of girls hostels have not been undertaken are Uttar Pradesh (141 hostels), Bihar (109 hostels), Telangana (70 hostels), J&K (68 hostels), and Odisha (42 hostels). Together, these states represent 74.0 per cent of the total unconstructed girls hostels.
- 7.13. The Mission has noted that all the newly constructed girls' hostels have not become functional due to some operational issues. A key issue is that RMSA has no provision to appoint a full time warden in the girls' hostel. As per the guideline, a female teacher is required to act as a warden for an additional honorarium of Rs. 5,000 per month. Many states find it difficult to run a hostel for 100 adolescent girls with a part time warden. The states also consider provision of cook and assistant staff under RMSA inadequate to manage girls' hostel. These are all practical issues and the states and MHRD jointly need to address them.
- 7.14. At present, there are 834 functional girls' hostels with an enrolment of 64,328 girls. These hostels are functioning in rented building, own building, or within the premise of KGBV.

Recommendations:

- Rec. 13:** Each state is required to scrutinize all the pending civil works in-progress pertaining to the period 2009-19 to 2011-12 and develop a detailed physical and financial proposal. A task force may be set up for technical and financial appraisal of the proposal before submission it to PAB. The Ministry may finance state specific proposal following the present basis of GoI-state sharing of costs.
- Rec. 14:** An on-line tracking system may be developed to monitor physical and financial progress of civil works. Specific measures would also be required to (i) ensure completion of civil works within the timeline specified in the MoU with the construction agency; (ii) site inspection of construction materials; and (iii) collection of *completion certificate* at the time of handing over of the school building by the construction agency. Besides, the states may collect regular feedback from schools regarding the quality of construction.
- Rec. 15:** MHRD may like to revisit the RMSA provisions on recurring budget for running the girls' hostels and make suitable amendments in consultation with the states/UTs.

Vocational Education in Secondary Schools

- 8.1. Even before the National Policy on Education (1986) NCERT had in a 1976 document presented to the country a model conceptual framework on vocational education. Accordingly a programme for vocationalisation of Higher Secondary Education was implemented in 10 states and 5 union territories from 1976 onwards. However in 1985 only about 2.5 percent of the student population at higher secondary stage had access to vocational education. Partly on account of the poor response to this program there started at national level vocational training for out of school population at post-secondary education level, initiated by different Ministries like agriculture, health, rural development, textiles and so on. As a result even in 2016 we have some 23 ministries of the Government of India engaged in vocational training (with its own problems of coordination across skill development programmes today).
- 8.2. Prior to 1986 at the primary level of education work experience in general education was provided under the subject Socially Useful Productive Work (or SUPW). At the middle school level SUPW programs were offered so students could enter the world of work. However none of these programs (though endorsed by NPE 1986) had much impact and did not raise the share of vocational education at secondary or Higher Secondary stages.
- 8.3. In other words, both the programme started in elementary schools in 1976 nor the one initiated at senior secondary level in 1988 managed to raise enrolment in vocational education in schools. Even today India has one of the lowest share of secondary or higher secondary students in vocational education in Asia, well below the shares found in East and South east Asia (all of which have a relatively stronger manufacturing base than India).²

A Vision for Vocational Education for the 21st century

- 8.4. Recognizing the limited reach of vocational education the Ministry of Human Resource Development (MHRD) had initiated the scheme for vocational education in 1988 at higher secondary stage. However its design weaknesses after 30 years of its implementation are clear. First even in 2011 only 3% of all Higher Secondary students were enrolled in vocational courses. An important reason was that after class 10 these children were streamed into what were exclusively vocational courses and not offered general academic subjects. In most of the country, as part of the vocational stream, 3 vocational subjects were taught at Higher Secondary Level, in addition to English

² The Kothari Commission (1966) had visualised, as noted by the NPE 1986, that at 8th class about 20% of students will step out of the general stream and enter schools of vocational education. However, two decades later, the NPE 1986 recognized that “at the present stage the present vocational Institutions are not able to cater to this large number of students after 8 + and 10 + stage”.

language. However no subject from the general academic stream were taught. (The exception were Kerala and Maharashtra, where general academic subjects were indeed taught.) The result all over the country was that almost every state abandoned vocational at secondary and even senior secondary level over the years, with the exception of Kerala and of Maharashtra. This problem (the absence of academic subjects for vocational students) is being addressed in vocational education being rolled out under NSQF since 2014.

- 8.5. A second reason why there has been a collapse of vocational education at senior secondary level is the absence of practical training. There was an emphasis on theory and very little practical training was imparted in vocational courses at Senior Secondary Level since 1988 – resulting in poor employability. This problem must be addressed in the roll out of NSQF (more effectively than is being done currently – see Recommendations).
- 8.6. A third reason why vocational education at Senior Secondary Level never found favour with parents and students in the past was because there was no upward mobility permitted within the educational system. Vocational education at senior secondary level was perceived as a dead-end. Both UGC and AICTE should ensure, in consultation with states, that this is no longer the case under the NSQF.
- 8.7. Underlying these problems with the vocational program at senior secondary level was the lack of recognition that in the 21st century a work force requires at least three types of skills: cognitive, transferable and vocational. What India needs is rounded Secondary and Higher Secondary graduates for the workforce. Vocational education cannot replace the deficits in other areas such as numeracy and literacy (i.e., cognitive skills). Nor can it replace transferable skills such as knowledge of IT and English, of teamwork and communication skills as well as problem solving skills. As the rest of this report has cogently argued both cognitive and transferable skills among the Secondary and Higher Secondary graduates are seriously lacking in India; when combined with the lack of vocational skills, the labour force is very poorly equipped for the 21st century.
- 8.8. A second requirement for a successful vocational education Secondary program is that it offers practical training to enable children to become employable. Past programs have not made sufficient provision for such practical training in an industry environment.
- 8.9. A third requirement for success is that it must be industry driven and demand driven rather than Government and supply driven. While the new NSQF based program provides for industry participation the current mode of implementation has scope for much more industry participation. The second and third requirements if fulfilled can ensure greater employability of Vocational students.
- 8.10. Finally a requirement must be that students in the vocational courses should have the potential for upward mobility in a vocational stream or in the general academic stream of higher secondary and tertiary education. Many states have indeed provided for this upward mobility ever since NSQF was instituted but those which have not will need to do so in order that vocational education becomes attractive.

Achievements

- 8.11. The program even though it began only in late 2013 has grown reasonably well across 22 States with 2992 schools offering vocational courses at secondary level (though only 25 children per school are permitted). One of the biggest achievements of the new scheme and a NSQF contribution is that for the first time in the history of India's educational system vocational courses are on offer in the secondary school system in classes 9 and 10 in all states. Table 1 shows the number of number of schools in which the program has been approved by each state over the last few years.
- 8.12. Another achievement is that industry participation (through SSCs) in certification has been ensured. Vocational programmes under the NSQF in school are graded by industry representatives as well as by the state board (70% for practicals is graded by SSCs, 30% for theory by the state board).

Concerns and Recommendations

- Rec. 16:** In 22 states the scheme has been rolled out and in 2 States the scheme has already been running for 4 years. Time is now right for a small study which examines the problems encountered in implementation and even more importantly if students graduating are getting jobs or engaging in self employment. A quick **evaluation within 6 months should be conducted** in states where the program has been running for a few years so that other states can benefit from their experience.
- Rec. 17:** Secondly, the study could also examine how much it is costing to set up different courses at secondary level, so that an appropriate costing is available for MHRD, which will enable it to make appropriate allocations in future for vocational education. Also, a funding model could be evolved. The Government of India needs to arrive at an appropriate financing model for vocational education/training across ministries, and the financing model proposed in the 12th Plan chapter on Skill Development should be examined carefully for this purpose.
- Rec. 18:** MHRD through the State Governments must ensure that five kinds of industry participation is enabled: instructors; internships; curriculum design; assessment; and placement counselling. Sector Skill Councils (reporting to the Ministry of Skill Development and Entrepreneurship) should be required to arrange through local industry for teachers. Currently teachers are being arranged by SSCs but as the number of schools and States offering vocational courses increases the shortage of teachers will be felt very quickly.
- a. Pedagogical training should be provided to such trainers sourced from industry.

- b. SSCs should train and orient the assessors for assessing vocational courses; training should be provided as per curriculum of vocational trade.
- c. MSDE has been discussing the possibility of using retired Personnel from the defence forces who have skills of a Vocational type as instructors. The state governments should consider drawing upon retiring personnel of public sector enterprises (e.g. RITES, SAIL, NTPC, etc) as instructors/resource persons. The scheme provides flexible funds or engaging such resource persons.

Rec. 19: The experience of PSSCIVE is that though under the curriculum design framework there is a prominent role of industry but the response from industry is not very encouraging. MHRD may need to engage with SSCs at senior level in order to ensure that curriculum design support for PSSCIVE is taken more seriously by SSCs; MSDE in collaboration with MHRD may need to orient SSCs on school system and their MoU may need revision specially on feedback for curriculum design. With the expansion of vocational education/training envisaged, it may be difficult for SSCs alone to cope; it may mean that industry associations for specific sectors could be directly engaged by MHRD RMSA for the purpose.

Rec. 20: Internships for vocational students may be arranged by SSCs. This needs to be written into the MOU with SSCs, in consultation with MSDE. SSCs should encourage industry to offer internships. In addition, placement support and counselling should be written into revised MOUs with SSCs, as children graduate from levels 2 and 4 in school.

Rec. 21: Aided schools account for a significant share of total secondary enrolment in the country. There is growing demand for vocational courses across the school system, regardless of management. Since RMSA and the new scheme will be able to finance only a small share of all Government schools it will be necessary to allow aided schools to offer vocational education if the growing demand is to be met. All that is required on the part of MHRD is that vocational courses are recognized for purposes of certification in those schools. The demand for such courses is such in many states that there is no need for state funding to incentivize aided schools to initiate vocational education.

Rec. 22: Funding constraints will prevent all schools to roll out vocational education. The phasing of scale-up is critical, and one criteria would be to focus on urban and semi-urban locations, where school size may be larger, for introducing vocational courses. In addition, there needs to be **a strategic approach in deciding which schools should be prioritized**. The country has 6000 clusters of modern and traditional manufacturing activities. In consultation with the Ministry of Micro, Small and Medium Enterprises (MSME), the Ministry for Heavy Industries (which have clusters of ancillaries), Textiles Ministry, and Department of Electronics, as well as other relevant ministries,

it is necessary to open schools which offer vocational education in and near such clusters. Micro and small enterprises account for most of the jobs in manufacturing. They are also in the unorganized sector and need trained workers but have difficulty in accessing them. Ensuring synergy between the cluster approach of MSME and other Ministries on the one hand, and MHRD and MSDE's focus on vocational education and training on the other, will be a win-win for all. Ensuring entrepreneurial training will ensure children are prepared for self-employment. Responsiveness to local labour markets will be ensured if a cluster-driven approach is adopted.

Rec. 23: A multi-skill foundation course is offered in state of Maharashtra. This course provides an opportunity to students to get orientation to nearly 4 skills in 2 years (at Level 1, but covering both classes 9 and 10). Such course may surely provide orientation to the students towards various sectors initially, but students need to specialize in class 11 and 12 in one of the four, or other vocations to get certified from various SSCs. Therefore, the evaluation of Vocational Education (recommended in item 1 above) should include a rigorous analysis of this programme before offering, the multi-skill foundation course in more schools under RMSA.

Rec. 24: With the introduction of a vocational subject in class 9, states have to decide which subject among the existing six must be dropped by a child, so that the burden does not increase on the child. The matter is being addressed differently in states. The RMSA Guidelines may wish to address this issue while keeping the spirit of cooperative federalism in mind.

Annexure to Chapter 8: Vocational Education in Secondary Schools

Delhi:

Delhi has introduced Vocational education scheme in 22 Delhi Government Schools in class IX during the academic year 2014-15, and the same was extended to class X (Level 2) during the academic year 2015-16. VE was initiated in four sectors namely -Information Technology, Automobile Technology, Dynamics of Retailing and Security, with a strength of 25 students per vocational course. Two of these four subjects were offered in each of the 22 schools. Unlike other states, in Delhi as per CBSE guidelines, it has been decided to teach a Vocational Subject under NSQF as a Sixth Additional Compulsory subject with English, Hindi, Mathematics, Natural Science and Social Science as the five main subjects. Student can opt for Sanskrit or any other regional language as the optional subject. Tripartite agreements have been signed between the State Government, respective Sector Skill Councils (SSCs) and selected Vocational Training Partners (VTPs) empanelled with NSDC. As per the agreements it is the duty of the VTPs to provide on-job training to students and also arrange guest lectures and industry visits. Certification of students at each level will be done jointly by CBSE and the respective Sector Skill Councils.

Maharashtra:

Maharashtra introduced Vocational education scheme in 328 schools out of total 1651 government schools. Like Telangana, in Maharashtra also the curriculum has been prepared by the PSS Central Institute of Vocational Education (Bhopal) (part of NCERT). One of the initiative taken by the State has been translation of course material into Marathi. Unlike other states of India Maharashtra has had a long history of offering vocational education in classes 8, 9 and 10 since 1986. The committee was set up by the state (before NSQF came into existence) to develop a vocational education policy which had industry representative from L&T, RPG group etc. NSDC is working for the implementation of the Scheme through its approved and funded Sector Skill Council (SSC). SSCs support the State in identification of Trades/occupations, accrediting curriculum with PSSCIVE, recommend the appointment of vocational (industry) coordinator, quality control of training, training of trainers, student assessment and certification and Industry Interface. SSC along with the State Education Board will conduct assessment and provide certification aligned to the NSQF.

Telangana:

Telangana has launched Vocational education scheme in 20 Model schools perhaps due to better infrastructural facilities in these schools. Each district has been given due representation and two to three schools have been selected from each district. PSSCIVE (Bhopal) has developed the curriculum within the framework of National skill Qualification Framework (NSQF). The

certification is both from the State Secondary Board and the National Skills Development Corporation. The state Government has offered four courses (1) Beauty and Wellness, (2) IT/ITES, (3) Tourism and Hospitality and (4) Retail. The courses have been offered uniformly in schools across all the districts without conducting any survey on the need assessment of particular course.

Uttar Pradesh:

The scheme has been initiated very recently in September 2015 in 100 schools with four courses - retail, security, IT and automobile repair/servicing. Vision India, Times Pro and Udyamita Vikas Sansthan are identified service providers. Principals of these schools have been trained by the PSSCIVE, Bhopal. Vocational Education is being taken up as an additional seventh subject in the state at the secondary level. The local craft skills such as zardozi, chilankaari and brass industry do not find place in the vocational courses offered by school. The trainers have been appointed but the students are required to be exposed more practically than theoretical classes.

The foregoing analysis shows that all the states except Delhi are following the curriculum designed by PSSCIVE, Bhopal. For Delhi the curriculum has been designed by CBSE. As on date CBSE doesn't have ready stock of books even in English language available for sale. CBSE should provide soft copies of books with authorization to States/UTs to publish them as per their local requirement.

To reduce the burden on the children, Delhi has offered VE as sixth compulsory subject and third language as optional subject whereas other states have included it as seventh subject.

Program Management

Financial Management:

Table 4: Allocation, Releases and Progress (in INR Crores):

Year	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
BE	1354	1700	2423.9	3124	3983	5000	3565	3700
RE	550	1500	2512.9	3172	3123	3480	3565	
Release	549	1481.9	2500	3171	3046	3398	3561	
Expenditure		900.57	1678.27	2402.84	4737.17	4239.84	4339.07	

Source: Data furnished by MHRD

9.1. The data presented in the table above relates to the RMSA Program till FY 2013-14. From FY 2014-15 onwards, 4 other Centrally Sponsored Schemes viz ICT at schools, Girls' Hostel, Inclusive Education for Disabled at Secondary Stage and Vocational Education were subsumed in RMSA. Therefore FY 14-15 onwards, the data presented in the table pertains to the Integrated RMSA Program which includes the other four schemes.

Table 5: Budget Allocation & Releases for RMSA, Girl's Hostel, ICT@Schools, IEDSS/IEDC and Vocationalisation of Secondary Education (in INR Crores):

FY	Budget/Revised Estimates	RMSA	Girls' Hostel	ICT @ Schools	IEDSS/IEDC	Vocationalisation of secondary education	Total
2013-14	BE	3983	450	350	50	80	4913
	RE	3123	376	559	48	65	4171
	Releases	3046	372	559	42	65	4084
2014-15	BE	5000					5000
	RE	3480					3480
	Releases	3398					3398
2015-16	BE	3565					3565
	RE	3565					3565
	Releases	3561					3561
2016-17	BE	3700					3700

9.2. The aggregate budgets and releases for all 5 schemes over the last four years as presented in the Table above clearly shows that the allocation and releases for the Integrated Program has shrunk over the years although a lot is yet to be achieved to meet the targets in each one of these constituent schemes.

Table 6: Spending against Program Components under RMSA in the last two Financial Years (in INR Lacs)

ACTIVITIES	FY 2014-15		FY 2015-16	
	Expenditure	Percentage ³	Expenditure	Percentage
<i>Recurring</i>				
School Annual Grant	34306.93	18.05	37340.79	19.48
Minor Repair	2936.91	1.55	553.95	0.29
Training of teachers	6504.94	3.42	4504.26	2.35
Financial Support for Staff in Schools	43468.15	22.32	59837.28	31.21
Guidance and Counselling cell	22.57	0.01	0.00	0.00
SMDC training			550.86	0.29
Salary of teachers	86866.33	45.71	67119.56	35.01
Training for yoga/physical education teacher	0.00	0.00	0.00	0.00
Promotion of art & craft at block level	0.00	0.00	0.00	0.00
Equity Intervention/Component	1795.25	0.94	2196.47	1.15
Quality Components	4733.56	2.43	7290.04	3.8
MMER	9349.93	4.92	11890.02	6.20
Other Miscellaneous Activities	46.92	0.02	409.11	0.24
Su-total – Recurring	190031.08	44.82	191706.33	44.18
Non-recurring : Civil Works	233952.46	55.18	242200.16	55.82
Total Expenditure	423983.54		433906.49	

Source: Data furnished by MHRD

9.3. As shown in the Table above, in FY 2014-15 and 2015-16 recurring expenditures constituted about 45% and non-recurring about 55% of the total expenditures incurred in the respective years. Spending under recurring Grants in RMSA is dominated by salaries of teachers and staff which comprise about 67% of the total recurring expenditure. Spending on Teachers' training is about 2-3% and on Quality Components is about 3-4%. Spending on Equity interventions is negligible.

³ Each component of recurring expenditure is expressed as a percentage of the total recurring expenditure for the financial year. The total recurring and non-recurring expenditure is expressed as percentage of total expenditure of the Program for the financial year.

Recommendation: With a shrinking financial envelope RMSA needs to prioritize and focus on a fewer activities for a visible impact on the ground. It should be ensured that complementarities with State Government Schemes for Secondary Schools are leveraged to ensure that important areas like Quality, Equity, and Training etc. are not left unattended.

9.4. **Linking allocation of Annual School grants under RMSA to enrollments in Classes IX and X.** In most of the States, Annual School Grants of INR 50, 000 are given under the Program to Secondary schools irrespective of their size or requirement. In the National Capital Territory of Delhi, release of school grant (received from MHRD @Rs. 50000/- per school) has been rationalized by linking it with enrollment of students which ensured that schools with larger number of students in Class IX and X get larger amounts as shown below:

Students' Enrollment (Classes IX, X)	Unit Cost (in thousands)
200 or less	30,000
Between 201 and 500	50,000
Between 501 and 800	60,000
Between 801 and 1200	70,000
Above 1200	80,000

Recommendation: The Mission is of the view that the practice of allocation of the Annual Grants to Schools based on enrollments in Classes IX and X is prudent and States need to encourage to replicate this model.

9.5. **Delay in release of Funds:** The Mission observed delays in release of funds in FY 15-16 to State Implementation Societies and consequently to schools in the States visited. For example in Delhi, Annual Grants were released to schools in two installments of 50% each. The first installment was released in November 2015 and the second installment in March 2016. Some of the Schools visited received the second installment on March 31, or in early April 2016. On further scrutiny, it was found that there were delays in release of funds at both Union and State levels. The details are given in the respective State Reports.

Recommendation: MHRD should release the first instalment of funds in the first quarter. Delays with regard to releases by the State Government was also observed by the JRM members visiting Uttar Pradesh. Now that funds for the Program, as in case of all Centrally Sponsored Schemes, are routed through the State Treasury, the fund flow mechanism at the State level also needs to be stream-lined to eliminate avoidable delays and ensure that availability of funds does not become a bottleneck for implementation. It should be ensured that there is no need to go back to the SIS for sanctions by the District machinery for release of funds to the SMDCs.

- 9.6. **Financial Review of the Program:** Based on the recommendation made by the last two JRMs, MHRD has agreed to undertake a Financial Review of the Program. This will help ensure midcourse correction for system improvement and better utilization of the scarce resources.

Recommendation: The Review needs to be undertaken by independent domain experts from the area of government finance and accounting systems under the guidance of MHRD to resolve data anomalies and also assess the control framework in financial reporting and fund management.

- 9.7. **Inspection/Audit of Schools:** It was observed in two schools visited, that cash payments were made by the Principal after withdrawal of the entire amount of annual school grant through self-cheques. This is against the spirit of the Financial Management norms laid down for RMSA necessitates payments by account-payee cheques. In one of these schools, serious inconsistencies were observed in the supporting invoices. Some of the Schools visited have not undergone any financial audits in the last 5-10 years.

Recommendation: Every school should be subject to a comprehensive inspection including financial check at least once in a year.

- 9.8. **Quality of Audit Reports of State Implementation Societies:** .As required by the Financing Agreement between the GoI and the Development Partners participating in the Program, Annual Audit Reports of State Implementing Societies are to be submitted to the Development Partners by December 31 every year. Out of 36 States and Union Territories, Audit Reports of 32 States for the Financial Year 2014-15 have been shared with the Development Partners. Out of the 32 Audit Reports furnished till date, Audit Reports of 24 SIS are qualified. Also, 28 Audit Reports have been reviewed by the Development Partners till date. Audit Reports of 9 States does not meet acceptable standards as the financial statements are either incomplete or prima facie appear to be incorrect. A detailed communication has been sent to MHRD with regard to the audit reports reviewed.

- 9.9. Quality of audit reports continue to be a concern. The JRM is pleased to note that as recommended by successive previous JRMs, MHRD has agreed to hold two regional workshops for the States in May and June 20116 in partnership with the donors. The workshop will elaborate on the roles and responsibilities of the State Implementation Societies towards preparation of financial statements and facilitation of audits with special emphasis on audit observation follow up mechanism. The workshop also aims to enhance the auditors' understanding of (i) the requirements of the Financial Management

and Procurement Manual (FMP Manual) developed for the Program and (ii) expectations based on the Audit Terms of Reference developed for the audit of these Societies.

- 9.10. MHRD should ensure resolution of the serious issues based on risk implications of audit findings by closely following up with the concerned SIS, and report to the JRM on audit findings.

Recommendations (Financial Management):

For MHRD

- Rec. 25:** With a shrinking financial envelope RMSA needs to prioritize and focus on fewer activities for any visible impact on the ground. It needs to be ensured that complementarities with State Government Schemes are leveraged to ensure that important areas like Quality, Equity, Training etc. are not left unattended to.
- Rec. 26:** MHRD should release the first instalment of funds in the first quarter and eliminate avoidable delays in release of funds.
- Rec. 27:** Encourage States to link allocation of Annual School Grants to number of enrollments in Classes IX and X
- Rec. 28:** Complete Financial Review of the Program by December 2016 by independent domain experts from the area of government finance and accounting systems.

For States

- Rec. 29:** The processes for release of funds at the State level needs to be stream-lined to eliminate avoidable delays and ensure that availability of funds does not become a bottleneck for implementation.
- Rec. 30:** Inspection of Schools should also include inspection of financial books and records.

Procurement

- 9.11. All States are mandated to follow the RMSA Manual on Financial Management and Procurement issued by MHRD on 24th January 2012 for their procurement of works, goods and consultancy activities. This is applicable for all procurement done on and after

1st April 2012. Mission noted from states visited that the officials in most of the states are aware of the FM &P Manual and they are using it for FM & procurement activity.

9.12. Achievements and Good Practices in the states visited

- In the five states JRM visited, mission observed that civil works are entrusted to either PWD or state corporations for execution of the same. For example, in the state of Telangana, the state Government has entrusted strengthening of existing schools, construction of Girl's hostel to the State TEWIDC (Telangana Education Welfare and Infrastructure Development Corporation). Whereas in UP, the procurement is decentralized and tender are finalized at the district level by agencies, identified by the district magistrate. Further in UP, the furniture and other goods are procured at district level as per FM&P manual norms following manual tendering process.
- In Telangana the quality of construction of schools visited appeared to be good, whereas in UP there was a complaint on quality of civil works from some members of SMDC.
- The Telangana state has adopted e procurement system for all procurement irrespective of size of procurement. However in UP & Tripura, all procurement with estimated value above Rs 50 lakh are procured following e procurement method as per MHRD guidelines.
- At the school level, there is not much procurement activity except small procurements under Annual school grant of Rs. 50000/- out of which Rs. 10000/- for books for library, Rs. 25000/- for lab equipment and balance for elect bill, water bill payment etc.
- The design of RMSA envisages Post Procurement Review (PPR) by both the MHRD and the World Bank independently on sample basis. In FY 13-14 & 14-15, two rounds of post procurement review were conducted by Bank in eight States viz., Uttarakhand, Andhra Pradesh, Mizoram and Maharashtra in first year and Kerala, Karnataka, Tamil Nadu & Madhya Pradesh in second year. The reports were shared with MHRD with a request to get it circulated to respective states for their follow up actions and comments. Further for the current FY, World Bank has identified another four states i.e. Bihar, Chhattisgarh, HP and Orissa for post procurement review based on value of non recurring expenditure.
- Regarding independent PPR by MHRD of sample contracts equivalent to 20% value of total contract per each state; MHRD has already selected the agency, who will take up the Post Procurement Review shortly in different states.

Concerns:

- As envisaged in the FM&P Manual, the first step in the procurement activity is preparation of a realistic procurement plan based on AWP & B. However all states visited have not prepared any procurement plan at state level, which is a matter of concern.
- Mission noticed that civil works progress is slow in almost all states visited. For example in Telangana state, overall 71% of civil works is complete whereas for toilet blocks, the work is not started for 49% of cases. Telangana officials explained that toilet blocks are constructed under SSA scheme and therefore such a huge back log in RMSA, which will be critically reviewed and if not required, will be dropped; but if required, the proposal will be submitted to MHRD with revised estimate based on current SOR of the state for sanction of additional fund.
- However, Maharashtra has already surrendered a large portion of civil works (where construction not started), which the state government feels are not viable to execute with the existing sanctioned amount based on SOR of 2009-10.
- Civil construction takes much longer period than the period agreed in the contract, which is generally 9 months. For example in UP, civil construction of schools in two districts that started in 2011-12 were completed over a period ranging from 25 months to 33 months from the date of first instalment payment to the construction agency.
- Funds are now released to State Government directly through treasury. It is noted that this process further delay the receipt of fund at the RMSA state society. Consequently, the State Government have more responsibility and they have to stream line the system to ensure that funds are released on time to State societies so that they are able to use the releases for efficient and effective procurement.
- It has been observed that the concept of a systematic and scientific procurement planning for goods and services have not been adopted by the states visited. While some states have left the procurement activity to be at the discretion of external agencies, there is no organised and competent procurement unit at state level to monitor the physical and financial progress of procurement activity. In the absence of full-scale e procurement (e tendering to entire value chain up to e contract), the transparency and monitoring of workflow is not possible. Be that as it may, even under the existing dispensation, a robust procurement planning and monitoring unit at state level may be a good support system for procurement activity and programme management.
- If inventory management is considered as an adjunct to procurement, the situation is not very happy in the states. Proper maintenance and accounting of stores inventory especially at the school level is absent in many cases. Annual physical verification has not been done in many schools. Issue register was not maintained in some schools.
- Lack of fund is indicated as one of the major reason for slow progress in civil works.

Recommendations (Procurement):

For States

- Rec. 31:** It is recommended that state prepares a detailed monitoring framework (preferably on line tracking system) and follows the same meticulously both at school and district level for efficient execution & completion of civil works.
- Rec. 32:** States may have proper procurement unit established at RMSA state level with regular financial & procurement expert.

For MHRD

- Rec. 33:** MHRD may write to states regarding importance of Procurement Plan and request them to prepare a realistic Procurement Plan and work on it for efficient procurement.
- Rec. 34:** MHRD may consider early release of balance fund for nonrecurring expenditure like civil works, procurement of goods and services to the state so that the fund is not a constraint for contract execution and the states can take up the construction activities in the current FY and complete the same.

Annex 1: Terms of Reference (ToR) the seventh RMSA JRM

1. Introduction

1.1 Rashtriya Madhyamik Shiksha Abhiyan (RMSA) is a Programme of the Government of India, implemented in partnership with the State Governments with the main objective to make secondary education of good quality available, accessible and affordable to all young persons. The scheme seeks to enhance enrolment in classes IX and X by providing a secondary school within a reasonable distance of every habitation, to improve quality of education imparted at secondary level by ensuring all secondary schools conform to prescribed/ standard norms, to remove gender, socio-economic and disability barriers and to achieve universal access to secondary level education by 2017, i.e. by the end of the 12th Five Year Plan.

1.2 RMSA was launched in 2009, funded through national resources (central government + state government) and now has tied up for external funding by Development Partners (DP) – World Bank’s International Development Association (IDA), United Kingdom’s – Department of International Development (DFID) and European Union (EU). As part of the agreement for external aid from the DPs which came into effect in November, 2012, the Joint Review Mission (JRM) is to be conducted every six months in the months of January and July/August each year. The January Mission undertakes to visits States, while the July/August mission is a desk review.

1.3 The Seventh Joint Review Mission (JRM) of Rashtriya Madhyamik Shiksha Abhiyan is scheduled to be held from *April 11, 2016*. The Mission will be a field Mission to review programme implementation, with a focus on the themes identified for the Mission. The Mission will be led by Government of India (GoI). The states to be visited are: Delhi, Maharashtra, Telangana, Tripura and Uttar Pradesh.

2. Mission Plan

2.1 The RMSA Mission will comprise of 16 members, including two specialist members on financial management and procurement. Members would be chosen in such a way that expertise would be available for all the major functional areas.

2.2 The agency wise composition of the Mission will be as follows:

- Government of India (MHRD) :- 8 members including Mission Leader and Finance and Procurement Team
- World Bank, EU and DFID :- 8 members (including Finance and Procurement team)

3. Mission Objectives and Guiding Principles

3.1 The main objective of the JRM is to review the status of progress and to also consider issues related to programme planning, implementation, monitoring and evaluation, including financial management/procurement, capacity of States with respect to programme objectives.

3.2 The guiding principle will be one of a Learning Mission from the experiences so far; identify gaps and to collaboratively explore and work out options for bridging those gaps. RMSA has been under implementation since 2009-10 and is still evolving its processes and systems. The JRM therefore will include reviewing overall strategies being adopted in the planning and implementation of the programme with reference to its basic objective.

4. Terms of Reference (ToR) for the Mission

4.1 The Mission will:

- follow up on issues identified during the 6th JRM (August, 2015)
- examine issues related to programme implementation in the following areas:
 - Progress against Sanctioned Annual Work Plans
 - Challenges in physical access and strategies for ensuring education to the children of un-served habitations
 - Status of quality interventions – in-service teacher training arrangements and strategies, nature of on-site academic support structures, availability of required number of teachers and classrooms, progress in teacher recruitment, production and distribution of textbooks, release and utilization of school grants.
 - Progress of civil works particularly new schools, up-gradations, additional classrooms, toilets and drinking water facilities.
 - Review of the Financial Management and Procurement (FMP) procedures will also be carried out as part of the JRM. The Mission would review the extent to which States are complying with the provisions and processes laid down in the FMP Manual of RMSA.
 - Review Monitoring Institution reports and other third party evaluation and studies
 - Identify innovative/ best practices – specific interventions that have been successful and can be replicated;
 - Identify areas needing interventions (administrative, HR, financial, capacity building) and areas for further qualitative research/ case studies;

4.2 The Mission however will put a special focus in their work on the following aspects of the programme:

- Understanding quality of secondary education, with special focus on ICT and its use in enhancing student learning, use of ICT in teacher professional development and teacher training on use of ICT enabled learning.
- Understanding quality of secondary education with special focus on maths and science curriculum, teaching-learning of maths and science, including availability of maths and science teachers, teacher training to enhance subject knowledge and pedagogy in these subjects.
- Understanding the status of outstanding civil works (including not yet started construction of school buildings), construction and availability of toilets and drinking water facilities.

4.3 The Mission may also look at the preparatory work in the identified research areas during the exercise.

4.4 The organization of meetings and deliberations in Delhi for the JRM will be the responsibility of the EU. MHRD will be responsible for inviting states and national institutions.

5. Time Frame

5.1 The JRM will take place between 11th – 23rd April, 2016 and the draft schedule / time - frame is proposed as follows:

Date	Day No.	Venue	Activity
11 th April, 2016 (Mon)	Day 1	The Park Hotel, New Delhi	<ul style="list-style-type: none"> ➤ 9.45-10.00am : Opening remarks by GOI and introductions ➤ 10.00 – 11.00 noon: Briefing by Government of India ➤ 11.00 – 1.00pm: Discussion on Action Taken Report from recommendations of 6th JRM ➤ 1.00- 2.00pm: Lunch break ➤ 2.00- 3.00 pm: Presentation on National Achievement Survey for Class X by NCERT ➤ 3.00 - 5.30pm: Sharing of background notes/analysis on JRM themes on quality +

			internal discussion on distribution of tasks and writing responsibilities among mission members
12 th April (Tues)	Day 2		JRM members leave for State Visits
13-16 April (Wed- Sat)	Day 3, 4, 5, 6		Field visits in the States; return to Delhi on 16 th April, 2016
17-22 April, (Sun - Thur)	Day 7,8,9,10,11, 12	The Park Hotel, New Delhi	JRM Members internal discussion + Report Writing and Pre-wrap meeting with MHRD
23 April (Sat)	Day 13	Conference Hall, Hotel Ashoka Samrat, New Delhi	Wrap- Up Meeting

6. Documents and information

6.1 The following documents will be shared with the Mission members one week prior to the JRM:

- a) GOI budget allocation for RMSA 2012-13/2013-14/2014-15/2015-16
- b) Financial Management Reports
- c) Audit Reports from States/UTs for the period of 2014-15
- d) Updated Results Framework Document
- e) Overall annual programme implementation reports on States and UTs
- f) Reports of the Monitoring Institutions for all the States
- g) Action Taken Report from 6th JRM Recommendations

Annex 2 – List of Seventh JRM members

Government of India

- S. R. Sathyam (Mission Leader)
- R. Kannan
- Ajit Patnaik
- Santosh Mehrotra
- Ranjana Arora
- Sunita Chugh
- Shailendra Sigdel
- Pranav Kothari

DFID India

- Colin Bangay
- Jeena Abraham

European Union

- David Smawfield
- S.K. Chaudhuri

World Bank

- Sangeeta Dey
- Vimala Ramachandran
- Papia Bhattacharji
- Satyanarayan Panda

Annex 3:

State Reports:

- **Delhi**
- **Tripura**
- **Telangana**
- **Uttar Pradesh**
- **Maharashtra**

State Report: Delhi **(12th -16th April, 2016)**

1. Introduction

Keeping in view the main objective of the JRM to review the status of progress and to also consider issues related to programme planning, implementation, monitoring and evaluation, including financial management/procurement, capacity of States with respect to programme objectives, two member team comprising of Dr Sunita Chugh, and Ms Papia Bhattacharji visited 10 schools across different districts of Delhi, as well as DIET Moti Bagh and office of District North West - B. Team members also visited the office of State Mission of Director Mr. E. Raja Babu State Mission Director RMSA , Delhi and interacted with him along with his other team members of IEDSS, Vocational & IT Branches. Our special thanks to Mr. Anil Kumar, DDE-RMSA and Dr. (Mrs.) Poonam Nagpal for facilitating visit to different educational institutions.

Administration of Secondary Education

Directorate of Education is primarily responsible for Secondary education whereas other two local bodies (NDMC and Delhi Cantonment Board) have schools imparting education at Primary and Secondary/Senior Secondary level. In addition, there are Kendriya Vidyalayas and Navodaya Vidyalayas and more than 1000 Un-Aided Recognized Schools affiliated with CBSE providing schooling facilities. Administratively, the entire Delhi has been divided into 4 regions, each headed by a Regional Director. Total number of Districts in these four regions is 12, each headed by a Deputy Director (District). Further, there are 29 Zones in all, each headed by a Deputy Director (Zone).

Directorate of Education has separate branches for planning and implementation of various schemes such as IEDSS, ICT@ School, Vocationalisation at Secondary level, headed by respective Joint Director/Deputy Directors of Education.

Overview and Key Issues on RMSA Implementation

Delhi has made considerable educational progress with high literacy rate, improved access to educational facilities, improvement in infrastructural facilities. Secondary education has also seen enormous quantitative expansion in Delhi with increase in secondary and senior secondary schools. All habitations in the State have Secondary schools within 05 km. The State is also catering to the children of neighbouring states of Haryana and Uttar Pradesh. Additional Classrooms constructed under SSA are being used by Secondary classes in the school as they are composite schools. The mission visited nine schools in which one was located in rural area and all the schools were having sufficient classrooms, playground facility.

Though against the spirit of RtE Act, the State is running around 30% of schools in two shifts. Even many KVs in Delhi have also started running a second shift from the existing premises of their schools. The state has around 39 percent private un-aided schools and has 5794 composite

schools, from Grade I to Grade XII. State has shown considerable improvement in the participation in respect of Girls and other social groups including CWSN.

Gross Enrollment Ratio (GER) at secondary level in 2014-15 stands at 103.56% and Net Enrolment Ratio is reported as 65.13 percent. Though the transition rate from elementary to secondary stage is 96.36%, retention rate at the secondary level is 66.38%. The huge gap exists between enrollment from IX to X Grade and it steeply falls between the two Grades thereby the number of sections reduces in Xth standard. Promotion rate from IX to X is recorded as 65.86%. (UDISE: 2014-15). Tables below show the number of school and the enrolment of children in Delhi.

Table 1: No. of Schools (Govt. and Local bodies) in State (2015-16)

Type of Schools	Total No. of School	
Secondary/ Sr. Secondary	Schools run by DOE+	990
	Schools run by Local Bodies (NDMC + DCB)	34
	Kendriya Vidyalayas	43
	Jawahar Navodaya Vidyalayas	02
	Govt. Aided Schools	186
	Private Un-Aided Schools	801
Total	2056	

**An increase of 2.9% over the previous year*

Source: Annual Work Plan RMSA, 2016-17

Table 2: Enrollment across the District of Delhi

S. No.	District	Total Enrollment	SC Enrollment	% Share of SC Children	ST Enrollment	% Share of ST Children	Minority Enrollment	% Share of Min. Children
1	East	72542	9089	12.53	219	0.30	8410	11.59
2	North East	103157	13486	13.07	91	0.09	31187	30.23
3	North	28579	4385	15.34	94	0.33	4100	14.35
4	North West	150635	22809	15.14	366	0.24	12353	8.20
5	West	103716	11962	11.53	286	0.28	7540	7.27
6	South West	86524	8420	9.73	763	0.88	3980	4.60
7	South	110520	11893	10.76	537	0.49	19738	17.86
8	New	14470	2090	14.44	151	1.04	980	6.77

	Delhi							
9	Central	21538	4138	19.21	60	0.28	6283	29.17
	Total	691681	88272	12.76	2567	0.37	94571	13.67

Source: UDISE 2015-16

Table 3: Enrollment of class 9th and 10th (Year 2015-16)

S. No.	District Name	Class-9th			Class-10th		Total
		Boys	Girls	Total	Boys	Girls	
1	East	24622	20251	44873	14248	13421	27669
2	North East	34461	30015	64476	18614	20067	38681
3	North	9596	8606	18202	4738	5639	10377
4	North West	49983	41036	91019	31940	27676	59616
5	West	35371	29755	65126	20522	18068	38590
6	South West	29842	23002	52844	18537	15143	33680
7	South	37547	32184	69731	21226	19562	40788
8	New Delhi	4755	3989	8744	2821	2905	5726
9	Central	7521	5919	13440	4188	3910	8098
	Total	233698	194757	428455	136834	126391	263225

Concerns in Secondary education

- Despite having good infrastructural facilities, providing quality education to all the children to enable them to achieve the requisite competency level and to reduce the repetition, wastage at the secondary level is a major challenge.
- The promotion rate from IX standard to X standard is abysmally poor. The gap between the enrolment in IX and X standard is huge. Around one third of children are seen to be enrolled in X standard in comparison to IX standard as many children do not get promoted even after availing a chance for improvement.
- Pass percentage is very low in IX standard. Children are given a chance for improvement in a scheme introduced by CBSE called 'Eligible for Improvement of Performance' (EIOP) but still a large proportion of children are unable to qualify for next grade. State

has large number of composite schools having classes from Nursery or Ist to XIIth Grade and the same principal is incharge of school, even at elementary level, therefore the learning deficit at the elementary level is matter of concern. Poor learning level at the elementary level is one of the significant reason for children to dropout as well as high rate of retention in IXth standard.

- On the use of ICT in curriculum transaction, Delhi has yet to make any beginning in this direction. ICT Labs have been set up in the schools with a provision of 11 computers (including one server) and one instructor. However, ICT remains stand alone as on date and is yet to be used in enhancing students' learning.

Achievements: Maths and Science

The State has made consistent efforts to improve the learning levels of children especially in mathematics and science. In both the subjects teachers at the Secondary level are made available in required numbers in majority of the schools. During the visit by Mission, except in one school, there was no gap between the sanctioned and available teachers. State Govt. is going to provide on-site support to teachers to improve classroom transaction. Learning Enrichment programme has also been launched for the Grade/Class Readiness of Learners entering class IX. 54 Govt. schools have been identified to be developed as Pilot Model Schools. State Govt. is running a Mental Mathematics Programme for students of classes V to X. Booklets and learning material on Mental Maths has been prepared which has been distributed across all the schools. Mathematics and Science kits have been provided to all the schools. District science fair and also school science fair as regular feature is being conducted to popularise science.INSPIRE Programme is also being held and students & teachers are provided opportunities to participate in a number of Science related activities (National Science Congress, Children Science Congress, Jawahar Lal Nehru National Science Exhibition etc.). NTSE and National Means cum Merit Scholarship Exams are conducted by the State for the students. Students of classes VI to X are also taken to National Science Centre. Enrichment classes for the weak students to improve their performance are held. Earlier students of SC/ST educationally backward minority & weaker sections of society were covered under this scheme. The facility of enrichment classes is now extended to all students who has poor achievement level academically.

Concerns

Achievement in mathematics and science still remains the weak spot for the children. From the records of the school register the Mission members found that maximum number of children fail in these two subjects out of the total children who do not pass in IXth standard. The latest National Achievement Survey (NCERT, State report card of Grade X) indicates that educational performance in Delhi in English, Mathematics and Science, is significantly lower than the national median average.

The key factors responsible for poor performance are:

- Poor language comprehension. Students are unable to follow instruction and express in English medium in particular.
- Still the emphasis is on learning by rote. There is hardly any emphasis on 'learning by doing'.
- Too much emphasis on end product rather than the processes.
- Lack of reasoning ability and critical thinking (even among teachers)
- Automatic promotion upto VIIIth standard and children having academic deficit at the elementary level.

Suggestions for MHRD/State Govt

- State Govt needs to generate material for providing on-line courses to teachers and educational administrators.
- Steps need to be taken to regulate and monitor the mushroom growth of institutes providing degree/diploma in teacher education. (Teaching of school subjects).
- As the infrastructural facilities have been significantly improved therefore a major shift is required on improving the quality by reducing the teacher-pupil ratio, generation of teaching-learning modules, more intensive training to teachers in Maths and Science.
- MHRD should seriously think about instituting Indian Educational Service (IES) on the pattern of ICS for recruitment of teachers and educational administrators and their deployment only on successful completion of Induction Training.
- Teachers are the pillars for improving the quality in education, in view of this MHRD should insist on stringent procedure to be followed while recruiting teachers at the Primary/Elementary Level and these teachers should be highest paid.
- MHRD should also set some benchmarks for teachers to continue in this noble profession.
- Appointment of Guest teachers at the secondary level should be avoided and regular teachers should be appointed.

Achievements: Vocational Education

The main objective of the introduction of vocational education (VE) at secondary level is to provide diversification of education opportunities so as to enhance individual employability, to reduce the mismatch between demand and supply of skilled manpower and to provide an alternative for those pursuing higher education without any particular interest.

Under RMSA, National Vocational Education Qualification Framework (later on subsumed in National Skill Qualification Framework) was introduced in 22 Delhi Govt. Schools in class IX during the academic year 2014-15 and same was extended to class X (Level 2) during the academic year 2015-16. VE was initiated in four sectors namely -Information Technology, Automobile Technology, Dynamics of Retailing and Security with strength of 25 students per vocational course. Two of these four subjects were offered in each of the 22 schools. To promote and upscale the VE, Department of Education has introduced Vocational Education at Level 1 during 2015-16

in 205 Govt. Schools without any restriction on the number of students in two additional subjects besides four subjects mentioned above, namely Introduction of Tourism and Financial Market Management.

As per CBSE guidelines, it has been decided to teach a Vocational Subject under NSQF as a Sixth Additional Compulsory subject with English, Hindi, Mathematics, Natural Science and Social Science are the five main subjects. In a 48 periods-a-week schedule, 5 periods have been allocated to each Vocational Subject under NSQF.

For the introduction of Vocational Education under NSQF, tripartite agreements have been signed between the State Govt., respective Sector Skill Councils (SSCs) and selected Vocational Training Partners (VTPs) empanelled with NSDC. As per the agreements it is the duty of the VTPs to provide on-job training to students and also arrange Guest Lectures and Industry Visits. In addition, labs are also being set up in each school with the help of respective VTPs for imparting practical (hands-on) training to students. Industry participation is through selected VTPs that are already empanelled with respective Sector Skill Councils. As per Tripartite Agreements, Certification of students at each level will be done jointly by CBSE and the respective Sector Skill Councils.

Concerns

- The state govt. did not conduct any survey to gauge the demand of vocational subjects to be offered. It has been observed that IT is very popular followed by Travel and Tourism and Security was least popular. One of the reasons is that the children and parents are not fully aware of the future prospects of each vocational course.
- The vocational courses basically focused on the theoretical aspects without any visits or on-hand experience to the children.

Recommendations for the HRD/State Government

- Curricula in subjects other than Vocational Subjects should be considerably rationalised and there should be more focus on functional usage of these subjects.
- State govt. should come out with a compendium of Frequently Asked Questions (FAQs). This will help in mobilizing students to join Vocational Courses without any apprehensions or without any pre-conceived notions.
- Vocational Subjects should not be offered to only a select few. Generally, Vocational Courses (Stream) have been offered to students obtaining low grades in academics. This mindset need to change.
- Text Books in Vocational Subjects should be available in Hindi as well as regional Languages. As on date CBSE doesn't have ready stock of books even in English language available for sale.
- CBSE should provide soft copies of books with authorization to States/UTs to publish them as per their local requirement.
- Sector Skill Councils should play more active role in assisting States/UTs in the implementation of the scheme of Vocationalization of Secondary Education under NSQF.
- Awareness among the students on the various job roles in each sector should be created.

- CBSE should collaborate with PSSCIVE (Bhopal) for the development of curriculum and learning material within the National Skill Qualification Framework (NSQF).

ICT at Schools:

The Centrally sponsored scheme of ICT at School has been subsumed in RMSA since 2013-14. Under this Scheme, the Directorate of Education, Delhi Government, has entered into a 5 year contract with TCIL (Telecommunications Consultants of India Limited) on October 4, 2013. TCIL has been contracted to implement the project in 1110 Government and Government aided schools in Delhi. The Project envisages imparting computer education and computer-aided education to the students of Class VI to XII.

Under this Contract TCIL has installed a Computer Server, 10+1 shared computing terminals with keyboard and mouse, two 1 KVA line interactive UPS, one generator, one Printer, one scanner, one web camera, one video camera, one projector and one modem with internet connection. The systems are loaded with Microsoft Operating systems, Office Suites and Antivirus systems. TCIL has also installed computer-based training program on multimedia (edu-comp software) and provided a full time ICT Instructor and Computer stationery and furniture for the ICT lab. The ICT Instructors deputed in schools shall have minimum qualification of basic graduation with PGDCA/BCA/MCA and shall also impart orientation and in-service training to teachers in each school. The Directorate of education has created 788 posts of PGT and 2026 TGT Computer Teachers in the Schools under the Directorate. As and when the Computer teachers are recruited and placed in schools, they will replace the ICT instructor.

Out of 1110 schools, 1058 schools were completed in all respects i. e. with hardware, software and manpower on 31st Mar' 2016. Internet connection was provided in 981 schools as on 31st Mar 2016.

PAB approved Rs.7430.30 Lakh in 20015-16 to implement ICT@ School including Rs. 1038.00 Lakh spill-over of the previous year for implementation of the Project in 1110 Govt. and Govt. Aided Secondary and Sr. Secondary Schools of Delhi. Out of this only 12.8 crores have been spent in FY15-16.

During the field visits, it was observed that an ICT lab has been set up in every school. 11 terminals have been installed in all schools, along with UPS, a printer, scanner, generator and projector. In almost all the schools visited in Delhi, it was observed that the ICT labs have become operational only in January/February 2016. An ICT instructor has also been placed in every school though not present on the day of our visit in two out of the 9 schools visited.

Since the ICT labs have just become operational in most schools, the Instructors have just started giving preliminary lessons acquainting students with hardware etc. Evidence of ICT being used for teaching subjects was not evident and perhaps it is too early considering that the

labs have just become operational. The Mission was informed that a list of 10 teachers from each School is being prepared for Training of teachers by the ICT instructor.

Recommendation: Considering that the contract was signed in October 2013 and that ICT labs in schools have become operational in Jan/Feb 2016, progress seems quite slow. Out of the contracted period of five years , 3 years have been taken for making the ICT labs operational. Implementation of contract with TCIL needs to be closely monitored by the Directorate to reap benefits from this scheme. State Govt needs to generate material for providing on-line courses to teachers. Train all the teachers including guest Teachers as part of Teachers’ Training on know-how of ICT and its usage in the curriculum transaction. Monitor the ICT contract closely for timely and effective implementation.

In-service Teacher’s training status in FY 15-16

Subject	Hindi attended/ proposed	English attended/ proposed	Maths attended/ proposed	Science attended/ proposed	Social Science attended/ proposed	Total (phaseswise) attended/ proposed
Phase 1 2 - 16 Nov’15 (8 days)	417/451	326/367	410/452	427/455	420/459	2000/2184
Phase 2 18 -28 Nov (9 days)	172/221	155/213	262/349	173/241	257/324	1019/1348
Phase 3 30 Nov- 10 Dec (10Days)	186/229	235/316	181/259	66/83	159/211	827/1098
Phase 4 11-23 Dec (10days)	153/186	166/210	252/330	223/285	225/273	1019/1284
Phase 5 28 Dec-08Jan’16 (10 days)	Nil	Nil	Nil	502/646	229/277	731/923
Phase 6 18-29 Jan 2016 (ten days)	411/526	413/556	306/456	Nil	Nil	1130/1538
Total no. of TGTs trained	1339/1613 83.013% trained	1295/1662 77.92% trained	1105/1390 76.44% trained	1391/1710 81.35% trained	1290/1544 83.59% trained	6726/8375 80.31% trained
Total TGTs trained =6726 (80.31%)						

Recommendation: The Mission observed that in the absence of sufficient number of regular teachers, Guest Teachers were a regular feature in almost all schools visited. However, they were not imparted training under the program. MHRD may consider including Guest Teachers (who are teaching for months and years together) under the Teacher’s Training Programs.

School Standards and Evaluation Programme launched by NUEPA for School Improvement: 200 heads of Govt. schools received 3 day training by faculty from NUEPA and Azim Premji Foundation.

School Leadership Development Prog. Launched by NUEPA: 33 members of the State Resource Group underwent 10 days training at NUEPA in FY 2015-16. 200 Heads of schools will now be trained over a period of 16 days during 2016-17.

States' Initiatives to improve the Quality in Education

- DIETs and SCERT conduct training need analysis for teachers in a workshop mode on which training modules are developed. It has been reported that the hard spots are identified and based on that existing training modules are modified or new modules are developed. These modules are developed in consultation with experts from NCERT and other institutes. DIETs have the facility of ICT enabled teaching for the teacher training and they appear to be using it. However e-modules have not been developed as yet. Face to face interactive mode for teacher training is the prime mode of training. During 2015-16, 10-day training Programme was conducted for improving the pedagogy and content knowledge for 1105 Mathematics teachers and 1391 Science teachers.
- In the schools estate managers have been appointed having administrative functions such as cleanliness of school compound, toilets etc. Each school has sufficient number of Safai Karamchari (Cleaning staff).
- State has utilised part of School Grant for promoting Kala Utsav activities at the School Level. This has led to active participation of students at different levels of the competition which ultimately won the state First Prize in Folk Music and Second Prize (jointly with Haryana) in the Visual Arts Competition at the National Level.
- Mental Maths books for the year 2015-16 printed by DBTB were distributed to all schools through the respective Zonal Distribution Centres and state level competition was organised.
- To fulfill the gap between the sanctioned and vacant posts of teachers, the State has appointed Guest teachers having all the requisite and equivalent qualifications required for the teachers at secondary level of education. Effort is made to post teachers in schools as close to their residence as possible.
- On-line transfer policy of DoE also ensures that schools are not left without at least one teacher in each subject.
- In one of the Schools visited, the Mission saw an initiative worth replicating in other schools. Youths from “Teach India⁴”, were conducting classes for Class VIII where each student was given a random topic for an extempore speech on the topic. The Mission was informed that these classes were held on a regular basis. The purpose is to develop

⁴ Teach India is a Corporate Social Responsibility initiative of one of the corporate houses of India implemented through partner NGOs.

communication skills of the students. The mission observed that the students have developed good communication skills and were engaging with great enthusiasm.

Overall Progress under Recurring Grants:

In the National Capital Territory of Delhi, about 80-85% of the funds released under RMSA goes towards Annual School Grants. In FY 15-16, apart from the Annual School Grant, the other activities undertaken under RMSA under recurring grants are In-service Teacher's Training, School Standards Evaluation Program by NUEPA and School Leadership Development Program launched by NUEPA.

Allocation and Release of Annual Grants to Schools.

During FY 15-16 Annual Grants were released to schools in two installments of 50% each. The first installment was released in November 2015 and the second installment in March 2016. Some of the Schools visited received the second installment on March 31, or in early April 2016. The fund release data obtained from MHRD shows that the second instalment under RMSA was released in February 2016. (Data requested from the Directorate of Education regarding date of release of funds by State Government and then SIS, as well as date of submission of UCs. Information awaited as of now. Details will be provided as soon as data is received)

Allocation of Annual School Grants linked with enrolments: Release of school grant (Received from MHRD @Rs. 50000/- per school) has been rationalised by linking it with enrollment of students which ensured that schools with larger number of students in Class IX and X get larger amount.

Students' Enrollment (Classes IX, X)	Unit Cost (in thousands)
200 or less	30,000
Between 201 and 500	50,000
Between 501 and 800	60,000
Between 801 and 1200	70,000
Above 1200	80,000

Good Practice: The Mission is of the view that this practice of allocation of the Annual Grants to Schools based on enrollments in Classes IX and X is prudent and could be replicated in other States.

It was also observed that the Annual School Grants were allotted under several activities with specific amounts earmarked against each of those activities.

Recommendation: A menu of activity choices with flexibility to the school to expend on any one or more activities/items would be more useful rather than earmarking specific amounts for the listed activities. Some of the Schools visited echoed the same opinion. Allocate School

grants with menu of activity choices (without earmarked amounts) and avoid releases at the fag end of the year. MHRD and Directorate of Education needs to ensure timely release of funds. Undertake a comprehensive inspection/audit of schools once in a year.

Review of Books and records in Schools: It was observed in two schools visited, that cash payments were made by the Principal after withdrawal of the entire amount of annual school grant through self-cheques. This is against the spirit of the Financial Management norms laid down for RMSA in the FMP manual which advocates payments against expenditures through cheques. In one of these schools, serious inconsistencies were observed in the supporting invoices.

Recommendation: *Every school should be audited/inspected by a third party at least once in every year.*

Status of Civil Works:

Under RMSA allocation towards Civil Works was done only in 2014 -15. The total allocation and financial and physical progress of works is given in the table below which shows substantial delays in execution.

Activity	Approved Unit for the year 2014-15	Completed	in progress	Unit Cost	Fin. Approved	Total Releases Up to Mar 2016	Budget Spill over for 2016-17
Science lab	4	0	4	13.55	54.20	46.74	7.46
Computer Lab	7	0	7	13.14	91.98	62.56	29.42
Art & Craft Room	16	2	14	12.64	202.24	110.74	91.50
Library room	7	0	7	12.39	86.73	61.73	25.00
Toilet	26	3	23	3.67	95.42	48.12	47.30
Total	60	5	55		530.57	329.90	200.67

Projects not started as on March 31, 2016

Sl.	Activity	Unit	Remarks
1	Science lab	2	Money released in respect of 25 of the 33 works on 31 March 2016.
2	Computer Lab	4	

3	Art & Craft Room	9	
4	Library room	4	
5	Toilet	14	
	Total	33	

The State Government has opened 3 new schools and undertaken bifurcation of two schools due to heavy enrolment in FY 2015-16. Bifurcation of another 7 schools have been sanctioned for FY 2016-17. These initiatives are funded by the State Government.

Annex 1: Itinerary followed and Persons met

JRM Field Visit

Date	Place of Visit	Persons met
12.04.2016		1. Mr Anil Kumar , DDE-RMSA, coordinator 2. Dr(Mrs) Poonam Nagpal, OSD-RMSA, Coordinator
	Rouse Avenue-SBV Deen Dayal Upadhya Marg,(school ID- 2127001)	1. Dr Rajeshwari Kapari -Principal Maths, Science teachers of IX and X, IT instructor, Vocational instructor & students
	Ram nagar,NO1- GGSSS, Pahar Ganj (School ID- 2127018)	1 Ms Rekha Sharma (Vice Principal) Maths, Science teachers of IX and X, IT instructor, Vocational instructor & students
	Chhatarsal Stadium Sports Branch	1Mrs Harjeet Kaur DDE (PE &NI)
	Shakti Nagar, No1- GBSSS (School ID: 1207019)	1. Mr Rakesh kumar Sorot (Principal) Maths, Science teachers of IX and X, IT instructor, Vocational instructor & students
13.04.2016	Mehrauli Ramanujan SKV (School Id 1923038)	Ms Madhu Gupta-Principal Maths, Science teachers of IX and X, IT instructor, Vocational instructor & students
	Ishani Govt.Sarvodaya Kanya Vidyalaya G-	Kiran Bhorla Vice Principal

	Block Saket New Delhi (School ID 1923036)	Maths, Science teachers of IX and X, IT instructor, Vocational instructor & students
	Hauz Rani-GBSSS Near Malviya nagar, Hauz Khas (School ID: 1923021)	Mts Shakti Raj (Principal)
	DIET, Moti Bagh	Dr Dushyant Kaur , Principal. Dr Anamika Singh, Lecturer, English
16.04.2016	Sarvodaya Vidyalaya FU Block Pitampura	Dr Omveer Singh Dhaka
	Deputy Director, North West District	Ms Shashi Bala Saini
	Shalimar Bagh, Block BT-SV	Dr Ranjeet Singh (Principal)
	GBSSS-Shahbad Daulatpur	Dr Praveen Thakral Vice Principal

Officials met at SMD office

Mr E.Rajababu, SMD- Chairman

Mr R.S.Mehra, Deputy Director, Vocational

Mr U.S.Kurmi, Deputy Director, IEDSS

Mr Anil Kumar , DDE-RMSA, coordinator

Mr S.K.Shaw, Consultant , Civil work

Mr Santosh Behra, Joint Director, ICT

Mr Bhagwati Prasad, Financial Controller of Accounts

State Report: Telengana

7th RMSA Joint Review Mission (JRM) (April 11-23, 2016)

1. Introduction

The JRM team visiting Telengana (April 12-16, 2016) comprised of the JRM members: Dr. R Kannan, Dr. Ranjana Arora, Satyanarayan Panda and Vimala Ramachandran. The team visited nine schools and two RMSA Girl's Hostel in Ranga Reddy District, Medak and in Hyderabad City. A detailed list of persons met is provided at Annex 1. An opening session was held with Director of School Education, Government of Telangana on 14th April 2016. The team also visited SCERT and held a detailed discussion with the faculty on 13th April 2016.

In the debriefing discussions with the Special Chief Secretary, School Education, Dr. Ranjeev Acharya IAS several clarifications and the future plan of action that made it clear that Telengana was doing well and was on the road to further improvement emerged. Shri Krishan IAS, Commissioner of School Education and other officers of RMSA Telengana, and SCERT attended. It was appreciated in the debriefing session that the Participatory Rural Appraisal (PRA) participatory family of methods like Semi-Structured and Depth Interview made the teachers and students to relax and therefore elicited very good responses in a spirit of sharing.

The team would like to thank the Special Chief Secretary, School Education, RMSA State Project Director, Director, SCERT, DIET faculty, all the RMSA officials at the state, district and school levels, the Principals, teachers and students of the schools visited for extending their cooperation, support and the warm hospitality during the state visit.

2. Overview and Key Issues on RMSA Implementation

There are about 23,200 habitations in the Telangana state out of which 19,604 habitations are covered by secondary schools, which comes to 84.5%. There are 11,685 Secondary Schools. Private unaided schools account for 49.1 per cent (5739) of secondary schools. There are 293 private aided schools. Government schools are run by the following agencies:

- a. State Government
- b. TSREI Society
- c. Social Welfare TSSWREI / SW Department Schools
- d. Tribal Welfare TSTWREI / TW Department Ashram Schools / Mini Gurukulams / TWPS / Sports Schools
- e. Model Schools
- f. KGBV (extended up to class 10 by Telangana Government) – TSREI / Disabled Welfare / SSA / TSTWREI / TSSWREI
- g. BC Welfare
- h. Mandal Panchayat Parishad / Zillah Panchayat Parishad
- i. Navodaya Vidhyalaya and Kendriya Vidhyalaya

The GER at Secondary for boys is 78.02 and girls it is 82.57 (Total 80.21). The GER of SC is 86.25 (boys 84.17, girls 88.41) and ST 74.64 (boys 73.32, girls 76.11). It is important that the gap between GER and NER is fairly significant – the NER boys 49.5 and girls 53.4 (total 50.9). The community break-up for NER is not available. It would be important to explore the reasons for the gap between GER and NER (GoT, 2015-16). It is very interesting to note that the GER for girls both in the General and SC categories is more than that of boys. The reasons have to be explored and may be, the time has come for affirmative action for boys within these communities.

Achievements:

1. Curriculum reform, new textbooks, CCE and examination reform – as a continuum. This is the most important achievement in RMSA Telengana – along side the important fact that all secondary teachers are qualified and trained.

Comprehensive quality improvement efforts of Telengana Government

The state of Telangana has developed its State Curriculum Framework, which guided the development of new syllabi and textbooks across all stages. The state has also developed academic standards for each class and printed these on each textbook for the use of teachers. In consonance with the learner-centred approach adopted for new curricular material, the state has also implemented Continuous and Comprehensive Evaluation from classes I to X. At the secondary stage, the state has come out with a comprehensive progress report card to track the progress in learning of the students from VI to X. The report card shows that the state has introduced multiple assessment approaches in addition to paper pencil test i.e. project work, observation of children participation in activities, etc. However, under CCE the state has adopted the formative and summative assessment forms. Further, making strong linkages with new textbooks and school based assessment (CCE) with external examination, the state has introduced reforms in its examination pattern which includes changing the typology of questions shifting content based learning towards competency based learning taking into considerations the academic standards which include critical thinking, problem solving, etc.

2. The Government of Telangana created and developed State Resource Groups (SRGs) for all the subject areas (with 50 members in each SRG drawn from SCERT, CTEs, IASEs, DIETs, etc.) for teacher training. The state has also developed teacher-training manuals. This SRG has been continuously imparting teacher training for all the secondary teachers – as a result majority of teachers in government schools have undergone in-service training (except Physical Education teachers) (please see the table 5 in Annexure-I)
3. The mid-day meal programme has been extended up to class 10. This has had a significant positive impact in the over school environment. Equally, all students from classes 6 to 10 are provided free uniforms and free textbooks.

4. As per the demand of the parents and community members, the state has initiated the process of introducing English as a medium of instruction along with Telugu and Urdu medium. During school visits, in three rural schools (Medak District), English medium section as well as Telugu medium sections was observed. The three schools had more enrolment, which is significantly higher than only Telugu medium. In both the schools in urban Hyderabad, the three medium phenomenon operate in a single school i.e. Urdu, Telugu and English.
5. There has been significant reduction in dropout rates (class 9 to 10) from 4.5 in 2014-15 to 1.2 in 2015-16.
6. The overall gender gap is fairly modest 0.009. However it would be important to take note that among the general category more girls are enrolled in government schools (see Table 1 in Annex). This could be an indicator of gender bias in families who enrol their sons in private schools and daughters in government schools. It is important to note that this is also the case among Muslim community – with over 17,000 more girls than boys are studying in government schools. This trend was confirmed by a perusal of data on enrolment in private schools and during field visits.
7. The teachers, the team interacted with said that with the there has been a lot of improvement in schools through the implementation of RMSA. The quality of supplies and equipment has improved and so has the access of teachers and students to additional educational resources.
8. In the state, Student–Classroom Ratio (37 per class) is low (see Table 4 in Annex), which creates a positive environment for learner centred constructivist pedagogy practices and smooth implementation of CCE.
9. State-wide teacher recruitment tests are conducted at regular intervals. This requirement of teachers is based on the vacancy position. Based on the examination scores, the District Selection Committee (chaired by the District Collector) appoints teachers for both primary (classes 1-5) and secondary schools (classes 6 to 10). The state government is planning to introduce Teacher Eligibility Test (TET) for secondary school teachers from this academic year (2016-17). Once this is introduced – there will be a two-stage process for recruitment of teachers for secondary schools. During the debriefing meeting it was discussed that it is the experience in many states that it is difficult to build up centralised pressure and pressurise the system, since pressure becomes diffused and also there is competition among Collectors to perform better inter-se.

Some important facts about Telangana

- Telangana State has three levels of schools: primary from classes 1 to 5 and Upper Primary from Classes 6 to 8 and secondary classes 9 to 10. Most secondary schools start with upper primary (class 6) and go on till class 10. For classes 11 and 12, there are junior colleges.
- The Teacher Eligibility Test (TET) is a qualifying examination to enable candidates to apply for teaching positions. Another examination is conducted for recruitment. A

District level committee headed by the Collector makes the appointment.

- Telangana has two kinds of science teachers for the secondary stage– Physical Science (Physics and Chemistry) and Biological Sciences (Zoology and Botany).
- All Secondary Teachers have a Bachelors Degree in their subject and a B Ed Degree. Many also have M Sc/M.A. Degree and a B Ed.
- All RMSA teachers are appointed as regular teachers and there are no contract teachers.
- The state has a Teacher Deployment Policy and rationalisation of posts is done every year.

10. The quality of construction of civil work in schools visited appears to be good. The civil work has been undertaken as per the RMSA norms.
11. Financial management as prescribed in the FMP manual is being followed at various levels, i.e. Head Quarters, district officers and SMDC level as per the procedure. Regarding procurement, there is no centralized procurement at Headquarters. The HM and the senior most teacher have been designated as joint signatories as per the decision taken in the SMDCs. They jointly authorise payments for the programme implementation – i.e. as joint signatories.

Concerns:

1. The team did not come across a single Child With Special Need (CWSN) in any of the schools visited. Most of the secondary schools in the state have no CWSN. It may be worthwhile doing a status paper on the situation of educational access of CWSN from primary right up to higher secondary. However, there are children under the SSA tied up with the state's own Inclusive Education Resource Centre (IERC). While some transition to mainstream school, what happens to others is a matter for serious research and remedial action, if necessary.
2. The rural schools visited were clean and neat, the overall environment was vibrant and students were happy. However, this was not the case in the urban schools visited in Hyderabad city.
3. The enrolment of students of ST in children in secondary schools is far lower than that the overall enrolment rate in the state. This merits special attention.
4. Most of the secondary schools have toilets. However the major issue is providing running water to the toilets. Out of 4583 secondary schools under Government and local bodies about 3441 secondary schools access drinking water facility taps, hand pumps, wells. The remaining schools do not have regular facility but alternative arrangements are made by providing water through cans, pots etc. (see Table 3 in Annexure 1).
5. The salary scale in Telangana is fairly high (see table in Annex). As a result, the RMSA grant for teacher salary is inadequate. This was flagged as an area of concern by the state government.
6. The allocation of Rs. 300 per teacher / per day is grossly inadequate. This was flagged as an area of concern in all our meetings and discussions.

7. Monitoring of schools has suffered because of the non-finalisation of unified service rules, 90 per cent of supervisory staff (MEO / Dy DEO / Teacher Educators) are lying vacant.
8. The government clarified that there are two types of committees in the Secondary Schools i.e. School Management Committee (SMC) an elected body for classes VI to VIII as per RTE norms. Further there is another committee i.e. SMDCs constituted in all the Secondary Schools for classes IX & X as per the composition suggested under RMSA. The SMDCs is assisted by two sub committees i.e. school building committee and academic committee headed by Headmaster. Two members of Panchayat or Urban local body are members of the SMDC along with other members. The members of SMDC are nominated. However, schools visited had not complied, as yet, with the state government norms. There is a need for effective monitoring by the state.
9. In the rural schools, we found that the Sarpanches were members of the SMDC. They helped in sanitation related matters. In the urban school at Ameerpet, we found that the MP had given funds for drinking water under the MPLADS Fund. In the other school at Vengala Rao Nagar, no such participation was forthcoming. The role for Panchayat Raj envisaged in the 73rd & 74th Amendments to the Constitution has not been achieved in practice.

Recommendations:

- **For State Government:**

1. Since, the state has secondary schools from 6th to 10th, there is a need for convergence of SSA and RMSA provisions in organised way so that the either the civil work or teacher training should not suffer because of this. Since, all the teachers who are teaching classes 6 to 10 have been undergoing the same kind of training, it needs to be ensured that teachers get appropriate pedagogic and also content enrichment training for classes IX and X. Moreover, under RTE Act 2009, state need to take initiatives towards making elementary schools (by combining classes I to VIII). Further, there is also a need to bring junior colleges in the purview of school education for enhancing access of students to higher secondary education.
2. Now, in view of the introduction of English medium in addition to Telugu medium in all the schools, there is a need for proper planning as far as infrastructure and teachers are concerned.

In the daily newspaper on 15.04.2016, the Supreme Court in a case of falling enrolment in Government Schools in Telengana has asked the state for reasons. Preference for English medium available in private schools was mentioned as the reason. At the SCERT presentation, it was stated that the Government is starting English Medium Schools based on demand. However, there was a shortage of teachers trained to teach in English medium. This was being remedied by a crash course of in-service training, so that the shift can take place. No posts have been sanctioned for English Medium. This issue needs attention under SSA and RMSA and also under state funding.

3. In view of Digital India and Skill India drives, there is a need to take urgent steps to provide vocational education and also ICT enabled education in all the

secondary schools so that the children in the state should not be devoid of employment opportunities being created in the country.

- **For GoI:**

1. ICT@School Scheme needs a review and also an extension to provide support to state for implementing models other than BOOT model, which has not helped in promoting ICT-enabled secondary education.
2. There is a need for language education policy, which can guide states on the issue of introduction of English medium of instruction in the government schools as per the demands of the society and also for improving enrolment in schools.

3. Focus themes for this JRM

3.a: Use of ICT in Student Learning:

Achievements:

Telengana implemented the ICT@School scheme in the year 2010-11 in 2680 Secondary Schools using the BOOT model. The government signed a contract with NIIT for providing the hardware, maintenance and computer instruction. Under this contract, 10-11 computer terminals with one or two servers were installed along with a diesel generator for back up. One instructor was also provided. The agency decided the curriculum – which was not available in written form. The team was informed that students were essentially taught how to use MS Word and Paintbrush.

From 2016-17 onwards the State Government decided to discontinue the BOOT model and run the ICT@School directly for the remaining 2420 schools (as the initial proposal was to cover 5000 schools under the Scheme). They have also decided to revamp ICT facilities in the old BOOT model schools. We were informed that the State Government is proposing to sanction a sum of Rs 50,00,000 (Rupees 50 Lakhs) per district for installing computers, training teachers and develop ICT curriculum. The government referred to the Kerala model and plan to emulate that in Telengana – train schoolteachers to use the computers, teach the children and simultaneously upgrade the skills of teachers.

The state government, on its own steam, have provided Receive Only Terminal (ROT) in schools for tele-conferencing / video-conferencing and also provided a projector and a set of CDs (developed by SIET and also procured from other agencies) to many rural schools. During the field visit to five rural schools we saw the school in Ranga Reddy and Medak Districts used projectors and CDs. We were informed that the government is planning to open Telengana Repository of Open Educational Resources with the support from SIET and NCERT. E-content is being developed for this purpose.

Concerns:

The state government shared many concerns that they had with the BOOT model, namely:

1. The BOOT model is inherently unsustainable as the external agency exercises full control and the school / teachers do not have a sense of ownership. The BOOT model

is case of Market Failure while State Failure is usually highlighted. This may be due to inadequate preparation for tendering, in a sense a State Failure also. The Market Model is to be replaced by a full State as the Great Provider Model that prevailed in India prior to 1995.

2. The curriculum was limited to typing and computer literacy. The curriculum did not seek to develop the application skills of children. Equally, ICT was not integrated into the teaching-learning process.
3. Given the short life span of technology, many computers provided in 2011 are not fully functional in many schools. Any computer based Learning Programme has to take the life of Hardware as 5 years and provide for replacement and seamless transition of software.
4. While there may not be long hours of power outage in the state, when there is no electricity the generators could not be used because of lack of funds for diesel. The teachers explained that the school grant of 50,000 per annum is expected to cover a wide range of school-level requirements – including payment of electricity bills. As a result very little funds remain for diesel. The teachers also informed us that the grant amount is the same for schools of all sizes, as a result in large schools with over 400 students the grant cannot cover even the very necessary recurring expenditures involved in the school. State government RMSA officials also confirmed the concerns expressed by teachers. Also, irrespective of the number of students, the grant is the same. This handicaps schools with large student strength – a typical example of One Size Fits All Approach.

Recommendations:

- **For State Government:**
 - Given the importance of ICT the state government could consider training teachers in the use of ICT in educational processes and actively using e-content to reinforce and make the lessons more interesting. They could identify motivated and interested teachers and conduct an orientation and training programme for them immediately.
 - The SCERT developed lessons can be used. The ROT based interactive teaching programmes can be extended to all schools including those in Hyderabad and urban centres.
 - Telengana state has a large IT sector. The government could reach out to industry to support the programme, develop content and enhance investment. Short-term internships after class 10 could also encourage the students.
 - The IT curriculum used in the Vocational Training Programme (developed by PSSCIVE (NCERT)) could be adapted for ICT education for teachers and all students. This curriculum starts with basis of computers and enables students to use computers effectively – and goes well beyond computer literacy.
- **For GOI:**
 - RMSA could consider extending financial support to schools that were covered under the BOOT model for long-term sustainability of ICT enabled education.

- Enhance the school grant of Rs. 50,000 to either a higher fixed amount or link the grant amount to the size of the school (school strength).

3.b: Math and Science teaching:

Achievements:

1. The most significant achievement of Telangana has been a comprehensive and coordinated approach from 2013; which includes: (a) revision the curriculum for class 9 and 10, (b) develop and produce new textbooks in all subjects, develop and produce teacher manuals in all subjects, (c) introduce Continuous and Comprehensive Evaluation procedure for classes 9 and 10 along with a detailed report booklet for each student from class 6 to 10; and (d) examination reform to ensure that the learning of concepts and theories are given precedence over memorisation. The science and mathematics textbooks include lot of activities, experiments and projects, which make teaching-learning of these subjects interesting. Curriculum load has been reduced making these books learner friendly. This, the JRM Team believes, is a Good Practice that needs to be shared with all the states.
2. The government has created a State Resource Groups (SRGs) at the state level, which was trained by national level resource persons drawn from premier institutions. The SRG has been given the responsibility to train teachers in all districts. They have removed one layer from the old cascade model of training. Teachers are being trained on the use of the new textbooks.
3. Mathematics and Science kits have been provided to all the schools. District science fair and also school science fair as regular feature is being conducted to popularise science.
4. Our field interaction with teachers and students – on science and mathematics – revealed that new textbooks are appreciated. Cursory oral questions revealed a lot of interest among children in both science and mathematics and the majority of them seemed to engage with the discussions. The teachers were forthcoming during discussions with the team and they demanded a lot more rigorous training to use experiments and activities in science subjects.
5. While there are no external practical examinations in the state, the new CCE regime requires students to conduct at least 10 experiments in both Physical and Biological Sciences.

Concerns:

1. In view of its historical practice, Telangana state has separate teachers for Physical and Biological Sciences – the textbooks for the two are separate. This does not address the need for an integrated approach to science teaching.
2. While most schools are using available space for an integrated science lab, majority of the schools in the state do not have Science Laboratories or a good reference library for science and mathematics (for both teachers and students). Improving the quality of education requires access to both libraries and laboratories. The schools need proper equipment, a sink for washing and a safe space for working. The state government clarified “There are about 4583 Secondary Schools under Government and Zilla Parishad managements out which 2396 Secondary Schools have been sanctioned

additional class rooms i.e. 6 rooms per secondary school which includes 2 class rooms 1 laboratory room, 1 library room, 1 staff room and 1 room for Headmaster. Labs have been established in these schools i.e. 2396 where a separate room for laboratory is provided. In addition to the construction of building, funds also sanctioned for furniture and for lab equipment i.e. Rs.4.55 lakhs for furniture and Rs. 1.00 lakh for lab equipment per school. Now it is proposed to procure the furniture and equipment and make full-fledged laboratories to the number of secondary schools to the extent of sanctions have been made from GoI.” The government expects to make significant progress in the current academic year.

3. Science and Mathematics training needs to go beyond the subjects – focusing equally on multiple pedagogies including ICT enabled teaching.

Recommendations:

For State Government:

- While it is important to focus on subject-specific training, it would be good if the State design need-based training programmes integrating pedagogic practices – especially multiple pedagogies and ICT infused pedagogy. Support from Regional Institute of Education (RIE), NCERT may be sought for this.
- The innovations and the good work of teachers – especially in the classroom – needs to be documented and disseminated. This would not only motivate the exemplary teachers and teaching-learning practices; but would also showcase the good work being done in government schools.
- The availability of national level resources (like NROER, *e-pathashala*, e-content, laboratory manuals) or state level resources need to be disseminated in the schools through posters or other adequate mechanism. This will encourage teachers to reach out when they require support or material.

For GOI:

- RMSA could consider providing funds for laboratories in all the government schools under strengthening component.
- The schools have to use the school grant of Rs. 50,000 for library book, equipment for science laboratories and consumables necessary for experimentation, instead of entirely spending it on electricity bills. Enhancing the school grant could be considered, especially linking the grant amount to the number of students enrolled in a school.

3.c: Status of pending civil works:

Achievements and Good Practices:

- JRM team reviewed the State’s civil works activities. It is noted that the Telangana Government has entrusted the construction of Girls’ Hostel as well as strengthening of schools to APEWIDC (Andhra Pradesh Educational Welfare and Infrastructure Development Corporation) of Telangana state.
- No new school under RMSA was sanctioned. Only strengthening of existing Government schools and construction of Girls hostel were sanctioned. Under strengthening of existing school component, some 3950 additional class rooms are

sanctioned out of which 79% is already completed, 11% under progress and for balance 10% additional rooms, the work is not yet started. Overall under strengthening activity, some 71% is already complete with 13.5% under progress and for 15.5% the work is yet not started. On enquiry, the project director indicated that these 15% works are being reviewed critically and they will come back to MHRD with revised proposal for either dropping them all together or retention with modified place of execution as per demand.

- For Girls' hostel, out of 192 units sanctioned for the whole state in the year 2011-12 and 40 hostels in 2015-16, some 117 hostels are already completed and 30 are at finishing stage, which are likely to be completed by 30th June 2016. Project officials requested for early release of balance fund of INR 125.96 cr for civil works by GOI, so that balance 85 girls hostels can be completed in the current financial year 2016-17.
- During debriefing on 16th April 2016, spl Chief Secretary indicated about additional burden on the RMSA Telangana unit for carrying out civil works which are sanctioned in the year 2011-12 with SOR rate of 2009-10. She expressed that Telangana govt is not in a position to absorb the additional fund required for completing the civil works. Mission advised the RMSA Telangana team to revise the estimate based on current SOR and submit to MHRD for their consideration and sanction of additional amount.
- As per the legal agreement with the Developmental Partners, all States are required to follow the Manual on Financial Management and Procurement for RMSA issued by MHRD on 24th January 2012. The project officials confirmed that the manual is followed in the state of Telangana.
- The quality of construction of schools visited appears to be good.
- The APEWIDC have awarded all the major works i.e. construction of Girls' hostels and strengthening of existing Govt. schools through an e-tendering process as per MHRD guidelines.
- At the school level, there is not much procurement activity except small procurements under Annual school grant of Rs. 50000/- out of which Rs. 10000/- for books for library, Rs. 25000/- for lab equipment and balance for elect bill, water bill payment etc.
- Regarding toilets in schools, the Engineering wing of SSA is the nodal agency for construction of Toilets in all the Schools in the State. Hence the Engineering wing of SSA is taking up the construction of Toilets in High Schools. During the year 2015-16, the construction of 2257 toilet units in 1647 High schools were taken up. There is still a gap to an extent of 1737 Toilet units in 935 High Schools which will be taken up during this year (table 9 in annexure).

Concerns

- One of the major concerns is slow progress of civil works, specially the toilet construction under RMSA. It is observed that out of 1725 toilet blocks sanctioned by MHRD for the state of Telangana under RMSA, the construction work was completed for only 467 toilets (27%) though sanction was made in the year 2011-12. Further more than 49% cases, the construction activities have not started. Project officials

indicated that toilets are being constructed under SSA and 49% of toilets where work has not started will be reviewed and wherever toilets are not required, the activity will be surrendered & where requirement exists, the construction will be taken up by construction wing under SSA with funding under RMSA A/c.

- Lack of fund is indicated as one of the major reason for slow progress in civil works.
- Lack of proper monitoring by SMDC as well as district education officials is the second reason for slow progress.

Recommendation

For the state Government:

- It is recommended that state prepares a detailed monitoring framework and follows the same meticulously both at school and district level for efficient execution of civil works.

For GOI

- MHRD may consider early release of balance fund for nonrecurring expenditure like civil works to the state so that they can take up the construction activities in the current FY and complete the same.

3.d: Financial management

Achievements and Good Practices

- The total approved outlay under RMSA to Telangana till date in NR (non- recurring) category is Rs 1104.16 crores including the Central share of Rs 820.46 crores. So far, Centre has released Rs 547.46 crores. Till date, state has spent only Rs. 605.96 crores.
- Mission noted that total release by centre and state for RMSA activity on non recurring account is Rs 708 cr, whereas total spent till date is Rs 606 cr approx.. Therefore there is around Rs 102 cr available in RMSA ac, which can be used to clear the pending bills of contractors (approx. Rs 110cr) for work already done and then seek for central fund release at the earliest.
- For the FY 16-17 AWP&B of the state was submitted on line through Project monitoring system, which was accepted by PAB of MHRD.
- The State Project Unit maintains an independent bank account for RMSA.
- The auditor for the year 2014-15 has been appointed and audit is being conducted by auditing company called C V S Balachandra Rao & co.

Concerns

- There is no Audit Cell at RMSA HQs office. The project officials indicated that district account officers of education department will do the internal auditing. The mission suggested for internal audit by independent agency from education department. SIS is taking necessary steps for doing internal audit on a regular basis and exploring the option of using independent agency.
- There is no Vigilance Cell in the State RMSA office.

Recommendation

For state

- State may take steps for engaging Internal Auditors so that the internal audit can be carried out on regular basis.

3.e: Vocational Education (VE)

The Vocational Education programme has been introduced for classes 9 and 10 in 20 Model Schools from 2013 – in 2 to 3 model schools per district. This is still at a pilot stage and the Government is planning to extend it 100 more model schools in the current academic year (2016-17). The curriculum has been developed by PSSCIVE (Bhopal) and is done within the framework of National Skill Qualification Framework (NSQF). The certification given to students is both from the State Secondary Board and the National Skills Development Corporation (NSDC). The course is being offered as a part of the regular course and all the students were offered the course. The state Government has offered four courses (1) Beauty and Wellness, (2) IT/ITES, (3) Tourism and Hospitality and (4) Retail. The HMs conducted a discussion with parents and students in order to select the courses in the schools. We noted that in the 2 model schools visited two courses were being offered (1) Beauty and Wellness and (2) IT / ITES. Both schools had qualified teachers. The high employment potential Tourism, Hospitality and Retail sectors have fewer takers so far. Public perception has to be enlarged by information dissemination through media etc. The government informed that a skill gap analysis preceded introduction of 4 VE courses.

The Market oriented Service Provider model has so far been a success in the 20 Model schools probably as the lessons from the failure of 2010-2011 have been internalised and acted upon. Scaling up has to be careful. The lessons on how to access the Market with Tight Tender conditions on quality etc. appear to have been learnt. *Any Model State or Market will work if it is efficiently and effectively planned and implemented*

The State Government has a scheme under the Rural Development Department to take care of school dropouts, who are guided into Vocational Training and become qualified Blue Collar workers with Certification. Absence of such plumbers, electricians is severely felt need in cities and towns. This is market oriented and also gives employment with good wages. The state government informed “Employment Generation and Marketing Mission (EGMM)⁵ of Telangana has emerged as one of the largest Jobs mission working for the underprivileged youth. To date it has trained 2,26,909 and placed 75% of them in entry-level corporate jobs. 45% are girls and 37% are SCs/ STs. The youth are from economically and socially underprivileged sections of the society. EGMM works in a public-private partnership mode

⁵ Employment Generation and Marketing Mission (EGMM) is a society set up by the Department of Rural Development of the Andhra Pradesh (AP) Government to provide employment to the rural unemployed youth. Set up five years back, EGMM has emerged as one of the largest Jobs mission working for the underprivileged youth. To date it has trained 2,26,909 and placed 75% of them in entry level corporate jobs. 45% are girls and 37% are SCs/ STs. The youth are from economically and socially underprivileged sections of the society. EGMM works in a public-private partnership mode with Government, companies and the rural communities as its stakeholders. The entire approach is a bottom-up approach, tailored to move the rural poor from the unorganized to the organized labor market.

with Government, companies and the rural communities as its stakeholders. The entire approach is a bottom-up approach, tailored to move the rural poor from the unorganized to the organized labour market. The brand EGMM has been built by its innovative products developed like the country's first Grassroots level English, Soft Skills & Computers Academy, Textile Training Academy, and Security Academy. EGMM has also customized the trainings linked to new investments like Rural BPOs, SEZ's manufacturing units, etc.”

Achievements:

1. Vocational Training for classes IX and X started in 20 model schools established in Economically Backward Blocks;
2. Forged linkages with PSSCIVE for curriculum and for teacher training with ICFS and National Skills Council (NSC)

Concerns:

1. The first concern is that Vocational Education has not yet been introduced in regular secondary schools. However we were informed that the PAB sanction of 2016-17 includes VE in 19 regular secondary schools.
2. A mapping of skills that would be relevant in the districts has not yet been conducted. Equally, career counselling and career opportunities were not explored sufficiently – either with the students or the parents. They were just offered 4 courses to choose from.
3. As the state government has been extremely busy revising the secondary school curriculum and developing textbooks etc. they have perhaps not paid adequate attention to vocational education.

Recommendations:

- For State Government:
 - Given the employment situation of young people in the country, meaningful vocational education could go a long way in expanding career choices of students. It is in context that the vocational education component merits greater engagement. In intermediate stage (class XI and XII) there are 4 exclusive vocational junior college, polytechnics and the government could forge forward linkages to make the VE component more effective.
 - If the vocational education done in classes 9 and 10 is carried forward and developed further in classes 11 and 12 (as envisaged in NSQF) – then it could give a strong foundation for related Polytechnic or other vocational education after school. This would open up many more employment opportunities for students.
- For GOI:
 - MHRD needs to facilitate vocational education by conducting workshops and training programmes for state governments, setting up exemplar institutions that can beat the path and open up this field further. It may be recalled that vocational education in the 1980s collapsed because of lack of initiatives across the country. A lot more needs to be done at the national level to give vocational education a push and forge forward linkages with Polytechnics and

other technical institutions (nursing colleges, horticulture, sericulture, physiotherapy and related para-medical courses).

3.f: Any additional observations/comments not included in the above sections:

- The toilets in the rural schools were in excellent condition with piped water etc. The wastewater from washing hands etc. is linked to Rain Water Harvesting and Tree Sapling plantation. In urban schools, sanitation is not up to the mark.
- There is need for Sanitation and Toilet Training for students to sustain Swachh Bharat mission making people promoting self-regulated cleaning habits.
- Rain Water Harvesting must be included in the curriculum and use the practice in all the schools for demonstration
- In rural schools, local linkages has led to installing RO Plants for drinking water. However, the situation Hyderabad needs special attention for drastic improvement.
- The team found that libraries are being used in rural schools. There is a Library period and children are being given opportunities to go to library and get the books issued for home. In the urban schools, this was not the case. The situation needs much improvement.
- The state of Telengana organises Kala Utsav, cultural festivals and competitions, programmes etc., in collaboration with the State Department of Culture.
- In order to document and disseminate innovative practices from teachers and innovations from children a **innovative forum** is being established by the NGOs and start innovation clubs and set up lab hubs in schools for prototyping and establish State level awards for the innovators. In this connection the innovations will be shared through the connected networks from grassroots level. The innovations will be evaluated and State level awards will be conferred. This is one of the strategies to encourage innovations in Science and Mathematics.
- Issues specific to urban schools: SMDC related, no laboratories / libraries (in HM room)
- Conclusion:
- Telangana has excellent education system in terms of quality. Basic indicators e.g. GER, GPI, Drop-out ratio, etc. are showing continuous improvement (at or near the targeted level). Teachers are fully qualified and the staffs at the department are very enthusiastic probably because of the good leadership of the department. Most the civil work has been completed. Students in rural area were happy and in urban areas are paid special attention. Library, toilets, etc., in rural areas are excellent, while some urban schools could do with improvement. Headmasters and Headmistresses, we saw were leaders who could attract donors to supplement official grants. The state government is responsive to the society and community like starting English medium sections, having better quality Vocational Education, lectures through satellite are the summum bonum
- But anything good can be improved further for which the state is striving.

State Report: Tripura

7th RMSA JRM (April 11-23, 2016)

1. Introduction

The JRM team visiting Tripura (April 12-16, 2016) comprised of the JRM members: Shailendra Sigdel, GoI delegated member, Jeena Abrahams (DFID) and Colin Bangay (DFID). The team visited eight schools combination of Urban and Rural and one SCERT. A detailed list of persons met is provided at Annex 1. A closing session was held with on the 16h April to present the draft state report.

The team would like to thank the Principal Secretary, School Education, RMSA State Project Director, Director, SCERT, DIET faculty during the field visits, all the RMSA officials at the state, district and school levels, the Principals, teachers and students of the schools visited for extending their cooperation, support and the warm hospitality during the state visit.

2. Overview and Key Issues on RMSA Implementation

Achievements: The mission visited four urban ‘best’ schools and four “poor” schools in Tripura. The four best schools were staffed with a full complement of specialist teachers. They appeared dedicated and their students motivated. It was particularly pleasing to see students doing creative homework of such high quality and the mission does hope this will be displayed around the school. Overall what was demonstrated in these schools is that with the right inputs, economies of scale and good management it is possible to deliver quality education.

The mission also visited four rural schools. The overall impression from these schools was mixed. However, the headmaster in Tarapur high school demonstrated that with energy and commitment it was possible to make a difference with what little resource were available.

JRM members were treated to a rich demonstration of the vibrant cultural diversity and talent in dance, music and drama within the State. There is clearly a health development of the arts in Tripura and this is important for a broad well balanced education.

Concerns: Overall RMSA seems to be operating in a very supply driven manner – civil works spending dominates. Attention to common and often more pressing school requirements such as running water, electricity (which goes beyond supplying the head teacher and staffroom), maintenance, classroom furniture and learning support materials are neglected.

The five km (4 km given the dispensation for North East states) norm appears to be driving expensive investments without any reference to broader issues associated with good

education such as availability of teachers and teacher utilisation rates. The mission visited one school where RMSA had built five classrooms however the building had been locked up and remained unused for the last two years and staff at the school were unclear as to why the classrooms had been built – given the status of the school there appeared no shortage of other priorities that this money could have been spent on.

The proliferation of small schools – in a state where already 2/3 of schools do not have qualified maths/ science teachers presents a massive quality and financial challenge. The schools proposed for upgrade in 2016/17 AWPB are of an average size of 22 students but , should state norms be followed will still require staffing with five teachers– maths, science, English, MIL and social studies teacher – i.e. 1 teacher for every 4 students. This is neither realistic nor affordable.

There was a very evident difference in resourcing, management and performance between rural and urban schools. Despite being double shift schools the large urban schools were much better resourced and delivered much higher test board exam success rates. In contrast small single shift rural schools were struggling – were ill equipped and did not have full complements of qualified staff. Given that the state board exam requires clearance in all subjects to pass it is perhaps not surprising some rural schools were reporting pass rates as low as 10%.

Despite extensive evidence collection– UDISE, NAS, GIS, school mapping etc there was limited evidence of that data was being used to inform state wide strategies to best deploy scarce resources. The inflexibility of RMSA norms appears to be impeding devising of locally appropriate solutions. This is particularly evident in school based planning –which appears to have turned into an obligatory but ultimately futile exercise as what is needed is not necessarily on the menu of what RMSA offers.

Overall the mission found that the UDISE figures and actual enrolment as reported at schools did not tally. In some cases the UDISE reports are some 80% higher than school records and huge gap between reported enrolment and attendance. The suspicion that results are inflated is further supported by the limited numbers of desks in classrooms. These discrepancies warrant further investigation as if un-tracked they could potentially distort resource allocations.

The JRM team also noted a substantial variation in enrolment figures in rural schools between grades 9 and 10. In the four rural schools we visited this gap was more than 60%. On enquiry school management could not explain this discrepancy. However during the last wrap up meeting RMSA director clarified that it is because the high influx of class 8 students automatically. At the same time many grade nine repeaters are counted as new entrance instead of repeaters. The schools are doing these practice to control the grade 10 enrolment and to show high percentage of pass rate at state board examination.

Over the last 5 years centre and state provision of ICT provision to schools appears haphazard involving multiple short lived schemes. Two issues are evident (i) The focus to date has been on provision of hardware with no attention on a coherent evolutionary model

for use of ICT for learning. (ii) Insufficient attention to the need for recurrent expenditure for maintenance, replacement and upgrades.

Tripura faces a chronic subject specific teacher shortage – yet no one appears able to quantify either the supply of new teachers (how many and of what type of teachers are coming out of Tripura’s teacher training institutions) or the projected demand. Without understanding of the magnitude of the gap between supply and demand (and deployment of the current workforce by subject / school) it will be impossible to practically address and cost affordable solutions.

MHRD thoughts on introducing a SLAS in every grade for every year were regarded as unnecessary, impractical and unaffordable. Small states such as Tripura do not have the human/technical resource to undertake such an endeavour and are also concerned (i) of the disruption it will cause and extent to which it will divert staff time from other important duties (ii) it is unlikely changes in learning will be seen on an annual basis. The prevailing view was that the three year NAS cycle provides sufficient feedback for remedial action – SCERT activities would be better spend on further investigating and devising responses to issues identified in the NAS.

Civil works remains a concern across multiple aspects – from the need for construction of many of these buildings, through to quality control and management of contractors/ implementers. The slow progress in securing utilisation certificates and the existence of large unspent balances (which it is assumed will be generating interest) are a potential financial risk.

Recommendations:

- For State:
- Better use of evidence to inform planning and financing strategies.
- Enhance capacity of school, block, district and state officials on education indicators, use of data and evidence on planning and monitoring exercise
- Deeper consideration of the affordability and performance implications of policies currently being pursued
- In response to every State NAS report Tripura devises a detailed remediation strategy to address key issues and learning deficits identified. The strategy includes impact evaluation to ascertain whether interventions are effective.

- ***For GoI:***
- NAS and UDISE data concur that Tripura is an underperforming state with particular challenges associated with the nature of its geography, population composition and distribution and available state budget. MHRD could consider a needs based formula which recognizes Tripura's situation and allocates additional funds with the aim of achieving national median learning performance.
- MHRD Review and revise RMSA norms to provide greater options for state based decision making based on local context. In particular expansion of norms to consider broader set of parameters – e.g. not just distance but student population and cost of providing full complement of teachers; maintenance grants that relate to the enrolment of school and number of buildings.
- MHRD carefully weigh the expected gains and significant costs and resourcing implications of conducting census based SLAS for all years in all states – taking particular cognizance of existing levels of capacity.
- A task force be established to devise more effective ways of managing civil works fund management, construction and quality control.

3. Focus themes for this JRM

4.

a. Use of ICT in Student Learning

Achievements: The large urban schools visited by the JRM did have computer labs containing around 10 functional computers and internet access. It was reported that secondary level students would spent at least two hours in a week in computer lab during school hour.

One school was using a laptop and projector to deliver powerpoints in social sciences in an E-class within the Computer Assisted Lab).

Tripura was experimenting with Edusat based technologies and will be making significant further investment in this technology (all be it without a rigorous analysis of the effectiveness of the technology on improving learning outcomes).

Most of the secondary school teachers have smart phones and are connected with the social sites especially on Facebook. There are huge possibilities to harness the power of smart phones use for educational purpose – such as SIM card libraries and use of boom boxes as has been impressively demonstrated across the border in Bangladesh by the English in Action Programme.

Concerns:

- As per World Bank analysis of UDISE data (Annex 2) Tripura secondary level ICT infrastructure is poor. Only one government secondary school meets a basic set of ICT infrastructure, while 100 government secondary schools (12%) meet none.
- There has been a strong focus on provision of hardware and little attention to the recurrent costs of financially supporting computer assisted learning over the long term. All the schools visited were provided computers under the BOOT model. With the closing of this scheme there is no provision for staffing, support and maintenance of computers – the result being functional computers are lying unused in the dusty rooms.
- There is little evidence of any coherent strategy on how to use computers in schools to aid learning. The potential of laptops, tablets and digital projectors did not appear to have been explored – CAL was envisaged as fact based learning about computers – and use of scheduled use of computers in labs

Recommendations:

For State:

1. The state needs to urgently consider what to do with the stock of computer equipment lying unused in schools across the state. If these computers cannot be effectively used at the school it may be worth collecting and redistributing them to institutions where they would be useful, e.g. to DIETs or district education offices where the equipment could be utilized.
2. State government needs to budget for the recurrent cost of running ICT in schools, which includes replacement, maintenance, internet costs.
3. A holistic staff development programme is needed to induct use of computers in schools. This needs to cover both pre-service and in-service training.

For GOI:

1. MHRD provide greater flexibility in funding using a formula based approach (taking cognizance of school enrolment, terrain, equity and need) for block grants and empower schools to have discretionary spending enabling them to spend on priorities as detailed in their school development plans.
2. Develop a comprehensive learning strategy on computer use which covers both hardware, software and human capacity building. This should recognize the huge

potential of new technologies including the use of the SMART phone for education purpose.

b. Math and Science teaching :

Achievements: The mission visited two excellent schools in which maths and science teaching appeared well delivered. It was noted that that these schools were large (+1500 students) composite schools (grades 1-12). School management emphasized that the quality of teaching was enhanced by use of post graduate higher secondary teachers for secondary classes.

Concerns:

- The latest National Achievement Survey State report card (grade X) indicates that educational performance in Tripura in English, Maths, Science, Social Science and MIL is significantly lower than the national median average (Annex 3).
- 62% of Tripura's secondary schools have no teacher in either science / maths or both— only one third of schools have teachers in both subjects (Annex 2).
- In maths particular weaknesses were identified in number systems, algebra and coordinate geometry. These should be focus areas for the next round of in-service training.
- The proliferation of small schools will only exacerbate subject teacher shortages – leading to the creation of schools with school buildings but no hope of staffing them and consequently no hope for a decent education for their students. The 2016-17 AWPB contains request for support in upgrading upper primary to secondary schools for enrolments that range from 7 to 53 with the average being 25 (Annex 4)
- Though all officials expressed dire concern on subject teacher shortage— no official was able to provide quantified answers on (i) teacher supply by subject (i.e. how many teacher graduates are being delivered each year by Tripura's teacher training colleges) or (ii) subject teacher demand (i.e. how many teachers will be needed given population projections, retirements of existing teachers, number of secondary schools (all of which will need a full complement of subject specific teachers).

Recommendations:

- ***For State:***

1. Tripura expand its successful model of consolidated secondary and higher secondary schools and seek alternative approaches such as hostel accommodation or providing safe motorized transport for students to avoid small, costly, poorly staffed and poorly performing schools.
2. Tripura urgently quantify both supply of and demand for subject specific teachers at secondary and put enact realistic plans to ensure optimum utilization of teachers in shortage subjects – e.g. peripatetic teachers.
3. Tripura further exploit its powerful GIS school mapping facility to look at expanded strategies to ensure all students are taught by subject specialist teachers e.g. school rationalization and sharing of specialist teachers via cluster arrangements.
4. Tripura pay particular attention to the State findings of the grade 10 NAS – particularly the areas where the state has been identified as significantly under-performing (Number systems, Algebra, coordinate geography, and history). The state commission the SCERT and other concerned bodies such as teacher training institutions develop a remediation plan for every NAS survey published addressing key findings on learning challenges e.g. through – enhanced pre-service and in-service training, textbook reform, additional education support materials, research.

- ***For GOI:***

1. MHRD urgently review the 5 km norm – with cognizance of the broader implications of following a norm based solely on distance with no consideration of student enrolment or the implications of distance based decisions on cost, teacher availability utilization, and learning performance.
2. MHRD in consultation with states devise a broader range of options eligible for RMSA financing – e.g. transport costs, hostel accommodation, peripatetic subject teachers etc to enable greater localized decision making on the most appropriate solutions. (Particular sensitivity should be given to states such as Tripura with remote, sparsely populated areas).

c. Status of pending civil works

Achievements: The labs, class rooms, office rooms in the schools visited seemed were bright, clean and well maintained. However, none of these were constructed under RMSA funds.

The state of Tripura appears to have coped well in managing civil works across plain and hills adjusting costing and design accordingly.

It was reported that procurement norms as per the state and project guidelines are followed and any tenders above IRs 5,000,000 are required to be submitted as per e-procurement guidelines.

The RMSA State office in Tripura has engaged the PWD and Rural Development Department (RDD) as their implementing partner for civil works. Both PWD and RDD further engage contractors to undertake the construction works when they are advanced payments/awarded work. The state office seemed to be satisfied with the pace and quality of civil works.

Concerns: The RMSA state office reported an unspent balance of IRs 386,000,000 (three billions and eighty six millions) at the end of the financial year 2014-15. The state had transferred the money to PWD for civil works but the latter had not submitted the utilisation certificates, hence the huge unspent balance.

The Fund flow from the centre to the states remains an issue of concern. RMSA headquarters releases money in phases with the bulk of it coming very close to the end of the financial year. The implementing partners PWD and RDD will not commission any work until they get an advance of 50%. Conversely it was reported that securing utilisation certificates from PWD and RDD takes a long time and this information then needs to be communicated through state to central government. The combination of delays in financial provision from the centre and delays in utilisation certificates from the State create problems for cash flow and risk in accounting. Thus at any one time there is imperfect knowledge of what has been done and what has been paid for. Further it is not clear how interest accrued from the large sums of advance money lying unutilised in the bank is handled.

There appeared to be much greater interest and attention on construction than on maintenance. . One of the schools the team visited was struggling to get their Library repaired for a couple of years, with no luck. Moreover the funding for repair and maintenance as offered by RMSA seemed to bare little relation to school size and need – rather a fixed amount.

Recommendations:

For State:

1. The state should carefully consider its civil works needs beyond applying a crude 5 km rule. The mission visited excellent schools in urban areas that were required to run double shifts because of over demand (thus warranted additional classrooms or even brand new schools). Conversely the mission was informed of a school upgrading for 7 students was being proposed. Given the chronic shortage of teachers, and the significant recurrent expenditure of teacher costs (typically 80% -90% of education costs) a more holistic view – which connects - enrolment, teacher deployment and

utilisation, and student performance (students cannot be expected to excel if they do not have access to a qualified subject teacher). Tripura should consider a radical plan of consolidation and rationalisation together with alternative approaches to give its students the very best chance of not only having school buildings but schools in which there are teachers and learning takes place.

2. The RMSA society needs to get a better understanding of civil works progress from PWD and RDD level. It should follow up as a matter of urgency on utilization certificates for previously released money is received before any further monies are released. It should also clarify how interest is being treated.
3. The RMSA may consider inserting penalty clauses for missing deliver deadlines, standards and delayed issuing of utilisation certificates with implementing agencies.

For GOI:

1. RMSA should consider additional measures which incentivizing states which adhere to deadlines for utilisation certificate return and speedy completion of civil works and penalises laggards..
2. At the national level RMSA could set the example by ensuring timely release of funds at the start of the financial year.
3. Work is needed to build greater flexibility into RMSA norms and financing which facilitate flexibility while retaining proper financial due diligence. More sophisticated and needs based norms are urgently required which give more option for localised solutions.
4. One possible way is to allow states to present any deviation from the plan (submitted in April) at the end of 6 months to enable midterm corrections. In addition RMSA may consider a bottom up planning process with possible limitations on the budget, while being flexible within (under line items) it.
5. **Any additional observations/comments not included in the above sections**

The SCERT expressed concern that it has neither the financial or technical resources to deliver annual census based SLAS for all levels of education as mooted by MHRD at the opening of the 7th JRM. It stated that the NAS and SLAS findings providing a consistent picture. There would be little additional to be gained by annual census and further the statistical reliability of the IRT based approach of NAS could be compromised. Further it would be very unlikely that any change in learning outcomes would be seen on an annual basis and the three year cycle is adequate for tracking change. It was felt a better use of SCERT resources was ensuring proper response to the findings of NAS state reports and ensuring appropriate remediation strategies were put in place, monitored and adjusted as needed to maximize impact.

Overall the mission was struck by the considerable efforts being made in collecting data through UDISE, GIS, NAS, SLAS, School Mapping. However there was little 'read across' between the various data collection activities –e.g. schools were not using UDISE data while preparing School Development Plan and overall development of the school. Overall it appeared that data collection was a mechanical process and little effort was being made to analyse and use findings to inform strategy and guide funding based on needs. The verification of UDISE data seems mechanical and officials are not aware with the findings and use of the verification results.

A good example of this is the school development plan –SDP which could be the guiding document for identifying individual school needs. Overall the quality of SDPs was deemed low and this is perhaps not surprising as all involved know the SDPs are of little significance. No evidence was seen of their use and there appeared to be no 'guardian' of the SDP in the DEO office. Rather than responding to school needs as articulated in the SDPs financing appeared to be driven by the funding options as defined by RMSA funding pro-forma. For example while many schools needed support with ICT expenditure this was not an option under RMSA so bids were put in for excursions, book fares and science kits which RMSA did treat as eligible. There is a real opportunity for RMSA to incentivize and stimulate real needs based planning through reform of its financing norms and operational procedures.

It was noticeable that schools reporting high % pass rates at state board exams were also only entering those students whom they were confident would pass. Those who were thought unfit to pass were re-admitted back into grade 9. This potentially has a distorting effect on education statistics in at least two ways (i) implying a more efficient system in taking students to grade board exam pass in two years than actually exists (ii) potentially skewing the rates of transition from grade 8 to 9.

The IEDSS programme (now integrated within RMSA) appears to operate as a stipend only programme for identified CWSN. There does not seem to be any expenditure on systemic reforms to make the education system more CWSN friendly such as employment of specialist teachers or development of specialist units to support such children. This may be as intended but MHRD may wish to consider developing a broader and costed policy on systemic reform of the education system to make it more supportive of CWSN but which recognizes the realities of a limited resource envelope.

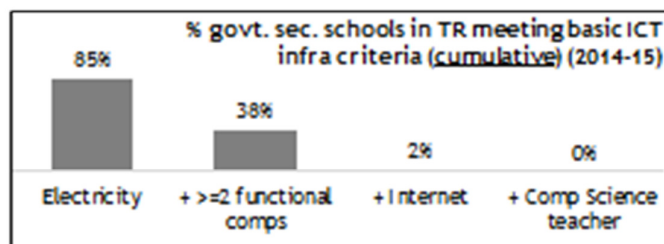
Annex 1: Itinerary followed and Persons met

JRM Visit

Date	Place of Visit	Persons met
12.04.2016	Agartala Airport	1. N. Adhikari, Jt. Secretary & Nodal Officer 2. Nikhil Biswas, ASMD, RMSA & Nodal Officer 3. Rita De Chowdhury, Liaison Officer 4. Prabir Mallik, Liaison Officer 5. Md. Selim, Liaison Officer 6. Narayan Debnath, Liaison Officer 7. Ajoy Choudhury, Coordinator
	Sishubihar HS School,	1. Nibir Sen, HM 2. Parthapratim Acharjee, AHM
	Tulsibati HS School	1. Subir Chouhan, HM
	Chowdhuribari Girls HS School, HM / AHM	1. Ratan Kr. Debnath, AHM 2. Krishna Dhar, PGT(Eng)
	Taidubari Girls Hostel	1. Daniel Jamatia, Hon'ble MLA 2. Laxman Das, DEO, Gomati 3. Atul Bikash Chakma, AHM
13.04.2016	Mariamnagar Church	
	Udaipur Temple	
	SCERT	1. D.K. Debbarma, Addl. Director, SCERT & Other Officers
	RMSA State Office,	1. N. Biswas, Jt Director 2. Prabir Mallik, OSD 3. Ajoy Choudhury, Coordinator
15.04.2016	Akhalia Charra High School	Bipul Debbarma, HM
	Kalagachia High School	Nikhil Bhowmik, Teacher In-charge
	Tarapur High School	Kamal Chakraborty, HM
	Fatikcharra High School	Krishna Kr. Paul, Teacher In-charge

Annex 2: World Bank Analysis of ICT infrastructure and Maths & Science teacher availability in secondary schools in Tripura.

Tripura's secondary level ICT infrastructure is very poor, especially for govt. schools. Only 1 govt. sec. school meets a basic set of ICT infra. criteria, while 100 govt. sec. schools (12%) meet none.



- Govt. sec. schools in TR have inferior ICT infrastructure than all sec. schools
- 1 in 50 govt. sec. schools have Internet, just over 1/3rd have >=2 functional comps, and only 5 (1%) have a CS teacher.
- TR's 18 girls' only sec. schools have better ICT infra. than all sec schools (except CS teacher)

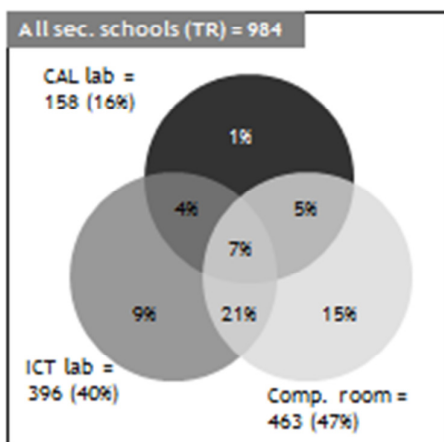
Infra criterion	All sec.	Govt. sec	No. of govt. sec. schools in TR not meeting criteria ¹
Electricity	87%	85%	126 ²
Internet connection	7%	2%	791 ²
>=2 functional comps	42%	38%	539
Comp. Science teacher	1%	1%	831 ²

• ICT infra. in TR is better in HS schools than in sec. schools (except CS teacher availability)

Note: a secondary school is any school with at least classes 9 & 10

(1) In 2014-15, there were 867 govt. sec. schools in Tripura (2) Counts only specific "No" responses for the criterion ("Not Applicable" and other responses are ignored) (3) Counts schools with zero CS teachers (schools with missing data on the criterion are ignored).

7% of sec. schools in TR have a CAL lab, an ICT lab and a Computer room, while 38% have none of the three¹. The purpose of / need for having 2 or more of these facilities (36% of sec. schools) is unclear.



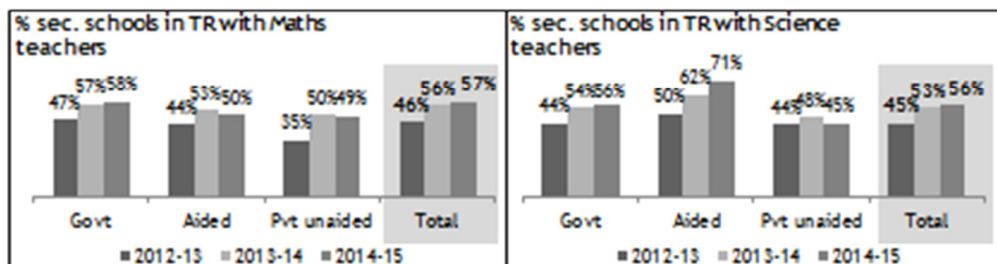
Infra criterion	All sec	Govt sec	No. of govt. sec. schools in TR with no ICT facilities
CAL lab	16%	13%	746
ICT lab	40%	42%	487
Comp room	47%	42%	488

- ICT labs and Comp rooms are much more common than CAL labs in sec. schools in TR
- Yet each of the 3 ICT facilities is available in less than half of TR's sec. schools
- 60% of all sec. schools in TR have at least 1 of the 3 facilities, while 36% have 2 or more facilities

ICT labs / CAL labs / Computer rooms are all much more commonly available in higher secondary schools in TR than in secondary schools.

(1) Counts schools that specifically say "No" for availability ("Not Applicable" and other responses are ignored)

Availability of Maths & Science teachers in sec. / govt. sec. schools in TR improved from 2012-14 (by 8-10pp) and then plateaued. Yet only just over 1/3rd of schools have teachers for both subjects.



- In TR, subject teacher availability is quite similar in govt. sec. and all sec. schools, but availability in sec. GOSS is much better for Science (72%) and much worse for Maths (39%)

- 62% of sec./govt. sec. schools have no teacher for at least 1 subject

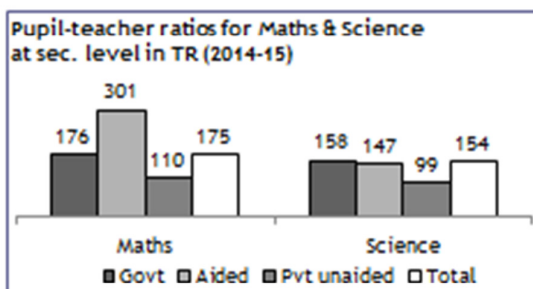
- 18% of sec. schools and 17% of govt. sec. schools are without teachers for both subjects

% sec. schools in TR with both Maths & Science teachers (2014-15)

Government	34%
Aided	44%
Unaided	29%
Overall	34%

NOTE: less than 1% of sec. schools in TR offering Arts / Commerce / Science streams are without a HS section, suggesting that the streams are offered by the HS section of these "sec." schools. Data on stream availability in the 2014-15 Flash Statistics is thus misleading, since it considers all sec. schools (with or without a HS section)

Tripura's sec. Maths PTR is higher than all-India PTR, and Science PTR is lower. Govt. sec. PTRs are higher than all-India govt sec PTRs for both subjects. Science teachers are poorly qualified in Science.



% sec. schools in TR with 0 subject teachers		
2014-15	All sec. schools	Govt. sec. schools
Maths	39%	39%
Science	40%	40%

Note: Subject PTR = Total sec. enrolment in TR (by mgmt. type) / Total sec. teachers of subject in TR (by mgmt. type). School-level PTR is distorted by 0-teacher schools, hence PTR is estimated for the state as a whole.

- Over 1,600 sec. teachers in TR (32%) teach either Maths or Science; 183 (4%) teach both¹

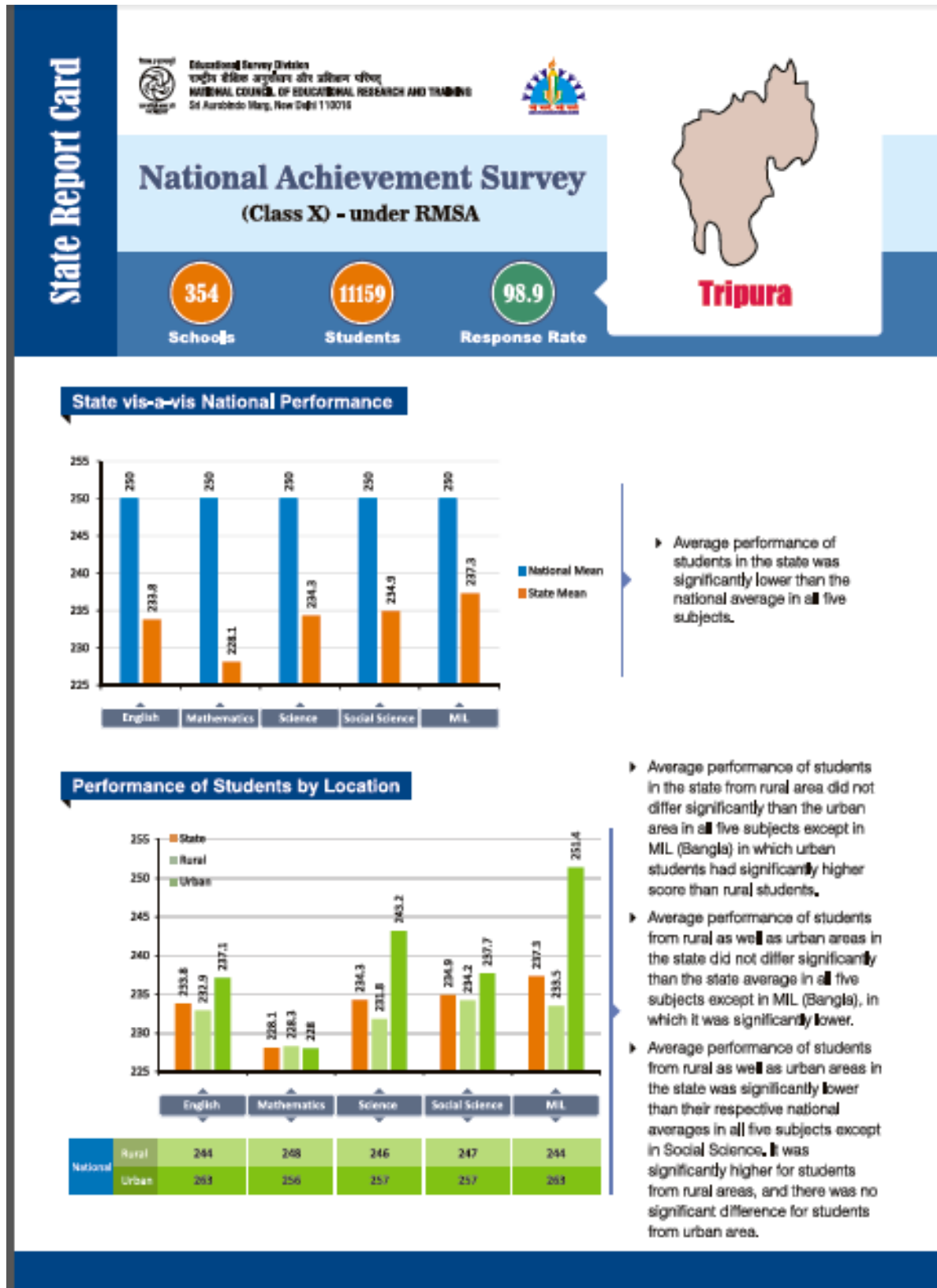
- Only 66% of Maths teachers / 9% of Science teachers have studied Maths/Science beyond HS

- Teachers in govt. sec. and all sec. schools in TR are similarly qualified (academically and professionally²); those in girls' only sec. schools are more qualified

(1) Hence there is some (small) double-counting of teachers in estimating PTRs for Maths and Science

(2) Academic qualification refers to % teachers who have studied beyond high school; Professional qualification refers to % teachers holding B.Ed., M.Ed. or equivalent degrees

Annex 3: Tripura NAS Grade X: State Report Card



State vis-a-vis National Performance



Subject	National Mean	State Mean
English	250	233.8
Mathematics	250	228.1
Science	250	234.3
Social Science	250	234.3
MIL	250	237.3

- ▶ Average performance of students in the state was significantly lower than the national average in all five subjects.

Performance of Students by Location

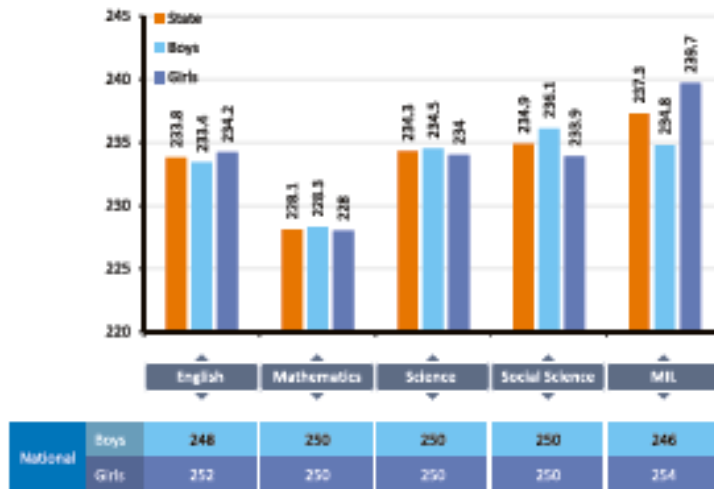


Subject	State	Rural	Urban
English	233.8	232.9	237.1
Mathematics	228.1	228.3	228
Science	234.3	231.8	243.2
Social Science	234.3	234.2	237.7
MIL	237.3	233.5	251.4

	Rural	English	Mathematics	Science	Social Science	MIL
National	244	248	246	247	244	
Urban	263	256	257	257	263	

- ▶ Average performance of students in the state from rural area did not differ significantly than the urban area in all five subjects except in MIL (Bengla) in which urban students had significantly higher score than rural students.
- ▶ Average performance of students from rural as well as urban areas in the state did not differ significantly than the state average in all five subjects except in MIL (Bengla), in which it was significantly lower.
- ▶ Average performance of students from rural as well as urban areas in the state was significantly lower than their respective national averages in all five subjects except in Social Science. It was significantly higher for students from rural areas, and there was no significant difference for students from urban area.

Performance of Students by Gender



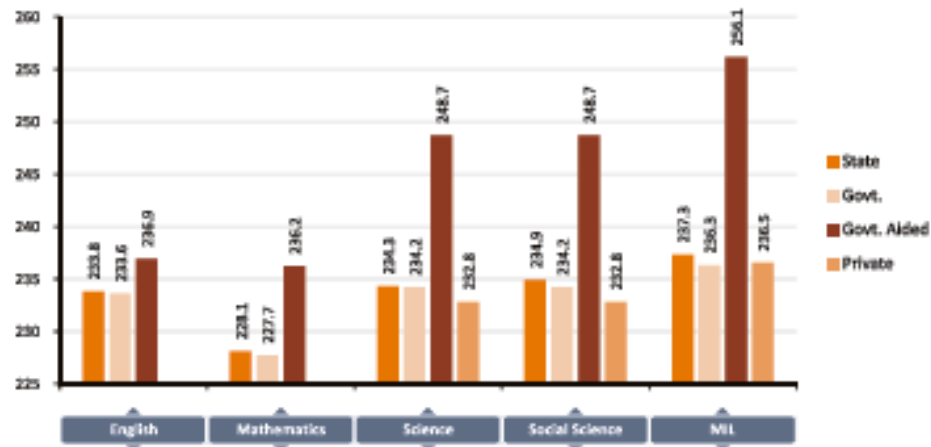
- ▶ Average performance of girls did not differ significantly than boys in the state in all five subjects.
- ▶ Average performance of girls as well as boys in the state do not differ significantly than the state average in all five subjects.
- ▶ Average performance of girls as well as boys in the state was significantly lower than their respective national averages in all five subjects.

Performance of Students by Social Group



- ▶ Average performance of students from different social groups (SC/ST/OBC/GEN) in the state did not differ significantly amongst themselves in all five subjects except in Social Science and MIL (Bangla). It was significantly lower in Social Science for students from ST group than students from general group and in MIL (Bangla), it was significantly higher for SC, students from OBC and general groups than students from ST group.
- ▶ Average performance of students from different social groups in the state did not differ significantly than the state average in all five subjects except for students from ST and OBC groups in MIL (Bangla). It was significantly lower than state average in case of student from ST group and significantly higher in case of students from OBC group.
- ▶ Average performance of students from different social groups in the state was significantly lower than their respective national averages for students from General Groups in all five subjects; students from SC group in English and Mathematics; In case of students from SC, ST in Mathematics, Social Science and MIL (Bangla) and OBC group in English, Mathematics, Science, and Social Science.

Performance of Students by School Management



National	Govt.	236	239	239	238	235
	Govt. Aided	246	249	248	248	252
	Private	277	269	270	271	269

- ▶ Average performance of students from different school managements (government/government aided) in the state did not differ significantly amongst themselves in all five subjects except in MIL (Bangla). It was significantly lower for students from government schools than students from government aided schools.
- ▶ Average performance of students from different school managements did not differ significantly than the state average in all five subjects except MIL (Bangla).
- ▶ Average performance of students from different school managements was significantly lower than their respective national averages for students from government schools in Mathematics.

Distribution of Students by Score Range

SUBJECT		0 - 32%	33 - 44%	45 - 59%	60 - 74%	75% & above
English	State	38	45	17	1	0
	National	35	32	21	8	5
Maths	State	43	38	15	4	0
	National	45	31	18	5	1
Science	State	39	30	23	5	3
	National	43	28	18	8	3
Social Science	State	30	28	27	9	5
	National	32	28	24	11	5
MIL	State	21	18	26	30	5
	National	22	16	28	23	10

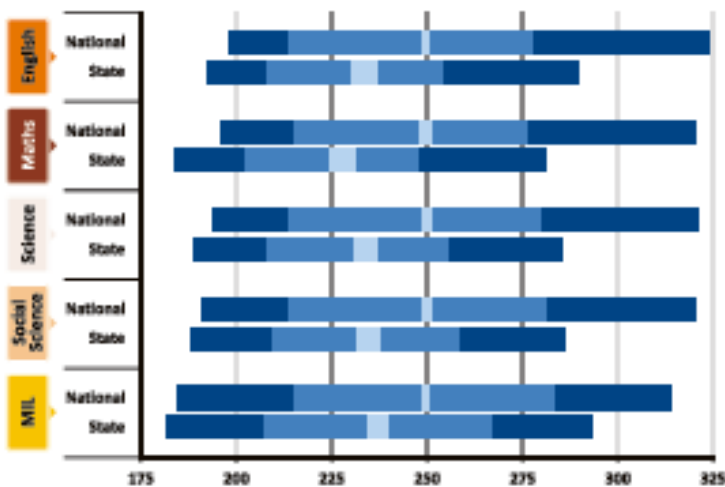
- ▶ About more three fourth students in English, Mathematics and Science, more than half students in social science and almost one third students in MIL were towards lower end of the state.
- ▶ In the state the largest proportion of students scored 0-32% in all the subjects, in Mathematics and Social Science. It was higher for MIL in the score range 60% - 75%.

Competency wise Performance of Students (in item of % correct)

Subject	Competency	National	State
English	Reading Comprehension	41	35
	Language Elements	41	38
Mathematics	Number System	37	31
	Algebra	39	31
	Coordinate Geometry	39	31
	Geometry	43	38
	Mensuration	39	38
	Statistics, Probability & Data Handling	40	33
	Trigonometry	36	37
Science	Physics	40	37
	Chemistry	42	36
	Biology	43	42
Social Science	History	35	29
	Geography	50	51
	Economics	48	41
	Political Science	47	43
MIL	Reading Comprehension	53	62

- ▶ Competencies with less than 33 percent correct were in Number System, Algebra, Coordinate Geometry (Mathematics) and History (Social science) in the state.
- ▶ The difference between per cent correct the national and in the state is more than 10 in Reading Comprehension competency (MIL) only.
- ▶ In not a single competencies in any of the five subjects percent correct in state were higher than percent correct in state except MIL (Bangla).

Percentile Distribution of Students Performance



- ▶ The range between 90th and 10th percentile in MIL is more than 100 in the state. This indicates that there is a large variation between high and low achieving students.
- ▶ The distribution of scale scores are statistically significant between the state and the nation in all the subjects.
- ▶ There are a large variations of scale score between state and nation at 90th percentile scale scores in all subjects.

STATE NEEDS TO FOCUS ON:

- Achievement in all five subjects.
- Achievement levels of boys and girls; students from rural and urban areas except Social Science as rural areas all categories (SC/ST/OBC and general) all management schools.
- All competencies in all subjects specially Number System, Algebra, Coordinate Geometry (Mathematics) and History (Social Science).

Annex 4: Summary of school upgrade requests in Tripura AWPB 2016/17

<i>School name</i>	<i>Enrolment</i>			<i>Distance from nearest Govt / Govt aided secondary schools</i>
	<i>Boys</i>	<i>Girls</i>	<i>Total</i>	
<i>Vivekananda</i>	32	21	53	4km
<i>Patichari</i>	11	12	23	4km
<i>Taikumba</i>	7	15	22	12 km
<i>Madhya Krishnaganagar</i>	14	12	26	4 km
<i>Chalita Bankul</i>	15	10	25	5 km
<i>Upendra Roaja</i>	10	10	20	8km
<i>Purba Bulongbasa</i>	20	7	27	6km
<i>Ratan Mani Para</i>	15	8	23	6 km
<i>Much Kimbir</i>	15	9	24	4 km
<i>Keori Bari</i>	6	1	7	8km
<i>Purba Hurua</i>	11	16	27	3 km
<i>Hemsukla</i>	10	11	21	5 km
<i>Konaban</i>	15	20	35	4 km
<i>Aralia</i>	12	16	28	4 km
<i>Mayong Bekereng Kusum</i>	15	9	24	5km
<i>Biladhan Reang (Chow)</i>	12	2	14	10 km
<i>Bagma</i>	11	19	30	4 km
<i>Gamakobari</i>	4	10	14	5 km

State Report: Uttar Pradesh

7th RMSA JRM (April 11-23, 2016)

6. Introduction

The JRM team visiting Uttar Pradesh for the 7th RMSA JRM (April 12-16, 2016) comprised of the JRM members: Mr. Ajit Patnaik (GOI representative), Mr. Pranav Kothari (GOI representative), Dr. S K Chaudhuri (EU representative) and Ms. Sangeeta Dey (World Bank representative). The team visited two districts- Meerut and Muzzaffar Nagar and three schools in each district. The team also visited the DIET in Meerut district and a school in Lucknow. Following the district visits, the team received a state briefing on the UPMSA program at the State Project Director's Office in Lucknow chaired by the Principal Secretary cum SPD, UPMSA, Mr. Jitendra Kumar. (The itinerary is attached in Annex 1).

The team would like to thank the Principal Secretary, School Education, cum UPMSA State Project Director, Director, Secondary Education, Jt. Directors, Mr. Pandey and Mr. Nautiyal, the state UPMSA team, the district officials of Meerut and Muzzaffarnagar, the CDO of Meerut district met with during the field visits, the Principals, teachers and students of the schools visited for extending their cooperation, support and the warm hospitality during the state visit. The JRM is very appreciative of the full participation of the UPMSA teams at the state, districts and the schools despite the two holidays in the middle of the mission visit.

7. Overview and Key Issues on RMSA Implementation

Progress till date: The state has a GER of 72.6% (2015-16) at the secondary level. Close to 85% of habitations have access to a secondary school (of the total 24291 schools, approx.73% of secondary schools are unaided, 19.5% are government aided and 7.5% are government aided). The GPI is 1.01 as is the national average. The transition rate is 87%. The state has recognized that the transition rate from class 8 to 9 has to be improved significantly and is placing special focus on community mobilization efforts in 5 districts with the lowest transition rates with the support of UNICEF. The construction of 104 girls' hostels has started. The state has raised a concern about the lack of funding provision for cooks and security guards in the hostels, which will make it difficult to run them.

Achievements: The state has partnered with many civil society organizations to bring training and holistic education to the children. In most of these cases, the organizations have brought their own funding which is good.

- NCC training for girls and boys: The JRM saw evidence of this in minimum 3 schools and visited one school where it got a demonstration of the shooting capabilities of many of its students.
- Judo Training for girls in partnership with the Judo Association. This is good given the fact that this is helping children learn self-defense. The state plans to invest and scale this initiative further.

- Life skill training program for secondary school students is being carried out in partnership with UNICEF
- The Aurobindo Society has conducted in-service training for master trainers and teachers on spreading awareness about the innovative practices used by teachers to make learning easy for students. The Zero-Investment Innovations on Education Initiatives (ZIEI) has been launched by them to gather innovative ideas and practices from teachers, and in future compile them in a compendium and share them with other teachers in print.
- Unnati is an Initiative of IL&FS to help improve functional English speaking skills of class 9 and 10 students through a 3 month course which is being conducted in 100 schools.
- The Kusuma Foundation is supporting 25 secondary schools in Hardoi to improve math, science and English skills for secondary students through 6 month bridge courses and has also helped the state prepare training modules for SMDC training and conducted training for them.

These initiatives are supporting the state government to strengthen the holistic development of students and the JRM appreciates the openness and progressive thinking of the state government to promote these supportive partnerships.

Concerns:

- Learning outcomes of children are very low – majority of the children at the 10th grade level are not able to read with comprehension. When asked to read a passage from their textbook or other similar books from the library, children are able to decode and speak words aloud but are not able to understand what they just read. Comprehension of the passage and interpreting the meaning even in their own mother tongue language is a challenge. Writing a few lines based on the passage that they just read is an even bigger challenge for children.
- Libraries are rarely used by kids – although schools show that they have many books – but these are behind locked cabinets – books are rarely lent out to children and they are not encouraged to read. In certain cases, the library room is repurposed to be a staff room, waiting room or in certain cases a pantry.
- The number of teacher vacancies is high (at 44%). Math/ science teacher availability is poorer than the all India average (57%/53%). 72% of secondary schools and 74% of government secondary schools are without a teacher for at least 1 of the two subjects (math and science). And more than half of the secondary schools are without a teacher for both subjects. This makes the PTR for math very high at 552:1 for all secondary classes (government secondary schools-322:1) and for science at 669:1 (in government secondary schools-300:1)
- Only 36% of math teachers and 18% of science teachers have studied math/science beyond higher secondary (At the All India level only 57% of math

teachers and 22% of science teachers have studied math/science beyond Higher Secondary) [Source: UDISE 2014-15]

- The state is in the process of teacher recruitment.

Recommendations:

- *For State:* Teacher recruitment needs to be given a high priority and completed within the committed timelines. An online counseling system may be considered for fair and transparent deployment and to make the process efficient.
- *For GoI:* The teacher recruitment test for secondary school teachers should ensure that there is a written test that comprises of the following sections:
 - General skills such as communication, intelligence, general awareness and basic ability in Maths and Science, knowledge of student errors
 - Subject content knowledge: in-depth content specific to their chosen subject expertise
 - Pedagogical skills: This is a combination of general pedagogic skills as well as specific to their subject area (eg. Maths, Science, EVS, etc)

8. Focus themes for this JRM

a. Use of ICT in Secondary Schools:

Achievements: The State has conducted two rounds of procurement of ICT in its schools. In the first round in 2009, a five-year BOOT model was signed with a service provider. The computers are outdated at the time of the visit in 2016 and many are dysfunctional but no efforts have been made to upgrade the computers in these schools. The ICT tender included provisioning of 10 computers, a scanner and a printer. The number of computers per school is regardless of school size – in one particular instance the JRM visited a school with enrollment of 800+ in grades 6-12 but had only 8 working computers.

Concerns:

- Many of the schools under the ICT scheme do not have computers yet based on our visit.
- Even where children are using computers they are mainly doing Paint, Word, etc. One particular govt. aided school was found to have internet with at least 2-3 grade 11 children proficient with doing Google search in Hindi – this needs to be the norm for secondary classes also.
- There is no use of ICT for subject specific learning –such as Maths, Science, Social Studies, etc.
- Per the UDISE 2014-15 data, only 55% of government secondary schools have electricity and 11% of govt. schools have electricity and internet connection.

- New RMSA schools have built computer rooms and have received furniture – but not the computers. 1 school observed converted it to Library (which is good use of infrastructure) while another school had just stacked the tables and locked the room.
- Despite rapid advances made in computers the syllabus covers outdated topics such as floppy disk, etc. Among the students who are getting ICT coursework and access to computers, only 2 students knew about Google!

Recommendations:

- *For State:*
 - Unlicensed Microsoft software was found in schools – or old versions were being used. Recommendation to use latest open source software such as Open Office. An even stronger recommendation is to find software that is helpful for subject specific learning.
 - Overall recommendation for giving 40 desktop computers per school (in the ratio of 1:10 with enrollment)
- *For GOI:*
 - In this day and age computers and internet need to be given as much importance as the provisioning of classrooms, tables and teachers. It is ironical that the emphasis on vocational training has been without the use of computers and Internet. In many ways all modern jobs will extensively use technology. This needs to be given the #1 priority and funding needs to be allocated towards the same.
 - ICT for subject specific learning needs to be the most important focus of ICT. There exist many proven models that ICT can help with basic reading and Math of students as strong foundational courses.
 - The curriculum needs to be dynamic and need not be extensive. Identify and procure software that helps children learn basic Maths and Reading as well as exploratory use of Internet.

b. Math and Science teaching:

Subject Choice in secondary schools: The curriculum at secondary includes five core subjects but there is variation across schools in options between math and home science (for girls). Agriculture and commerce are also offered as subject choices in some schools.

Concerns:

- Principals and teachers feel majority of their class 10 students would be able to read and comprehend fluently as well as do basic Math & Science that is up to class 10 knowledge; however in practical observations this was not the case and children struggled with even class 5 material.

- Learning outcomes does not occupy much mindspace with principals, they are more concerned about cleaning, construction, administration, enrollments, etc.
- Principals request for more building construction rather than teacher training, etc.
- No subject specific teacher training done since 2012-13. 2015-16 training has been limited to inspiration/motivation conducted by the Aurobindo Society
- Teachers obsess more with completing the syllabus predominantly so that students do well in the Board exam, not realizing that it is virtually impossible to teach Grade 10 material when children do not have strong foundations. Teachers may end up teaching to a few select students and focus on them rather than teaching to where the majority gap is. Typically the primary school from where they come from and the no-detention policy are blamed and used as excuses.
- Subject choices –Students (girls) who do not opt for math at the secondary, maybe losing the opportunity to have foundational skills in basic concepts of math.
- Following are some observations from a random sample of children during the visit studying in Grade 9/10 in Maths
 - Children are able to do single digit multiplication, many are able to do 2 x 2 digit but make mistakes (such as carryover, etc)
 - Children are not able to do 4th grade simple subtraction of fractions (eg. $\frac{2}{3} - \frac{1}{7}$)
 - Children are not able to do 5th grade multiplication of decimal (eg. 2.09×4.3)
 - Children are not able to 4th grade division (eg. 4202 divided by 16)
 - Examples of student work are attached in Appendix 2
- Following are some observations made of children studying in Grade 9/10 in Science – overall conceptual understanding is very weak
 - In certain questions asked it was discovered that children think that crumpling a paper increases the weight of the paper
 - In other questions they were not able to explain the practical example of air resistance when two objects are falling
 - Practical knowledge - such as an everyday example of how to compare the weights of two objects through the use of measuring instruments was non-existent.
 - Most of the Science labs were limited to having certain specimens of objects in glass jars with a lot of dust

Recommendations:

- *For State:*
 - Create a small research team at the State level (group of 5-10 of the best subject teachers) to solely focus on student misconceptions, difficult concepts and how to tackle these learning gaps, creating teacher resource material that helps teachers be aware of how their students think with suggestions on how this can be remediated in the classroom

- Provide on-demand (via Internet, WhatsApp, etc) subject-specific and concept-specific teacher training (videos, audio clips, reading material)
 - Create a simple one page sheet that allows visiting officials and inspectors to directly interact with children and check their learning levels
 - Skills of scientific inquiry and logical reasoning need to be strengthened
 - Maths and Science subjects need to have a higher component of practical knowledge – by exploring multiple everyday nature objects often found within the school environments
 - Use of science labs and experiments need to be encouraged (rather than preserving every equipment that has been received)
- *For GOI:*
 - Provide a list of vetted computer based programs that allow children to learn various Mathematical and Scientific concepts
 - Conduct a nationwide campaign on the importance of Maths and Science along the lines of Swachh Bharat Abhiyaan that helps all stakeholders take this up as an important subject.

c. Status of pending civil works:

Achievements: Till date, the state has received approval to construct 1,504 new schools of which 968 schools (64.4 per cent) have been constructed and operationalized, while the civil works of 278 schools (18.5 per cent) are in progress (*Table 1*). Pending release of funds by GoI, civil works for the remaining 258 schools (17.1 per cent) have not yet commissioned.

Table 1: Progress in civil works during 2009-10 to 2015-16

Civil works	Completed	In-progress	Not started	Surrendered ^a	Total
New school	968	278	258		1,504
ACR	728	155	-	60	943
Science lab	80	1	-	22	103
Computer room	133	5	-	7	145
Art/craft room	314	20	-	26	360
Library	269	10	-	25	304
Toilet	85	-	-	50	135
Drinking water	30	-	-	52	82

Girls hostels	-	104	-	87	191
^a The civil works (excluding girls' hostels) sanctioned in 2013-14 and 2014-15 have been surrendered. The state is also proposing to surrender construction of 87 girls' hostels sanctioned in 2010-11.					

The status of other civil works has been as follows. Of the sanctioned numbers, civil works have been completed for 728 additional classrooms (77.2 per cent), 80 science labs (77.7 per cent), 133 computer rooms (91.7 per cent), 314 art/craft rooms (87.2 per cent), 269 library rooms (88.5 per cent), 85 toilet blocks (63.0 per cent), and 30 drinking water facilities (36.6 per cent). However, several civil works sanctioned in 2013-14 and 2014-15 (*viz.* construction of 60 additional classrooms, 22 science labs, 7 computer rooms, 26 art/craft rooms, 25 library rooms, 50 toilet blocks, and 52 drinking facilities) could not be executed since government agencies were not ready to accept low unit costs that were set in 2010-11. The state has now included those civil works in the current year's budget proposal at revised rates.

The construction of girls' hostels in backward districts has not progressed. In 2010-11, construction of 141 girls' hostels was approved of which works have commenced for 54 hostels. The state is now proposing to surrender construction of the remaining 87 hostels since no government agency is ready to undertake works at low unit costs set by GoI. The state has also initiated construction of 50 girls' hostels sanctioned in 2015-16.

Concerns:

- The government agencies in UP are not ready to undertake construction works at low rates set by GoI, which has caused surrender of some approved works (*Table 1*). The construction works also got delayed due to non-release or delayed release of funds by GoI.
- Civil construction of a new school takes much longer period than the period agreed in MoU. For instance, civil construction of schools in two districts that started in 2011-12 were completed over a longer period, ranging from 25 to 33 months from the date of release of first instalment by DPO. According to MoU, works should have been completed within 9 months from the date of release of the first instalment.
- Some schools have complained about poor quality of construction materials.

Recommendations:

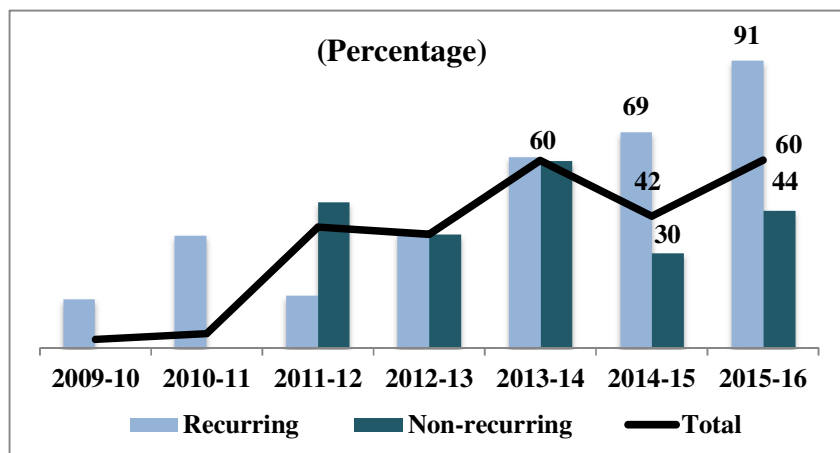
- *For State:*
 - SPO may develop an on-line tracking system to monitor physical and financial progress of the construction works. It is also desirable that such system regularly captures feedback from the concerned schools regarding quality of civil works.
 - It is recommended that the task force inspect and certify quality of materials at site.
 - The state may consider commissioning a post-procurement audit of civil constructions undertaken till date.

- For GOI:
 - MoHRD is required to arrange immediate release of GoI share of funds to the state for initiating civil works for 258 schools and 104 girls' hostels.

Financial management and procurement

Progress till date: The state's utilization of RMSA funds was 60 per cent in 2013-14, which dipped to 42 per cent in 2014-15 and then again scaled up to 60 per cent in 2015-16 (*Figure 1*)⁶. Thus, overall funds utilization has remained low, mainly because of underutilization of non-recurring funds. While utilization of recurring funds has steadily increased and touched 91 per cent in 2015-16, use of non-recurring funds (mainly for civil construction and furniture procurement) declined sharply from around 59 per cent in 2013-14 to 30 per cent in 2014-15, and then improved to 44 per cent. The issue related to civil construction as discussed earlier underpin poor utilization of non-recurring funds.

Figure 1: Utilization of RMSA funds



A quick tracking of funds flow from GoI to school level reveals significant delays at different layers of administration. For instance, in 2015-16, GoI released funds to the state after first quarter, and funds reached SMDC *via* SPO and DPO *six months* thereafter (*Table 2*). In other words, SMDC receive school grants in the fourth quarter. In anticipation of such delay in grants receipt, SMDC has adopted an unhealthy practice of 'procuring in advance and paying later'. Furthermore, due to routing of GoI funds through treasury system, SPO receives GoI share of funds two months after the receipt at the state level. There is an urgent need to look into all the factors impeding the funds flow at every level, including transfer of funds through treasury system.

⁶ See Annex 3 for details.

Table 2: Illustrative tracking of funds flow (2015-16)

Release by GoI	Release by GoUP	Received by SPO	Received by DPO	Received by SMDC	Period
20.7.2015	27.8.2015	12.10.2015	06.01.2016	25. 01. 2016	6 months
Source: SPO			Source: DPO	Source: SMDC	

The state is faced with shortage of AAO at district level, with 40 (53 per cent) vacant posts. In some districts, AO of secondary education have given additional charge of AAO. The district AAOs are on deputation and they are having accounts and financial management skills. But, their felt need is to get advanced training on the subject, and a chance to interact with accounts staff in other states and learn best practices. All DPOs currently have assistant accountants.

Financial management at SMDC level is reasonably good *albeit* there are a few issues (discussed later). Clerical staffs properly maintain ledger, cashbook, and stock registers, and they also carry out bank reconciliation annually. The clerical staffs are not trained in accounts, but they receive necessary guidelines and support from AAO/AA.

Procurement process has been decentralised in the state. For civil construction, GoUP prepares a list of state agencies and hand over the list to the districts. In each district, DM selects agencies for civil works. Regarding procurement of furniture, DPO follows RMSA guidelines for procurement through tendering process. However, DPOs have not adopted e-tendering system although SPO has adopted it for state level procurement.

Concerns:

- There are significant delays in funds flow at GoI/state/district levels.
- Shortage of AAOs at district level.
- Electronic system (RTGS) is used for funds transfer, but the Mission noticed transfer of funds to SMDC by DPO in one district during 2015-16 due to some specific reasons.
- SMDC does not maintain stock issue register and conduct physical stock verification annually. The bank reconciliation is done annually instead of monthly or quarterly. SMDC also follows an unhealthy practice of procuring goods in advance and making payments later.
- There is no internal audit cell as required under terms and conditions of RMSA.
- SPO is not currently preparing action taken report based of statutory audit observations.

Recommendations:

- *For State:*
 - The state needs to take suitable measures to expedite release of funds to DPO/SMDC.
 - The vacant posts of AAO may be filled up at the earliest.
 - DPO needs to strictly follow RTGS for transfer of funds to SMDC. A directive may be issued by SPO to this effect.
 - SMDC may be advised to maintain a stock issue register and conduct physical stock verification. The Principal may nominate two teachers for conducting stock verification and a certificate to that effect may be recorded.
 - A centralised peripatetic internal audit wing may be created. Alternatively, local fund auditors may be engaged to conduct internal audit. The Mission would prefer the first option.
 - The SPO is urgently required to prepare an action taken report based on the observation of external audit conducted in 2014-15 and submit a copy to MoHRD.
 - Suitable training and exposure visits may be organised for AAOs and FC

- *For GOI:*
 - MoHRD needs to take all possible steps for timely release of funds.
 - There is also a need to revisit the system of transferring GoI share through treasury system. The key question is whether use of treasury route has improved financial accountability.

9. Any additional observations/comments not included in the above sections:

Vocational education

Progress till Date: The implementation of vocational education in secondary schools was launched in September 2105. The state is in the process of introducing vocational education (VE) in 100 schools with four VE courses: retail, security, IT and automobile repair/servicing. The team interacted with students of class 9 undergoing the retail and IT courses in one government girls' intercollege (classes 6 to 12) in Lucknow. There are three VE service providers: Vision India, Times Pro and Udyamita Vikas Sansthan. Principals of these schools have been trained by the PSSCIVE, Bhopal. VE is being taken up as an additional seventh subject in the state at the secondary level.

The state expressed concern about the inflexibility in the types of courses being offered, as they do not take into account the local crafts and family businesses. For e.g. in UP, zardozi, chikankaari and the brass industry are traditional crafts skills of which are passed on through generations. The suggestion from the state for PSSCIVE is to include craft specific VE courses can help the current generation of students learn modern techniques and marketing skills to enhance the value of these local craft businesses.

Concerns: The students have had very few visits to the relevant industry /workplaces in their practical course, e.g. Big Bazaar for the retail course. One service provider – Times Pro honestly admitted that it was not able to take students to any industry visits during the 6 months of offering the course from September to March. At the time of the JRM visit in April, these students had already finished Grade 9 and had graduated to Grade 10.

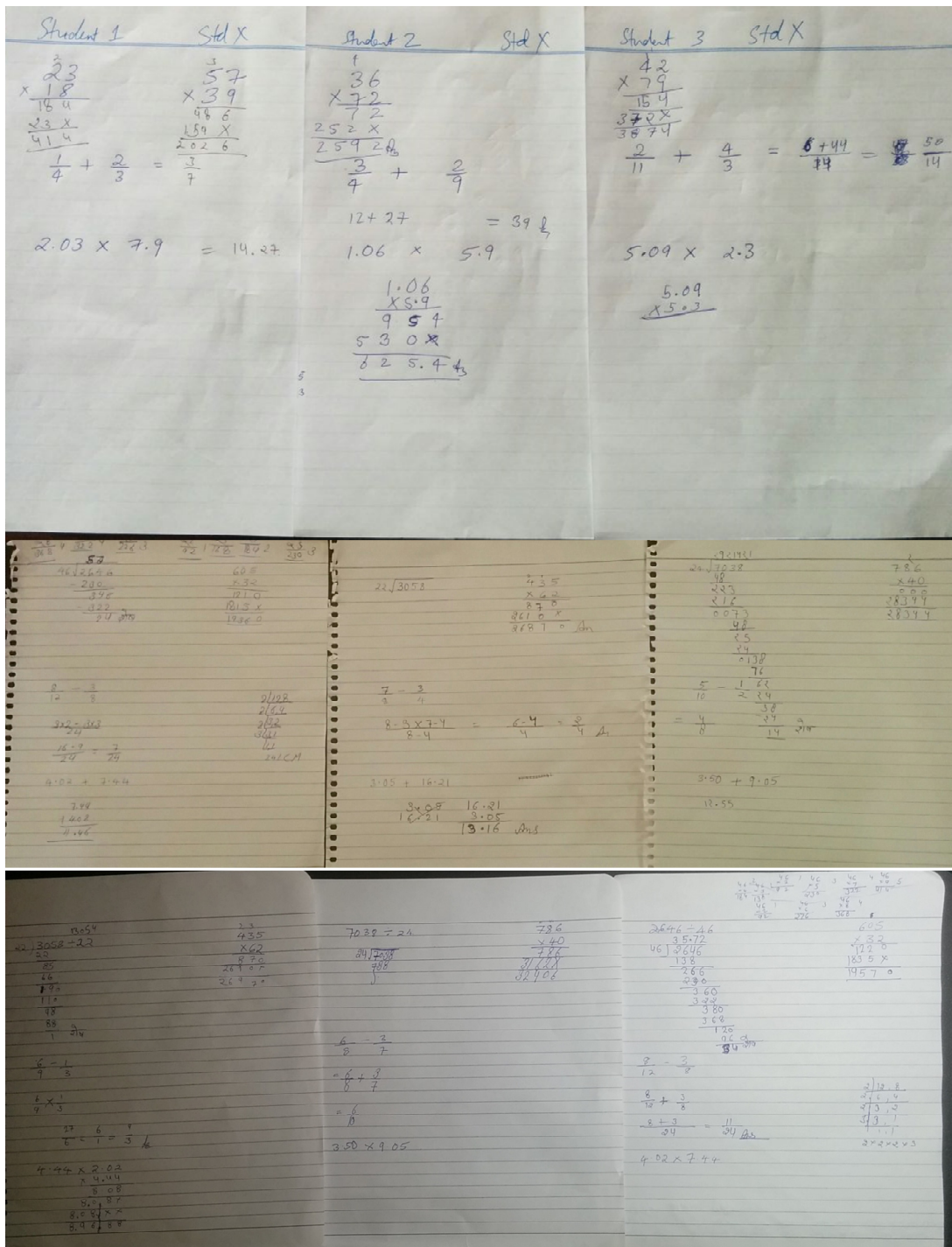
Recommendation:

- *For State:* Attention needs to be paid to the practical aspect of the course and linkage to industry
- *For GOI:* The suggestion of the state is to include a VE course on local craft specific skills that are in demand may be taken up by MHRD and PSSCIVE or to allow the State flexibility to choose VE and design coursework that is customized to its local intricacies.

Annex 1: Itinerary followed and Persons met

12 th April: Day 1	Meerut District- District briefing by the UPMSA district officials at the District Project Office
13 th April: Day 2	Meerut district-Visit to three schools: Upgraded Government Secondary School, Govt. aided girls' intercollege, Govt. Secondary School + Visit to DIET (interaction with DIET faculty and students undergoing the BTC course)
14 th April: Day 3	Muzzaffarnagar district- visit to three schools: Govt. aided girls' Intercollege, Govt. intercollege, upgraded secondary school
15 th April: Day 4	Lucknow- State briefing by the State UPMSA team chaired by the Principal Secretary cum SPD. Interaction with UNICEF, the three VE service providers, IL&FS, Kusuma Foundation, Aurobindo Society, MI(Giri Institute)
16 th April: Day 5	Lucknow- Visit to girls intercollege, discussion with VE service providers and civil society organizations Wrap-up discussion

Annex 2: Examples of student work in Maths Standard 10



Annex 3: Year-on-year utilization of RMSA funds

FY	Expenditure	Opening balance	GOI releases	State releases	Other receipts	Interest	Total available fund	Expenditure	Closing Bal	Utilization of funds (%)
2009	Recurring	0	95	500	0	0	595	91	504	15

FY	Expenditure	Opening balance	GOI releases	State releases	Other receipts	Interest	Total available fund	Expenditure	Closing Bal	Utilization of funds (%)
-10	Non-recurring	0	2,805		0	0	2,805	0	2,805	0
	Sub-Total	0	2,900	500	0	0	3,400	91	3,309	3
2010-11	Recurring	504	0	404	0	62	970	346	624	36
	Non-recurring	2,805	3,933	0	0	0	6,738	0	6,738	0
	Sub-Total	3,309	3,933	404	0	62	7,708	346	7,362	4
2011-12	Recurring	624	6,849	0	0	821	8,294	1,359	6,934	16
	Non-recurring	6,738	14,610	2,321	0	0	23,669	10,930	12,739	46
	Sub-Total	7,362	21,459	2,321	0	821	31,963	12,289	19,674	38
2012-13	Recurring	6,934	2,920	0	0	1,474	11,328	4,103	7,225	36
	Non-recurring	12,739	19,167	13,804	0	0	45,710	16,474	29,237	36
	Sub-Total	19,674	22,087	13,804	0	1,474	57,039	20,576	36,462	36
2013-14	Recurring	7,225	0	2,654	0	1,188	11,067	6,718	3,983	61
	Non-recurring	29,237	9,680	573	0	0	39,489	23,409	16,081	59
	Sub-Total	36,462	9,680	3,227	0	1,188	50,556	30,127	20,064	60
2014-15	Recurring	3,983	4,687	1,562	0	905	11,137	7,639	3,498	69
	Non-recurring	16,081	6,960	2,320	0	0	25,361	7,620	17,741	30
	Sub-Total	20,064	11,647	3,882	0	905	36,498	15,259	21,239	42
2015-16	Recurring	3,498	2,788	1,858	0	980	9,123	8,317	806	91
	Non-recurring	17,741	0	0	0	0	17,741	7,720	10,021	44
	Sub-Total	21,239	2,788	1,858	0	980	26,864	16,037	10,828	60

State Report: Maharashtra

7th RMSA JRM (April 11-23, 2016)

10. Introduction

The JRM Team visiting Maharashtra (April 12-16, 2016) comprised the following JRM members: Shri S.R. Sathyam, (Mission Leader, GOI); Prof. Santosh Mehrotra (GOI); and Dr. David Smawfield (EU). The team visited schools in Pune and its surrounds and had meetings in Mumbai and Pune with a wide range of RMSA stakeholders, officials, representatives from support institutions, and implementing partners. A detailed list of persons met is provided at Annex 1.

The Team would like to thank the Principal Secretary, School Education, RMSA State Project Director, Director, SCERT, DIET faculty during the field visits, all the RMSA officials at the state, district and school levels, the Principals, teachers and students of the schools visited for extending their cooperation, support and the warm hospitality during the state visit. The efficient programme laid out for the Team was also appreciated and contributed well to a fruitful visit. The Team gratefully acknowledges in particular the generous help willingly given by all concerned even in holidays.

11. Overview and Key Issues on RMSA Implementation

Maharashtra is a State where only 7% of the total number of 22,576 schools are Government schools, making RMSA implementation challenges somewhat atypical. Indications are this position may, however, change with more new secondary schools likely to be proposed for sanction in the government sector. Trends against key indicators such as Gross and Net Enrolment Ratios, Dropout and Retention, over the last four years, all show positive patterns. The Gross Enrolment Ratio has increased from 84.86 in 2012/13 to 91.54 in 2015/16. Net Enrolment Ratio has increased from 53.87 to 60.16 over the same period. Dropout rates have reduced from 14.94% in 2012/13 to 13.5% in 2015/16 and Retention has increased from 85.05% to 86.5%. Maharashtra has achieved an impressive access ratio of 99.71%. 22,551 secondary schools are available in the State; 222 habitations presently remain un-served. **Annex 2** comprises a pictorial summary of status and progress against a range of key indicators, according to U-DISE data.

It is important to appreciate that, through its SARAL EMIS database, the State reports making huge strides in the elimination of bogus data, such as double enrolment. Therefore, real positive trends highlighted above can be considered to be even stronger than the data suggest. However, in view of the fact the RMSA interventions on increasing and improving access comprise such a small part of overall provision, it is also manifest that not all of the progress against key indicators can be attributed to RMSA itself. There are other factors at work. Appreciating this highlights the challenges of measuring programme impact.

Major initiatives associated with ICT, the teaching of Science, Mathematics, and English, Vocational Education and Civil Works will be identified and discussed below. In addition to these components, RMSA thrusts have included a set of interventions addressing children with special needs, and a laudable set of pilot and experimental smaller scale interventions of an innovative nature (Pragat Shaiksnik Maharashtra, Samriddh Shala, Shala Siddhi, provision of school grants the promotion of self defence activities, the provision of educational concessions for Diyyang children, and a twinning programme between urban and rural schools).

The key overall impressions of the Team were fourfold. Firstly, it is wished to acknowledge and commend the high level of commitment of individuals involved in RMSA implementation and management, the high calibre of staff and their enthusiasm for the programme. This is an acknowledgement that goes beyond the superficial. It is integral to what RMSA in Maharashtra is achieving. Moreover, it is an observation that extends from the highest levels, right down the line, to those in schools.

A second overall impression was of the serious attention that is being given to all three pillars of the programme: i.e. of access, equity and quality. Thirdly, the Team was particularly impressed by the participatory approach that underpins so much of programme implementation.

Fourthly, it is wished to highlight the way the Government of Maharashtra has so strongly embraced third party participation. This is an attitude and approach that is commendable. It has clearly added considerable value to the programme.

Across the programme the Team noted numerous innovative initiatives and approaches that could be considered either ‘highly promising’ or indeed ‘best practice’ in nature. These will be mentioned below as they warrant wider recognition, especially as other States may be able to learn from or be inspired by them. It is the intention of the Team to highlight these practices on return to Delhi.

Among challenges, and to further enhancing educational quality, the status of headteacher vacancies, as depicted in the Table below, remains a critical consideration:

Vacancy Status in Government Secondary Schools			
Headteachers		Teachers	
Approved	1610	Approved	9016
In Position	765	In Position	8706
Vacant	845 (52.48%)	Vacant	194

12. Focus themes for this JRM

a. Use of ICT in Student Learning:

At the outset of RMSA, 8,644 ICT schools were approved. As of April 2016, 500 schools have completed 5 years of Implementation. The present status is that ICT is considered functional in 7,144 schools. It is planned that a further 1000 schools, ICT approved in 2015-16, will also become ICT operational.

ICT in Maharashtra, and indeed more widely in RMSA, is projected as a 'BOOT' Model: 'Build, Own, Operate, and Transfer'. The Mission strongly believes that this is a most unfortunate terminology. RMSA needs to appreciate that it owns the initiative from the outset. Thus, Government and schools could and should be far more assertive and proactive in articulating quite what they want the service providers to deliver, to meet RMSA priorities. Indeed, instructors should be answerable to Principals. Payment by performance, a practice adopted by the Maharashtra Government, should not interfere with passing academic control to the schools.

It is wished to acknowledge the high level of performance of one service provider in particular: IL&FS, including its innovative approaches. Among these are its propriety 'KYAN' computer which is essentially a portable PC and digital projector contained in one unit. Also noteworthy is a system developed for monitoring the attendance of its instructors. This uses security enhanced SMS messaging, online log-ins and GPS coordinates to confirm that instructors are indeed in station. This could have wider replicability for monitoring, say, teacher attendance.

ICT seems to have been conceived mainly in support of teacher and student learning of ICT as a subject: e.g. how to use a computer, how to use word processing software and introductions to spread sheets, etc. It is acknowledged that a limited amount of student learning software supporting other curriculum subjects has also been provided and is used to a limited extent.

However, there is a very important and presently partly missed opportunity, to use ICT more to develop teacher competences and to support teachers in their own classroom teaching. Indeed, many experts would argue that this is the more-appropriate "first stage" for making ICT effective in schools. In other words, student e-learning should follow this first Stage, not precede it. It is relevant to note here that the Maharashtra Government also has been training 5 teachers per school every year in ICT. The Team thus recommends approaching the introduction of ICT in a phased manner.

Providing computers and a projector in one dedicated specialist room, which is present practice, is not so conducive to supporting teachers in using ICT in the classroom. It could be argued that it would be better to spread resources for use in several general classrooms by giving teachers the discretion to carry the equipment from the ICT lab to the classrooms. This is something that Principals and Programme Managers may wish to reflect on.

The digital projector is an especially powerful resource for supporting classroom teaching. Presently RMSA norms provide for just the one digital projector. When schools are further ICT equipped in future, it may make more sense to allow for greater flexibility as to what equipment is purchased from a fixed ICT budget. This would allow for more digital projectors if they are deemed more appropriate and other technologies such as tablets and 'Edutainment' TV monitors. (It is understood a digital projector suitable for school use, is approximately twice the cost of a typical PC). We also recommend that future flexibility should be allowed to take account of school size: manifestly a very small school needs less computers than a very large school to ensure equity of access to the equipment.

Schools visited had a timetable for ICT lab usage, which was a pleasing finding. However, we would also encourage the blocking off of specific times on the timetable, say at the end of the school day or during the lunch hour, when the lab is scheduled to be used exclusively by teachers. Principals could encourage their staff to make use of these slots to search for materials and develop and share e-materials of their own, such as lesson plans, worksheets, video clips of good classroom practice, etc., and also for e-record keeping. Where staff are not comfortable with using computers, these dedicated timetable slots could also be used for staff development by the ICT resource person. In this connection it is noteworthy that the SPD had itself circulated model video clips and software for installation in the computers of the ICT labs for the benefit of the teachers. The installations were, however, not activated to be of any real benefit in practice.

To help further to encourage teacher engagement in searching for and using e-resources, the Team has another very simple suggestion to make. This is to encourage, on all school computers, the creation of a desktop folder Icon titled “Resources for Teachers”. [There could be subfolders within the main folder, such as: “Resources for Science Teachers”, “Resources for Maths teachers”, etc.] Teachers could be encouraged to save in these folders any useful resources they themselves identify or indeed create themselves, to build up an “E-library”. Key State level institutions and implementing partners should themselves be proactive in helping to build these offline libraries of relevant, quality resources. RMSA project management has an important role to play in promoting this kind of initiative.

Presently, 5 teachers are trained per year, per school, under the rubric of the programme. If the Misson’s recommendation is accepted - to shift the emphasis towards empowering teachers to use ICT in support of their classroom teaching – this needs to be scaled up, and with increased vigour.

The Team learned that in some schools there is a current issue of software activation and renewal, including anti-virus software. This prevents computers from being operable. The problem is caused by lack of Internet connectivity to upgrade or activate the software. More-creative solutions need to be found, such as loading up latest software via a portable hard drive. Computers should not be allowed to stand in an un-operable state.

b. Math and Science teaching (maximum 1 page):

RMSA in Maharashtra is taking some excellent initiatives designed to raise standards in the teaching of mathematics and Science. This includes some exemplary practice deserving of highlighting nationally. Efforts are being made to cover 100% of teachers in English, Science and Mathematics. Currently, 88% of teachers in the secondary sector in the State are classified as ‘trained’.

NYASS is a third party provider contributing Science teacher training under RMSA. Through State and District Level workshops and demonstration lesson activities at Cluster level it has trained 160 key resource persons, 900 master trainers and 8160 teachers. More than a 1,000 teachers have also received an identical Science Kit, linked to the training, to support their classroom teaching.

The ambitious programme for strengthening maths teaching in schools, led by IIT Bombay, as presented to the Team, sounded very impressive and well-thought out. The initiative has a vision to impact upon a total of 50,000 teachers. So far, it has trained 350 Master Trainers and 11,792 Teachers and Principals. The IIT Bombay Model incorporates the set up 750 'A-VIEW' teleconferencing training facilities: highlighting the power of modern media in helping to go to scale with capacity building.

The Team also notes that when the programme reaches a later stage, it is likely to be resource rich. IIT Bombay has plans to place resources online as part of an e-portal. This will be a most welcome and valuable initiative. However, in the strongest terms, the Team would also recommend that IIT and RMSA could also reach an agreement to find a way for these resources to be shared locally on the hard drives of school computers. This is an especially critical consideration for rural schools where Internet connectivity may be poor or non-existent. Indeed, the Team makes an appeal that all service providers and Support Institutions to the RMSA Programme should do their best to contribute teacher resource materials to build the 'e-libraries' of schools.

A further important RMSA initiative in relation to supporting and strengthening Mathematics and Science Teaching comprises NCERT supported State Resource Group Training. Presently, the State Resource Group for Science comprises 36 persons, and the State Resource Group for Mathematics, 38 persons. The Team stressed the importance of coordination and communication to ensure that there were no mixed messages or duplication of efforts between the State Resource Groups and the activities of NYASS for Science and IIT Bombay for Mathematics.

The Team flagged the importance of always looking for ways to expand maximum impact from fixed resources. For example, concerning the number of teachers NYASS has been able to train, as detailed above, the Team mooted whether it would have been possible to add one extra stage to the model? Before teachers were certificated, could they possibly have been given the extra task of passing on their knowledge to just one other peer on a one-to-one basis? This may have been something that could have been achieved at no extra cost but would potentially have doubled the number of teachers impacted. With regard to the 1,000 identical science kits the Team put forward the idea of providing, for the same cost two different kits: for example, 500 of 'Kit A' and 500 of 'Kit B'. Some schools could start with 'Kit A' and then swap their kits half way through the academic year with a neighbouring school – potentially doubling the number of experiments that could be conducted by everyone.

Flowing from the Maharashtra initiatives, the Team would make the following additional recommendations for incorporation in State-level (subject) teacher training programmes:

- (i) Set up State Institutes of (subject) education.
- (ii) These institutes must work in collaboration with the State Resource Groups concerned; and, be primarily responsible for teacher training.
- (iii) Teachers recruited, notwithstanding their status as professionally educated graduates/post-graduates in teacher training, must undergo a 6-month certification course in classroom teaching of their subject.

- (iv) The State Institutes shall prepare Key Resource Persons (KRPs) and also train them in assessment of training needs.
- (v) The content of the in-service training courses shall be formulated with reference to such assessed needs.
- (vi) The KRPs must be trained to transact this course content with help of the subject kits provided.

c. Status of pending civil works :

The Table below provides a summary of completed and outstanding civil works. The impasse in construction activity was as a result of agreed unit costs no longer being sufficient to undertake the works in consequence of price escalation: a problem addressed by the 6th JRM in August 2015. The way forward suggested by the JRM was the recommendation to surrender sanctioned civil works where progress could not be made and resubmit proposals for which new norms would apply. This is what has occurred in Maharashtra. The State has submitted new proposals based on U-DISE 2015-16 data analysis. It is understood that no further substantial implementation challenges remain and the State is confident that all civil works will be completed before the end of the programme.

Progress of Civil Works:

Originally Approved	Completed	Surrendered
Additional Classroom	362	117
Integrated Science Lab	134	70
Lab Equipments	134	70
Computer Room	0	238
Library	0	444
Art & Craft Room	0	597
Toilet Block	0	118
Water Facility	0	118
New Girls Hostels	0	43

13. Any additional observations/comments not included in the above sections (1/2 page):

While not designated priority themes for the Team, the Team availed itself of the opportunity to appreciate what RMSA in Maharashtra is doing to strengthen the teaching of English and also to promote skills development for Grades 9 and 10 students through the provision of vocational programmes. Substantive presentations on both themes were made to the Team, and Team members were also able to see for themselves some of the vocational training activities taking place in schools.

In respect of English language teaching, the State has contracted the British Council as an implementing partner. The thrust of the programme is not 'new content' related (the programme draws entirely from the National Curriculum Framework). Rather, it is on how that curriculum is transacted: using new and varied, communicative and active learning teaching approaches

intended to help students learn more effectively. It is worth considering that these teaching methods have replicability across the wider curriculum, not only for English.

A feature of the programme is its use of social networks (Whats App, Facebook, and text messaging) to consolidate and follow up on the face-to-face training activities. The Team believes this is an exemplar approach for reinforcing capacity building. However, based on feedback from the British Council itself, the Team would stress that: for approaches of this kind to be meaningful and reach their maximum potential it is vital that each social network is actively managed by a high calibre development professional. Among the roles that need to be played are keeping conversations on track and stimulating further discussion and interest when necessary by introducing relevant content. In other words, an important lesson to heed is that social network initiatives will likely be far less meaningful and effective if they are launched and then simply left to run by themselves without some on-going quality control and moderation.

Vocational Education

Achievements

The number of schools offering vocational education in Maharashtra under the centrally sponsored scheme of Vocationalisation of Secondary And Higher Secondary Education is 328. the scheme started in 2013 nationwide, and 350 schools were approved during the year 2015 16. There are 1651 government secondary school in Maharashtra, of which 328 are currently offering vocational education.

The curriculum in Maharashtra has been prepared by the PSS Central Institute of Vocational Education (Bhopal) (part of NCERT), as per the National Skills Qualification Framework, **which became national policy as of December 2013**. The course material has been translated into Marathi by the state government.

As expected under the NSQF industry has been part of Curriculum as well material development. The committee formed by the state (before NSQF came into existence) to develop a vocational education policy had industry representative from L&T, RPG group etc. Maharashtra has had a long history of offering vocational education in classes 8, 9 and 10 since 1986, rather unlike other states of India.

As with the earlier vocational education policy industry participation was ensured with NSQF related course material as well. In addition industry experts from the local area where the school is located are invited as guest faculty to speak on related subjects for vocational education under RMSA.

Concerns

A concern in almost all states with vocational education offered at senior secondary level in the past has been that very little practical training was available for the children. Under NSQF the workshop and labs are being set up in the school itself. Theory is taught in the classroom and workshop practicals are implemented through industry visit . the visit to local industr shows that

students learn how the business operates, the manufacturing process and the challenges faced and opportunities ahead. They can understand how was small or micro business works in their own area. In addition guest lecturers by industry experts is a mandatory requirement for vocational education in the schools.

An overview of vocational education suggests that this degree of industry participation is going to be in sufficient for ensuring the employability of students after they finish Secondary School. It is true that aptitude testing and career counselling is being offered at the school level, but there is no provision for internship in industry nor for practical counselling for purposes of placement. However this is the first year of implementation of the scheme in grade 9 and arrangements will need to be made for internship and placement once they complete the secondary our higher secondary level in the relevant vocational occupational discipline. Without addressing practical training and practical advice from industry and the regular participation of industry in such Activity the employability of students is likely to be jeopardized in the future.

One concern is that students are required, in order to take up a vocational education subject to replace a second language . Maharashtra is a three language state and has adopted Marathi, Hindi and English as the three languages. Students are being encouraged to drop Hindi as a language and substitute it with the vocational subject. However it should be noted that general science, social science and Math remain compulsory and because of these subjects it is possible for children to continue with academic studies at Higher Secondary Level if they so wish, in case they wish to drop the vocational subject.

Another concern is that for school only 25 students are permitted to opt for the vocational subject. Given the large and growing need for as well as the demand for vocational education there is potential for increasing the availability of more vocational places at secondary level both in government as well as in aided schools.

Recommendations for State and Central Government

Maharashtra is a relatively fast growing state and has been progressive in providing vocational education for the last 3 decades at secondary level. Demand for vocational skills is growing in both Maharashtra as well as in other parts of the country. Without compromising on the quality of language Science and Math instruction at secondary level there is scope for expansion of vocational education.

1. In Maharashtra out of total 22000 high schools only 16 10 schools are government schools. Currently vocational education is intended to be offered in 350 under RMSA. This does not cover the aided schools. In order to achieve through universalization of vocational education, it is necessary to allow aided schools to start vocational education as well. However, no financial incentive should be offered by the Government. There is demand from parents and children and the aided schools will be willing to meet this demand at their own cost.

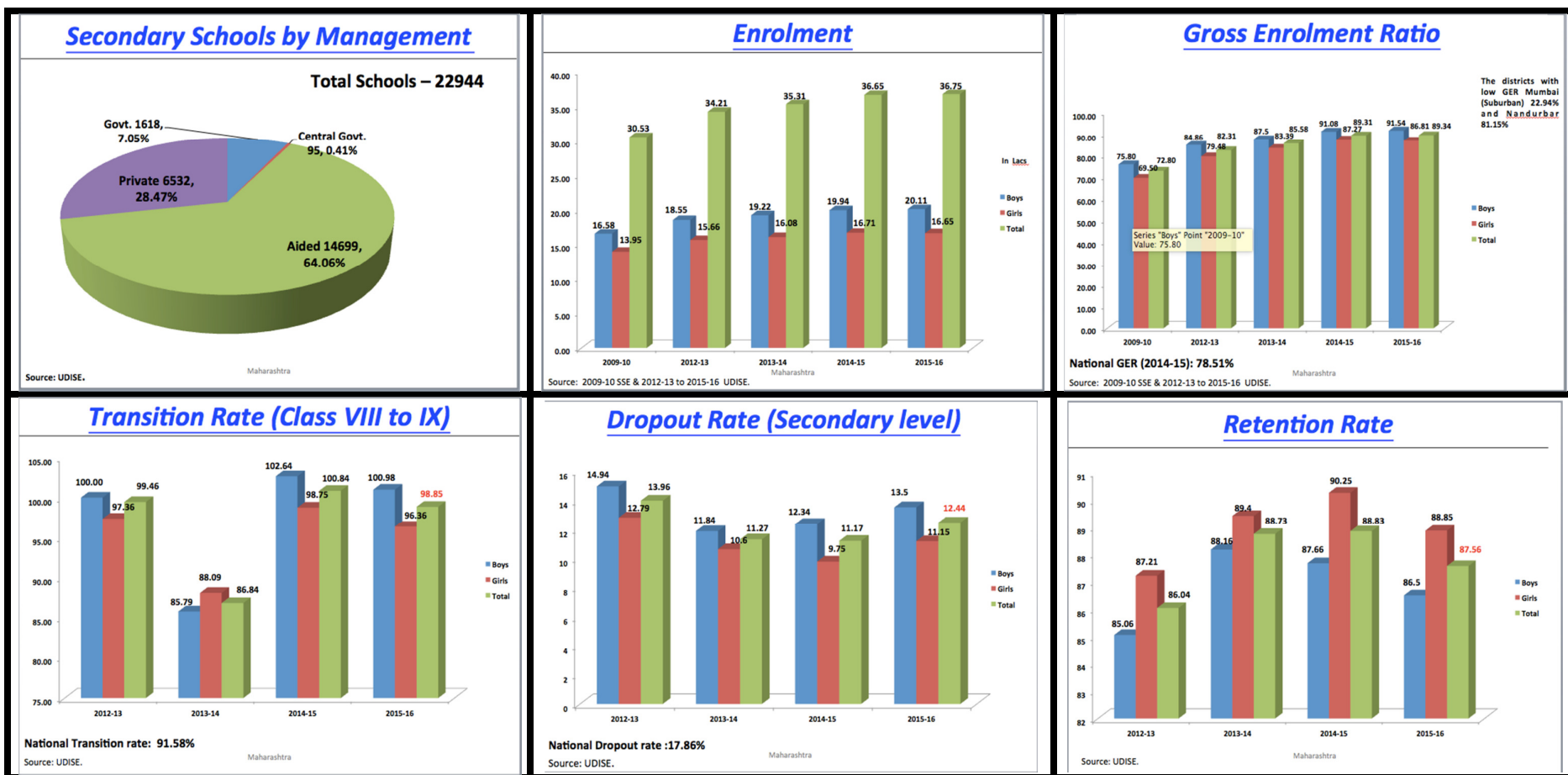
2. Industry participation remains limited. The Sector Skills Councils supported by the NSDC are conducting assessment and certification of skills. The Sector Skill Councils are responsible for

assessing the practical training for which 70% marks are allocated and the State Board assesses the theory part for which 30% marks are assigned. In future Sector Skills Councils will need to increase their capacity to conduct quality assessment. Once the private and aided schools offer vocational education the need for quality assessor will go up manifold. One alternative can be to build the State Boards capacity to conduct assessment with inputs from industry. But, for this to happen, even industry needs to come forward through the mechanism of the Sector Skill Council.

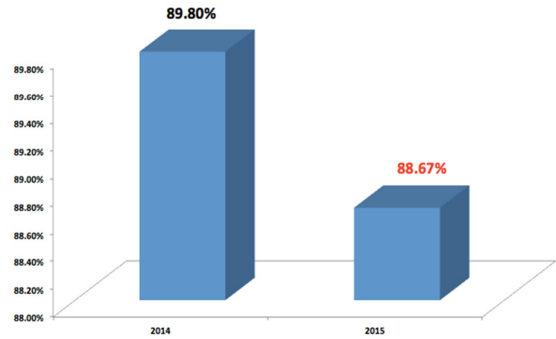
3. Maharashtra started a multi-skill foundation course (MSFC) at NSQF level 1 & 2. The course enables orientation in 4 skills in 2 years (agriculture, healthcare, construction , mechanical). Demand has grown rapidly and it is already available in nearly 800 schools & is also known as V1 or introduction to basic technology. State is already in process of developing curriculum for level 3 & level 4 for MSFC in collaboration with PSSCIVE . Students can choose any one of the four trades at level 3 & 4. It is already a successful model in 800 schools and should be encouraged as a good practice.

4. The 350 schools in which vocational education is approved need to be upgraded till 12th std at least for vocational courses (as the students in these schools will be in 10th std now). Till the private aided schools introduce vocational education these students needs to get an opportunity for vertical mobility.

Annex 1 – Maharashtra State Report: Status and Progress Against Selected Key Indicators



Pass Percentage - Class X



National Pass Percentage 81.36

Source: UDISE.

Maharashtra

National Achievement Survey-Class-X

Subject	National Score	State Score	0-35% (Low)	36-50% (Average)	51-75% (Above Average)	Above 75% (High)
Maths	250	255	38	40	20	2
Science	250	246	42	36	20	2
English	250	248	32	49	19	0
Social Science	250	250	34	39	23	3
Language (MIL)	250	263	15	13	43	30

Maharashtra

Progress of Civil Works

