



# SECONDARY EDUCATION IN INDIA

Universalizing Opportunity



Public Disclosure Authorized

Public Disclosure Authorized

Public Disclosure Authorized

Public Disclosure Authorized



# **SECONDARY EDUCATION IN INDIA: UNIVERSALIZING OPPORTUNITY**

**Human Development Unit  
South Asia Region**

**January 2009  
Document of The World Bank**



## Abbreviations and Acronyms

BRC	Block Resource Center
CABE	Central Advisory Board for Education
CBSE	Central Board for Secondary Education
CDC	Curriculum Development Center
CISCE	Council for Indian School Certificate Examinations
COBSE	Council of Boards of Secondary Education
CSS	Centrally Sponsored Scheme(s)
CRC	Cluster Resource Center
CWSN	Children With Special Needs
DEA	Department of Economic Affairs, Ministry of Finance and Planning
DEC	Distance Education Council
DIET	District Institute of Education and Training
DISE	District Information System on Education
DPEP	District Primary Education Program
GER	Gross Enrollment Rate
GIA	Grant-in-aid
GoI	Government of India
IASE	Institutes of Advanced Study in Education
IB	International Baccalaureate
IEA	International Association for the Evaluation of Educational Achievement
ICT	Information and Communication Technology
IGCSE	International General Certificate of Secondary Education (United Kingdom)
IGNOU	Indira Gandhi National Open University
IIT	Indian Institute of Technology

ITI	Industry Training Institute(s)
MHRD	Ministry of Human Resource Development
KVS	<i>Kendriya Vidyalaya Sanghathan</i> (Central Schools Organization)
MoLE	Ministry of Labor and Employment
MOFD	Ministry of Finance and Planning
NCF	National Curriculum Framework
NCERT	National Council for Education, Research and Training
NCTE	National Council for Teacher Education
NER	Net Enrollment Rate
NIOS	National Institute of Open Schooling (within the MHRD portfolio)
NUEPA	National University for Educational Planning and Administration
NVS	<i>Navodaya Vidyalaya Sanghathan</i> (Rural Gifted Schools Organization)
OBC	Other Backward Castes
OTL	opportunity to learn
PRI	<i>Panchayati raj Institutions</i> (local self-government)
PTA	Parent-Teacher Association
SC	Scheduled Caste
SCERT	State Council for Education Research and Training
SIS	State Implementation Society
SMC	School Management Committee
SSA	<i>Sarva Shiksha Abhiyan</i> (National Program for Universal Elementary Education)
ST	Scheduled Tribe
TIMSS	Third International Mathematics and Science Study
UCLES	University of Cambridge local examination syndicates
UGC	University Grants Commission
VET	Vocational Education and Training

## Acknowledgments

The team is grateful to officials in the Ministry of Human Resources Development and the Ministry of Finance of the Government of India for their support of this study. In addition, a large part of this report draws on two in-depth case studies in Rajasthan and Orissa. Accordingly, the team is deeply indebted to officials in the Department of Elementary, Secondary, and Sanskrit Education in the Government of Rajasthan, and officials in the Department of School and Mass Education and Department of Higher Education in the Government of Orissa for their support and advice. The team is appreciative of the guidance of the advisory panel – consisting of senior representatives from the Ministry of Human Resource Development, Ministry of Labor and Employment, National Council for Education, Research and Training, National Council for Teacher Education, Council of Boards of Secondary Education, Central Board of Secondary Education, National University for Educational Planning and Administration, National Institute of Open Schooling, National Knowledge Commission, PSS Central Institute of Vocational Education, and Federation of Indian Chambers of Commerce and Industry.

This report was prepared initially by Kin Bing Wu, who designed the study, commissioned new research, formed the advisory panel and oversaw the work of the team. Sam Carlson updated and re-worked the report in a subsequent stage, particularly the chapters on access and equity, management, and financing, and conducted consultations with key stakeholders on the final draft, but wishes to credit Kin Bing Wu for the major analyses and insights of the report, while taking full responsibility for whatever weaknesses remain. Additional important contributions were made by Deepa Sankar (access and equity, public expenditure review, school-level finance, supervision of the secondary school surveys in Rajasthan and Orissa), Amit Dar (the economic context), Pete Goldschmidt and Christy Kim Boscardin (item response analysis and hierarchical linear modeling of the data from the secondary school survey),

Prema Clarke (curriculum and examinations), Venita Kaul (teacher training), Sangeeta Goyal (grant-in-aid reform and cost recovery), Priyanka Pandey (framework for government investment in education), Nalin Jena (institutional aspects), Hena Mukherjee (transition to tertiary education), Ashish Narain (labor market), Anuja Utz (knowledge economy), Xiaonan Cao (international comparison), and Harry Patrinos (case studies of private education in the Netherlands and Colombia). Mehtab Azam provided extensive and timely assistance in data compilation and data analysis. Yevgeniya Savchenko provided supplementary data analysis. Masako Uchida provided support to the field surveys and editorial assistance, and Hiroshi Saeki provided research assistance. Renu Gupta, Savita Dhingra and Bertha Mburugu assisted in the administrative aspects of the work. Gertrude Cooper assisted in proofreading the initial drafts, which also benefited from editing by Rachel Weaving.

The report draws from four commissioned papers: A. K. Sharma (teacher education and management in Rajasthan, Orissa, and Delhi), B. P. Khandelwal (study on secondary examination in India), S. N. Prasad (curriculum and textbooks in the Indian secondary education system), and Peter A. J. Bouhuijs and Peter Edelenbos (comparison of Indian curricula and syllabi with International Baccalaureate and International General Certificate of Secondary Education).

Peer reviewers were: Emanuela di Gropello (EASHD, World Bank) and Sajitha Bashir (AFTH3, World Bank). Juan Manual Moreno (HDNED, World Bank), Geeta Kingdon (Oxford University), and Marlaine Lockheed (Independent Consultant) reviewed earlier drafts. Comments were also received from Paul Gertler, Elizabeth King, Ahmad Ahsan, Lant Pritchett, Harry Patrinos, Jishnu Das, Elena Glinskaya, Geeta Sethi, Deepak Mishra, V. J. Ravishankar, Emiliana Vegas, Shobhana Sosale and Philip O’Keefe.

Country Director:	Roberto Zagha
Sector Director:	Michal Rutkowski
Sector Manager:	Amit Dar
Task Team Leader:	Sam Carlson

# Key Data Sources and Data Limitations

## Data Sources

This report has drawn on several different data sources from India. The main ones used are as follows:

- ◆ National Sample Survey (NSS), conducted by the census bureau, provides data on wages and education levels. The NSS rounds used for the analysis were 1983/4, 1987/8, 1993/4, 1995/6, 1999/2000, and 2004/05. Because the NSS is a nationally representative household survey, it is more inclusive of all persons' education and labor force participation than administrative data.
- ◆ Ministry of Human Resources Development's (MHRD) Selected Education Statistics, 2004-05 provides national and state data on enrollment, number of schools, shares of schools by government and private management, and public expenditure on education by level on education and composition of spending.
- ◆ The 6th and 7th All India Education Surveys (1993 and 2002) provides information on school facilities and services, student enrollment, and teacher and principal qualifications and deployment in rural and urban areas.
- ◆ A Survey of Government and Private Secondary Schools in Rajasthan and Orissa (2005) provided in-depth information on the characteristics of students, teachers, schools, and on student

achievement in mathematics. These data form the basis of in-depth case studies.

- ◆ Public examination records from the two Central Boards and from selected State Boards.

## Data Limitations

The NSS rounds do not contain questions that provide information on enrollment in government and private schools, nor on household expenditure on education, except the 50th round in 1995/96 which has an expanded education module. The various rounds also do not contain questions that allow for estimation of repetition, promotion, and dropout in the school system. The NSS is a household survey which is not linked to any schools. It is not possible to estimate the extent to which school distance is associated with enrollment.

MHRD's Selected Education Statistics does not contain information on unrecognized private schools. It has information on the number of schools, but not student enrollment, by government and private management.

Studies on secondary education in India are far fewer than those regarding elementary education. There have been no impact evaluations on what interventions are effective in expanding enrollment and raising student achievement. In addition, there have been no studies on issues such as teacher absenteeism and accountability. Additional research needs to be undertaken to fill these gaps.

## Abstract

The dramatic growth in Indian elementary education enrollment and improvements in retention and transition rates over the past ten years, particularly among more disadvantaged groups, are increasing pressure on the secondary level to absorb new entrants. Given ongoing center and state investments in Sarva Shiksha Abhiyan (Education for All), this trend will continue for the next 10 years. At the same time, India's impressive, sustained economic growth has increased household and labor market demand for secondary and higher education. Secondary education's contribution to economic growth, demonstrated high social benefits (particularly for girls), and support of democratic citizenship reinforce the need for increased public support at this level, particularly in light of the very large inequalities in access to secondary education, by income, gender, social group and geography. **The challenge is to dramatically improve access, equity and quality of secondary education simultaneously.**

The role of government in secondary education (whether center, state or local) is not as clear as it is in elementary education. At this point in time, **government's role should be to universalize opportunity to attend secondary school**, rather than to universalize access. Clear distinction needs to be made between public financing and public provision of secondary education; there appear to be significant opportunities to improve access, quality and equity of secondary education through public-private partnerships (PPP) and a variety of demand-side financing measures, which increase accountability and parental choice between public and private providers. The current grant-in-aid PPP model urgently requires reform. PPP does not mean privatization. In poor and/or remote areas private providers are unlikely to establish secondary schools in sufficient quantity, such that the Government will likely need to both finance and provide secondary education. Increasing the supply of effective teachers is a major issue, which may require alternative paths to teacher professional development and certification.

Government has an important role to play in improving equity of secondary education. The bulk of the growth in secondary education over the last ten years has been financed by households for private schooling, such that the typical secondary school student is male, urban and middle class. Whether because of poverty, credit constraints, lack of information about perceived benefits of schooling, cultural norms or other factors, access to secondary education by girls and by children from scheduled castes, scheduled tribes, rural and poor households is significantly lower than state and national averages. Indicators of internal efficiency and quality of learning among these groups are also well below average. Targeted, supply- and demand-side programs for these groups are called for.

Small-scale learning achievement studies and parental preference for private schools suggest that the quality of public secondary education is alarmingly low. Efforts to improve the quality of secondary education are thus urgent, but medium- to long- term in producing results. **India needs to make the qualitative investments now in teacher education and accountability, curriculum reform, quality assurance, examinations reform, national assessment capabilities and management information systems, which will require time and significant institutional capacity-building to succeed at a national scale.**

The recently launched centrally sponsored scheme for secondary education, Rashtriya Madhyamik Shiksha Abhiyan (RMSA), offers a strategic opportunity to improve access and equity; enhance quality, accountability and ability to measure learning outcomes; and promote standardization of curriculum and examinations across states. In addition, India's recent decision to participate in international assessments of student achievement is an extremely positive sign. Over time, such participation will provide an important objective baseline of students' cognitive skills and a future measure of success of the country's investments in elementary and secondary education.

# Contents

<b>Executive Summary</b>		<b>xv</b>
<b>Chapter 1.</b>	<b>Why Invest in Secondary Education in India?</b>	<b>1</b>
1.1	<b>Introduction</b>	<b>1</b>
	1.1.1 Structure and Goals of The Education System	1
	1.1.2 The Respective Roles of Public and Private Schools	2
1.2	<b>Rationale for Public Investment in Secondary Education</b>	<b>2</b>
	1.2.1 Secondary Education Contributes to Economic Growth	3
	1.2.2 Social Benefits of Secondary Education	5
	1.2.3 Social Equality	5
	1.2.4 Democratic Citizenship and Social Cohesion	7
	1.2.5 International Competitiveness	8
1.3	<b>Conclusion</b>	<b>9</b>
<b>Chapter 2.</b>	<b>Access and Equity of Secondary Education</b>	<b>10</b>
2.1	<b>Trends in Access to Secondary Enrollment</b>	<b>10</b>
	2.1.1 Public Secondary Schooling	11
	2.1.2 Private Aided Secondary Schooling	12
	2.1.3 Private Unaided Secondary Schooling	12
2.2	<b>Equity of Enrollment</b>	<b>13</b>
	2.2.1 By Expenditure Quintile	13
	2.2.2 By Gender	14
	2.2.3 By Social Group	15
	2.2.4 Children with Special Needs (CWSN)	15
	2.2.5 By Geography	16
	2.2.6 Differences among States and Districts	16
2.3	<b>Options to Improve Access and Equity of Secondary Education</b>	<b>17</b>
	2.3.1 Addressing Supply-side Constraints on Access and Equity	17
	2.3.1.1 School Infrastructure, Facilities, and Learning Resources	17
	2.3.1.2 Increase Output of Teacher Training Institutions and Develop Alternative Paths to Teacher Certification	21
	2.3.1.3 Pupil-Teacher Ratios	23
	2.3.1.4 Public Private Partnerships (PPPs)	23
	2.3.1.5 Flexible Open Schooling Delivery Systems	25
	2.3.2 Addressing Demand-side Constraints on Access and Equity	27
	2.3.2.1 Perceptions of the Benefits of Schooling and Cultural Factors	27
	2.3.2.2 Demand-side Financing to Address the Direct and Indirect Costs of Secondary Schooling	28-31
2.4	<b>Conclusion</b>	<b>32</b>
<b>Chapter 3.</b>	<b>Quality and Efficiency of Secondary Education in India</b>	<b>34</b>
3.1	<b>Student Achievement in Mathematics and Key Determining Factors: Lessons from Two Case Studies in Rajasthan and Orissa</b>	<b>34</b>
	3.1.1 International Benchmarking	37
	3.1.2 Key Factors Determining Student Achievement in Mathematics	37
3.2	<b>Internal Efficiency of Secondary Education</b>	<b>39</b>

3.3	The Quality of Teaching	41
	3.3.1 Teachers' Pre-service Education	41
	3.3.2 In-service Professional Development	42
	3.3.3 Teacher Accountability	45
3.4	Curricula and Examinations	46
	3.4.1 Education Boards and their Curricula	46
	3.4.2 International Comparison of Curricula	49
	3.4.3 Board Examinations	53
3.5	Quality Assurance	56
3.6	Evaluation and Research	61
	3.6.1 Impact Evaluation	61
	3.6.2 Monitoring Student Achievement	61
	3.6.3 Education Research	62
	3.6.4 International and Comparative Studies	62
3.7	Options to Improve Learning Outcomes and Internal Efficiency	63
	3.7.1 Improve the Quality and Effectiveness of Teachers	64
	3.7.2 Actions to Strengthen the Curriculum and Reform Examinations	66
	3.7.3 Strengthen Institutions and Technical Capacity at National, State and District Levels	67
	3.7.4 Support Policy Analysis and International Comparison	68
Chapter 4.	Management of Secondary Education	70
4.1	The Institutional Context of Secondary Education	70
4.2	School Management: Comparing Public, Private Aided and Private Unaided Schools	71
4.3	Management Cost-effectiveness	73
	4.3.1 Regulation of Private Schools	76
4.4	Teacher Recruitment Criteria and Methods	76
	4.4.1 Deployment: Matching Supply and Demand	77
	4.4.2 Terms and Conditions of Service For Teachers	80
4.5	Qualifications of Private Aided and Unaided Teachers	83
	4.5.1 Academic Qualifications of Private Aided and Unaided Teachers	83
	4.5.2 Professional Qualifications of Private Aided and Unaided Teachers	83
	4.5.3 Years of Experience of Private Aided and Unaided Teachers	84
	4.5.4 Average Salaries of Private Aided and Unaided Teachers	84
4.6	Teacher Performance Appraisal and Incentives	85
4.7	School-based Management and Decentralization	87
4.8	Secondary Education Management Information System (Semis)	88
4.9	Options for Improving Management of Secondary Schooling	89
	4.9.1 Optimal Mix of Public, Private and Ppp Schools	89
	4.9.2 Options for Improving Teacher Recruitment and Management	94
	4.9.3 Regulation of Private Schools	95
	4.9.4 School-Based Management and Decentralization	95
	4.9.5 Management Information Systems	95
4.10	Conclusion	96
Chapter 5.	Financing Indian Secondary Education	97
5.1	Secondary Education Spending in its Sectoral Context	97

5.1.1	Public Spending on Elementary versus Secondary Education	98
5.1.2	Differences across States	100
5.2	Sources and Uses of Public Spending on Secondary Education	101
5.2.1	Sources of Public Spending on Secondary Education	101
5.2.2	Uses of Public Spending on Education	101
5.3	Measures of Relative Costs and Efficiency of Spending	101
5.3.1	Per Student Spending, by School Type	104
5.4	Measures of the Equity of Public Spending on Education	104
5.5	School-level Finance	106
5.5.1	Schools' Sources of Funds	106
5.5.2	Schools' Uses of Funds	108
5.6	Options to Increase Financing for Secondary Education	109
5.7	Simulations of Future Secondary Education Expenditures and Affordability	113
5.7.1	Resource Implications	113
5.8	A Centrally Sponsored Scheme for Universal Secondary Education	116
5.9	Conclusion	117
	References	118

### *Figures*

Figure 1.1:	Marginal Returns to an Additional Educational Level - Males, 1983–2004	4
Figure 1.2:	Marginal Returns to an Additional Educational Level - Females, 1983–2004	4
Figure 1.3:	Hourly Wages in Constant 1993 Prices by Education Level and by the Richest and Poorest Consumption Quintiles, 1987–2004	6
Figure 1.4:	India's "Stock of Skills"	9
Figure 1.5:	China's "Stock of Skills"	9
Figure 2.1:	Long Term Trends in Educational Enrollment In India, 1950–2005	10
Figure 2.2:	Gross and Net Attendance Rates of Secondary (Grades 9–12) in India	10
Figure 2.3:	Actual and Projected Demand for Secondary Education, 1990–2020	11
Figure 2.4:	Secondary Schools by Management Type, 1995 and 2005	12
Figure 2.5:	Attendance Rates for Secondary Education, by Expenditure Quintile and Type of Schooling	13
Figure 2.6:	Gross Attendance Rate of Secondary Education, by Gender, 1995 and 2005	14
Figure 2.7:	Percentage Point Gap Between Enrollment Levels of Boys and Girls at Secondary Education	15
Figure 2.8:	Gross Attendance Rate of Secondary Education, by Social Group	15
Figure 2.9:	Gross Attendance Rate at Secondary Level, by Location, 1995 and 2005	16
Figure 2.10:	Gross Enrollment Ratios by State, 2005	16

Figure 2.11:	Gross Enrollment Ratios by State and Highest/lowest Income Quintile	17
Figure 2.12:	Number of Schools by Level of Education, 2005	18
Figure 2.13:	Average Number of Students Per School, 2002	18
Figure 2.14:	Number of Districts with Less than one Secondary School for Every 1,000 Youth Aged 15–19	19
Figure 3.1:	Rajasthan: Distribution Of Grade 9 And 11 Test Scores, 2005	35
Figure 3.2:	Orissa: Distribution of Grade 9 and 11 Test Scores, 2005	36
Figure 3.3: (A)	Average Percent Correct in Rajasthan	36
Figure 3.3: (B)	Average Percent Correct in Orissa	36
Figure 3.4:	Adjusted and Unadjusted Score Gaps	38-39
Figure 3.5:	Age-wise School Attendance, 2005	40
Figure 3.6:	2005 Lower Secondary School Examination Results, by State and Student Type	54
Figure 3.7:	The Institutional Relationship for Education Service Delivery	57
Figure 3.8:	Framework for Assessing School Performance	58
Figure 4.1:	Management of Secondary Education by State, 2005	72
Figure 4.2:	Management of Senior Secondary Education by State	72
Figure 4.3:	Teachers by Education Level, 1950–2005	79
Figure 4.4:	Pupil:teacher Ratios in Government Schools, 1950–2002	79
Figure 4.5:	Pupil-to-teacher Ratios in Government Secondary and Senior Secondary Education Across States, 2001	79
Figure 5.1:	Public Expenditure on Education as % of total Public Expenditure and as % of GDP, 1951–2004	97
Figure 5.2:	Central and State Governments' Shares of Plan and Non-plan Expenditure on Education, 2006 (Us\$ Billion)	197
Figure 5.3:	Intra-sectoral Allocation of Investment Spending on Education, 1980-2006	99
Figure 5.4:	Intra-sectoral Allocation of Recurrent Spending on Education, 1980–2006	99
Figure 5.5:	Intra-sectoral Allocation of Investment and Recurrent Spending on Education, 1980–2006	99
Figure 5.6:	Public Expenditure on Education by Level, 2006 (Us\$ Million)	99
Figure 5.7:	Intra-sectoral Resource Allocation across States, 2006	100
Figure 5.8:	State Per-capita GDP and Secondary Enrollment Rates, 2004–05	100
Figure 5.9:	Variation across Major States in Secondary Level per Student Expenditure, in Government and Aided Schools, 1993-94 And 2005–06 (in Constant 1993-94 Rupees)	101

Figure 5.10:	Variation Across States in Spending on Grants-in-aid as a Percentage of Total Spending on Secondary Education, 1991-92 and 2005-06	103
Figure 5.11:	Share of Investment (Plan) Expenditure in Total Secondary Education Expenditure, by States, 1991-92 and 2005-06	103
Figure 5.12:	Lorenz Curve – Distribution of Public Expenditure on Education by Level and by Quintile, 1999	105
Figure 5.13:	Lorenz Curve – Distribution of Public Expenditure on Education by Level and by Quintile, 2004	105
Figure 5.14:	Lorenz Curves in Kerala, 1995	106
Figure 5.15:	Lorenz Curves in Rajasthan, 1995	106
Figure 5.16:	Per-student Tuition Fees by School Type and by Urban and Rural Location, 2005	107
Figure 5.17:	Per-student Private Funds Raised by Schools, 2004 – 05	108
Figures 5.18- 5.21:	Projections of Secondary and Senior Secondary Gross Enrollment Rates, 2005-2020	115

### *Tables*

Table 1.1:	Impact of Females' education on Health Indicators	6
Table 1.2:	Secondary Gross Enrollment Rates by Country	8
Table 2.1:	Percentage Completion of Elementary Education and Attendance of Secondary Education, by Expenditure Quintile, 2004-05.	14
Table 2.2:	Percent Enrollment in Grades 9-12 by Location and Gender, 1993 & 2002	14
Table 2.3:	Cwsn Education Attendance and Attainment by Severity, 2002	16
Table 2.4:	Number of Schools by Education Level and Location	18
Table 2.5:	Distribution of Villages by Distance from the Nearest Secondary School, 2002	19
Table 2.6:	School Resources in Sampled Government, Aided and Unaided Secondary Schools in Rajasthan and Orissa (Percentage), 2005	20
Table 2.7:	Household Expenditures Per Child on Education in Indian Rupees, 1995-96	28
Table 2.8:	Students' Combined Payment of Monthly School Fees and Private Tutoring, 2005	29
Table 2.9:	School Stipend Coverage and Receipts, 2004/05 (Urban and Rural)	32
Table 2.10:	Coverage and Receipts of Schools Stipends by Wealth, Social Category and Location, 2004/05	32
Table 3.1	Incompletion Rate of Lower Secondary, 2004-05	40
Table 3.2:	Teachers' Reports on Frequency of School Inspection and Who they Discussed Problems with in Rajasthan Secondary Schools, 2005	59

Table 4.1:	Administrative Responsibilities at Different Levels of State Government for Secondary Education	71
Table 4.2:	Examination Pass Rates by Type of Management, 2005	74
Table 4.3:	Achievement Scores, Corrected for Selectivity Bias, by Management Type	74
Table 4.4:	Comparison of Teachers' Salaries and Test Scores of Government, Aided and Unaided Schools, 2005	75
Table 4.5:	Distribution of Secondary School Teachers, by Rural and Urban Location and by Employment Status, 2002	77
Table 4.6:	General Norms for Deployment of Teachers in Government Schools	78
Table 4.7:	Teachers' Salaries and Secondary Job Income by School Type in Rajasthan and Orissa, 2005	81
Table 4.8:	Average Monthly Salaries of Secondary Teachers and Non-teacher Salaried Workers, by School Management Type and Educational Level, 1999–2000 (Rupees)	82
Table 4.9:	Average Monthly Salaries of Secondary Teachers and Non-teacher Salaried Workers, by School Management Type and Educational Level, 2004–05	82
Table 4.10:	Academic Qualifications of Teachers	83
Table 4.11:	Professional Qualifications of Teachers	84
Table 4.12:	Monthly Average Gross Salary of Teachers (In Rs.)	85
Table 5.1:	Relative Proportions of Public and Private Expenditure on Education for Primary, Secondary, and Post-secondary, Non-tertiary Education, 2002	98
Table 5.2:	State Public Spending by Category, as a Percentage of Total Spending on Secondary Education	102
Table 5.3:	Per-student Spending as a Proportion of GDP Per Capita by Country Group, Late 1990s	104
Table 5.4:	Typical Per-student Cost Pattern by Education Level and Economic Growth Record	104
Table 5.5:	Secondary Level Per Student Spending by School Type, 2003–04	104
Table 5.6:	Monthly Tuition Fees in Rupees in Public and Private Secondary and Senior Secondary Schools in Rajasthan and Orissa (Standard Deviation in Parenthesis), 2005	107
Table 5.7:	Composition of School Expenditures by School Type in Rajasthan & Orissa, 2005	108
Table 5.8:	Sources of Finance for Public Secondary Education in India, 1950–95	110
Table 5.9:	Primary and Secondary Attendance Ratios, first and Fifth Quintiles, Selected Indian States 1987-88 and 1999 –2000	112
Table 5.10:	Calculation of Affordability of School Fees (Indian Rupees, 2004–05), by Consumption Quintile, Urban and Rural	112
Table 5.11:	Additional Resource Requirements to Finance Expansion of Secondary Education	114
 <i>Boxes</i>		
Box 2.1:	Regional Comparisons of Private Secondary Schooling	13
Box 2.2:	Lessons Learned from alternative certification route programs	22

Box 2.3:	Lessons from Expansion of Secondary Education Around the World	24
Box 2.4:	International Experience with Distance Learning	26
Box 2.5:	Conditional Cash Transfer Programs in Pakistan and Bangladesh	30-31
Box 3.1:	Teacher Education by Distance Learning	43
Box 3.2:	Policy Trends in Teacher Education and Development in OECD Countries	44
Box 3.3:	International Trends in Curricula	47
Box 3.4:	Perceived Irrelevance of Secondary School Curricula	48
Box 3.5:	International Baccalaureate (Ib) and International General Certificate of Secondary Education	50
Box 3.6:	The Role of Information and Communication Technologies to Improve Learning and Acquisition of Global, Knowledge-economy Skills	52
Box 3.7:	The Process of Conducting Board Certificate Examinations in India	55
Box 3.8:	School Quality Assurance (QA): Hong Kong, Singapore, and Uganda	60
Box 3.9:	How Jordan and Norway Use Results From the Third International Mathematics and Science Studies (TIMSS) to Inform Actions and Improve Student Outcomes	63
Box 3.10:	INDONESIA – Improving Quality Through Teacher Assessment and Upgrading	65
Box 3.11:	Putting It All Together to Improve Educational Achievement: Case Study of Delhi Department of Education	67
Box 4.1:	Teacher Management in Karnataka and Uttar Pradesh	80
Box 4.2:	Performance-Based Incentives: Some National and International Experience	86
Box 4.3:	What do we Know About School-Based Management?	88
Box 4.4:	Public Private Partnerships for Education	90
Box 4.5:	Formula Funding of Private Schools: an International Perspective	91
Box 5.1:	Case Study from Sri Lanka	110

## Executive Summary

This report on Secondary Education was prepared by the World Bank with the support of the Ministry of Human Resources Development (MHRD) and the Department of Economic Affairs of the Ministry of Finance, as a contribution to the Government of India's strategy for the development of secondary and higher education. The report analyzes secondary education from the perspectives of access, equity, quality, efficiency, management and financing, and proposes options for the improvement of secondary education in all these dimensions. It is hoped this will inform and stimulate the dialogue regarding central and state government policies and programs for the development of secondary education over the next decade, and shape the orientations of possible external partner programs, as well.

### I. Rationale for Public Investment in Secondary Education

**The primary justification for investment in secondary education lies in its contribution to economic growth and poverty reduction.** Most of the economic and employment growth over the past ten years in India has taken place in skilled services (information technology, financial services, telecommunications, tourism and retail) and skill-intensive manufacturing, all of which require, at a minimum, a secondary education degree. However, employer surveys (FICCI 2007) increasingly indicate that shortages of skilled workers constitute constraints to new private sector investment and growth in these very sectors. Further, analysis shows steadily rising rates of return to secondary and senior secondary education, reflecting that demand for knowledge and skills gained at the secondary level (fueled by economic growth) has increased faster than supply. Public investment can accelerate the response to this skills demand and overcome certain market failures which would result in underinvestment in secondary education by the private sector alone.

Secondly, **the positive externalities of secondary education on health, gender equality, and living**

**conditions are even stronger than those of primary education,** although these are difficult to quantify in economic terms. Through its impact on young people's age at marriage, and its propensity to reduce fertility and improve birth practices and childrearing, expanded secondary education of girls leads to significantly lower maternal and child mortality, slower population growth and improved education of children, all of which are important GoI goals. These social benefits to secondary education are very clearly seen in the results of the recently released National Family Health Survey III (2007).

Elementary education is of course necessary for all, but it is frequently insufficient to enable young workers to lift themselves and their families permanently out of poverty; recent economic studies have shown that secondary education is critical to breaking inter-generational transmission of poverty. Unfortunately, access to secondary education in India is highly unequal. There is a 40 percentage point gap in secondary enrollment rates between students from the highest and lowest expenditure quintile groups (70 percent versus 30 percent enrollment, respectively). In addition, there is a 20 percentage point gap between urban and rural secondary enrollment rates, and a persistent 10 percentage point gap between secondary enrollment rates of boys and girls. Enrollment of STs, SCs and Muslims is well below their share in the population at large. **Public policy has an important role to play in ensuring learning opportunities for all students irrespective of their home backgrounds, through the use of public funding to alter the distribution of the costs and benefits of secondary education.**<sup>1</sup> Furthermore, to the extent that ability is not correlated with wealth, a society can gain by providing equal opportunity for equal ability, rather than equal opportunity for equal wealth (Das, 2008).

---

<sup>1</sup> "Expanding Opportunities and Building Competencies for Young People: A New Agenda for Secondary Education", World Bank, 2005.

Fourthly, **public investment can overcome education market failures and household misperceptions of the value of secondary education, particularly among the poor.** Many poor households simply cannot afford the direct and opportunity costs of secondary education, nor can they access credit markets because of lack of collateral and other credit requirements. Other households, for socio-cultural reasons, under-value the benefits of secondary education, particularly for girls (Kingdon, 2002).

Fifthly, **secondary education makes an important contribution to democratic citizenship and social cohesion,** which are extremely important principles in India. Given India's size and diversity in terms of languages, ethnicities, religion and caste, secondary education enables students from different backgrounds to learn together and provides all youth with the foundations for democratic and civic participation. This simply cannot be done adequately at the elementary level, and by higher education the vast majority of youth have already left the education system.

Sixth, **there can be no major expansion or improvement of higher education in India without first improving and expanding the secondary level.** Given the relatively small enrollment rates at higher education (11 percent), and higher education's critical role in knowledge generation and promoting India's integration with the global knowledge economy and society, there is a rationale for public investment in higher education, albeit limited. Secondary education is the basic requirement for continuation to higher education. In addition, the opportunity to attend secondary education has been proven to be a powerful incentive for students to complete elementary schooling, reinforcing achievement of Millennium Development Goals. Indeed, secondary education can be a "bridge" or a "bottleneck" between elementary and higher education; public policy has an interest in ensuring it is the former, not the latter.

Finally, **India's gross enrollment rate (GER) at the secondary level of 40 percent is far inferior to the GERs of its global competitors in East Asia (average 70 percent) and Latin America (average 82 percent).** Even countries such as Vietnam and Bangladesh, which have lower per capita incomes than India, have higher gross enrollment rates. The relative success of these countries suggests that

India is underperforming at the secondary level, and has scope for significantly improving access and quality of secondary education given its current (and projected) GDP per capita. It also suggests that India needs to increase public investment in secondary education to remain globally competitive.

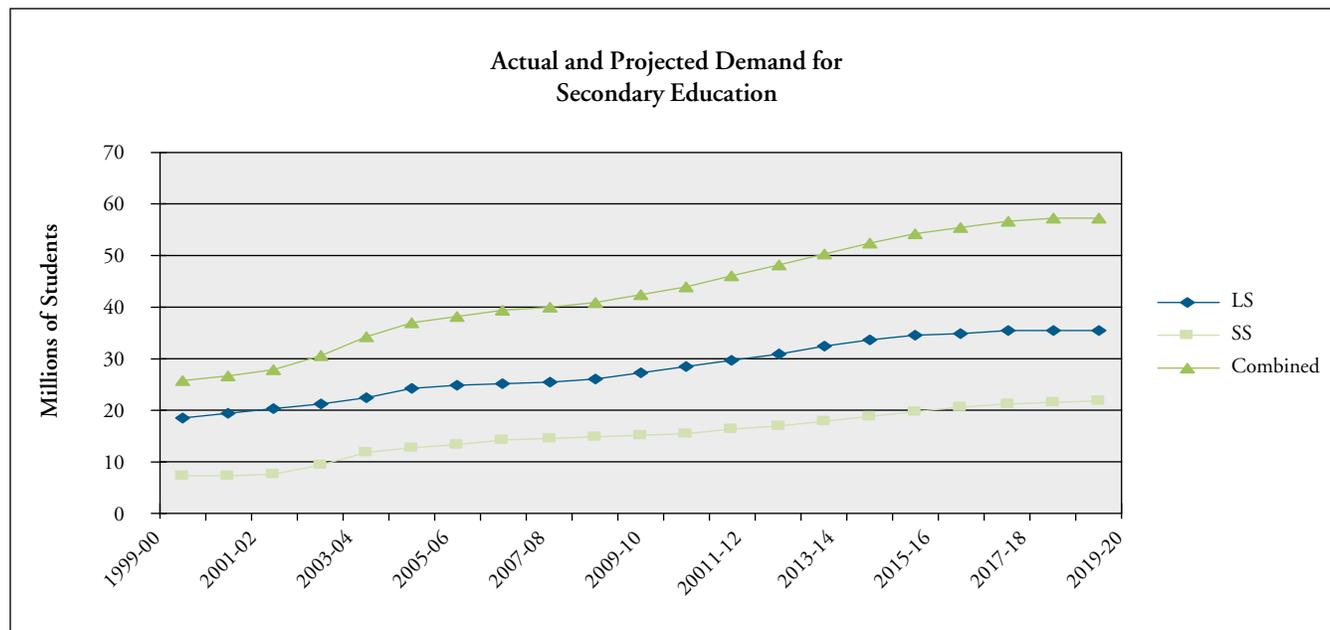
## II. Access and Equity of Secondary Education

At the lower secondary level (grades 9 and 10), the gross enrollment rate (GER) is 52 percent, while at the senior secondary level (grade 11 and 12) it is just 28 percent, for a combined GER of 40 percent (2005). In absolute terms, total secondary enrollment (lower and senior secondary) in 2004/05 was 37.1 million students, with 65 percent (24.3 million) in lower secondary and 35 percent (12.7 million) in senior secondary. It is estimated at over 40 million in 2008. Secondary education has expanded slowly, but steadily, over the past twenty years, largely contingent on the growth of elementary education. The growth in the number of secondary schools over the last two decades has occurred primarily among private unaided schools, which now represent almost one out of three of India's secondary schools. Jointly, private aided and unaided schools make up 60 percent of all secondary schools. Most secondary students are boys, and disproportionately from urban areas and wealthier segments of the population.

**Projections suggest an increase in absolute demand for secondary education between 2007/08 and 2017/18 of around 17 million students per year, with total enrollment growing from 40 to 57 million students.** (Note: the projections use rather conservative assumptions regarding retention and transition rates at elementary and secondary levels.) The number of students finishing upper primary education has been increasing at over five percent per year since 2001; this is projected to continue through 2014 with increased elementary enrollments linked to Sarva Shiksha Abhiyan (SSA), the Government of India's massive centrally sponsored scheme for elementary education<sup>2</sup>. Secondly, the benefits of secondary education are

<sup>2</sup> Projections suggest an additional 4–5 million grade 9 students per year by 2014 over 2008 levels.

## Actual and Projected Demand for Secondary Education, 1990–2020



LS: Lower Secondary, Grades 9–10; SS: Senior Secondary, Grades 11–12.

*Source: Selected Education Statistics, 2004-05 and author's calculations*

increasingly apparent to Indian households, at the same time as household incomes have increased (and average family size has decreased). This has made secondary education more affordable and in greater demand. However, an increasing share of these students will come from rural and lower income quintile groups, who will be less able to afford private unaided secondary education.

**Access to secondary education is highly inequitable, across income groups, gender, social groups, geography, and states.** Wealthier children are more than twice as likely to be enrolled in secondary education as poor children. In some states (e.g. Rajasthan, Uttar Pradesh, Madhya Pradesh) there is more than a twenty-point percentage gap in enrollment between boys and girls. Secondary attendance of the general population is 80 percent higher than that for STs, SCs and Muslims. Finally, secondary enrollment by state varies greatly, from 22 percent in Bihar to 92 percent in Kerala; and from 4 percent in Jharkhand to 44 percent in Tamil Nadu at the senior secondary level. Such huge differences reflect, in part, a lack of central government involvement in secondary education to equalize opportunities, particularly in the poorer states.

**On the supply side, four key constraints limit access to secondary education:** (i) insufficient and uneven distribution of school infrastructure; (ii) lack of trained teachers and inefficient teacher deployment; (iii) sub-optimal use of the private sector to expand enrollment capacity and to achieve social objectives; and (iv) insufficient open schooling opportunities for those who have left the formal system. For example, 27 percent of India's districts have less than one secondary school for every 1,000 youth aged 15–19 possessing their grade 8 diploma, meaning many schools are located too far from home to be accessible. Furthermore, multi-level regression analysis shows that more than 25 percent of the variance in secondary school attendance by grade 8 graduates can be explained by secondary school availability, after controlling for individual and household factors. Regarding teachers, projected expansion is likely to require at least 500,000 new secondary teachers for both public and private schools, not considering normal attrition. As for the private sector, the current grant-in-aid system (a form of public-private partnership) includes no incentives for improved student learning or expanded access. Finally, with respect to system flexibility, almost 50 percent of all secondary students either drop out or

fail the 10th grade exam and leave the education system, resulting in a huge loss of human capital.

Options to increase the supply of secondary education include:

- i. **innovative public-private partnership models (including reform of the current grant-in-aid system)** which take advantage of existing underutilized capacity in the private sector and induce a supply response to expand that capacity;
- ii. **public classroom and school construction**, especially in rural areas where private suppliers are unlikely to venture;
- iii. **training and hiring of more teachers**, including implementation of alternative paths to certification and rationalization of their deployment, so that supply better matches demand; increasing the size of classes and schools to make better use of available subject teachers;
- iv. **introduction of double-shift and multi-grade teaching** where appropriate; and
- v. **expanded use of open learning and new technologies** to complement and supplement face-to-face teaching, particularly for those who wish to re-enter the education system at the secondary level.

**On the demand side, the biggest factor is the low completion rate of elementary education, which limits the number of students ready for secondary education.** Currently, fewer than 60 percent of children complete grade 8, even allowing for repetition, although this completion rate is improving with SSA. Other factors limiting demand include the high direct and indirect costs of schooling borne by families, parents' misperceptions of the benefits of secondary education, especially for girls and among rural families, and poor quality and relevance of secondary education. The average direct costs of secondary education are double those of primary education, the costs of senior secondary education are four times as much, and the costs of tertiary education are six times as much.

The opportunity costs of education may be an even more important factor than direct costs in dissuading parents from secondary education, given average annual wages for grade 8 completers (Rs. 16,000) in a fast growing economy. Households have to forgo earnings and bear the direct cost of schooling, with just a 50 percent chance on average their child will graduate from Grade 10 (never mind Grade 12); demand-side constraints are real.

Options to raise demand for secondary education include:

- i. **programs to improve the internal efficiency and quality of elementary education** (this is being addressed through Sarva Shiksha Abhiyan), so as to increase the number and quality of grade 8 graduates;
- ii. **provision of financial and in-kind assistance for poor and disadvantaged students**, to offset direct and indirect costs of schooling, and overcome household reluctance to send their children (especially girls) to school;
- iii. **public information campaigns** to change attitudes about the benefits of schooling and delayed marriages; and
- iv. **investments in curriculum revision, progressive pedagogy, technology and examination reforms**, to make secondary schooling more relevant and attractive to young people and their parents. This would include remedial education programs to help children who may have attended poor quality elementary schools re-gain their grade learning levels.

### III. Quality and Efficiency of Secondary Education

Recent research (Hanushek and Wobmann, 2007) indicates that quality (measured by cognitive skills) is more important than access (measured by years of schooling) in determining future income and contribution to economic growth. **Unfortunately, small-scale standardized assessments of student achievement**

**in mathematics at the secondary and senior secondary level in two states suggest that the quality of instruction and learning is very low.** (Recent, reliable, large-scale learning assessments at the secondary level simply do not exist.) Statistically, it is possible to place the results of these small-scale assessments from Rajasthan and Orissa, based on published TIMSS test items, within an international league table. Both the methodology and results are somewhat controversial and should not be over-stated; nevertheless, this exercise places students from these two states in mathematics on average in 44th place out of 51 countries tested, just above South Africa and Botswana. On the other hand, the top performing 5 percent of students in Orissa and Rajasthan performed far higher, on average, than most of their peers around the world, including in OECD countries (Das and Zajonc, 2007). The sheer size of India's student population translates this small percentage into a large absolute number of high performing children.

**Analysis of key factors affecting student achievement confirms that schools play a very important role, determining approximately 50 percent of student achievement.** This is an important finding relevant for policy, insofar as it shows that schools can overcome to some extent disadvantageous socio-economic backgrounds of children and their parents. Analysis of these key factors and international research more generally indicate some consensus regarding the elements of educational quality, which include *inter alia* the quality and availability of teachers, the curricula and pedagogical processes applied to master it (Wu et al, 2008), the quality and availability of learning materials (e.g. textbooks, ICTs), learning assessments and examinations, and quality assurance/supervision.

**Teachers' pre-service education at the secondary level (university degree plus teacher education) suffers from poor standards, weak accreditation and monitoring, outdated pedagogical approaches, inadequate supplies of basic teaching and learning materials (including ICTs), and few incentives for improvement.** This is a critical issue facing the country as it proposes a massive expansion of secondary education which will require an estimated 500,000 new teachers, plus replacement of those currently teaching who will retire, and recent research

clearly establishes the importance of well-trained teachers (Hanushek and Wobman, 2007; McKinsey, 2007).

**In-Service teacher professional development secondary level is ad hoc, poorly resourced, and disconnected from classroom realities. Teacher effectiveness is also weakened by a lack of teacher accountability.** Unlike elementary education which has undertaken serious efforts over the last five years to enhance teacher effectiveness, increase community oversight of school performance (including teacher attendance), and decentralize teacher recruitment to local levels (increasing accountability), no such reforms have been undertaken at the secondary level. Publicly financed secondary teachers are thus largely unaccountable to parents, headmasters and educational administrators.

Secondary education in India is institutionally diverse, with three National Boards and 34 State and Union Territory Boards. Each Board has its own specified curriculum and school certificate examinations for Grades 10 and 12. **The result is lack of coordination and non-comparability of learning outcomes as measured by Board examinations between states and over time, a critical weakness in system accountability.** More positively, the National Curriculum Framework (NCF) of 2005 provides a set of guidelines for secondary education across the country, while leaving the states to determine their curricula and examination content within its broad direction and parameters. The NCF aims to lighten the overloaded curriculum in India's schools and to shift emphasis from rote memorization to conceptual understanding, synthesis, and application through an integrated and/or thematic approach to teaching and learning. Its approach accords with the worldwide trends in curricula, and is a very important reference point to build from. State Boards need to do more to align themselves with the NCF.

**A comparison of Indian and international curricula in language arts, mathematics and sciences highlights the issue of over-emphasis on rote learning of facts** as opposed to development of students' higher-order thinking skills. In addition, the sheer volume of facts which students are expected to master in order to succeed on examinations appears to exacerbate this problem, pointing to **curriculum overload.** More generally, secondary education curricula must address two objectives simultaneously: helping youth

develop the skills, knowledge and attitudes they need to succeed in the labor market upon graduation, while preparing others for higher education.<sup>3</sup> This challenge implies periodic curriculum reform to remain relevant, which has been slow to materialize in most Indian states.

**The quality of learning materials in secondary education, particularly of textbooks, is low.** National and state Boards differ widely in their approach to the organization of information and presentation of content in textbooks, with Central Board textbooks considerably better than State Board textbooks. State-level textbooks predominantly address students' examination needs, with even less emphasis on conceptual understanding than in the Central Board textbooks. In an effort to ensure affordability, states have compromised on the physical quality and attractiveness of the books. Finally, in some states textbook development remains a virtual monopoly of central institutions such that government schools and teachers do not have a choice and private publishers are excluded from the market; in those cases there is little incentive to improve.

At the secondary level, other learning materials than textbooks are required, such as information and communication technologies (ICTs), laboratory equipment, visual aids, audio-visual equipment, library and reference books. It is not possible within the context of this study of secondary education to assess the availability and quality of these learning materials, but it is safe to say these are in short supply. **The very limited availability of ICTs at the secondary level, in particular, limits teachers' ability to upgrade their subject-matter knowledge and students' ability to access essential learning materials,** in addition to constraining the development of ICT-related skills and behaviors youth need to succeed in the global knowledge economy.

**India lacks an effective quality assurance mechanism at the secondary level, for government, aided, and unaided schools.** The growth of the educational administration has not kept pace with that of the school system, particularly at the district and sub-district levels. Staff are often hindered by the large number of pending legal cases regarding transfers,

promotions, and pensions, and by lack of computerization. Teachers' service records and student enrollment statistics often are manually updated and processed, leading to inefficiency and mistakes. Data are not available on a timely basis for district offices to monitor key performance indicators at the school, block, or district levels. School inspectorates' staff numbers and travel budgets are too limited to supervise schools adequately; when inspectors do visit schools the focus is on administrative compliance, not effective student learning. Finally, the gaps between most parents' educational backgrounds and the academic level of secondary education make community-based school inspection a weak (though still important) alternative. There is a need for professional supervision.

**Unlike in elementary education, there are no national assessments of student learning at the secondary level,** essential for the identification of key determinants of achievement and the design of interventions to improve it, and to compare educational performance of states and sub-groups across time. This is a critical gap; unless quality can be measured it is impossible to know if it is improving or declining. Furthermore, as India has not participated in international assessments of student learning, such as the Programme for International Student Assessment (PISA), it is very difficult to benchmark its emerging human capital against that of other countries. (Note: In December 2008 MHRD committed to participation in PISA 2009, an extremely positive sign.)

Options to improve quality of secondary education include:

- i. **strengthened secondary education teacher training colleges,** including institutional accreditation assessments and improvement plans; competition for investments in facilities, equipment, faculty upgrading, etc.; and increased intake of trainees for underserved subjects. This could be complemented by expansion of **alternative paths to teacher certification** which allow those with strong educational backgrounds in needed subject areas to enter the profession;
- ii. **peer-based, mentor-led, practical, subject-specific professional development of teachers,**

<sup>3</sup> "Meeting the Challenges of Secondary Education in Latin America and East Asia", World Bank, 2006.

which networks teachers across schools for mutual exchange and observation (this is currently being practiced in CBSE schools under the name of “Sahodya”). This would include remedial education strategies to get all new students to grade 9 levels;

- iii. **Definition and dissemination of clear teacher performance standards and their use teacher performance evaluation;**
- iv. **Financial incentives and technical assistance for state Boards to align both curriculum and examinations to the National Curriculum Framework;**
- v. **Reforms in textbook development and procurement**, including teacher participation in their revision and a focus on enhanced quality and focus on higher order thinking skills, and **investments in ICTs** to enable more student-centered learning which draws from a wide range of resources available on the Internet;
- vi. **Reforms and investments in secondary education quality assurance mechanisms**, emphasizing strengthened pedagogical supervision and links to in-service teacher professional development;
- vii. **Examination reform**, to increase the focus on problem-solving and information-reasoning skills and decrease the emphasis on rote memorization of facts presented in textbooks. Until examinations change, it is unlikely that what is taught and how it is taught will change.<sup>4</sup> This could include modification of the State-level Grade 10 “high stakes” examinations, to increase the weight of internal assessment to determine if a student passes and to include common questions in all States in math and sciences. The pass/fail nature of the exam could be replaced by (a) an optional exam for those wishing to leave the system and obtain a Grade 10 diploma; and (b) an optional exam for those students wishing to enter the most competitive

academic track in senior secondary education. Under this scenario, other students who succeed on internal assessments would continue to Grade 11;

- viii. **Development and administration of national sample-based assessments for Grade 10 and 12**, and careful analysis of results to define quality improvement interventions;
- ix. **Participation in international assessments of student achievement at the secondary level**, and use of the results of those assessments to determine needed remedial investments.

Finally, it must be emphasized again that the parameters of access, equity and quality are integral and synergistic. They should be addressed simultaneously, not in sequence. Furthermore, the expansion of access will increase the challenge in some respects of maintaining, much less improving, educational quality, given that more students will be first-generation learners from less advantaged households.

#### IV. Management of Secondary Education

India’s secondary school sub-sector comprises approximately 150,000 schools, of which about 100,000 are secondary (Grades 9–10) and 50,000 are senior secondary (grades 11–12). Secondary education is largely a state-level issue, with relatively limited involvement by central, Panchayat Raj Institutions, or community-level authorities, compared to elementary education. Management is defined here to cover the administrative aspects of secondary schooling, including the ownership and financing of schools, recruitment and deployment of teachers, regulation of schools, and information-gathering and processing.

Central government manages slightly less than 1,000 Kendriya Vidyalaya (KV) schools (serving about 1 million children of central government employees who are frequently transferred), and 550 Navodaya Vidyalaya (NV) schools (serving 200,000 academically gifted children from rural areas). In addition, it runs the National Institute of Open Schooling (NIOS), operating in 11 regional centers and 1,943 accredited institutions,

<sup>4</sup> Recent moves by the Central Board of Secondary Education to emphasize higher order thinking skills (HOTS) is a very welcome step in the right direction, which State Boards should follow.

servicing 1.4 million students who did not complete formal secondary education. Given this relatively small number of centrally-managed schools (accounting for less than ten percent of total enrollment), this study focuses on state-recognized schools which enroll more than 90 percent of all secondary students.

**India has a long history of multiple management models at the secondary level, which provides opportunities for further experimentation and reform, particularly with respect to public-private partnership models.** There is great diversity at the state level in the mix of government, private aided, and private unaided schools for secondary education. Some states (e.g. Bihar, Jharkhand, Punjab and Himachal Pradesh) have large government school systems, while others (e.g. West Bengal, Maharashtra, Gujarat) have predominantly private aided systems, and others (e.g. Uttar Pradesh, Tamil Nadu, Rajasthan) rely mainly on private unaided schools. Analysis of relative cost-effectiveness and equity of different school management types leads to mixed conclusions, with no model unambiguously better, although private schools tend to do better on Board examinations, even after correcting for student selectivity bias, and have lower cost structures because teacher salaries are generally lower. More research is needed which compares learning outcomes to the locus of decision-making authority. **In summary, no single, “one size fits all” model will suffice for all states.**

The most important management issue in the education sector is teacher recruitment, given that teacher salaries consume the largest share of education budgets and the quality of teaching is the most important factor in student achievement. **Common problems in teacher recruitment in India are centralized hiring, insufficient objectivity, a shortage of candidates with the necessary attributes, and a high frequency of court cases arising from disputes on selection.** Government teachers are hired through state-level commissions, after which they are assigned to schools, with no input from the principal, community or local authority. Each state has its own academic and professional standards for teachers in government schools, although a university degree plus a Bachelor of Education (B. Ed) degree is typically the minimum requirement for secondary education. For senior secondary education, the requirement is typically a post-graduate

degree. The booming private sector labor market for higher education graduates has started to make it increasingly difficult to attract young people to consider secondary education as a career (particularly in mathematics and sciences), given their other options after completing university and/or post-graduate degrees. Subjectivity, reservation policies and political interference in teacher recruitment has led to tens of thousands of lawsuits across the country. This has a substantial impact on the school system, because once litigation on a recruitment case has started a court injunction prohibits any recruitment of civil service teachers until the lawsuit is settled. In addition, the relative job security of a secondary teacher in either government or private aided schools can lead to corruption, such as the sale of teaching posts (a recent study indicated Rs.100,000–200,000, or US\$2, 500–5,000, per position in private aided schools is common).<sup>5</sup>

Secondary teacher salaries in government and private aided secondary schools average Rs. 9,000–10,000 per month (US\$225–250), whereas in private unaided schools they average about Rs. 6,000 per month. (National Sample Survey, 61st round, 2004-05). **The limited employment opportunities in many sectors and in many states have enabled private schools until now to hire secondary teachers at lower salaries than government school teachers. This situation is changing, as the rate of expansion of secondary education (hence teacher demand) outstrips the supply of teachers, at the same time as other sectors also expand and compete for people with similar skills, particularly in mathematics, science and English.** The rapid growth in private sector salaries for university graduates over the last five years suggests that teachers who are required to earn university and post-graduate degrees may choose not to pursue teaching as a career when they graduate. In addition, some states have recently introduced the subject of English in the first grade; if this policy is adopted across all states, the demand for English teachers will surge, further increasing pressure on salaries. Private schools are likely to have to pay increased wages in order

<sup>5</sup> “Financing of Secondary Education in India”, edited by J.B.G. Tilak, NUEPA, 2008. In addition, teacher interviews as part of Rajasthan and Orissa case studies showed 17 % of Grade 9 teachers in urban aided schools in Rajasthan paid money to get their job, and 33 % of Grade 9 teachers in rural aided schools in Orissa paid money to get their job.

to attract and retain teachers with marketable skills. Rural schools will face even greater difficulty attracting and retaining subject teachers unless they can offer stronger financial or other incentives to serve there. **However, the issue is not so much relative teacher salaries between publicly and privately funded schools, but rather relative teacher effectiveness and accountability (a topic which requires additional research).**

Options to improve school management include:

- i. **Reform of the Grant-in-Aid System**, through which the state provides financing to private secondary schools. At a minimum, school grants could be made conditional on achieving certain performance standards (e.g. independently verified student and teacher attendance, retention/pass rates, examination results, etc.). More substantive reform would shift from financing of teacher salaries to financing per student capitation grants based on average public school unit costs, conditional upon previous year's fulfillment of minimum quality criteria (Bashir, 2003);<sup>6</sup>
- ii. **Introduction of school-based management in India's publicly funded secondary schools**, both public and private, to promote (i) improved decision-making based on better information, and (ii) increased community and parental involvement, which can increase accountability of decision makers and teachers (World Bank, 2008);
- iii. **Decentralization of new teacher recruitment to increase accountability**, with all new teachers recruited at the district or school level, initially on a contractual basis, from among those who have passed a state-level certification (Pritchett, 2007);
- iv. **Application of clear teacher performance standards**, their use for teacher evaluation in decisions regarding contract extensions,

promotions and other forms of incentives, and enactment/enforcement of policies which prevent teacher transfers during the school year;

- v. **Strengthened inspectorate and process for recognizing private schools (including their affiliation with Boards);** and
- vi. **Immediate improvements in basic management information collection and analysis for secondary education**, with Central and state investment and recurrent financing, building on the District Information System for Education (DISE).

## V. Financing of Secondary Education

**During the recent drive to achieve universal elementary education, the share of public investment in secondary education has dwindled**, although recurrent spending on this level has stayed relatively constant. Secondary education currently accounts for less than a third of India's total public spending on education, equivalent in absolute terms to about US\$7.2 billion per year (less than 10 percent of this on investment). About 75 percent of the public spending on secondary education comes from the states, which spend less than 1 percent of their per capita incomes for this purpose.

**Compared with international benchmarks, India's per student public spending on secondary education as a percentage of GDP per capita is somewhat high (27 percent, compared to a benchmark for fast-growing economies of 18 percent).** India's per-student public spending on secondary education is also high as a ratio of per student spending on primary education (2.9, compared to a benchmark for fast-growing economies of 1.4). **On the other hand, by international standards, India's per student spending on secondary education appears quite reasonable in absolute terms (average US\$173, compared to spending per student in secondary education of US\$577 in Latin America and the Caribbean, US\$257 in Sub-Saharan Africa, and US\$117 in South Asia).** Public teacher salaries as a ratio of GDP/capita are 4:1 (private teacher salaries as a ratio of GDP/capita are 2.3:1). International experience suggests such a high ratio constitutes a major challenge

<sup>6</sup> Bihar (March 31, 2008) recently announced its intention to provide public financing for private schools, based on student performance, with funds transferred to school management committees, not directly to teachers.

in achieving financially sustainable massification of secondary education through an approach based purely on public provision.

With current low levels of efficiency in India's secondary schools, the estimated cost of producing a lower secondary graduate is high, at around Rs. 21,500 (about US\$500 in 2005), or about Rs. 40,000 (US\$911) for both levels of secondary education. Government schools spend less per student than private aided schools; approximately, half of public funds in secondary education are spent through grants-in-aid to private schools, although these schools constitute just 30 percent of the total number. **Sustainable expansion of secondary education will require efforts to control (or reduce) unit costs where possible, through more efficient use of infrastructure, teachers and open schooling (where appropriate).**

**Inequities in access to secondary school mean that public subsidies at this level of education are distributed inequitably.** The subsidies are becoming more progressive, however, with the voluntary movement of the upper and upper middle classes out of publicly financed secondary education, and they will become more so as proactive efforts are made to expand the secondary enrollment of the poor and disadvantaged groups in public and aided schools. Not surprisingly, the equity of secondary education spending varies enormously among states. In Kerala, public subsidies are distributed almost equally between urban/rural areas and among boys and girls, and among students from all consumption quintiles. By contrast, public spending on secondary education in states such as Rajasthan favors urban boys from the upper three consumption quintiles.

**User fees are prevalent in secondary education, in government, aided, and unaided schools alike.** (Unlike for elementary education, India has no constitutional commitment to provide free education at the secondary and post-secondary levels.) The most prevalent user charges are tuition fees. Other types include: one-off admission or entry fees to a school; semester or annual examination fees; charges for using library, laboratory, or sports materials; and charges for participating in school activities.

For user fees in government schools, the secondary education departments of the states have the prerogative to fix the amount and the periodicity of collection. Typically, this is between Rs. 30–80 (US\$1–2) per month per student. Government schools are required to remit to the state department of education all the fees they collect. Private aided schools are required to remit part of their fees to government, but they are allowed to keep funds that they have raised for construction/repair or other specified activities. A 2005 survey in Orissa and Rajasthan indicated fees in private aided schools vary from Rs. 50–1,917 per month. Fee levels in private unaided schools are decided by the school boards that manage these schools; the same 2005 survey indicated tuition fees between Rs. 80–2,186 per month. Fees are part of school revenue. While government and most of the aided schools make ends meet, unaided schools often make a profit from the fees and funds they raise.

**There is some (albeit limited) scope for increasing school fees in publicly financed schools, particularly those from the top three consumption quintiles** (although those in the first consumption quintile have almost universally opted for private unaided schooling). Based on minimum estimates for teacher salaries, non-teacher expenditures, and classroom size, it is possible to calculate a theoretical minimum unit cost for a private secondary school of approximately Rs. 2,600 per year (US\$65), or Rs. 260 per month per child. Comparing that minimum monthly school fee with average household consumption quintiles provides a rough estimate of to what extent secondary education can be financed exclusively by households, under the assumption that households will be unable to spend more than five percent of total household consumption on one child's schooling. Calculations suggest secondary schooling is unaffordable without public subsidization for households in the lowest three consumption quintiles (perhaps the lowest four quintiles in rural areas). **In other words, the upper limit of private unaided secondary schooling in India is 35–40 percent of total secondary enrollment, compared to 30 percent today.** (Note: this actually overestimates potential financing, because the lowest consumption quintile could not be expected to have much disposable income for schooling, having to focus their expenditures on basic needs.)

Calculation of Affordability of School Fees (Indian Rupees, 2004-05), by Consumption Quintile, Urban and Rural					
	Q1 (lowest)	Q2	Q3	Q4	Q5 (highest)
Rural Household Average Monthly Consumption\1	1,299	1,786	2,230	2,845	5,378
Minimum Monthly Schooling Fee (Rs. 260) as % of Average Rural Household Consumption\2	20%	15%	12%	9%	5%
Urban Household Average Monthly Consumption\1	1,772	2,717	3,734	5,351	11,570
Minimum Monthly Schooling Fee (Rs. 260) as % of Average Urban Household Consumption\3	15%	10%	7%	5%	2%

\1: Per Capita Consumption Quintiles from NSS, 61st round, 2004-05;

\2: Average Rural Household Size: 4.9 (NFHS III)

\3: Average Urban Household Size: 4.6 (NFHS III)

Generically speaking, there are five options to increase financing for secondary education: (1) increase overall allocations to the education sector, including to secondary education; (2) shift resources from other levels within the education sector; (3) reduce/cap unit costs and improve internal efficiency; (4) increase private and community contributions; and (5) mobilize external assistance. Given the importance of achieving the elementary education agenda (MDGs) and supporting higher education, as well, a combination of options (1), (3), (4) and (5) appears to be the best strategy for India at this time. In addition, given the 11th Plan's commitments to greatly increase central funding for secondary education, it will be important to use that funding to leverage both state funding and state-level reforms for improved access, equity, quality and management.

## Conclusion

It is abundantly clear that enrollment capacity must expand in both public and private secondary schools. The pace of expansion of secondary schooling will depend on the numbers of students graduating from elementary education, and the extent to which both supply- and demand- side constraints on secondary education are reduced. Based on expected levels of efficiency and quality at the elementary level, projections suggest annual growth of secondary education on the order of 4–6 percent per year on average for the next 8–10 years. In the short term these increases may be absorbed without major new investments, but in the medium term additional secondary level classrooms and schools (both public and private)

need to be built. Each state needs to do its own analysis of enrollment capacity, equity, quality and affordable financing to determine how rapidly it can respond to this demand.

**Improved access must be accompanied by improved quality and equity, given their synergistic and integral nature.** To be meaningful, expanded access must lead to increased cognitive skills development among India's youth. Qualitative investments have long lead-times. This means India must start now. (e.g. curriculum revision and textbook development; teacher effectiveness frameworks; integrated educational technology programs; student assessment and examination reform; strengthening of quality assurance mechanisms; and management reforms which change incentives to promote quality). **India does not have the luxury of addressing access first and quality later.**

The disproportionately limited access to secondary education in the rural areas and for disadvantaged groups, point to the need to adopt a more effective and equity-oriented approach to using public finance to support both private and public provision. This could include reform of the existing grant-in-aid system in favor of a student-based, capitation grant-in-aid system that provides incentives to private schools to increase enrollment, with demand-size financing to encourage enrollment of girls and disadvantaged students. Or it could include reforms which introduce performance criteria to the existing system. In states with a large unaided sector — from which the poor are effectively barred by high fees — the challenge is to

provide targeted assistance for the poor to attend private schools where they operate in order to improve equity. In rural areas, however, the government is likely to remain the primary financier and provider of secondary education.

**The financial implications of universalizing opportunity for secondary education, combined with needed investments in educational quality, reforms in public-private partnership models, and increased cost recovery, are manageable given India's forecasted strong economic growth and revenue generation over the next ten years.**

This report examines the financial costs of four plausible scenarios for secondary level expansion; all of them are affordable so long as growth remains at least six percent

per year or so. However, given the primary role of the states in financing the recurrent costs of secondary education, sustainable expansion may not be affordable for those predominantly agricultural states whose growth is lagging behind the rest of the country (which typically also have relatively low elementary and secondary enrollment rates). In these cases the center will have to increase financial transfers to cover both investment and recurrent costs associated with the expansion of secondary education, or expansion will need to proceed at a slower pace.

**A consolidated agenda of options for reform and investment in secondary education in India is presented on the following pages.**

## Options for Reform and Investment in Indian Secondary Education

PILLAR ONE: IMPROVE ACCESS AND EQUITY	ACTION	SHORT-TERM (1–2 years)	MEDIUM-TERM (3–5 years)
<u>Theme 1:</u> Physical Capacity	Plan for expansion of supply of secondary and senior secondary school spaces;	State- and district- level secondary school GIS mapping exercise (covering public, private aided and private unaided schools), including current enrollments and enrollment capacities, cross-referenced against secondary-age population distribution from census data.	Maintain/update school infrastructure database, including enrollment capacities, school facilities, equipment, access to electricity, telecommunications, water, etc., at both central and state levels;
	Tap existing underutilized enrollment capacity in private schools;	Offer central and/or state funding to pilot per student capitation grants as new form of PPP, for attendance at private schools (aided or unaided), using independent monitors to verify enrollment/attendance. If needed, provide early remedial education to ensure subsidized students can keep up.	Evaluate pilot PPP programs (compare to current grant-in-aid system), revise and expand to new states and schools;
	Maximize utilization of existing secondary school places;	Introduce double-shift instruction in urban areas where demand justifies it, in public and private (PPP mode) schools. Provide central and/or state funding for additional staffing, textbooks, etc., at agreed marginal unit cost.	Compare performance between single- and double- shift students; adjust double-shift components (e.g. times of operation, staffing, resources. etc); expand double-shift instruction to additional urban areas, in both public and private schools;
	Increase public secondary and senior secondary school places;	At state level, conduct feasibility studies for new public secondary classrooms and schools in areas where private sector is unlikely to serve. Provide partial central funding to pilot PPP model which transfers price and construction risk to private sector; develop standardized bid documents and contracts for new school construction under PPP model;	Transfer funds to school management committees (to be strengthened) for additional classroom construction; implement PPP model for new school construction, including long-term (e.e. 20-year) maintenance/facility availability contracts on annual lease basis;
	Expand supply of non-formal secondary and senior secondary schooling.	Expand enrollment capacity of National Institute of Open Schooling and expand NIOS marketing programs, for working and/or out-of-school youth, rural areas, CWSN, migrant children, etc..	Compare examination pass rates and cost-effectiveness between open and formal schooling; assess affordability of open schooling for working youth and adjust financing as required.

<p><u>Theme 2:</u> Increase supply and quality of teachers</p>	<p>Rationalize existing teacher allocations;</p> <p>Increase supply of trained secondary and senior secondary teachers, particularly among reserved categories;</p> <p>Attract educated people to underserved areas of the secondary level teaching profession.</p>	<p>At state level, analyze existing teacher deployments in government secondary schools to identify those with very low Pupil-Teacher Ratios (PTRs), and revise policies and procedures governing teacher transfers;</p> <p>At central level, critically review existing Teacher Education centrally-sponsored scheme, and design a competitive, centrally funded program to increase pre-service teacher training capacity/intake (including civil works, curriculum revision, equipment, upgrading of faculty, learning materials, etc.), and at state level prepare promotional campaigns for targeted groups to enter teaching;</p> <p>NCTE to develop alternative paths to teacher certification (i.e. “easy entry” procedures), especially for those with math or science degrees who would only need short-term pedagogical training; pilot short-term pre-service training program.</p>	<p>Redeploy teachers from excess to underserved areas; enforce policies to restrict teacher transfers from rural to urban areas; offer non-salary incentives to teachers to remain in rural areas;</p> <p>Increase intake of secondary teacher trainees, with subsequent decentralized hiring at district or school level (initially on a contractual basis) from among candidates certified at the state level;</p> <p>NCTE and states to compare teacher performance between those with short- versus full- term teacher education; assess demand for alternative path entry into teaching profession and adjust incentives and pedagogical training as necessary.</p>
<p><u>Theme 3:</u> Stimulate Household Demand</p>	<p>Address financial constraints and defray opportunity and direct costs of schooling among disadvantaged groups;</p> <p>Address misperceptions of value of secondary education and socio-cultural constraints.</p>	<p>Provide central funding to pilot at the state level the provision of conditional cash transfers (CCT) and other forms of in-kind incentives to promote enrollment, retention and completion among targeted groups (girls, SCs, STs, Muslims, etc.). At central level, prepare templates for CCT administrative manuals which are adapted/adopted at the state level, train state-level administrative staff, publicize program, enforce conditionalities and ensure transparent flow of funds. Conduct baseline survey of beneficiaries.</p> <p>Provide central funding to conduct a national sample survey of poor households to identify and rank their reasons for not sending their children to school, disaggregated by gender, economic and social category.</p>	<p>Monitor, evaluate, revise and scale up provision of conditional cash transfers and other forms of in-kind incentives to promote enrollment, retention and completion among targeted groups (girls, SCs, STs, Muslims, etc.);</p> <p>At state level, launch public information campaigns among targeted groups, directed at poor parents, explaining benefits of obtaining secondary education degrees, using mix of state and central funds. Stress potential of securing jobs as teachers. Champion success stories of disadvantaged students who complete secondary education.</p>

PILLAR TWO: IMPROVE QUALITY	ACTION	SHORT-TERM (1–2 years)	MEDIUM-TERM (3–5 years)
<u>Theme 1:</u> Curriculum and Examinations	Promote national standards in core curriculum subjects;	States, NCERT and SCERTs to conduct comparative assessment of different curricula offered by various state and national boards, and develop consensus and roadmap for their alignment and convergence with National Curriculum Framework;	Center to provide financial incentives and technical assistance to align state curricula firmly with National Curriculum Framework.
	Align/Standardize State Board Examinations with National Curriculum Framework;	Center to provide states financial incentives and technical assistance to revise their Grade 10 and 12 Board Examinations to align with National Curriculum Framework;	At central level, establish and maintain web-based database and league table by States and districts of examination results;
	Consider reform of Grade 10 Board Examination;	Include in all State Board exams (at least math and sciences) a core set of “anchor” test items issued by NCERT and COBSE, and increase assessment of higher order thinking skills. Promote public debate regarding revision of Grade 10 examination, recognizing its utility for (i) academic sorting for students going on to Grade 11, and (ii) labor market signaling for youth leaving school to enter job market, but questioning its “gate-keeping” function which eliminates 35 percent of Grade 10 students from the education system each year;	At state level, pilot revisions of Grade 10 examination, evaluate results and continue revision as necessary. Increase public dissemination of results and internal analysis of results to determine remedial interventions.
	Introduce National Achievement Diagnostic Testing for Grades 10 and 12;	NCERT to develop sample-based Baseline Achievement Surveys (BAS) in maths, sciences and language arts for Grades 10 and 12, pilot in sample of states, and revise;	Administer BAS in Grades 10 and 12 on a sample basis in all states, build database, distribute results to states, districts and schools, and use feedback for design of school-based quality improvement programs; revise BAS.
	Benchmark student learning against international standards.	Obtain technical assistance from OECD and other sources in development of internationally-comparable student achievement tests, including test item development, testing standards/protocols, analysis and feedback of results into quality improvement programs.	Participate in international assessment programs at the secondary level, with capacity-building at central and state levels to administer and analyze international achievement assessments. Provide central funding to states to ensure participation.

<p><u>Theme 2:</u> Improve Teacher Effectiveness and Support</p>	<p>Promote teacher effectiveness and accountability</p> <p>Improve quality of teacher preparation</p> <p>Upgrade skills/ content knowledge of current teachers</p>	<p>NCTE, with NCERT/SCERTs, to develop, pilot and revise secondary level teacher performance standards, in consultation with teachers' unions and parent associations. All states to conduct sample survey of secondary schools (both levels and all management types) of teacher absenteeism, reasons for it, and propose measures to reduce it;</p> <p>Center and states to inform all teacher colleges receiving public funding that they must conduct self-assessment using National Assessment and Accreditation Council (NAAC) criteria, and submit to appropriate state, MHRD and NAAC authorities within period of 18 months or lose public funding. Based on institutional self-assessment (above), teacher colleges to submit institutional improvement plans for funding from central and state levels;</p> <p>NCTE and NCERT to establish minimum teacher knowledge and competency standards, including competency in ICTs (use of ICTs and integration into pedagogy). Develop new teacher professional development programs in DIETS, SCERTs/SIERTs, and Institutes of Advanced Study in Education, which emphasize inter-active, student-centered learning, and update teacher knowledge in their subject area which is directly relevant to the curriculum. Provide central funding for institutional improvement plans submitted by these entities, to ensure their capacity to offer quality professional development for teachers and headteachers;</p>	<p>At state level, disseminate teacher performance standards to all secondary schools (teachers, administrators and school management committees, SMCs); provide central funding to train headteachers and SMCs in their role to oversee fulfillment of standards; meeting of standards as certified by headteachers and SMCs would be condition for contract extensions of recently hired teachers, and/or for existing teachers to obtain promotions. Repeat survey of teacher absenteeism;</p> <p>NAAC/NCTE/MHRD to develop independent accreditation experts and methodology, to review teaching college self-assessments, visit institutions, and recommend approval or rejection of accreditation to NAAC/MHRD. Review and approve institutional improvement plans for funding, including public financing to accredited teacher training colleges for better learning resources, Internet/computer facilities, upgrading of faculty, A/V equipment, etc., based on monitorable targets for increased teacher trainee intake and output, enhanced student teaching, and improved performance on final exams;</p> <p>Ensure all secondary teachers have opportunities and incentives to participate in teacher professional development programs in DIETS, SCERTs/SIERTs, and Institutes of Advanced Study in Education, which enable teachers to meet minimum knowledge and competency standards;</p>
	<p>Strengthen pedagogical support for teachers, and enhance pedagogical competencies of Inspectors.</p>	<p>States, assisted by NCTE, to develop and pilot peer-based, mentor-led pedagogical groups among subject matter specialists to share topical resources, teaching techniques, lesson plans, assessment tools, etc. Center and states to provide minimal financing to ensure teacher participation in monthly meetings of pedagogical groups.</p>	<p>Increase central and state funding to expand peer-based model for teacher professional development, through subject-matter networks at the district and/or sub-district level, using ICTs to enable teachers to participate in a "community of practice".</p>

<p><b>Theme 3:</b> Improve availability and quality of learning materials</p>	<p>Improve textbook quality and supply</p> <p>Ensure complementary subject-matter specific educational resources which promote hands-on learning.</p> <p>Enable all secondary teachers and students to access ICT-enabled learning opportunities.</p>	<p>At state level, revise textbooks to emphasize higher-order thinking skills, improve production quality (paper, colors, graphics), and increase alignment with national curriculum framework;</p> <p>NCERT/SCERTs to develop, pilot and evaluate core sets of curriculum-specific learning materials and resources in language arts, mathematics, sciences and arts;</p> <p>At central level, prepare and introduce comprehensive policies and programs for integration of ICTs into teaching/learning of core secondary syllabi, including ICT infrastructure, capacity-building, content development, research and evaluation.</p>	<p>Provide central and state funding to ensure all government and aided secondary schools receive improved textbooks and core sets of learning materials; increase central and state funding to upgrade school libraries, science laboratories/ equipment, recreational facilities and equipment, etc.;</p> <p>At state level, roll-out integrated, classroom-based ICT programs in all public secondary and senior secondary schools, using combination of central and state funding. Offer private aided schools increased unit cost funding if they invest in similar comprehensive ICT programs.</p>
---	---	--	--

MANAGEMENT OF SECONDARY EDUCATION	ACTION	SHORT-TERM (1–2 years)	MEDIUM-TERM (3–5 years)
<u>Theme 1:</u> Improve secondary level planning and resource allocation.	Develop secondary education management information system (SEMIS).	At central level, in consultation with the states, design database architecture, reporting requirements, two-way information flows, etc. for SEMIS, building on District Information System for Education (DISE).	Roll-out SEMIS to all states, with financial incentives to states submitting information in timely fashion to MHRD/NUEPA. Continued government recognition of private schools would be conditional upon their prompt submission of this information.
<u>Theme 2:</u> Increase management effectiveness of secondary schools	Devolve new teacher recruitment to district level	At state level, assisted by central guidelines, establish policy framework, prepare training materials, allocate funding, and promote public debate for devolution of teacher hiring to the district level.	Devolve hiring and management of new teaching and non-teaching personnel to the district level (initial hires on a contract basis). Teachers should be State-certified, but funding for their salaries should be transferred to district level. Teachers may be transferred within districts, and only across districts on an exceptional basis.
	Increase parental/ community involvement in management of school resources.	At state level, assisted by central guidelines, establish policy framework, prepare training materials, and allocate funding for establishment of school management committees (SMCs) for all government secondary and senior secondary schools.	Establish SMCs in all government secondary schools; train SMC members in roles and responsibilities; introduce block grants to SMCs to cover operating costs and certain investment costs (e.g. for additional classrooms); conduct external audits of school accounts on a sample basis.
<u>Theme 3:</u> Reform and expand PPP models	Reform grant-in-aid system	Pilot reform of current grant-in-aid system, making continued annual funding conditional on teacher and school performance (e.g. teacher and student attendance, student retention and dropout, examination pass rates, etc.). Develop incentives for expanded enrollment, enhanced internal efficiency and improved student learning outcomes.	Evaluate and compare reformed grant-in-aid system to current system; expand the revised grant-in-aid program to additional private aided schools, using mix of state and central funding.
	Develop alternative PPP models	With central funding, pilot alternatives at the state level to current system, such that financing follows the student, not the teacher. Per student capitation grants would be paid to participating private schools, based on numbers of subsidized students enrolled, verified independently. Subsequent government payments would be conditional on achievement of minimum outcomes in terms of student and teacher attendance, student dropout and examination pass rates.	Compare student learning and efficiency results with traditional grant-in-aid system; revise and expand per student capitation model as per state demand.
	Increase credibility of recognition process, and supply of recognized private schools.	Increase transparency and rigor of process for recognizing private schools, and ensure their affiliation to a Board, and offer incentives for achieving recognition.	Increase availability of on-line information regarding private schools (recognition status, exam pass results, fees, etc.) so parents can make more informed choices.

FINANCING	ACTION	SHORT-TERM (1–2 years)	MEDIUM-TERM (3–5 years)
<p><u>Theme 1:</u> Increase volume, equity, efficiency and leverage of financing of secondary education.</p>	<p>Increase central and state public spending on secondary education, for both investment and recurrent demand-side financing. Use central financing to leverage state-level reforms.</p>	<p>States to prepare secondary level investment programs (3-year rolling design, with annual work programs and budgets). Beginning in FY09-10, MHRD to pilot fund transfer to selected states which have prepared their plans.</p> <p>MHRD and States work out cost-share arrangements for investments in expansion of secondary level capacity; prepare sample MoUs, clarify financial reporting requirements and formats, etc</p>	<p>Roll-out of centrally-supported investment program for secondary education to all states meeting specific planning, co-financing, fiduciary and outcome-oriented criteria.</p>
	<p>Increase financing for secondary education from households which can afford to pay.</p>	<p>States to revise policies and regulations regarding government and private aided schools, to permit increased fees and retention of generated revenue, combined with development of demand-side financing mechanisms for households in lowest two income quintiles.</p>	<p>Reduce non-targeted public subsidization of private aided schools; re-direct public financing to needy students attending private schools.</p>
	<p>Mobilize external financing on soft terms and use strategically to support central/state reforms in secondary education.</p>	<p>Allocate external financing to pilot and evaluate innovations in secondary education, such as per student demand-side financing (CCT programs and per student capitation grants); PPP models for secondary school facility availability, teaching services and non-teaching services; student assessment systems; teacher performance incentives; national and international achievement assessments, etc.</p>	<p>Evaluate pilots, revise and scale up as warranted, using combination of external and domestic financing.</p>



# Chapter 1. Why Invest In Secondary Education In India?

## 1.1 Introduction

Since Independence India has invested huge resources into the expansion and improvement of education in the country, in an effort to extend access from the elites to the masses. The first priority for the country has been the struggle to achieve Education For All at the elementary level, and rightly so; great strides have been made in this area over the past twenty years (and particularly over the last five years). The second priority has been to develop an elite higher education system, part of which is competitive at the global level, although much remains to be done at this level to improve access and quality. High-caliber graduates from the Indian Institutes of Technology (IITs) and Management (IIMs) have succeeded in generating jobs, economic growth and new knowledge, and enabled India's integration into the global knowledge economy. Now attention needs to shift to secondary education, to respond to rapidly increasing household and labor market demand for graduates with higher levels of knowledge and skills. Studies in other countries have repeatedly showed that expansion of secondary education is critical for sustained inclusive growth and poverty reduction. This first chapter provides the institutional context which affects access to, and quality of, secondary education, and establishes the rationale for public funding and, under certain conditions, public provision, of secondary education.

### 1.1.1 Structure and Goals of the Education System

The education systems in the States and Union Territories of India generally follow the 8+2+2+3 pattern, which provides for eight years of elementary education, two years each of secondary and senior secondary schooling, and three years of university education. Within this structure, each state independently determines the number of grades constituting elementary and secondary education. 18 of the 28 states offer five years of primary education, three years of upper primary education (also known as middle school), two years of lower secondary education, and two years of senior secondary education (5+3+2+2). Nine states provide four years of primary, three years of upper primary, three years of secondary and two years of upper

secondary (4+3+3+2). One state has a (6+4+2) structure. This diversity in terms of when students begin secondary education poses a challenge for development of coherent curriculum across educational levels and states.

In most states the first ten years of schooling are expected to provide general education without differentiation into arts, science, and vocational streams. Elementary education aims to develop literacy and numeracy, acquaintance with the social and physical environment, creative expression, and healthy living. Secondary education aims to develop the intellectual, social, and moral qualities essential for democratic citizenship, and to prepare young people for entry into the world of work or for continuation of academic pursuits (Secondary Education Commission Report, 1952; Report of Education Commission, 1964-66).

Senior secondary education is mainly for university preparation, and separates students into separate streams for arts, sciences and (often) commerce. Within these two main streams, there may be sub-groups, for example, a physical science stream along with mathematics and computer science.

Parallel to general education is a vocational stream. Indian policy has been to track 25 percent of the students in senior secondary education into the vocational stream, but vocational education has in fact been under-subscribed and constitutes less than five percent of total enrollment (World Bank, 2005c). Students who continue in Grades 11 and 12 usually aspire to tertiary education; those who attend vocational schools typically do so only because their academic results are not strong enough to enter the general academic track. Recently, the Central Advisory Board of Education (CABE) report on secondary education (GoI, 2005c) reversed this policy of "vocalization of secondary education", in favor of integrating general education with work skills, in line with international educational trends.

It is important to note that the responsibilities and budget for secondary and senior secondary education

were transferred in Fiscal 2006/07 from the Department of Secondary and Higher Education of MHRD to the Department of School Education and Literacy. This signals that the secondary level is no longer considered by the GoI as elitist, but rather as an integral part of mass education.

### 1.1.2 *The Respective Roles of Public and Private Schools*

India has a long tradition of partnership between the public and private sectors in education, dating back to the 19th Century. There are four types of schools:

- i. government schools, established by central and state governments;
- ii. local body schools, established by local government (e.g. municipalities);
- iii. private schools that receive government grants-in-aid (known as aided schools);
- iv. private unaided schools.

Government and local body schools are entirely financed and managed by the public sector. In the rest of this report, they are collectively known as “government schools” without further distinction. They account for approximately 40 percent of total secondary enrollment.

Private schools that receive grants-in-aid (GIA) are financed by the states, not by the central government, and account for approximately 30 percent of total secondary enrollment. They receive regular public funding to pay the salaries of teachers and administrative staff, but they remain under private management and finance their own capital expenditure (land, buildings, equipment, and some non-salary recurrent expenditures). They are subject to state laws and regulations, which usually require them to admit all eligible students irrespective of religion or caste, and use an Indian language as the medium of instruction. Teachers are funded based on the number of sections per grade offered, or some equivalent norms. Schools that use only English as a medium of instruction are less likely to be eligible to receive GIA. Aided schools are allowed to collect voluntary contributions from parents, but their fees are subject to government regulation, which has become restrictive on additional resource mobilization (World Bank, 2003a). In many

states, only private schools established before 1986 are covered by the grant-in-aid system.

Private unaided schools are entirely financed by school fees and funds that they themselves raise. They have considerably more autonomy regarding curriculum, the medium of instruction, the type of students admitted (e.g., single-sex schools, or religion-based admission), pupil-teacher ratios, and fee levels. However, they are subject to state regulation of teacher qualifications, and the terms and conditions of service of their teachers (although this is frequently ignored). Many private schools offer English as the medium of instruction, which has become increasingly in demand among Indian households. Because private, unaided schools are fee-financed, they have traditionally catered to children from families of means. The share of private, unaided secondary schools as a percentage of total secondary schools has increased from 15 percent in 1993/94 to 30 percent in 2004/05, reflecting the growth of the middle class.

## 1.2 Rationale for Public Investment in Secondary Education

Since human capital theory was incorporated into the mainstream of economic thinking in the 1960s, education and training have been widely viewed as an investment. Because education and training impart skills and knowledge that enhance productivity, they have positive effects on individuals’ life-time earnings (Schultz, 1961; Becker, 1964). Enhanced productivity contributes to economic growth. In a competitive labor market, where wages are determined by the supply of and demand for labor, the earning differentials among workers with various levels of education reflect differences in the marginal productivity of workers. The private rates of returns to education (at the individual’s level) tend to increase with levels of education (Psacharopolous and Patrinos, 1993). In India, these private rates of return to both lower and senior secondary education have been increasing steadily over time, as economic growth has increased demand faster than supply, and provide a clear rationale for household (private) investment in secondary education.

Furthermore, the benefits of education transcend individuals, and are often associated with innovation,

social cohesion, better health and nutrition outcomes, poverty reduction, and political participation (Friedman, 1955; Barr, 1993, 2002). The net benefits of education which accrue to society often outweigh public expenditure on education, resulting in positive social rates of return to education (Psacharopoulos and Patrinos, 1993). Where the social returns are higher than the private returns, public financing is justified, because the market would under-invest in education without the government's intervention. In theory, the level of public subsidy should correspond to the size of the positive externality, but in reality this is very difficult to assess. As the World Bank's recent publication regarding secondary education in Latin America and East Asia states, "Policy makers must rely on inherently imperfect information in reaching decisions on public financing".<sup>7</sup>

Even when private returns are higher than social returns, public financing can be justified on grounds of correcting household bias (for example, against girls education), information asymmetries (about benefits of education), and credit market failure (which precludes private borrowing to offset the cost of education), (Banerjee and Newman, 1993; Barr, 1993). These issues are particularly acute for poor households, which are least likely to be informed of the benefits of education and most likely to be excluded from credit markets. In addition, the opportunity costs of secondary schooling as a percentage of household income are greater for poor households, further dampening their demand. Thus, there is a strong equity argument for public financing, without which many talented children will simply be excluded.

In addition, with the rapid technological changes in the 1990s, developed countries shifted to considerable extent from resource-based to knowledge-based economies. The new growth theory holds that knowledge, unlike physical resources, is not subject to diminishing returns, thereby offering opportunities for continuous growth (Romer, 1986; Nelson and Romer, 1996). Therefore, not only should countries invest in education, but they should also invest in research and development, in order to generate

knowledge to drive growth. Knowledge generation typically means higher education which, of course, requires secondary education as a prerequisite.

Finally, as T. W. Schultz observed (1961), education's impact on productivity is highest in dynamic environments, where marketing opportunities, prices and technologies of production are changing. India's economic liberalization, increased global integration and sustained economic growth create the dynamic environment in which the returns to increased educational investment are likely to be high, and the risks to an uneducated individual (or to a country with a low stock of educated workers) are likely to be higher still.

The following sections elaborate how public investment in secondary education in India can facilitate economic development, increase social benefits, open opportunities for the poor and the disadvantaged, and promote democracy.

### *1.2.1 Secondary Education Contributes to Economic Growth*

In India, technological innovations, openness to world trade, and rapid economic growth have fuelled the demand for skilled workers. Recent analysis confirms that most of the employment growth over the past ten years has taken place in skilled services (information technology, financial services, telecommunications, tourism and retail) and skill-intensive manufacturing, all of which require, at a minimum, a secondary education degree. Meanwhile, employment declined in low-skilled occupations, and stagnated in agriculture as agricultural value-added growth decelerated sharply in the second half of the 1990s.<sup>8</sup> Even in rural areas, job prospects are better for the more qualified. Further, there is a rising overseas demand for highly skilled and semiskilled workers from India, most notably in the USA, UK, Southeast Asia, and the Gulf states.

However, employer surveys increasingly indicate that shortages of skilled workers constitute constraints to new private sector investment and growth. The Federation of Indian Chambers of Commerce and Industry (FICCI) conducted a survey of Indian industry in July 2007, whose results clearly showed that

<sup>7</sup> "Meeting the Challenges of Secondary Education in Latin America and East Asia", World Bank, 2006.

<sup>8</sup> "India's Employment Challenge: Creating Jobs, Helping Workers", World Bank, February 2008.

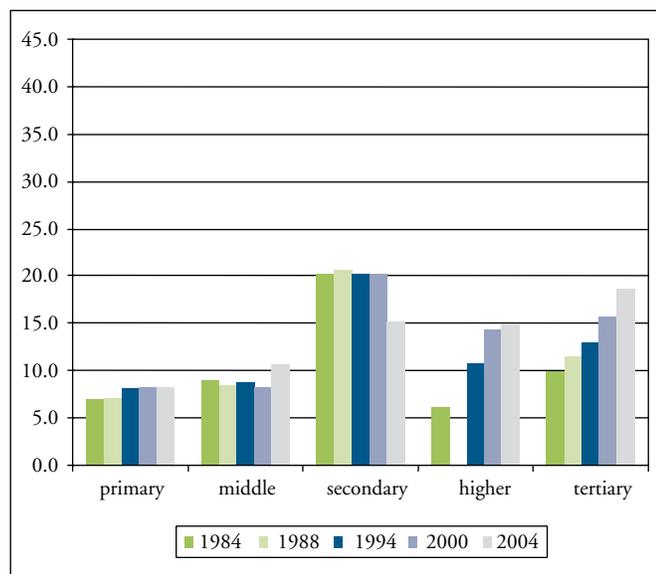
“the shortage of skilled and semi-skilled... workers has emerged as a critical factor impacting the competitiveness of Indian industry”. The skills shortages appear when trying to expand production (fill new vacancies), upgrade existing employees to more technology-intensive production processes, or replace loss of employees to higher paying employers. Shortages were reported across many segments of industry, including oil and gas, biotechnology, food processing, IT, aviation, health care, construction, automotive, mining, textiles, plastics, finance, insurance, chemicals and pharmaceuticals. From industry’s perspective, a more skilled workforce (meaning workers with at least secondary education) is critical for increasing technical absorption, reducing rejection levels and enhancing the quality of products for both domestic and international markets.<sup>9</sup>

Furthermore, a 2008 survey of 600 companies – both Indian and foreign - conducted by a human resources consulting firm<sup>10</sup> showed double-digit salary increases in both 2007 and 2008 in real estate, energy, retail, telecommunications, banking/finance, accounting/legal, IT and back-office processing (all of which require at least a secondary education), which

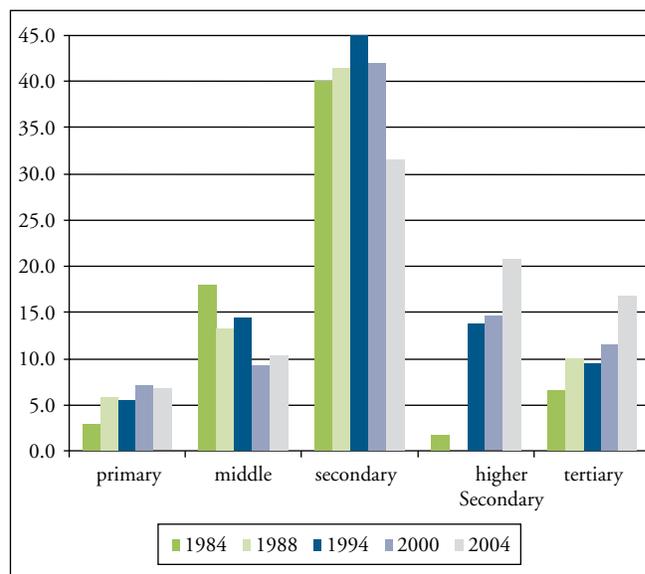
suggests employers are having to compete more for scarce skilled personnel. Interestingly, staff at the junior manager and professional levels received the largest pay increases, rather than senior/top management. In summary, all of the trends discussed above led a recent study of the Indian labor market to conclude: “This highlights the importance of enhancing secondary education, an area where India is still lagging.”<sup>11</sup>

Quantitative economic analysis supports this conclusion - the marginal private returns to additional education have been highest in secondary education, although in recent years the increases have been greatest at the senior secondary and tertiary levels (Figures 1.1 and 1.2). Given that skilled workers and professionals can migrate abroad much more easily to search for greater opportunities, if the earnings of Indian overseas workers were taken into account, the returns to secondary and higher education would be even greater<sup>12</sup> (World Bank, 2006c). The marginal returns to girls’ education have consistently been higher than those for boys and, comparing 1999 and 2004 calculations, the returns to girls’ senior secondary and tertiary education increased much faster than the returns to boys’ education.

**Figure 1.1: Marginal Returns to an Additional Educational Level - Males, 1983–2004**



**Figure 1.2: Marginal Returns to an Additional Educational Level - Females, 1983–2004**



Source: Authors’ analysis of National Sample Surveys, 43rd, 46th, 50th, 55th, and 60th rounds.

<sup>9</sup> FICCI Survey on the Emerging skill shortages in the Indian industry, July 2007.

<sup>10</sup> Hewitt Associates, quoted in *Hindustan Times*, February 29, 2008.

<sup>11</sup> “India’s Employment Challenge: Creating Jobs, Helping Workers”, World Bank, February 2008.

<sup>12</sup> There are about two million Indian nationals working in the Middle East, for example, according to Times of India, July 24, 2006.

The extraordinarily high rates of return for girls compared to boys are caused by the size of the earnings differentials between males and females at different levels of education. Females earn less than men at all levels of education, but the relative disadvantage is less for female secondary education graduates than at the elementary education level. The difference in earnings between girls with a secondary education and those with an upper primary degree is much greater than the difference between boys at these two levels. High returns for girls also reflect a selection bias, as girls who complete secondary education tend to be more able and motivated, and come from better socio-economic backgrounds, than the general population of girls.<sup>13</sup> As a result, girls realize a much higher rate of return on secondary education investments than boys (World Bank, 2002b). This selectivity bias will decrease as more girls attend secondary schooling.

The earning differentials between workers with high levels of education and those with less have widened, despite the expansion of the education system and an increase in the supply of educated workers at all levels. Since the early 1980s, the relative wages and relative supply of workers with secondary education have risen steadily in comparison with those of workers with only primary education. In recent years, the rise in demand for workers with senior secondary and tertiary education has been large enough to outweigh any downward pressure on wages resulting from the increased supply of such workers. This growth in demand for skilled workers is expected to continue, making the expansion of secondary education and improvement of quality a matter of some urgency.

India's trend of increasing returns to higher levels of education is consistent with worldwide trends in East Asia (including China), Latin America and Africa. These trends are likely to be associated with market liberalization and free trade (Lam and Leibbrandt, 2003; Schultz, 2003; Behrman, Birdsall and Szekely, 2003; Lloyd, 2005).

### 1.2.2 Social Benefits of Secondary Education

In addition to the private benefits of secondary education which accrue to households (which link to overall

productivity and contribute to growth), the social benefits of secondary education must be considered. Social benefits go beyond the wages of workers and consider other factors important to society. It is worth pointing out that the positive externalities of secondary education on health, gender equality, and poverty reduction are even stronger than those of primary education (World Bank, 2005a), although these are difficult to quantify in economic terms. Through its impact on young people's age at marriage, and its propensity to reduce fertility and improve birth practices and childrearing, expanded secondary education of girls leads to significantly lower maternal and child mortality, slower population growth and improved education of children, all of which are important GoI goals.

Table 1.1 below shows recently released data from the Third National Family Health Survey (2007), and compares the education level of females with a range of reproductive health indicators. The positive effects of upper primary and secondary education, as opposed to primary education or less, are strikingly clear.

In 2002 the World Bank estimated the social rate of return to secondary education to be 40 percent for girls and 13 percent for boys (compared to private rates for girls and boys of 26 percent and 15 percent, respectively, in 2004). This is more than high enough to justify increased public investment, particularly given the other non-quantified social benefits mentioned above.

### 1.2.3 Social Equality

Social inequality has resulted in differential access to quality education by young people from different household consumption quintiles, affecting their skills and earnings later in life. This, plus the fact that social networking affects access to good jobs, has resulted in inequality in earnings, even among workers with the same level of education. Workers from the poorest quintile have tended to earn less per hour than workers in the top quintile, even though they have the same level of education, if not the same quality (Figure 1.3). This has also been seen in Latin America where socioeconomic segmentation results in the poor attending schools of lower quality compared to their wealthier peers, which

<sup>13</sup> This selectivity will likely evaporate as the secondary enrollment rate of girls increases, reducing returns.

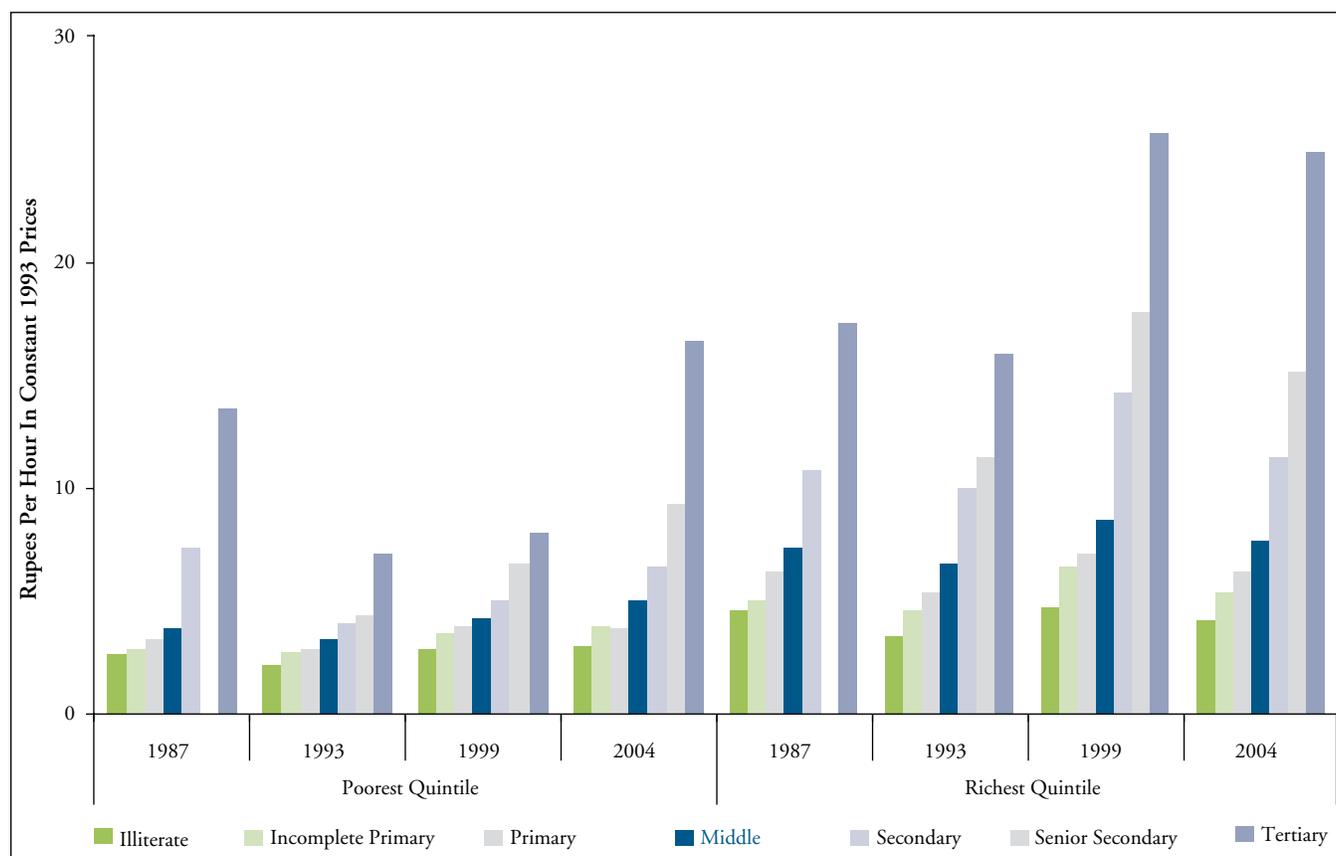
Table 1.1		Impact of Females' Education on Health Indicators						
Education Level of Females	Fertility Rate	Women Median Age of Marriage	% of Women 15–19 Begun Child Bearing	Mothers' age at 1st birth	Children < 5 Mortality (per 1,000 births)	% of Children with all basic vaccinations	% of Children who are malnourished (weight for age: < 2 S.D)	% of Women with Knowledge of HIV/AIDS
None	3.55	15.5	32.6	18.7	94.7	26.1	52	30.3
< 5 years	2.45	16.5	21.2	19	78.8	46.1	45.8	57.2
5–7 years	2.51	17.3	19.6	19.6	60.5	51.8	38.5	69.4
8–9 years	2.23	18.7	8.5	20.8	46.9	59.7	34.9	85.1
10–11 years	2.08	19.7	6.1	21.8	40.2	66.1	26.8	94.9
> 12 years	1.8	22.8	3.6	24.8	29.7	75.2	17.9	99.0

Source: National Family Health Survey III (2007)

translates into lower future earnings (World Bank, 2006). This situation has begun to change, however, as hourly wages have increased faster for those workers in the poorest quintile who have senior secondary and tertiary

education. This shows that education is a promising avenue for upward mobility for the poor, particularly in a rapidly growing economy. Government has an important role to play in encouraging this process.

Figure 1.3: Hourly Wages in Constant 1993 Prices by Education Level and by the Richest and Poorest Consumption Quintiles, 1987–2004



After India passed a Constitutional Amendment in 1976 which made education a joint responsibility of the central and state governments, there was much national debate regarding how to achieve education for all, and many state-level experiments with community-based primary education.<sup>14</sup> These contributed to the launching of the landmark National Policy on Education (NPE) in 1986, operationalized by the Plan of Action of 1992. The NPE laid the groundwork for a series of centrally sponsored schemes to support the universalization of primary education and gender and social equity.<sup>15</sup> In the 1990s, multi-state interventions, supported through the District Primary Education Program (DPEP) in half of the districts with low female literacy, built the foundation for the government's flagship National Program for Universal Elementary Education, *Sarva Shiksha Abhiyan* (SSA). Huge progress has been made in addressing inequality at the elementary level across all income and social groups through these programs, although the task is not yet finished.

By contrast, as will be seen in the following chapter, secondary level enrollment rates are far more unequal than those at the primary education level. There is a 40 percentage point gap between secondary enrollment in the highest (70 percent) and lowest (30 percent) quintiles, a 20 percentage point gap between urban and rural enrollment, and a 10 percentage point gap between enrollment of boys and girls. This raises significant equity (and political) issues for the State.

#### 1.2.4 Democratic Citizenship and Social Cohesion

Given India's diversity, education has been a central force for social cohesion, and for fostering a national identity

and democratic citizenship.<sup>16</sup> India is the world's biggest democracy, and is among the most diverse nations in terms of languages, ethnicities, and religions (Tharoor, 1997). It has 14 official languages and some 300 effectively spoken languages. Eighty-one percent of its population is Hindu; 13.4 percent Muslim; 2.3 percent Christian; 2 percent, Sikh; and 2 percent, other religions, according to the Population Census of 2001. Scheduled tribes (ST) account for 8 percent of its population and scheduled castes (SC), who are the most disadvantaged group in the caste system, for 16 percent. Extending opportunity to secondary education for all would level the playing field for individuals from different socioeconomic backgrounds (World Bank, 2005a), and strengthen effective democratic participation.

Indeed, soon after Independence, India's Secondary Education Commission (1952) stated, "...in a democracy... (the) individual must form his own independent judgment on all kinds of complicated social, economic and political issues and, to a large extent, decide his own course of action... a democratic citizen should have the understanding and the intellectual integrity to sift truth from falsehood, facts from propaganda and to reject the dangerous appeal of fanaticism and prejudice. He must develop a scientific attitude of mind to think objectively and base his conclusions on tested data... (and he must) dispassionately examine... and courageously reject whatever arrests the forces of justice and progress." Seen in this way, "universal secondary education is no more a luxury but a pre-condition for equitable social development, widening participation in India's democratic functioning" (GoI, CAGE Report, 2005).

Obviously, education *per se* does not contribute to democracy; education can be used for indoctrination. However, education that emphasizes reasoning, tolerance, and respect for diversity and social equity can build the

<sup>14</sup> Among the most famous operations that received international recognition are Rajasthan's Shiksha Karmi (sometimes known as barefoot teachers) and Lok Jambish (community-based education), and Madhya Pradesh's Education Guarantee Scheme, which operates in sparsely populated areas where there are not enough children to open a school.

<sup>15</sup> India opened up to external assistance in primary education after the World Conference on Education for All in Jomtien, Thailand in 1990. The mid-1990s saw the launching of the District Primary Education Program (DPEP) in 18 large states, covering about half of India's 600 districts with low female literacy rates. DPEP has built up the institutional capacity for planning and implementation at the state, district and local levels, strengthened coordination in training and research between schools and apex educational organizations at various levels, and created active partnerships between the government and civil society organizations.

<sup>16</sup> Milton Friedman (1955) has observed, "A stable and democratic society is impossible without widespread acceptance of some common set of values and without a minimum degree of literacy and knowledge on the part of most citizens. Education contributes to both. The gain from the education of one child accrues not only to the child or to the parents but to other members of the society; the education of one's child contributes to other people's welfare by promoting a stable and democratic society. Yet it is not feasible to identify the particular individuals (or families) benefited or the money value of the benefit."

essential foundation for democratic citizenship. The experience of post-World War II Germany and Japan in advancing democracy and peace testifies to the constructive and transformational power of education. Secondary education in the humanities and social sciences raises an individual's capacity for social and political discourse and enhances participation in political and civic affairs (World Bank, 2005a). Finally, while primary education takes place within relatively homogenous communities, secondary schools typically enroll more students with greater diversity given their larger catchment areas, which creates greater opportunities to foster citizenship and communal tolerance.

### 1.2.5 International Competitiveness

Beyond the purely domestic rationales for public investment in secondary education, it is important to consider whether India's development of secondary education compared to other countries justifies additional public investment at this level. Such a comparison is worthwhile as it highlights relative human capital formation. The supply of skilled human capital is consistently cited as one of the key variables in determining foreign direct investment in both manufacturing and services, which in turn is a key factor in economic growth.

Compared to India, East Asia and Latin America have much higher secondary enrollment rates (70 and 82 percent, respectively). On average, these countries have higher per capita incomes, as well. But as Table 1.2 below indicates, countries such as Vietnam and Moldova have lower per capita income than India and much higher gross enrollment rates. Bangladesh, with a far lower per capita income than India, has roughly the same enrollment rate at the secondary level. The relative success of these countries suggests that India is underperforming at the secondary level, and has scope for significantly increasing secondary enrollment given its current (and projected) GDP per capita. It also suggests that India may lose some private sector investment to these other countries which have much higher secondary enrollment rates.

Given their similar sizes and recent strong economic growth rates, it is worthwhile to compare India with

Country	GDP/Capita (US\$)	Secondary GER (%)
India	720	52
Bangladesh	470	52
Brazil	3,460	110
China	1,740	81
Indonesia	1,280	61
Kenya	530	48
Moldova	690	74
Mexico	7,310	79
Nicaragua	910	61
Pakistan	690	44
Peru	2,610	90
Philippines	1,300	84
Sri Lanka	1,160	83
Vietnam	620	72

Sources: WDR 2007; EFA Global Monitoring Report 2007; Pakistan SLM 2005-06

China, from the perspective of the stock of skills in the labor force (educational attainment among the share of the population aged 15 and older). The figures below, from the World Bank's recent publication, "The Knowledge Economy and Education and Training in South Asia" (2007), show that despite the increasing secondary enrollment, India lags far behind China. In fact, the share of the population which had completed secondary education in China in 1975 (31 percent) was twice the figure for the same indicator in India in 2004 (16 percent). The current speed of secondary enrollment expansion in India is insufficient to catch up with other parts of the world, especially East Asia (a major global competitor).

Figures 1.4 and 1.5 show that a larger proportion of the population aged 15 and older have completed higher education in India compared to China. But over the last 10 years, China has aggressively expanded its higher education system such that its enrollment rate (21 percent) is now twice that of India's. This has triggered concern in India and the current draft of the 11th Five-Year Plan calls for massive investments in the

Figure 1.4: India’s “Stock of Skills”

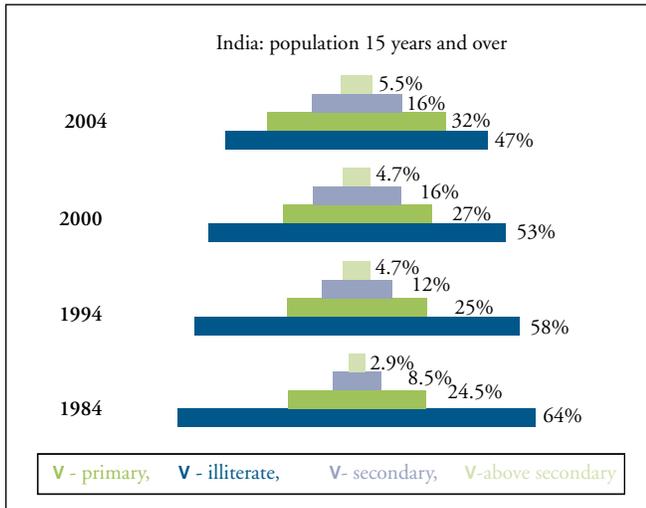
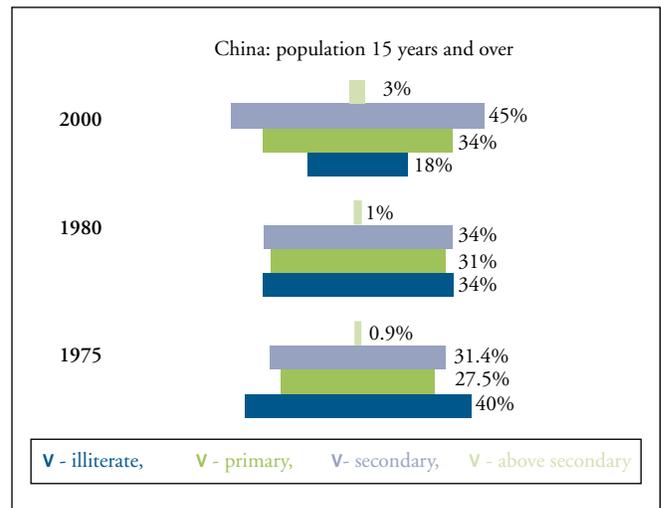


Figure 1.5: China’s “Stock of Skills”



expansion of higher education over the next ten years, with the goal of doubling its size. Obviously, such an expansion will only be possible if secondary education expands first.

### 1.3 Conclusion

The rationale for public investment in secondary education lies in its contribution to economic growth, demonstrated high social benefits, positive impact on equity, ability

to overcome education market failures and household misperceptions of the value of secondary education, preparation for higher education and generation of knowledge, and, finally, its contribution to democratic citizenship and social cohesion. However, public investment should not be conflated with public provision of secondary education, a topic which is considered further in subsequent chapters.

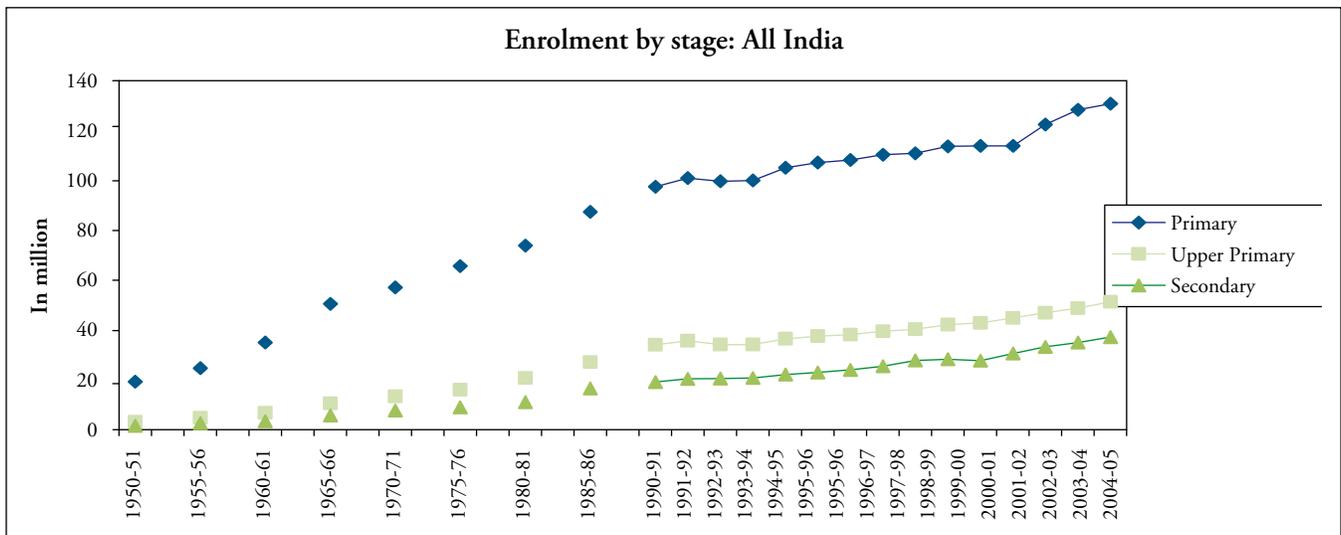
## Chapter 2. Access and Equity of Secondary Education

### 2.1 Trends in Access to Secondary Enrollment

Figure 2.1 below shows educational enrollment by stage since 1950. The most important feature for purposes here is the rapid growth of primary enrollment since 2001, when Sarva Shiksha Abhiyan was launched. As these students progress through the system, this increase in primary enrollment will soon manifest itself as increased demand at the secondary level.

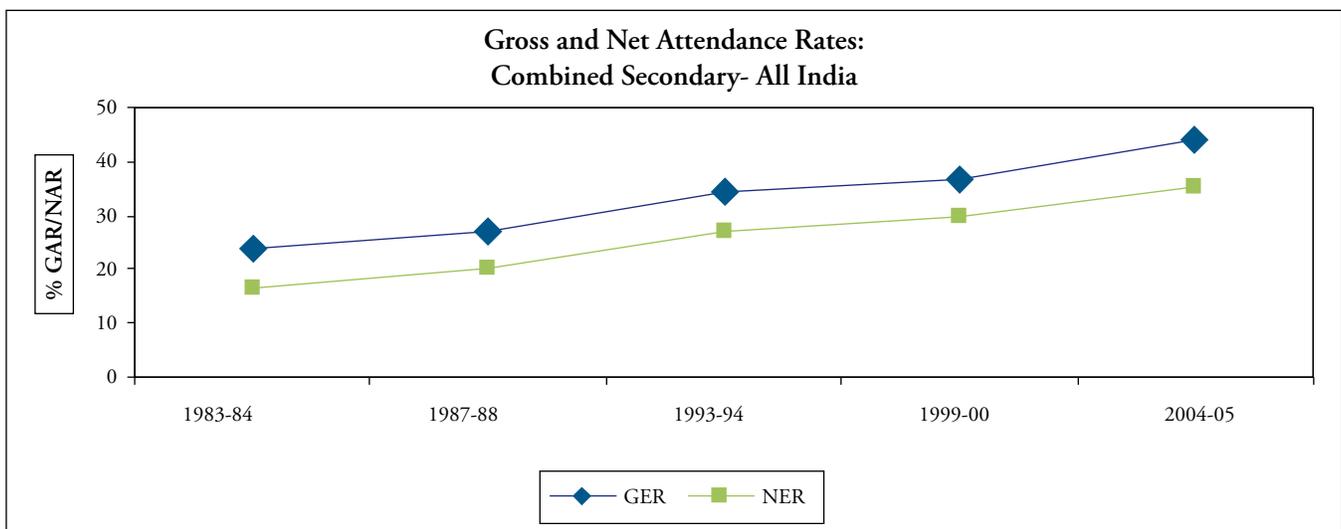
Figure 2.2 shows Gross and Net Attendance Rates of secondary education (both levels combined) between 1984 and 2004. It shows that secondary enrollment has increased steadily over the past twenty years, linked to efforts since the early 1990s to expand primary education and household willingness to invest in secondary education. But secondary level attendance remains low in relative terms: combined (secondary and senior secondary) gross

**Figure 2.1: Long Term Trends in Educational Enrollment in India, 1950–2005**



Source: Selected Education Statistics, 2004-05, MHRD

**Figure 2.2: Gross and Net Attendance Rates of Secondary (Grades 9-12) in India**



Source: National Sample Survey, various rounds

enrollment was just 40 percent in 2004/05 (52 percent for lower secondary and 28 percent for senior secondary).

Since 2000 total secondary enrollment has expanded at an average rate of 5.4 percent per year. In absolute terms this has meant an increase of 12 million secondary students, or a total cumulative increase of 48 percent. This huge increase in just five years reflects primarily greater household demand for secondary education and increased supply from the private unaided sector. In absolute terms total secondary enrollment (lower and upper secondary) in 2004/05 was 37.1 million students, with 65 percent (24.3 million) in lower secondary (grades 9 and 10), and 35 percent (12.7 million) in senior secondary (grades 11 and 12). It is estimated at over 40 million students today.

The secondary sub-sector is poised to continue rapid expansion. Figure 2.3 shows actual and projected demand for secondary education, using a set of rather conservative assumptions regarding retention and transition rates.<sup>17</sup> The

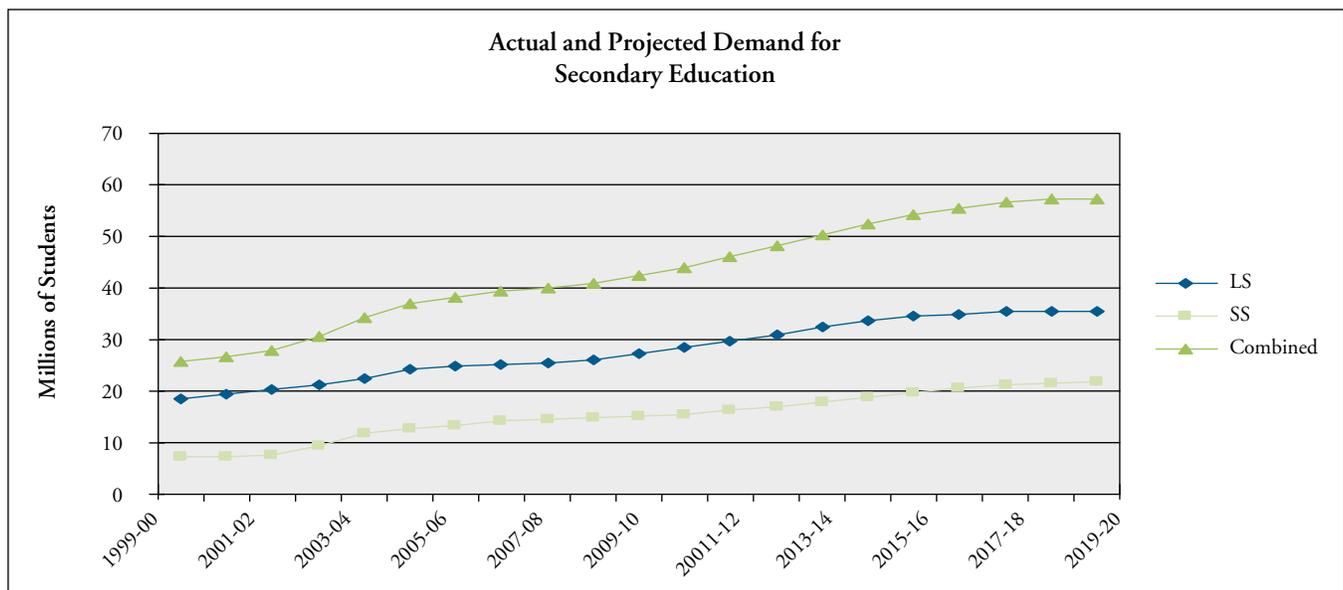
projections suggest an increase in absolute demand for secondary education between 2007/08 and 2017/18 of around 17 million students per year. This is a very large figure by any standards, and it may be even larger if retention and transition rates from lower education levels improve. More importantly, an increasing share of these students will come from rural and lower income quintile groups, who will be less able to afford private unaided secondary education. This calls into question the Government's recent strategy of relying largely on the private sector to absorb the increased demand for secondary education, and raises important financing, equity and political issues for the State.

### 2.1.1 Public Secondary Schooling

Public secondary education typically serves households who cannot afford to pay for private school, or who live in more rural areas where there is no private school (aided or unaided). Figure 2.4 shows that over the last 15 years the proportion of all secondary schools which are public has declined slightly, to 40 percent. By contrast, the share of private unaided schools has doubled, with a corresponding decline in the share of private aided schools. Note that this figure does not include enrollment in unrecognized private secondary schools, particularly in urban areas, such that it underestimates the real growth of private schooling.

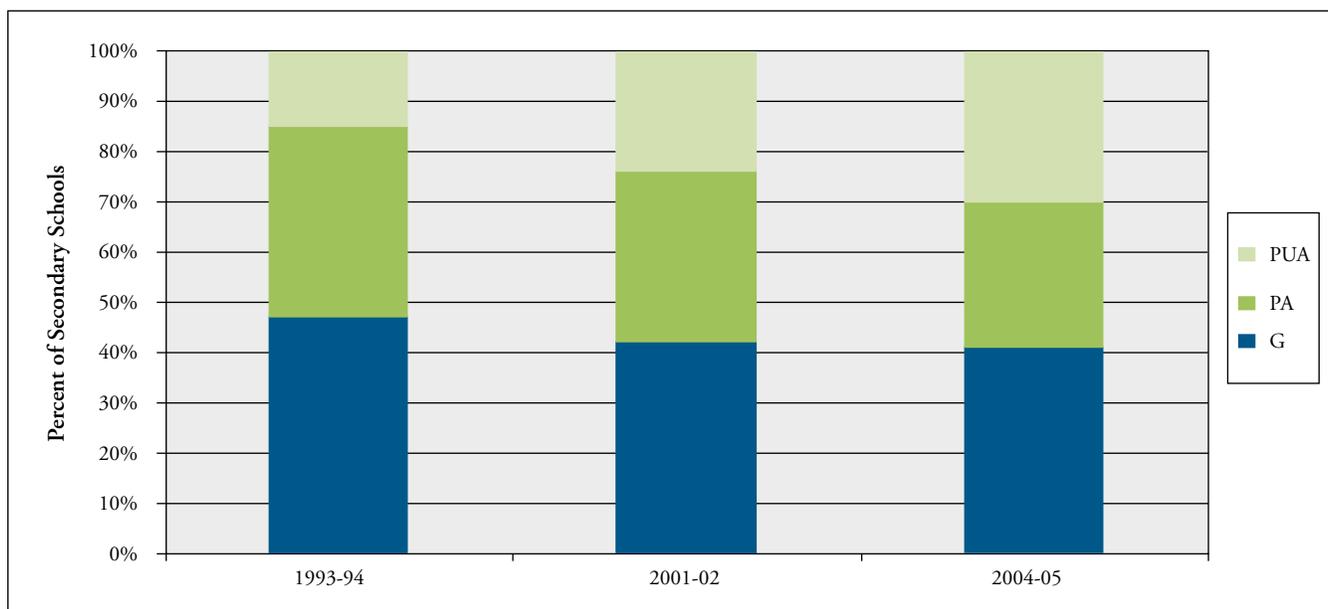
<sup>17</sup> Secondary level projections assume: (i) current enrollment trends at the elementary level; (ii) stable transition rates from primary to upper primary education (83 percent); (iii) the current transition rate from upper primary to lower secondary (86 percent); and (iv) the current transition rate from lower to senior secondary (65 percent).

**Figure 2.3: Actual and Projected Demand for Secondary Education, 1990–2020**



Source: Selected Education Statistics, 2004-05 and author's calculations

Figure 2.4: Secondary Schools by Management Type, 1995 and 2005



G = Government; PA = Private Aided; PUA = Private Unaided

Source: Selected Education Statistics, MHRD, 2004-05

### 2.1.2 Private Aided Secondary Schooling

Private aided schools are a form of public-private partnership (PPP). Currently, private aided schools provide 30 percent of total secondary enrollment nationwide, but this figure is much higher in some states (e.g. Kerala, Maharashtra, Assam, West Bengal and Gujarat) where more than 50 percent of enrollment is provided through private aided schools. Around the world policymakers are increasingly turning towards PPP models in education to address access, quality and equity concerns, because they typically increase accountability and performance through the terms of the contract between the Government and private provider. The current form of this partnership in India, through which the public sector finances private secondary teacher salaries and in many cases some operational costs, has its origins in the 19th century and the British colonial period. Unfortunately, the potential of PPPs described above is not yet realized in India.

Over time, the political power of teachers in private aided schools (many of them are members of state legislative assemblies, and almost all belong to active teachers unions) has eroded the contracting process, such that there is little accountability, performance assessment, or meaningful criteria for determining on a year-to-year basis whether the government should continue financing teacher salaries at

a particular private school or not. In many (though not all) states, aided school teachers' salaries are paid directly by the state government, not by the school administrator or local government (Panchayat Raj). In these states, teachers are not accountable to the principal or parents. Average unit costs of private aided schools in most states are slightly higher than for public schools, and parents appear to prefer them to traditional public schools if they have the option. However, the evidence comparing learning achievement in private aided and public schools is inconclusive, as will be discussed later in Chapter 3.

### 2.1.3 Private Unaided Secondary Schooling

Private unaided schools constitute 30 percent of all secondary schools (2004-05), up from 15 percent in 1993-94. Particularly in urban areas, they account for the majority of the overall increase in secondary enrollments. For example, between 1993 and 2002, 72 percent of the total increase in lower secondary enrollments in urban areas was provided through unaided private schooling (Kingdon, 2007: NCERT All India Education Surveys). This dramatic growth reveals both the willingness and capacity of households to pay for their children's secondary education, but also the increasing inequality of the secondary sub-

sector as poorer households cannot afford to pay both the direct and opportunity costs of their children's education.

schooling mean that inequity is poised to increase if nothing is done to change current policies.

### Box 2.1: Regional Comparisons of Private Secondary Schooling

The share of secondary enrollment served by private (aided and unaided) schools in India (60 percent) is far greater than in Latin America (25 percent) or East Asia (19 percent). In addition, India subsidizes private secondary schooling more than Latin America. By contrast, while East Asia has a smaller private secondary system than India, more than 50 percent of its funding comes from public sources, suggesting more effective use of public private partnership models to promote equitable access and higher quality.

*Source: Marshall, J. "Private Schooling and Student Achievement: Evidence from Latin America and Asia", 2005*

## 2.2 Equity of Enrollment

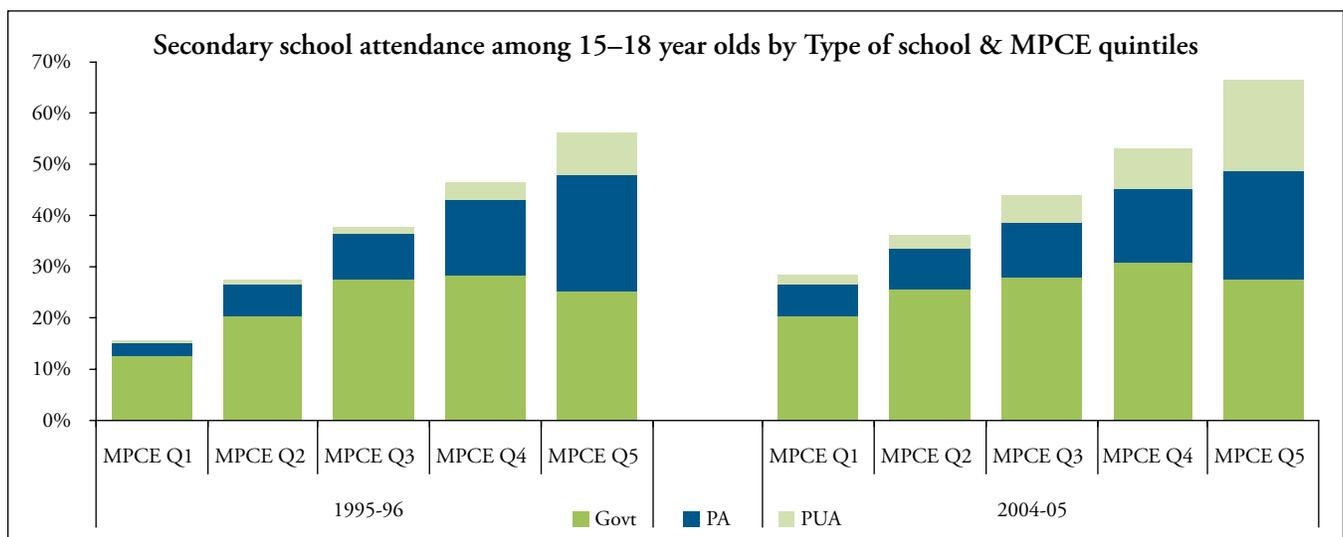
### 2.2.1 By Expenditure Quintile

Figure 2.6 presents attendance rates of secondary education (both lower and senior secondary combined) by expenditure quintile and by management type. In 2005 students from the highest quintile attended secondary school at more than twice the rate of students from the lowest quintile. While this inequity has decreased slightly over time since 1995-96 (as elementary education has expanded for poor children), the anticipated large increases in the number of grade 8 graduates from poor, rural areas over the next 7-8 years who will be unable to afford private secondary

In addition, Figure 2.5 shows that the increase over the last ten years in attendance by students in the top three expenditure quintiles is accounted for almost entirely by increased enrollment in privately financed secondary education. By contrast, the increase over the last ten years in secondary attendance among the lowest expenditure quintile is almost exclusively in publicly financed schooling (government and private aided schools), showing the importance of public financing to improve equity.

Inequitable enrollment at the secondary level by expenditure quintile is a logical extension of differential elementary completion rates among students from different expenditure quintiles, but not entirely. Table 2.1 shows elementary

**Figure 2.5: Attendance Rates for Secondary Education, by Expenditure Quintile and Type of Schooling**



*Source: NSS, 1995-96 and 2004-05*

education completion rates and secondary attendance rates by expenditure quintile. It shows higher inequality among quintile groups at the secondary than elementary level, perhaps reflecting poor households' inability (or unwillingness) to finance the costs of secondary education, or their location in rural areas where the distances to travel to a secondary school are simply prohibitive. Whatever the cause, simply improving equity at the elementary education will help but not resolve inequity at the secondary level.

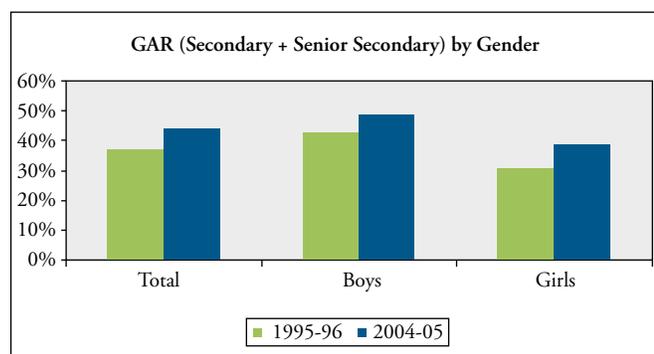
Education Level	Q1	Q2	Q3	Q4	Q5
Completion of Elementary Education	38	47	55	63	76
Attendance of Secondary Education	29	35	42	53	68

Source: NSS, 61st round

### 2.2.2 By Gender

As seen in Figure 2.6 secondary enrollment by gender shows a persistent ten-point difference over the last ten years between boys' enrollment (45 percent) and girls' enrollment (35 percent). This is a critical issue for reasons of efficiency (Chapter One showed that current rates of return to secondary education are far higher for girls than for boys) and equity. The very large positive externalities linked to girls' completion of secondary schooling also highlighted in Chapter One (reduced fertility, healthier children, etc.) increase the seriousness of this issue. India risks failure to achieve the Millennium Development

Figure 2.6: Gross Attendance Rate of Secondary Education, by Gender, 1995 and 2005



Source: NSS, 1995-96 and 2004-05

Goal of equal enrollment for boys and girls at the secondary education level by 2015 if comprehensive, high-impact measures are not urgently taken.

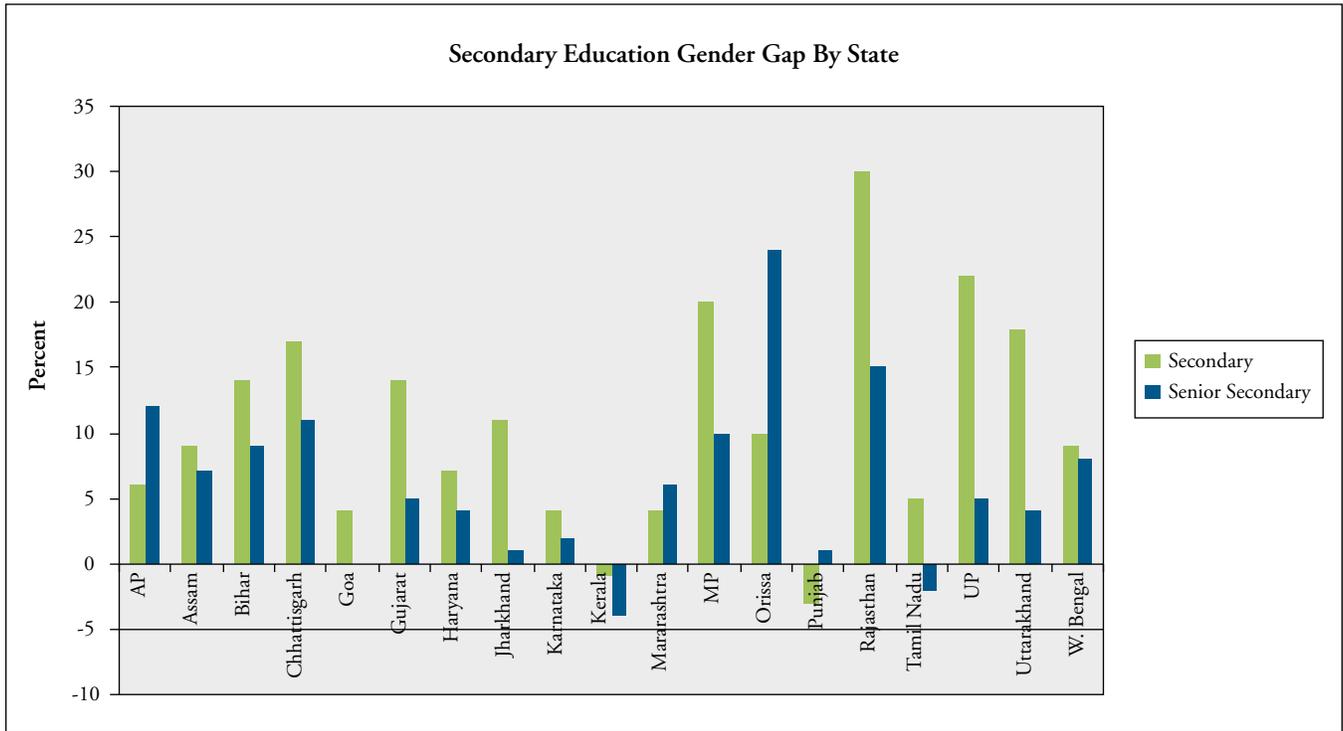
The gender equity issue becomes more acute when enrollment ratios are disaggregated at the state level, as seen in Figure 2.7 below, which shows the gap in gross enrollment ratios between boys and girls. At the secondary level, Rajasthan, Uttar Pradesh and Madhya Pradesh stand out as most inequitable, while at the senior secondary level, Orissa, Rajasthan and Andhra Pradesh are the most inequitable. Only in Kerala is girls' enrollment higher than that of boys at both secondary levels, while in Punjab it is higher at the secondary level and in Tamil Nadu it is higher at the senior secondary level. Otherwise, boys' enrollment at both secondary levels is higher than that of girls in all Indian states. This is linked to the relative percentages of boys and girls who finish elementary education (grade 8) in these states, but not entirely. The gaps in completion rates of elementary education between boys and girls by state are not as large as the gaps shown here. Clearly, this issue needs to be aggressively addressed, especially in the most inequitable states.

Secondary enrollment for girls in rural areas is particularly limited, averaging just 32 percent for both levels of secondary education (compared to 45 percent for boys). Though more than 70 percent of India's population lives in rural areas, rural enrollment only accounts for half of the total enrollment, and the male: female secondary enrollment ratio in rural areas is roughly 3:2 (Table 2.2). Gender inequality in access leads to gender inequality in the opportunity to improve one's life-time earnings.

	Urban			Rural		
	Total	Boys	Girls	Total	Boys	Girls
<b>Sixth All-India Educational Survey, 1993</b>						
Grades 9–10	62	37	25	38	27	11
Grades 11–12	49	29	20	51	35	16
Grades 9–12	45	26	19	55	37	18
<b>Seventh All-India Educational Survey, 2002</b>						
Grades 9–10	54	31	22	46	27	19
Grades 11–12	58	32	25	42	26	16
Grades 9–12	49	27	21	51	31	20

Sources: Sixth and Seventh All-India Educational Surveys, 1993 and 2002.

**Figure 2.7: Percentage Point Gap Between Enrollment Levels of Boys and Girls at Secondary Education**



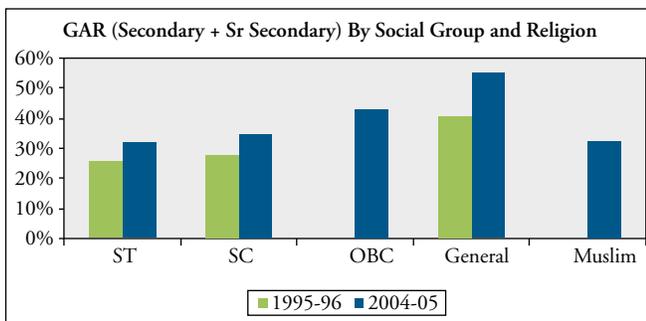
Source: Selected Education Statistics, 2004-05, MHRD

### 2.2.3 By Social Group

Figure 2.8 shows secondary school attendance by scheduled tribe (ST), scheduled caste (SC), other backward castes (OBC), Muslims and the general population. Roughly speaking, the attendance rate of the general population (55 percent) is nearly 80 percent higher than the average attendance rate for STs, SCs

and Muslims (31 percent). Obviously, this is not only a reflection of limitations (supply and demand) at the secondary level, but reflects the much lower elementary education completion rates of disadvantaged groups, similar to the discussion above regarding secondary enrollment by income quintile. But it points to the need for additional demand- and supply- side measures which target these disadvantaged groups.

**Figure 2.8: Gross Attendance Rate of Secondary Education, by Social Group**



Source: NSS, 1995-96 and 2004-05

### 2.2.4 Children with Special Needs (CWSN)

Children with special needs are another vulnerable group for whom educational attainment rates remain the lowest compared with all others. Disability legislation commits GoI to free schooling for CWSN to age 18, which includes secondary education, but Table 2.3 shows this is simply not happening: virtually no children with disabilities attain secondary education. At the elementary level, SSA has a clear “zero rejection” policy, such that provisions must be made to offer education to all CWSN in environments which are best suited to their individual learning needs; the same policy does not exist at the secondary level.

Achieving equitable access to secondary education, much less universal secondary education, will require pro-active efforts on the government’s part on behalf of CWSN.

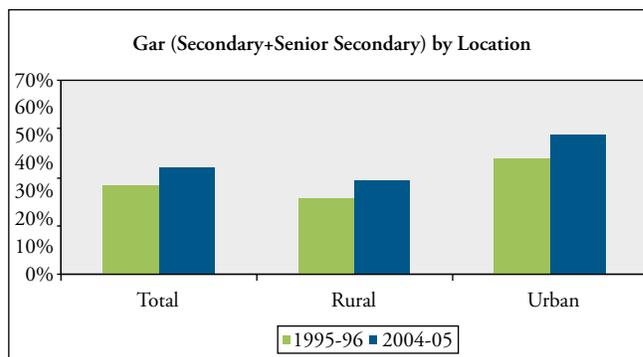
Table 2.3 / CWSN education attendance and attainment by severity, 2002			
Educational indicator	Severe PWD	Moderate PWD	Mild PWD
Goes to school	25.7%	56.3%	67.9%
Illiterate	72.2%	42.6%	34.9%
Primary or less	26.4%	52.0%	58.2%
Middle	1.5%	5.3%	6.8%
Secondary	0.0%	0.1%	0.0%
Higher	0.0%	0.0%	0.0%

Source: NSS, 58th round. Bank staff estimates.

### 2.2.5 By Geography

Figure 2.9 below shows secondary school attendance in urban and rural areas, indicating nearly 50 percent higher attendance in urban areas compared to rural areas. Geographic inequality actually increased over the last ten years, which reflects the expanded supply of private secondary schooling in urban areas, and greater ability of urban households to afford the direct and indirect costs of secondary schooling. Note this does not include unrecognized private schools, concentrated in urban areas, such that it underestimates the rural-urban disparity.

Figure 2.9: Gross Attendance Rate at Secondary Level, by Location, 1995 and 2005

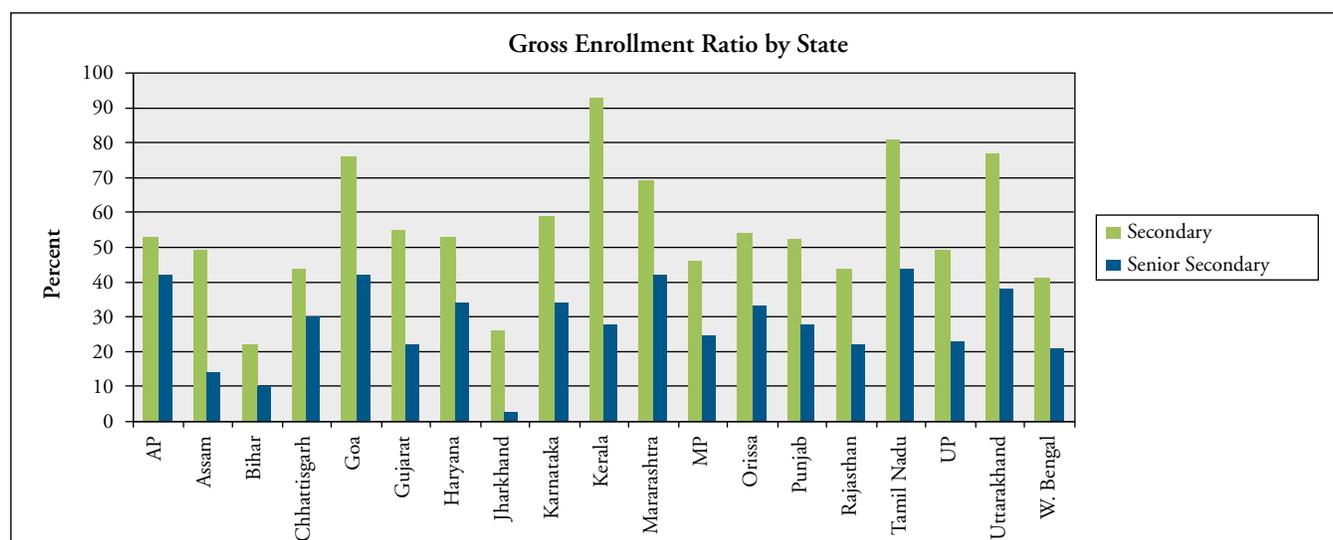


Source: NSS, 1995-96 and 2004-05

### 2.2.6 Differences among States and Districts

Figure 2.10 below shows Gross Enrollment Ratios by state, for secondary and senior secondary education. The first point is the huge range among states, and the large differences within states at different levels of secondary education. Because the central government has left secondary education largely to the states, determining what levels of access to each level of secondary education are desired and/or possible is a state-level decision, depending on their sustainable financing capacity, appreciation of labor market needs for secondary graduates, and ability of households in their states to contribute to financing of secondary education.

Figure 2.10: Gross Enrollment Ratios by State, 2005

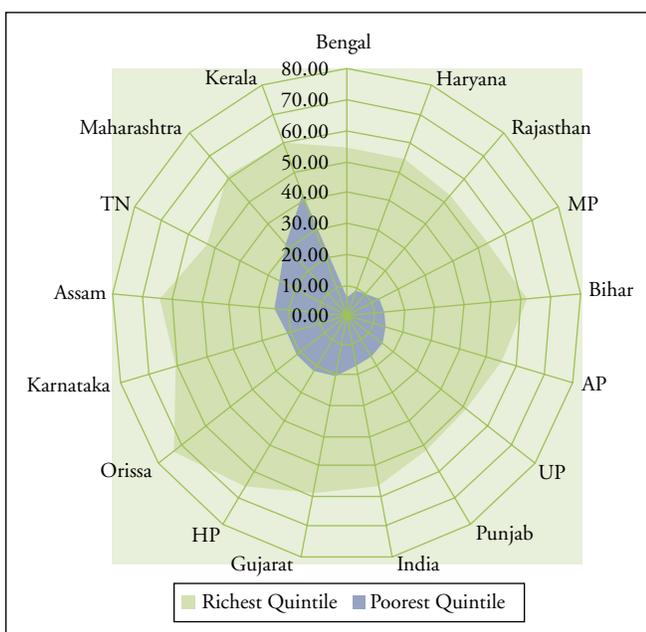


Source: Selected Education Statistics, 2004-05, MHRD

In the future, some states (e.g. Andhra Pradesh or Chhattisgarh) may wish to focus on its secondary level first (grade 9 and 10), leaving their senior secondary sub-system for later, while other states (e.g. Kerala and Uttarakhand) may choose the opposite approach given the lag in the senior secondary sub-system behind the secondary level. Still other states (Bihar and Jharkhand) must do their best to develop both levels of secondary education. In any case, this figure clearly indicates that a “one size fits all” strategy for development of secondary education in all states would be inappropriate, and the importance of increased central government support to equalize opportunities to attend secondary schooling across the states.

Figure 2.11 shows secondary level enrollment by state and by richest/poorest income quintile. States such as West Bengal, Haryana, Rajasthan, Madhya Pradesh and Bihar have particularly low overall secondary enrollment rates and high inequality by income group, whereas the southern states of Kerala, Maharashtra, Tamil Nadu and Karnataka do much better. Given that States are ultimately responsible for implementation of secondary education services, each

**Figure 2.11: Gross Enrollment Ratios by State and Highest/Lowest Income Quintile**



Source: NSS, 61st round

State needs to develop its own program to improve both access and equity of secondary education, in collaboration with MHRD.

## 2.3 Options to Improve Access and Equity of Secondary Education

### 2.3.1 Addressing Supply-side Constraints on Access and Equity

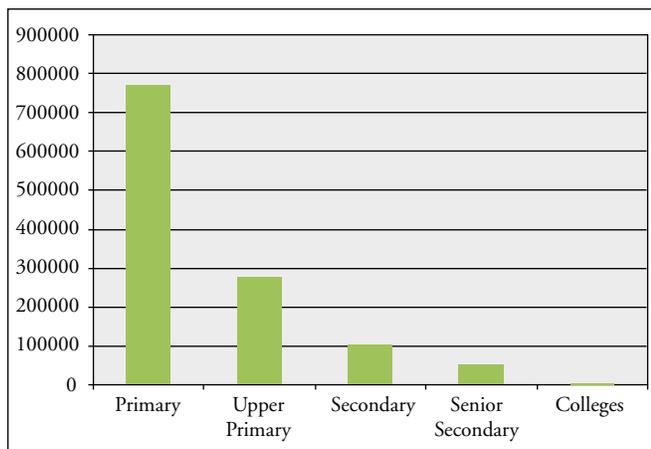
Supply-side factors are usually linked to availability of schools, teachers and learning resources. The key constraints on the supply of secondary education include the following: (i) insufficient and uneven distribution of school infrastructure, facilities, and resources; (ii) insufficient supply of effective teachers, uneven teacher deployment and low pupil-to-teacher ratios, which limit intake capacity; (iii) sub-optimal use of the private sector to expand enrollment capacity and to achieve social objectives; and (iv) insufficient open schooling opportunities for those who have left the formal system.

#### 2.3.1.1 School Infrastructure, Facilities, and Learning Resources

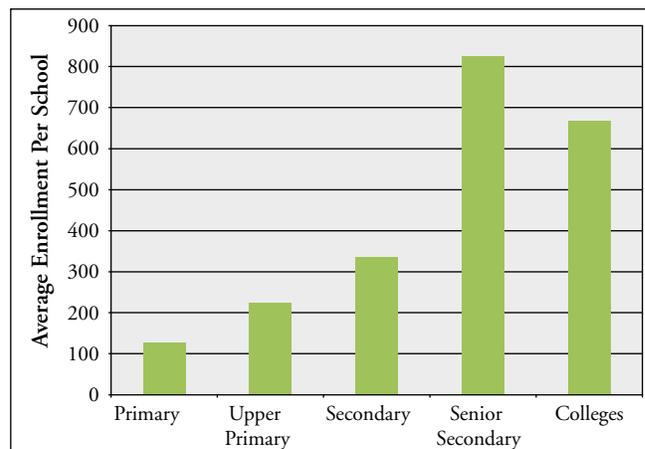
Secondary students come from “feeder” primary and upper primary schools. In 2005, India had approximately 770,000 primary schools, 275,000 upper primary schools, 100,000 secondary schools, 50,000 senior secondary schools, and 2,500 colleges with Grades 11 and 12 (Figure 2.12). On average, there are 2.7 primary schools for every upper primary school, 2.7 upper primary schools for every secondary school, and 2 secondary schools for every senior secondary school.<sup>18</sup> Although the current system of feeder schools appears reasonable, given the average number students per school (Figure 2.13), it contains serious imbalances between urban and rural areas, across states, within states, and even within cities.

<sup>18</sup> If schools with fewer than ten students are excluded from the calculation, there were 125 students on average in a primary school, 221 students in an upper primary school, 334 students in a secondary school, 823 students in a senior secondary school, and 665 students in a college with senior secondary grades (Kingdon, 2005).

**Figure 2.12: Number of Schools by Level of Education, 2005**



**Figure 2.13: Average Number of Students per School, 2002**



Source: Selected Education Statistics, 2004-05, MHRD; analysis by Kingdom of 7th All India Education Survey, 2000.

The relative lack of secondary schools in rural areas is seen in Table 2.4 below. Whereas there are more than 46,000 secondary schools in urban areas to accept students graduating from 87,000 upper primary schools (roughly 1:2 ratio), there are just 84,000 secondary schools in rural areas to absorb graduates from 250,000 upper primary schools (a 1:3 ratio). In addition, secondary schools in rural areas are typically located farther from upper primary schools than in urban areas, making accessibility a real issue.

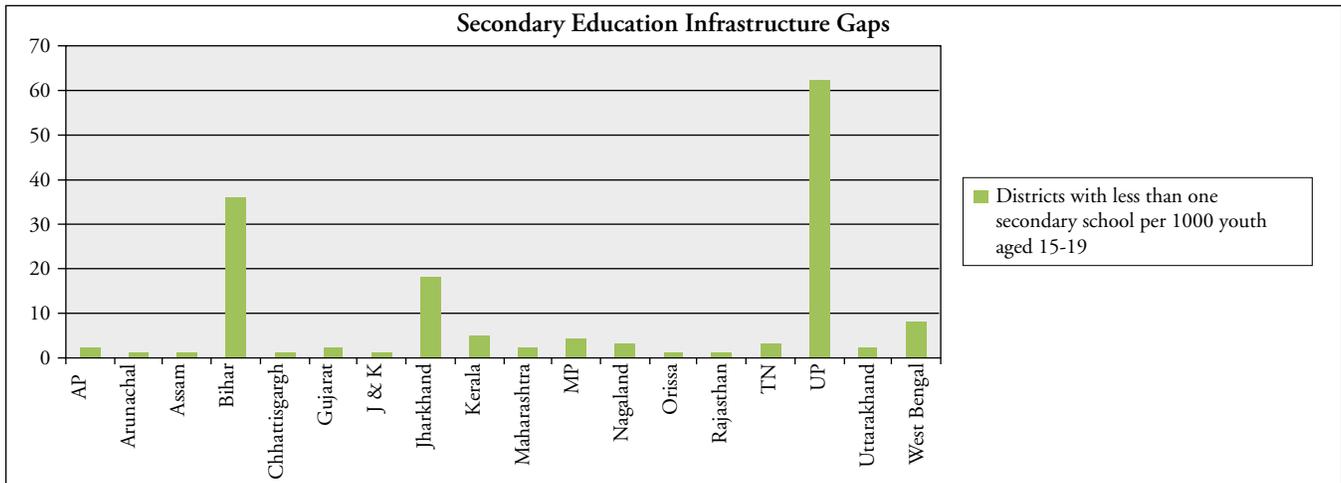
	Primary	Upper Primary	Secondary	Senior Secondary
Rural	716,037	250,975	84,370	22,847
Urban	134,384	87,005	46,305	21,022
Total	850,421	337,980	130,675	43,869

Source: 7th Survey NCERT (2002)

Closer examination of the situation at the district level permits the identification of key areas for intervention in terms of infrastructure. Figure 2.14 below shows the number of districts in each state which have less than one secondary school for every 1,000 youth aged 15–19. Uttar Pradesh, Jharkhand and Bihar clearly stand out as the states with the least coverage of secondary schooling relative to the distribution of the target population, where new schools need to be built.

Distance from home to school has been a deterrent to school participation in many countries and this affects girls more than boys (Andrabi et al 2007; Gertler and Glewwe, 1992; Alderman et al 1996a; Alderman et al 1996b; Alderman and King, 1998). Accordingly, 2004-05 National Sample Survey data were used to estimate the probability of attending secondary education, based on availability of secondary schools at the district level, and considering a host of individual and household factors. Multi-level regression analysis shows that more than 25 percent of the variance in secondary school attendance by grade 8 graduates in India can be explained by secondary school availability, after controlling for individual and household factors, which suggests that lack of school infrastructure is a major constraint on access. The norms of the MHRD are to establish a primary school within a kilometer’s walking distance from any habitation, an upper primary school within three kilometers’ distance, and a secondary school within five kilometers’ distance. But just 65 percent of villages have a secondary school within five kilometers, and in several states this figure is much lower (Table 2.5). (Beyond five kilometers, walking distance would be longer than an hour, particularly if no road exists, deterring either enrollment or regular daily attendance.) When high altitude or desert conditions, as well as heat and rain, are factored in, it is fair to say that distance to secondary school in India is a significant barrier to access.

**Figure 2.14: Number of Districts with Less Than One Secondary School For Every 1,000 Youth Aged 15–19**



Source: NSS, 61<sup>st</sup> round, and All India Census

	Villages within 5 km of Lower Secondary Schools	Villages within 10 km of Senior Secondary Schools
Andhra Pradesh	63%	42%
Arunachal	19%	9%
Assam	66%	65%
Bihar	46%	35%
Chhattisgarh	49%	63%
Goa	100%	100%
Gujarat	67%	57%
Haryana	87%	82%
Himachal Pradesh	83%	82%
Jammu & Kashmir	67%	49%
Jharkhand	36%	23%
Karnataka	70%	56%
Kerala	91%	93%
Maharashtra	79%	56%
Manipur	53%	55%
Meghalaya	35%	25%
Mizoram	25%	7%
Madhya Pradesh	59%	70%
Nagaland	67%	40%
Orissa	56%	37%
Punjab	95%	87%
Rajasthan	67%	59%
Sikkim	74%	73%
Tamil Nadu	74%	74%
Tripura	79%	70%
Uttar Pradesh	71%	80%
Uttarakhand	64%	86%
West Bengal	74%	80%
All India	65%	63%

Source: Authors' analysis of National Sample Survey, 58<sup>th</sup> round.

Within cities, too, secondary schools are not distributed evenly: “good” neighborhoods have an abundance of schools, but poor neighborhoods or slums hardly have any. Often the schools in poor neighborhoods have few teachers, resulting in extremely high pupil-to-teacher ratios. In Bhubaneswar, Orissa, for example, the PTR observed in a secondary school in a slum was more than 100:1, compared with the Indian average of 33:1.

State and municipal governments have a role to play in making land available for school construction, whether for public or private schools, and in providing associated infrastructure, including roads, electricity and telecommunications. Government subsidies are implicit in these transactions. In urban areas, land is increasingly scarce and expensive, making it difficult to establish new schools or expand existing ones. In the rural areas, scarcity of land is less of an issue but access roads are needed, and this could also imply an important role for the government and local communities. In any case, public authorities should do all they can to expand infrastructure on existing school properties, for instance, opening a secondary school adjacent to an upper primary school, or adding more secondary school classrooms to existing secondary schools.

As new schools are built and existing ones expanded, the imbalances in available facilities between urban and rural areas and across school types will need to be addressed to promote fairness in the system. In two in-depth case

studies of secondary schools in Rajasthan and Orissa, conducted in 2005, large disparities were found between rural and urban schools and also among different school types (Table 2.6).

schools, but fewer libraries and laboratories for science and ICTs. Rural schools fare worse on the whole, except they have more space for playgrounds. Rural government schools have laboratories and libraries, but few have

Table 2.6	School Resources in Sampled Government, Aided and Unaided Secondary Schools in Rajasthan and Orissa (Percentage), 2005.					
	Rural			Urban		
	Government	Private Aided	Private Unaided	Government	Private Aided	Private Unaided
<b>Rajasthan</b>						
Drinking water	95	-	100	100	100	100
Electricity	79	-	73	100	88	95
Telephone	33	-	67	68	75	85
Sufficient Classroom	79	-	93	64	88	88
Playground & Sports areas	86	-	93	82	63	71
Co-curricular Activities	72	-	47	91	38	27
Library	90	-	53	95	100	56
Science lab	50	-	13	68	63	34
Computer lab	43	-	47	77	88	63
Internet connection	0	-	7	14	38	17
<b>Orissa</b>						
Drinking water	68	88	72	90	94	86
Electricity	68	85	26	90	94	71
Telephone	34	74	13	90	81	43
Sufficient Classroom	89	91	82	90	100	86
Playground & Sports areas	71	91	82	70	94	71
Co-curricular Activities	76	91	18	80	88	29
Library	100	97	85	90	100	71
Science lab	42	76	26	50	81	29
Computer lab	11	29	5	40	44	14
Internet	0	9	3	20	13	0

*Source: Authors' analysis of Surveys of Secondary Schools in Rajasthan and Orissa, 2005.*

In Rajasthan, urban government schools have basic resources – electricity, drinking water, playgrounds, and co-curricular activities – but urban private aided schools have more “advanced” resources that are academically important, such as a library, science laboratory, computer laboratory, and Internet connections. Private unaided schools have better classroom availability than government

telephones or Internet connections. Rural private schools are slightly better off than rural government schools in terms of phones, classrooms, and Internet connections, but they have fewer co-curricular activities. In Orissa, private aided schools are much better resourced than any other school type in both urban and rural areas. Orissa's urban government schools are more connected with the

Internet than Rajasthan's schools. The point here is that availability of facilities and learning resources affect the quality of education. The provision of equal facilities and learning resources, to level the playing field between different types of schools and between rural and urban areas, is an essential part of the agenda for the secondary school system.

In addition, the CABE report (GoI 2005c) recommends building larger secondary schools with more facilities, even if that would mean double-shifting (i.e., using the same building for two shifts of students), in order to provide better learning resources and make more efficient use of available land infrastructure. This is a very rational approach for urban areas.

In fact, many countries around the world, particularly in urban areas, use double-shifting to optimize usage of school infrastructure. Almost all Latin American countries use this strategy, which has enabled them to reach over 80 percent secondary enrollment (in some cases, schools operate in the evenings, as well, in a triple shift mode). Urban areas have the necessary population density such that distances from home to school are not prohibitive for double-shifting. Land for school infrastructure is also much more expensive and hard to find in urban areas, making double-shifting more compelling. In most cases, two different sets of teachers are used for the morning and afternoon shifts, although double-shifting also allows for more efficient use of specialty teachers at the secondary level; they can cover both shifts so that separate teachers need not be hired. Double-shifting opens up new opportunities for public-private partnerships, as well, as private schools may be quite interested in operating an afternoon shift with public financing, enabling an increase in total enrollments at relatively little additional marginal cost.

### *2.3.1.2 Increase Output of Teacher Training Institutions and Develop Alternative Paths to Teacher Certification*

Most pre-service teacher education at the secondary level is privately financed by households. Given the huge need for additional teachers in both public and private schools to meet enrollment targets under the 11th Five-Year Plan, central and state governments may need to significantly increase public

funding and technical support to address this need. More specifically, public funding should target training of teachers where they are in short supply (e.g. mathematics), and/or to conform to reservations policies for hiring of SCs, STs, women, etc., as secondary level teachers. While provision of teacher pre-service education may remain privately managed, public accreditation of private teacher training institutions needs to be strengthened and made more transparent, at the same time as targeted public financing for these institutions could increase, ideally on a competitive basis which rewards private institutions for reforms and improvements in quality to reflect the 2005 NCF and related pedagogical approaches.

#### *Alternative Paths to Teacher Certification*

While in some Indian States (e.g. Kerala) there is a surplus of pre-service teacher training capacity, in precisely those States where the shortage of teachers is greatest there is a lack of pre-service teacher training capacity; these States may need to promote alternative paths to teacher certification. This issue has been faced by many countries around the world, both industrialized and developing. For example, England's "Teach First" program offers a two-year program for graduates who had intended to pursue business careers, including intensive employment-based teacher training during the summer after graduation and additional support and training during the first year of teaching, culminating with a teaching qualification after the second year of teaching. In the United States, more than 200,000 new teachers have gone through alternative routes in 47 out of 50 States. In fact, seventeen out of twenty-five OECD countries for which information is available make it possible for "side entrants" - that is, people who have pursued non-teaching careers - to enter the teaching profession.

Alternative certification programs typically enable individuals to earn their teaching certificates in one of the following ways:<sup>19</sup>

- ◆ *A condensed or shortened certification program, which may be completed during weekends*

<sup>19</sup> This section on alternative paths to teacher certification draws heavily from "Teacher Education Quality Assurance: Teacher Certification" (DRAFT), World Bank Policy Brief, January 2009 (author: Helen Craig).

and vacations at an accredited teacher training institute or university, while candidates work full-time. Another widely used mechanism is to obtain certification through some form of distance learning, often using multi-media radio, television, Internet and texts.

- ◆ *Supervised on-the-job training* under a “master” teacher or supervisor, often combined with course work in person or through distance learning.
- ◆ *Recognition for Prior Learning* may be used when masses of teachers need to be upgraded and certified. This is often combined with an examination and a portfolio of professional work.
- ◆ *Passing a written certification examination*, with or without some performance measure, with no additional course work, portfolio or recognition for prior learning, but is highly dependent upon the examination being able to discriminate well on the quality of the candidate.

Proponents of alternative teacher certification argue that such paths are not only viable but attractive because:

- ◆ Good alternative teacher certification programs are market-driven, designed specifically to meet the demand for teachers in geographic areas and in subject areas where it is greatest;
- ◆ They eliminate artificial and unnecessary licensing requirements, and are not overly onerous for

candidates to manage while they are employed as teachers on a provisional basis;

- ◆ The accompanying teacher preparation programs are tailor-made, specifically designed to meet the needs of individuals who already have at least a bachelor’s degree and, in many cases, experience in other occupations, to teach in specific areas and in specific subjects;
- ◆ Rather than train people to teach who may or may not ever go into teaching, alternative route programs recruit individuals for specific teaching positions and place prospective teachers in those jobs early in their training programs, increasing efficiency of training programs;
- ◆ The teacher preparation program is usually field-based, which provides much needed practical experience;
- ◆ Prospective teachers tend to work with mentor teachers while teaching;
- ◆ Candidates usually go through their program in cohorts, not as isolated individuals;
- ◆ Most of these programs require improved collaboration between the hiring entity (State or district) and the institutions responsible for training, which can help in making that training more relevant and practical, which in turn can positively influence traditional pre-service teacher training.

### Box 2.2: Lessons Learned from alternative certification route programs

1. Balance workability with a firm commitment to meaningful support and training. If the program is cumbersome and bureaucratic, States and districts will not use it and capable candidates will not tolerate it. Allow candidates to test out of coursework requirements. But if merely a “shortcut,” it will not have public or professional credibility, and use of it to attract quality people into teaching will not have support. School- and training institute- based mentoring after new teachers are placed is critical, but coursework required of new teachers in their first year of teaching should be limited to avoid overload. Limit program duration to a maximum of two years, including two years of practice teaching.
2. Eliminate emergency certification and disallow the employment and reassignment of teachers to teach subjects in which they have little formal education. The commitment to quality is underscored and the justification for

the “alternate route” strengthened if the program is a replacement for emergency employment and out-of-field teaching.

3. Educate the public and the profession. Any attempt to reform will generate opposition and rhetoric about “lowering standards.” State officials need to explain the advantages of this approach, using some of the arguments made above, and highlighting research results which show that teachers from alternative programs generate student learning outcomes on par with traditionally trained teachers.
4. Do not make operation of the “alternate route” program contingent on university participation. For example, in the United States, non-university regional teacher training centers were not only crucial to the program’s workability, they also were—ironically—the main stimulus for university involvement. Had university participation been guaranteed in regulation, most colleges would have resisted making the needed changes in practice or refused outright to participate. The threat of being left out, created by the non-university regional centers, increased universities’ willingness to participate in the “alternate route” program.
5. Expand the pool, recruit and select. In the State of New Jersey, USA, school districts can hire any graduate of any college who has a degree in the subject field, an appropriate mix of personal qualities and experience, and the ability to pass the relevant subject test. This expands and diversifies the pool of potential teachers to choose from. Marketing and incentive programs to attract the best candidates from this pool is the next step. Then application of transparent criteria to choose from among these applicants is needed, along with programs which provide on-going academic support to new recruits.
6. If possible, reform traditional teacher preparation, as well, by eliminating artificial and unnecessary requirements; thereby laying the groundwork for an alternative program that is equivalent and parallel. If an “alternate route” program is simply appended to an unchanged traditional system, then opponents can portray the excessive course requirements of the traditional program as “official standards” and the streamlined requirements of the alternative program as a “lowering of standards.”
7. Hold programs accountable; collect and analyze objective, measurable data on effectiveness of programs and graduates.

### *2.3.1.3 Pupil-Teacher Ratios*

In elementary education, the rapid growth in enrollment was made possible in part by raising the pupil-to-teacher ratio (PTR) in order to expand the intake capacity. Overall, the scope for increasing the PTR in secondary education is more limited than in elementary education. With its much wider-ranging curriculum, secondary education requires far more subject specialists than elementary education, and this means that pupil-to-teacher ratios naturally tend to be lower. In 2004/05, the PTR for all secondary schools combined was 33:1, basically unchanged since 1990, which indicates that teacher recruitment has followed in lock-step with student enrollment.

Nevertheless, nationwide, there is some scope for raising the PTR in secondary education by a change in policy to offer

all students general secondary education, rather than, as now, attempting to track 25 percent of students into the vocational stream, and by relaxing existing norms for the deployment of teachers in secondary schools. In states where senior secondary education is part of the tertiary education, not only is the PTR low but also teachers are paid on the salary scales of lecturers, not just secondary school teachers. This adds to the cost of secondary education. By co-locating secondary schools with upper primary schools, or secondary with senior secondary schools, more efficient use of teachers can be achieved. More discussion on this issue follows in Chapter 4.

### *2.3.1.4 Public Private Partnerships (PPPs)*

In terms of total supply of “seats”, secondary education depends on the active role of private aided and unaided schools. The dynamism and relatively promising

learning outcomes in private schools suggests an opportunity exists to further develop PPPs at the secondary level. However, the current grant-in-aid system does not provide incentives for aided schools to expand enrollment, or to operate in under-served areas, and reform of this system should be seriously considered, initially through alternative models which can be piloted, evaluated, and then scaled up.

PPPs can be structured in many different ways, with varying degrees of private sector risk and responsibilities, ranging from facility services (e.g. building construction and maintenance, catering, etc.) to a full PPP model where the private sector partner is contracted to provide all teaching and non-teaching services (including construction and capital financing of new schools).

For example, the government might offer land and a twenty-year lease to stimulate private school construction, along with a contract to “buy” 50 percent of that school’s places over a certain period at an agreed unit cost formula. Or the government could simply contract with the private sector for a build, operate and transfer contract, which requires the private sector to finance all up-front capital costs in exchange for an agreed-upon annual leasing fee paid by public sector. This would (i) enable the public sector to transfer the risks of construction time and price to the private sector, providing incentives to private sector to complete construction in a cost- and time-efficient manner, and (ii) allow States to rapidly expand

infrastructure beyond their immediate financing capacity (by spreading their costs over the medium-term). This has been done quite extensively in the UK and other Commonwealth countries.

If needed, the public sector could also contract out management and teaching services of public schools to the non-public sector, with payments based on agreed-upon per student unit costs and satisfaction of performance criteria (quality of inputs, retention rates, examination pass rates, etc.). This might allow for faster and less costly recruitment of personnel and mobilization of teaching and non-teaching services than would be possible through a purely public system, enabling faster and cheaper expansion of access. Government could specify whether the school could charge parents additional fees above the per student subsidy, in which case it could also offer scholarships to students least able to pay.

In other words, public policy and financing can provide incentives to induce increased supply of school places and improve quality, while ensuring equity for disadvantaged groups. Critical factors for success include the use of transparent, competitive and open public bidding processes to generate value for money, and clear, detailed contracts which specify requirements, outputs, and responsibilities of all parties, including maximum delays for public sector monitoring and payment. The last point appears to be particularly important, as interviews of private secondary school managers in

### Box 2.3: Lessons from Expansion of Secondary Education Around the World

The impressive expansion of secondary education in the United States in the first half of the 20th century, 40–50 years before such expansion in Europe, used an innovative formula: public funding and provision; an open and forgiving system which was nonselective and without early academic segregation; an academic yet practical curriculum; thousands of small, fiscally independent school districts with local control of schools and school funds. (Goldin 2001, cited in World Bank, 2005a)

After World War II European countries realized that restricted and elitist secondary schools with harsh selection measures entailed unsustainable losses of human capital and were anti-democratic. Secondary education expanded rapidly in the 1960s and 1970s in Europe via largely public schooling (financing and provision), followed by reforms to improve quality in the 1980s.

In East Asia (Japan, Singapore, Taiwan, South Korea) high public investment in expansion of secondary education broadened the human capital base and was critical to sustained, rapid economic growth. Efficient public-private partnerships and

enhanced relevance of technical education were key strategies. Expansion reduced income inequality by increasing the supply of educated workers from all income quintiles. (McMahon, 1998, cited in World Bank, 2005a).

During the 1990s, many Latin American countries invested heavily in secondary education and undertook reforms to improve coverage, equity and quality, emphasizing service delivery innovations such as decentralization and demand-side financing (World Bank, 2006).

Interestingly, across all four continents concerns were raised about educational quality, excessive rote learning associated with high-stakes secondary examinations, lack of development of creative, problem-solving skills, etc., which led to pedagogical reforms in almost all countries

India have revealed skepticism that the public sector would honor its commitments under PPP arrangements in a responsive and transparent manner. Confidence and trust among both sides are essential. There is a wide experience from both OECD and developing countries spanning the globe which demonstrates the potential for PPPs to improve secondary education, which is discussed in greater detail in Chapter 4 regarding school management.<sup>20</sup>

### *2.3.1.5 Flexible Open Schooling Delivery Systems*

India's education system is quite strict and unforgiving – if students fail or are unable to continue at some point, there is rarely a second chance. That schooling is, by and large, only available in a regular school, and that progression from grade to grade has to proceed en masse, have compounded the supply constraints. However, India has the potential to develop its open learning system, that allows for exit and multiple re-entry, so that youths and adults can upgrade their skills and qualifications at the time and place convenient to them. This would enable the large proportion of secondary school-aged children who simply cannot afford not to work to continue their education. Distance education using information and communication technologies (ICTs) can extend opportunities to young people who have to work and yet want to continue schooling, and because of economies of scale its recurrent costs per student are lower than those of face-to-face teaching. The challenge to open schooling has often been the public perception of its second class status. For this reason, it is the role of the government to set and

ensure equivalent standards of a qualification conferred by open schooling systems.

In this light, the National Institute for Open Schooling (NIOS) was established in 1989 by MHRD as an autonomous organization to cater to the educational needs of school dropouts and socially and economically disadvantaged sections of the learner population. It offers a secondary certificate course equivalent to ten years of schooling, and a senior secondary certificate equivalent to twelve years of schooling. It also offers a vocational education course that can be combined with general academic subjects. NIOS publishes its own distance learning materials, and has the authority to register, examine, and certify students. NIOS operates through a network of five departments, two divisions, eleven regional centers, and 2,750 study centers in India and abroad. Nearly three hundred thousand students are enrolled and it is increasingly viewed as a track for life-long learning. NIOS offers 26 courses in six languages for secondary examinations and 24 courses in Hindi, English, and Urdu for senior secondary examinations. Self-instructional material is provided in English, Hindi, and Urdu (Sujatha, 2002).

NIOS uses a multi-level and multi-media delivery mechanism, though print remains its main medium of instruction. It regularly revises course materials, and also develops them for self learning through graphics and simple illustrations. The NIOS material is considered to be of high quality and is sometimes used by the formal system for remedial teaching. The secondary education course material is available both in print and on the Internet for use by other students and interested learners. A CD version is also available for sale. The cost of printed NIOS materials is built into the student fee structure.

<sup>20</sup> A survey of 1,400 private aided and unaided private secondary schools in 2008, will further explore the potential for reform and expansion of the PPP model.

A study of the profile of students from NIOS shows that it reaches the intended clientele – women, SC and ST, and students from rural areas. In a survey, students revealed that they found current fee levels satisfactory, and even showed a willingness to pay more for course materials. The cost per student in NIOS is lower than that in government schools, though quality differences between the two are marginal. The last few years have seen a substantial improvement in the services provided by NIOS.

NIOS has proved itself effective in enabling students to obtain their secondary level equivalency degrees. (Note: NIOS examinations cover specific topics, rather than full secondary programs. What is reported as their “pass rate” is the percentage of students who successfully completed all five subjects, thus making them eligible for their degree, but this is calculated based on the total number of students taking individual subject-matter exams. This grossly and unfairly under-calculates the examination pass rate for NIOS. Correcting for this in 2005 and 2006, the Commonwealth of Learning calculated the actual average pass rate in subject-matter exams to be 58 percent at the secondary level and 61 percent at the senior secondary level, comparable to the overall average for India of 64 percent and 69 percent, respectively, for these levels.) Over the years, it has attained a high level of acceptability and credibility both in the formal higher education system and in the job market. As a result, a large majority of students have been able to continue their education, to find jobs, and to

better their employment opportunities. The decentralized mechanism of service delivery through regional centers and an expanding network of accredited study centers have further extended NIOS’s outreach. It has also allowed a more streamlined delivery mechanism, and led to improvement in the distribution of study materials (Commonwealth of Learning, 2007).

In 2002 the mandate of NIOS was changed so that it now acts as the national apex body for open schooling. That is, it functions as a teaching, accrediting and examining organization. Eleven state schools of open learning along the lines of NIOS are either already functional, or will become so in the near future. These schools will be able to cater to students between the ages of 15–35 years, including a large number of potential secondary and senior secondary enrollees.

NIOS, supplemented by the launching of India’s education satellite (EDUSAT) in 2004, has vastly expanded the possibility of providing education and training beyond the regular school hours or system. Given that there are far more secondary-level aged youth outside of the formal system than inside it, NIOS offers a real opportunity to expand secondary education access. The Commonwealth of Learning recently completed a major study of the costs and effectiveness of NIOS, and concluded that there is strong evidence demonstrating that open schooling, despite its many weaknesses, can deliver secondary education effectively to remote students who would otherwise have little

#### Box 2.4: International Experience with Distance Learning

Open, or distance-based, secondary schooling is often proposed for students who cannot attend traditional schools (e.g. migrants, rural populations far from schools, disadvantaged youth who need to work during the day). A review of alternative, open secondary schooling programs in Latin America and East Asia indicates they have lower per student delivery costs than traditional programs for similar target populations, but learning outcomes measured in terms of test scores and completion rates are uneven. In Colombia’s SAT program (flexible time schedule, for working youth) and Indonesia’s Open Junior Secondary Schools, students perform as well as or better than students in traditional schools. However, reading and math scores of students in Mexico’s Tele Secundaria program are slightly below those, on average, of traditional lower secondary school students. What emerges from this review is the need to focus on quality (understanding the special learning needs of target populations, availability of learning materials, appropriate technologies, training of facilitators/teachers, sufficient personal contact between students and teachers, etc.), rather than on attaining lower per-student spending.

*Source: Meeting the Challenges of Secondary Education in Latin America and East Asia, World Bank, 2006.*

or no opportunity to attend secondary school.<sup>21</sup> This same study calculated NIOS unit costs of Rs. 1150 per secondary graduate, versus Rs. 14,816 per graduate from Kendriya Vidyalaya Schools. Feasibility studies for the expansion of open schooling, along with communication programs and perhaps incentive programs to out-of-school youth to encourage enrollment and graduation, should be undertaken.

### 2.3.2 Addressing Demand-side Constraints on Access and Equity

Demand-side factors limiting access to secondary education relate to the family or the child. These include: (i) misperceived pecuniary and non-pecuniary benefits of schooling which affects household's decision to invest in their children's education; (ii) cultural and/or parental bias against girls' education; (iii) household's inability to bear the direct and indirect cost of schooling, which is not only affected by household income level, but also by the number of children in the household, child health, and the demand for child labor; (iv) the child's own lack of interest in schooling; and (v) low expectations of employment prospects and future income (King and Hill, 1993; Shavit and Blossfeld, 1993; Alderman and Gertler, 1997; King et al., 1998; Anderson, King and Wang, 2003; Lloyd, 2005). In turn, students' persistence in school and academic performance are affected by parental educational attainment, involvement and expectation; socioeconomic, gender and ethnic composition of the school and peer pressure; teacher support to students, teachers' content knowledge and pedagogical practices; availability of teaching and learning materials and resources; and students' own schooling experience and prior learning (Barro, 1987; Rumberger, 1995; Jimerson 1999; Hauser et al, 2000; Croninger and Lee 2001; Lloyd, 2005).

In India, studies on household demand for secondary education are limited. However, drawing from studies done on elementary education in India, it is likely that key constraints on the demand for secondary education include the following factors: the quality and completion rates in elementary education, which affect the number of students

ready for secondary education; appreciation by parents and young people of the benefits of secondary education and the cultural value of girls' education; and the direct and indirect costs of schooling (Sen, 1992; Dreze and Sen, 1995; Velkoff, 1998; The Probe Report, 1999; Nayar, 2002; Duraisamy, 1998; 2002; Drez and Kingdon, 2001; Kingdon 2002). Due to the unavailability of data that link household information with decisions on secondary schooling, only inferences can be made. The constraints due to poor quality and low completion rates are discussed further in Chapter 3, while the other points are discussed below.

#### 2.3.2.1 Perceptions of the Benefits of Schooling and Cultural Factors

Perception of the financial returns and non-pecuniary benefits of schooling influences parental decisions on children's education. For low income families, children are often parents' only insurance during their old age and thus, the decision to invest in their education may be related to how much parents believe that they will eventually benefit from it. In addition, if parents perceive that their children do not have the aptitude to succeed in secondary education and secure a well-paying job upon graduation, or if young people simply believe that secondary schooling is irrelevant, this could lead to a decision to dropout from the system. In many cases, particularly among illiterate parents, the potential value of a secondary education degree for both the child and the household is not known or is misunderstood. This is a case of imperfect information leading to underinvestment, which calls for public information campaigns to raise awareness and demand for secondary schooling, particularly among poor households.

The persistence of gender enrollment gaps in almost every sub-group, in spite of the higher private and social returns to girls' secondary education as compared to boys' (seen in Chapter 1), signals that parents' perception of the benefits of education differs between sons and daughters. This is where culture mediates in family preferences. The patriarchal social structure predominates in many Indian states and communities, though by no means uniformly in the country. It is characterized by a strong male preference, resulting in gender disparities in many social and economic indicators (Siddhanta and Nandy, 2003). The skewed sex ratio of 933 females for every 1,000 males reflects selective feticide, or

<sup>21</sup> "Open Schooling for Secondary & Higher Secondary Education: Costs and Effectiveness in India and Namibia", Commonwealth of Learning, 2007.

simple neglect of rearing of infant girls (Census 2001).<sup>22</sup> Many parents view educating sons as an investment for old age care, whereas having girls is often seen as a liability because of the obligation of parents to give dowry to their daughters' marriage and because whatever benefits might accrue from her education and work will go to her husband's family (Velkoff, 1998). Weak female preference also leads to under-investment in girls' education, reflecting in 71 percent male adult literacy rate for the population aged 15 and over, compared to just 47 percent for females (Census 2001).

Due to the need for both parents to earn a living, poor families are also more likely to keep girls at home to care for younger siblings, or to work in family enterprises. The PROBE report (1999) revealed that more than 50 percent of the girls could not attend school due to sibling care, as compared to 8 percent of the boys. In addition, the practice of early marriage of girls (often followed by adolescent pregnancy) constitutes another barrier to their education.

Filmer, King and Pritchett's (1998) analysis of India's National Family and Health Surveys (NFHS) found that while the absolute *level* of health and education outcomes for girls are strongly related to economic conditions, the disparities between females and males were not related to the same. Kingdon (2002) found that girls face significantly different

treatment in the intra-household allocation of education – there is a large unexplained component in the gender gap in schooling attainment which appears due to cultural factors.

The generation of increased demand for secondary schooling in rural areas is likely to require the use of public information campaigns to change attitudes about the financial returns and inter-generational benefits of schooling and delayed marriages, particularly for girls. It may also require curriculum and examination reforms to make secondary schooling more relevant to young people. The mass mobilization campaigns conducted under SSA have been quite successful in expanding elementary school enrollment in rural areas; similar strategies could be used for secondary education. Curriculum and examination reforms are discussed further in Chapter 3. To narrow the gender and social gaps will also require demand-side financing, as discussed below.

### 2.3.2.2 Demand-side Financing to Address the Direct and Indirect Costs of Secondary Schooling

The out-of-pocket costs of schooling borne by households are substantial (Table 2.7). In most states, government schools charge some nominal first-time registration fees, monthly tuition fees, and annual fees. For households with children attending secondary school, the total average costs of secondary

	Expenditure Per Child by School Type				Expenditure Per Child by Consumption Quintile					
	Gov't +Local bodies	Private Aided	Private Unaided	Average	Q1 (poorest)	Q2	Q3	Q4	Q5 (richest)	Average
Primary	269	1186	1431	507	200	309	425	605	1161	507
Upper Primary	639	1350	2159	921	426	586	729	907	1554	921
Secondary	1058	1565	2759	1333	693	858	1000	1278	1950	1333
Senior Secondary	1831	2553	3698	2257	1133	1372	1462	1853	3067	2257
Tertiary	2683	3416	5509	3164	1381	1669	1897	2329	4048	3164

*Source: Authors' analysis of National Sample Survey 52nd round (1996), which provides the latest available data on household expenditures on education.*

<sup>22</sup> There is much variation across states. For example, the number of females per thousand males ranges from 1,058 in Kerala state to 821 in Delhi.

education are double those of primary education, the costs of senior secondary education are four times as much, and the costs of tertiary education are six times as much. For a

typical family with four children, the amounts spent are quite substantial. It is likely that the higher direct cost of secondary education has a stronger deterrent effect on enrollment.

There is wide variation in household spending across school types. Even though fees in government schools are low, private schools account for more than half of the total number of secondary schools, so the average per household annual expenditure on secondary education is quite large. Spending per child in secondary education varies widely by household income level: the typical household in the richest quintile spends three times as much per secondary student as does its counterpart in the poorest quintile.

Many students across all income quintiles go for private tutoring, which accounts for a very significant component of direct costs at all levels of education (Annex 2.11 and Annex 2.12). The higher the level of education, the higher the spending on private tutoring. The prevalence of tutoring indicates deep flaws in the quality of teaching and in the examination orientation of the system. Reforming examinations is likely to have an equalizing effect because it would reduce the need for poor households to spend on private tutoring, thereby stimulating a broader demand for secondary education.

The 2005 surveys of secondary schooling in Rajasthan and Orissa found that students' out-of-pocket costs include not only school fees but also private tutoring fees (Table 2.8 below). The average costs for students who seek private tutoring are very substantial. Combining out-of-pocket household expenditures for fees and tutoring, the evidence suggests that the high direct costs of secondary education dampen demand, particularly for youth who are poor, female, SC, or ST.

Furthermore, the opportunity cost of schooling rises with age, as young people can enter the labor market and help support their families. In 2004, youth over the age of 14 with an elementary level education could earn an average weekly wage of Rs. 306 or Rs. 16,000 per year (NSS 61st round). Comparing this with the average out-of-pocket costs of secondary education (Rs. 1,330 per year) suggests that opportunity costs of education may be an even more important factor than direct costs in dissuading parents from secondary education. When the low pass rates in Board examinations are considered, the costs of secondary schooling become even more daunting; households have to forgo earnings and bear the direct cost of schooling, with just a 50 percent chance on average their child will graduate from Grade 10 (never mind Grade 12).

Table 2.8 / Students' Combined Payment of Monthly School Fees and Private Tutoring, 2005						
	Rural Gov't	Rural Private Aided	Rural Private Unaided	Urban Gov't	Urban Private Aided	Urban Private Unaided
<b>Rajasthan Grade 9</b>						
Monthly payment for private tutoring in Rupees	185	-	323	277	22	330
School fees paid per month in Rupees	34	-	224	61	197	246
Total payment	219	-	547	338	219	576
<b>Rajasthan Grade 11</b>						
Monthly payment for private tutoring	514	-	400	1032	426	549
School fees paid per month in Rupees	40	-	515	90	314	476
Total payment	554	-	915	1122	740	1025
<b>Orissa Grade 9</b>						
Monthly payment for private tutoring in Rupees	130	84	143	153	167	157
School fees paid per month in Rupees	10	8	37	30	11	56
Total payment	140	92	180	183	178	213
<b>Orissa Grade 11</b>						
Monthly payment for private tutoring	-	425	313	633	464	-
School fees paid per month in Rupees	-	54	15	248	62	-
Total payment	-	479	328	881	526	-

Source: Authors' analysis of Secondary School Survey from Rajasthan and Orissa, 2005.

An analysis was done using a probit model to examine the likelihood of a change in secondary level attendance in response to a change in per capita household monthly consumption, using data from the 61st round of the National Sample Survey (2004). For every 20 percent increase in household expenditure, the probability of secondary attendance rose by 7 percentage points. Controlling for urban residency, gender, scheduled caste, and scheduled tribes, and school-age cohorts, compared to the lowest income quintile the second quintile was 6 percent more likely to attend, the third quintile was 13 percent more likely, the fourth quintile was 20 percent more likely, and the richest quintile was 27 percent more likely. Among the lagging states (Uttar Pradesh, Bihar, Chhattisgarh, Jharkhand, Orissa and Rajasthan), the income effects on secondary education were even greater; after controlling for residency, socio-economic group and age, the richest quintile

was 29 percent more likely to attend secondary school than the lowest income quintile. In terms of type of school attended, children from the highest income quintile were 23 percent more likely to attend a private, unaided school than those from the lowest income quintile (33 percent more so in the lagging states). Controlling for other variables, the probability of female enrollment was 9 percent lower than boys, that of SC and ST enrollment was 7 and 6 percent lower, respectively, than the general population.

All of these findings reinforce how direct and indirect cost considerations are likely to affect households' decision to enroll their children in secondary education. To stimulate demand to achieve equity and efficiency objectives, targeted financial assistance to the poor, girls, and other socially disadvantaged groups will be needed.

### Box 2.5: Conditional Cash Transfer Programs in Pakistan and Bangladesh

A study in Pakistan revealed that only 57 percent of girls and women could read and write, and in rural areas only 22 percent of girls completed primary level schooling as compared to 47 percent of boys. To address this, a conditional cash transfer (CCT) program was launched in 2003, which means that cash is paid to beneficiary families if certain conditions are satisfied. In Pakistan's Punjab province for example, families receive 200 Rupees a month per girl to ensure that their daughters attend school, after the headmistress verifies attendance. As a result, girls' enrollment in secondary schools in the 15 poorest districts in Punjab increased by 60 percent from 175,000 to 280,000 in just three years.

Of course, such programs involve "errors of inclusion", meaning that some households who would have sent their daughters to school in any case received cash transfers. Accordingly, impact evaluation analysis including difference-and-difference, triple differencing and regression-discontinuity design was conducted. The net growth in female enrollments in stipend eligible schools was estimated at 9 percent between 2003 and 2005, which implies a per-additional-child-enrolled cost of US\$400, or roughly GDP per capita. This suggests a need for improved targeting.

The cash transfer has been particularly helpful in paying for private transport to school. Given Pakistan's social context, girls are less able than boys to take public transport or walk to school, which makes affordability of private transport an important factor in convincing parents to send their daughters to schools. Success of the CCT program has actually led to overcrowding of girls schools, and new challenges such as recruitment of qualified female teachers and building of classrooms to keep up with expanding demand.

In Bangladesh girls accounted for about one-third of all secondary enrollments in Bangladesh in the early 1990s. The Government decided some creative measures were needed to expand the access of girls to secondary education. The Female Secondary Stipend Program was designed in 1993 with the main objective of increasing girls' secondary school enrollment and providing a healthier, safer, and more attractive school setting for girls. The premise behind the program was fairly simple. It was clear that supply-side interventions were not highly effective in attracting girls to secondary school, hence demand-side interventions, in the form of a stipend, might attract families to send their girl children to school. The program was implemented in all rural sub-districts in

Bangladesh and was financed by the Government with support from the World Bank, the Asian Development Bank, and the Norwegian Government. Any girl attending grades 6–10 in secondary school in a rural area was eligible to receive a stipend provided she fulfilled three eligibility criteria: (i) attendance had to be at least 75 percent; (ii) her percentage score in annual exams had to exceed 45 percent; and (c) she remained unmarried till completing grade 10. The stipend – which varied from roughly US\$ 6 per year for grade 6 students to US\$ 10 per year for grade 10 students – was deposited directly into the girls’ bank accounts every six months, and participating schools also received tuition fees. In addition, schools were also provided with latrines and access to safe drinking water.

The Bangladesh program continues today and results have been encouraging. There has been a substantial increase in awareness of the importance of girls’ education, and overall, girls’ enrollment has increased by more than 50 percent. Most impressively, from a situation where, about twelve years ago, girls accounted for less than a third of enrollment at the secondary level, gender parity has now been achieved. Age at marriage has also risen by 6 percent, a fairly significant increase. The number of schools has risen by about 30 percent over the same period.

While there has been a significant increase in access, concerns with the quality of education remain. For example, fewer than 30 percent of girls enrolled in Grade 10 pass the standardized Grade 10 examinations, the quality of teaching is poor, and the quality of facilities remains low. Recognizing these problems, the government has recently started a systemic reform of *secondary* education and is giving significantly greater emphasis to teacher education, training, and support, as well as providing incentives to well-performing schools and students.

*Sources: Chaudhury and Parajuli (2006), World Bank Project Appraisal Document (World Bank, 1993); OED Report (World Bank, 2003b).*

### 2.3.2.3 Experience with Cash Transfer Programs in the Education Sector

India has a history of providing school stipends at both state and central levels. This combines a number of centrally-financed stipend schemes (e.g. for disabled children; ST girls), and state-specific schemes (e.g. Uttar Pradesh provides stipends to all SC, ST and OBC children in primary school). In some states, children belonging to scheduled castes and tribes receive incentives in the form of free textbooks, uniforms, stationery, scholarships, and transport allowances up to Rs. 250 (US\$ 5.50) per student per year. Madhya Pradesh provides a cash grant of Rs. 500 for girls who enter secondary education. Andhra Pradesh provides free bus passes to girls in secondary education. Rajasthan provides free bicycles to disadvantaged girls for entering secondary education. Tamil Nadu gives a choice of bus passes or bicycles to those who are admitted to senior secondary education; it is planning to use capitation grants to help girls to enroll in private schools. At one level, these can be considered conditional cash transfers, though they differ notably from CCT programs elsewhere in having weak – or most cases absent – enforcement of attendance requirements, being based largely on simple enrollment in school. Unfortunately, there is a dearth of rigorous impact

evaluation to assess the net effect of these programs, which calls for additional research on this topic.

Coverage of schools stipends is not insignificant nationally, at almost 10 percent, though it exhibits strong inter-state variation. Table 2.9 presents results on coverage rates for school stipends for major states, across the whole population and among those with school age children (6–18), and median stipend amounts reported for the previous year among households receiving stipends. Coverage exhibits major variations across states, with several states covering up to one fifth of children. Some patterns stand out and are consistent with national or state policies:

- ◆ Several states with high tribal populations have expectedly higher than average stipend coverage, though Orissa is an exception.
- ◆ In contrast, several poorer states have very low stipend coverage, including Bihar, Orissa and Rajasthan. Uttar Pradesh is a notable exception for a low ST poor state, and this share is likely to have increased sharply since with the expansion of OBC stipends in recent years.

- ◆ Stipends stand out as one area where southern and richer states have lower than average coverage rates, in part perhaps because of higher private schooling rates but also driven by central and state-level policies.
- ◆ There is significant variation in state levels of stipends reported paid. In contrast to the pattern for many other programs, however, it is generally the poorer states (though with Madhya Pradesh and Assam as notable exceptions) which report higher median stipends receipts. More specifically, some of the more tribal states such as Jharkhand and Chhattisgarh continue to have a healthy picture, and both Jammu & Kashmir and Tamil Nadu stand out with high median payments for those receiving.

State	% HH with children 6–18 receiving	Median benefits HH receiving (Rs annual)
J&K	0.8	4,023
Himachal Pradesh	8.0	839
Punjab	1.6	308
Uttarakhand	28.3	691
Haryana	0.8	582
Delhi	0.5	1,243
Rajasthan	1.1	1,200
Uttar Pradesh	31.4	759
Bihar	0.6	2,563
Assam	13.1	226
West Bengal	1.8	400
Jharkhand	10.7	1,556
Orissa	3.4	2,606
Chhattisgarh	29.0	1,788
MP	16.1	740
Gujarat	10.9	423
Maharashtra	5.0	1,666
AP	2.0	4,043
Karnataka	6.6	893
Kerala	0.6	1,040
TN	2.3	17,638
Other	7.2	1,652
All-India	9.6	1,224

Source: NCAER HD survey 2004/05. Ajwad (2006) for estimates.

Looking at the same findings in distributional terms, stipend coverage is quite progressive in terms of simple coverage rates, but expenditure incidence exhibits a much more mixed picture, as the median annual levels of stipends reported vary sharply across the distribution in a regressive manner in terms of both wealth and social category. This can be seen in Table 2.10. In terms of benefit incidence, the poorest quintiles captured only 12 percent of total benefits, in contrast to the richest capturing 34 percent. Interestingly, despite the prevalence of SC/ST stipends, the share of total benefits captured by ST households is almost exactly the same as their share in the sample and for SC it is less, while both Brahmins and OBC capture a higher share of total stipend spending than their share in sample. However, this needs to be interpreted in the light of state-specific schemes, in particular the major expansion to OBCs that was occurring in Uttar Pradesh during the period of the survey.

	% with children 6–18 receiving (HH)	Median benefits for HH receiving (Rs)	Share of total benefits captured (%)
Poorest	9.7	627	11.7
Q2	14.4	883	21.6
Q3	9.6	730	12.5
Q4	8.2	1,585	20.1
Richest	6.5	3,592	34.1
Rural	11.5	983	70.8
Urban	4.3	3,018	29.2
Brahmin	5.5	3,277	7.0
OBC	9.6	1,501	49.8
SC	14.6	860	24.3
ST	14.3	740	7.0
Other	4.2	1,349	11.6
Total	9.6	1,224	100

## 2.4 Conclusion

This chapter has attempted to present key trends in indicators of secondary education access and equity, and to highlight critical constraints which hinder their improvement. The overall picture which emerges is that the steady (if slow) historical expansion of secondary education

is poised to accelerate over the next decade. Aggressive efforts are needed to address both supply- and demand-side constraints to make this potential expansion a realistic possibility, particularly for certain groups (girls, poor, STs, SCs, Muslims) whose respective enrollment rates in

secondary education are far below country averages. These efforts are inextricably linked to activities to improve the quality of elementary and secondary education, in order to make that access meaningful for students and society as a whole. This is the topic of the next chapter.

## Chapter 3. Quality And Efficiency Of Secondary Education In India

Recent research on education quality and economic growth (Hanushek and Wobmann, 2007) presents strong evidence that cognitive skills, as opposed to mere school enrollment or years of schooling completed, are powerfully related to individual earnings, income distribution, and economic growth. Indeed, there is credible evidence that this is a causal relationship, and that educational quality, measured by tests of cognitive skills, is much more important for economic growth than education quantity (years of schooling). Once quality has been established, keeping children in school longer pays off. But if quality is low, simply increasing years of schooling does not appear to be worthwhile. This research clearly establishes the justification for this chapter's analysis of the quality of secondary education, and reinforces the importance of undertaking urgent measures to improve it.

The short version of an analysis of secondary educational quality in India is, "we don't really know, but relatively small-scale assessments suggest it is very low". No comprehensive national-scale independent assessment of learning achievement at the secondary level has been conducted in recent years. Lower and upper secondary education Board examinations are the responsibility of each individual state. They vary considerably in terms of their quality, what they actually assess in terms of learning, how they are graded and ultimately scored. They are not truly comparable across states or time. In light of this void, as part of this study, mathematics learning achievement examinations were administered in two states, Orissa and Rajasthan, using publicly available international test items from the Third International Mathematics and Science Study (TIMSS). The results of these examinations are analyzed in the following section.

### 3.1 Student Achievement in Mathematics and Key Determining Factors: Lessons from Two Case Studies in Rajasthan and Orissa

Given India's curriculum, how do its students perform in comparison to those in other countries? India has not

participated in any international studies to answer this question, so another approach was used to calibrate the standard in two selected states. A survey of secondary schools in Rajasthan and Orissa administered in 2005 applied selected items from two separate mathematics tests in the Third International Mathematics and Science Study (TIMSS) to 9th and 11th graders, respectively. The sample contained 144 schools in Rajasthan and 109 schools in Orissa, stratified by rural and urban areas and by school types (government, private aided, and unaided). A total of 6,274 students in Grade 9 and 1,372 students in Grade 11 in these states were tested (see Wu, Goldschmidt, Boscardin, and Sankar, 2005 for details of the study).

The test items were chosen from a published sample of TIMSS tests for Grade 8 and Grade 12.<sup>23</sup> Since Grade 8 is still part of elementary education in most states in India, and students in Grade 12 are preoccupied with preparing for the certification examination, the selected test items were administered to students in Grade 9 and Grade 11. The more difficult items in the original TIMSS test intended for Grade 8 were selected for Grade 9, and the easier items originally intended for Grade 12 were applied to Grade 11. The selected items were shown to state officials, teachers, and students to ensure that they were a reasonable choice in relation to the curriculum. The Grade 9 test aimed primarily to assess general mathematics knowledge (data representation and analysis, fraction and number sense, algebra, geometry, and measurement), while the 11th grade test also sought to assess mathematical and scientific literacy and competence in statistics, estimating probability, equations, and calculus. The competencies tested include knowledge, the use of routine and complex procedures, investigation, and problem-solving.

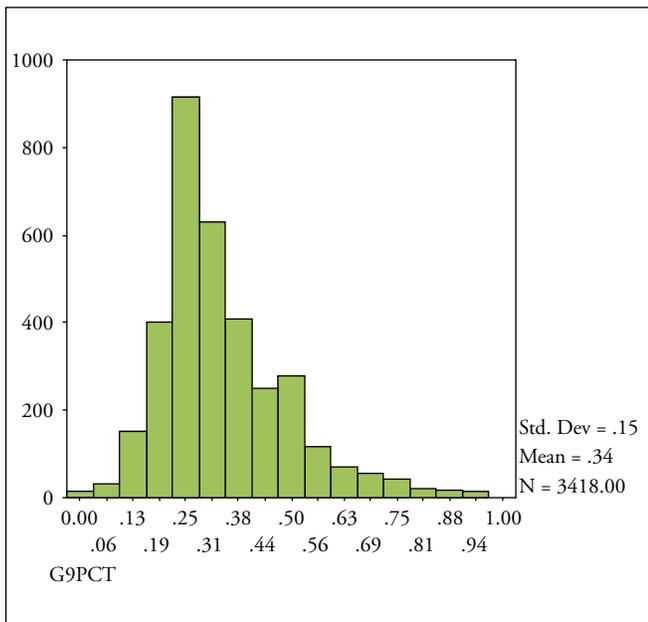
<sup>23</sup> TIMSS does not release all the items of its tests, to prevent their reuse. Only a third of the test items were released to the public. To participate in TIMSS, a country has to become a member of the organization (the IEA) that conducts it, agree to abide by very strict technical and other rules, pay the dues, and take part in the training and analysis. Otherwise, the results cannot be representative and strictly comparable across countries.

The findings should be treated as illustrative only. Caution should be exercised when interpreting the placement of students from Orissa and Rajasthan in an international league table because the school sampling methodology and testing protocols were different from TIMSS, only selected items from a sample of the full TIMSS tests were used, and the grade levels were different. Nor can the findings be reliably generalized to any other Indian state, given the differences in state education systems, curricula, and policies. Furthermore, the sample size of Grade 11 was so small that the exercise should be treated as a pilot test only. Only mathematics was tested, not the full curriculum which is covered in normal state board examinations. Nevertheless, this exercise is methodologically sound and its findings constitute at a minimum a very strong warning signal that students are not learning at acceptable levels, at least in mathematics.

Overall, students in both grades in both states had low average scores and high standard deviations (Figures 3.1 and 3.2). Rajasthan's 9th graders had a somewhat lower average score (34 percent correct) than Orissa's (37 percent correct). But Rajasthan's 11th graders on average performed better (44 percent correct) than those in Orissa (38 percent correct). In both states, 9th graders have much lower mastery of mathematics for their grade level than 11th graders. The higher mastery level in Grade 11 reflects perhaps the differentiation of the curriculum into arts and science streams at the senior secondary level, and the "survival" to the higher secondary level. Orissa's higher average score in Grade 9 than the equivalent grade in Rajasthan may be attributable to the fact that its secondary education covers three years, beginning with Grade 8, and that dropout rates between Grades 8 and 9 are high. Orissa's 9th graders have had an additional year to adjust to secondary education, compared to their counterparts in Rajasthan.

**Figure 3.1: Rajasthan: Distribution of Grade 9 and 11 Test Scores, 2005**

### Grade 9



### Grade 11

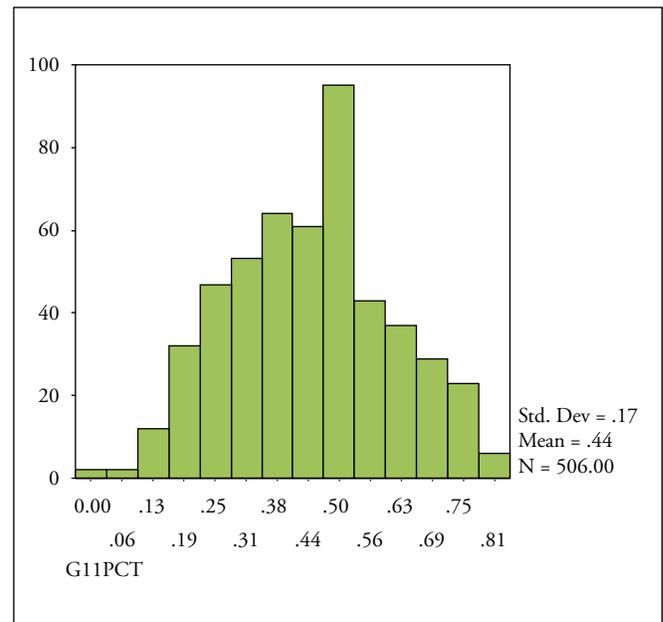
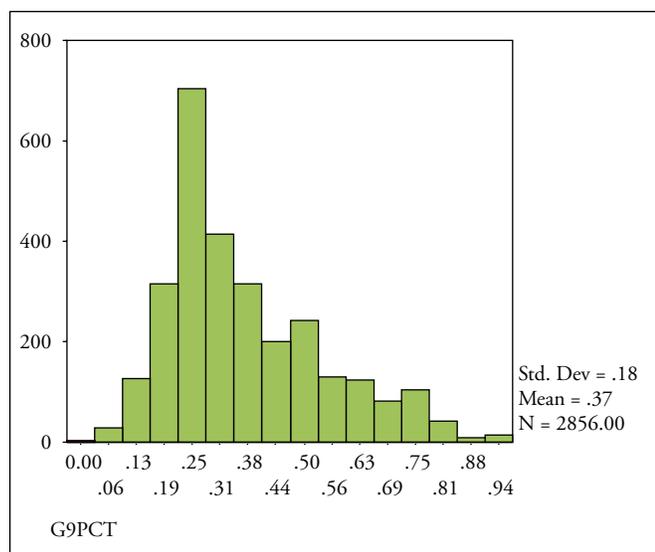
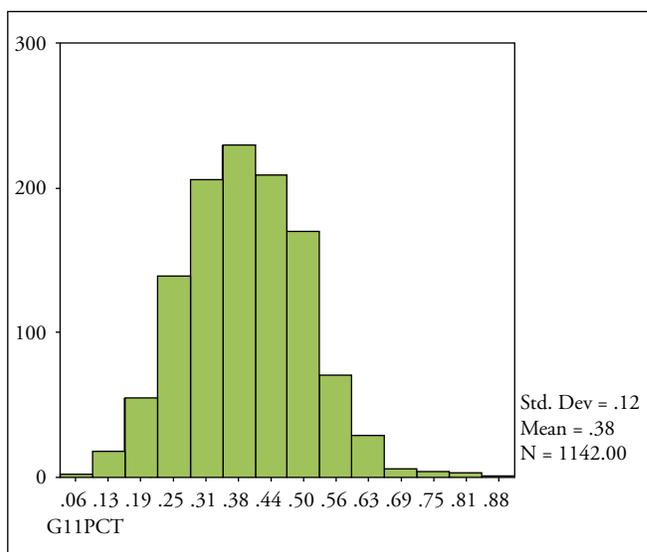


Figure 3.2: Orissa: Distribution of Grade 9 and 11 Test Scores, 2005

Grade 9



Grade 11



Sources: Authors' analysis of the Rajasthan and Orissa Secondary School Surveys, 2005.

Note: The Y-axis indicates the number of students.

The mathematics test results in Grades 9 and 11 in Rajasthan and Orissa show low average scores and high standard deviation, as shown above. Small differences in average test scores exist between boys and girls, between

students from the scheduled castes (SC) and scheduled tribes (ST) and general students, between urban and rural areas, and among government, private aided, and unaided schools (Figures 3.1 and 3.2).

Figure 3.3a Average Percent Correct in Rajasthan

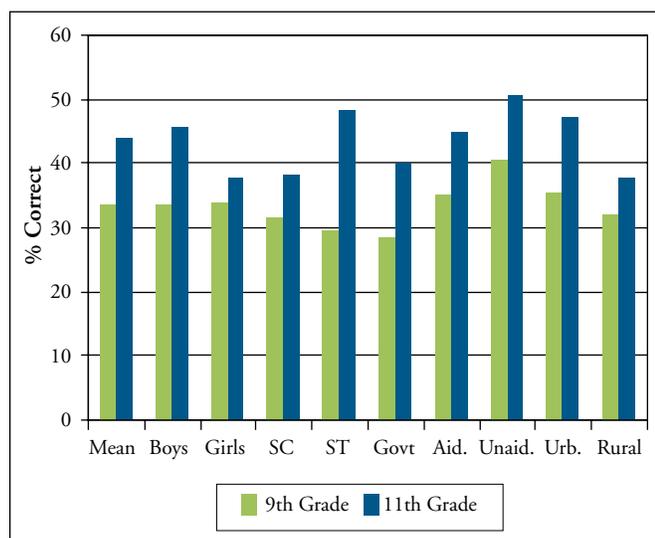
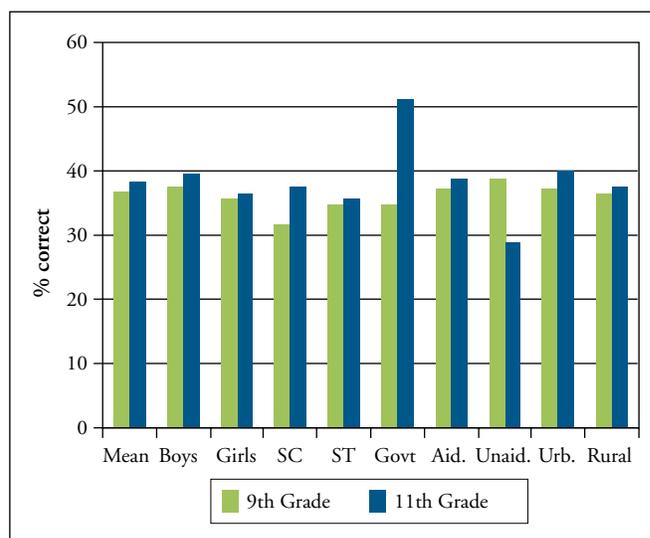


Figure 3.3b Average Percent Correct in Orissa



Source: Authors' analysis of Secondary School Survey in Rajasthan and Orissa, 2005

Note: The means are not weighted. The high mean scores of ST in Rajasthan and of government schools in Orissa are due to the very small number of observations.

An examination of average test scores by school indicates that there is a very large dispersion across both grades in both states. The large variability of student test scores within each school type was also evident in both states particularly for grade 9. In Rajasthan, private unaided schools tend to have higher test scores than both government and aided private schools. In Orissa, unaided private schools do best at grade 9 level, while government schools do best at the grade 11 level.

### 3.1.1 *International Benchmarking*

Further analysis of the Grade 9 mathematics learning achievement scores was carried out in 2006. Using published item parameters for the 36 publicly released test items from TIMSS, a distribution of scores for the tested students was constructed which is directly comparable to the worldwide distribution. This allowed placement of students' scores in reference to students from 51 other countries tested by TIMSS in 1999 and 2003 (Das and Zajonc, 2007).

Using this approach, students' average scores placed them below 43 of the 51 countries tested. Averaging across the entire tested sample, students in Orissa and Rajasthan scored 392 points, compared to the international average of 487 in 1999 and 467 in 2003. Less than 50 percent of students were able to demonstrate the lowest international benchmark, "some basic mathematical knowledge". (Note: given that lower secondary enrollment is under 50 percent in both states tested, it is reasonable to assume that children who dropped out before grade 9 would fare no better. If this is true, then approximately 75 percent of children aged 15 in these two states are unable to demonstrate basic mathematical knowledge, a rather grave figure.) For instance, only 11 percent of children in Rajasthan (17 percent in Orissa) were able to correctly identify the smallest number from the set 0.625, 0.25, 0.5 and 0.125 (Das and Zajonc, 2007). In fact approximately 20 percent of children scored no higher than what would be predicted by random guessing.

The low scores among 9th graders are of special concern because these students have had one more year of schooling than the 8th grade students from other countries who participated in TIMSS. In addition, lower scoring countries

such as South Africa and Botswana have larger secondary gross enrollment rates, such that the test in these countries covers a more representative sample of children aged 15. If testing in Orissa and Rajasthan included a large enough random sample of out-of-school children aged 15, such that the total pool of tested children approximated the tested pool in South Africa and Botswana, average scores in Orissa and Rajasthan would almost surely score very close to the bottom of all countries.

On the other hand, the top performing 5 percent of students in Orissa and Rajasthan performed far higher, on average, than most of their peers around the world. For example, in Orissa, the 95th percentile score of 577 is above the 95th percentile score of Norway, and above the 50th percentile score of all 51 TIMSS countries except for Hong Kong, South Korea, Taiwan and Singapore. This small percentage of students compare favorably with the highest scoring students in the world. India's huge population of children translates this relatively small percentage into a very large absolute number of high performing children, compared to other countries around the world, which is a very positive factor for the country's economic competitiveness. But this also reveals the tremendous inequality in student learning in India at the secondary level (by which time approximately one half of children have already dropped out of school). If India is to achieve "inclusive growth" it will have to do much better than this.

### 3.1.2 *Key Factors Determining Student Achievement in Mathematics*

Analysis of the case studies shows that roughly half of the variance in students' achievement is attributable to differences between schools. Put simply, school matters. This is a very positive sign, as it offers hope for public policy to improve learning outcomes by improving school-related factors. Holding student and school characteristics constant, teacher characteristics (educational qualifications, expectations, perceived need for additional training) are influential determinants of outcomes. In addition, several teacher and school characteristics are significantly related to the gender gap in performance: girls taught by female mathematics teachers scored slightly higher than boys in the same classroom (Wu, Goldschmidt, Boscardin and Sankar, 2008). So-called "opportunities to learn" are another key

determinant of educational outcomes: they arise from clear introduction to new concepts, effective teaching and use of questions to probe responses, and feedback on homework and examination. Private tutoring matters less to outcomes than might be expected. To improve students’ achievement in secondary education, the case studies point to the importance of strengthening teachers’ content knowledge and pedagogical skills through better teacher education and professional development.

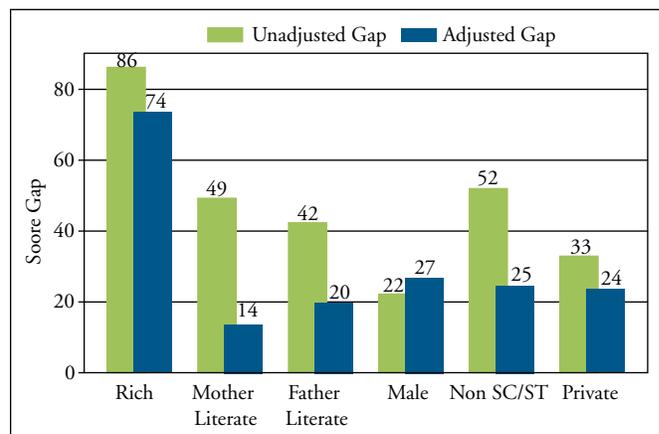
The other half of the variance in performance is due to differences among students. The key student characteristics correlated with learning outcomes are gender, mother’s education, parents’ educational expectations, and home resources—although the predictive power of these variables differs among grades and states. (Wu, Goldschmidt, Boscardin and Sankar, 2005) Being an SC or ST student is not associated negatively with student performance, which can be explained partly by the fact that those who have made it secondary school tend to be stronger students, the “survivors”. This also shows that good opportunities to learn can offset disadvantages in family background, although overall ST and SC children are only half as likely to pass the “high” benchmark. Parental literacy is strongly associated with success; a child with a literate parent is more than twice as likely to pass the “high” benchmark” as a child without one. Girls and boys on average perform equally, although after controlling for wealth, parental education and other fixed effects, females perform worse. This reflects the fact that girls who have “survived” until Grade 9 typically come from more privileged backgrounds (Das and Zajonc, 2007). Finally, although increased family size is associated with lower student performance, students’ home resources do not have a statistically significant main effect. However, aggregated to the classroom level, home resources do have substantial contextual effects (Wu, Goldschmidt, Boscardin and Sankar, 2008).

As discussed above, analysis of the differences in student outcomes across the three school types found mixed results across the states and grade levels. Unaided private schools had higher average scores in both Grades 9 and 11 in Rajasthan, and in Grade 9 in Orissa. However, in grade 11 in Orissa, government schools fared better

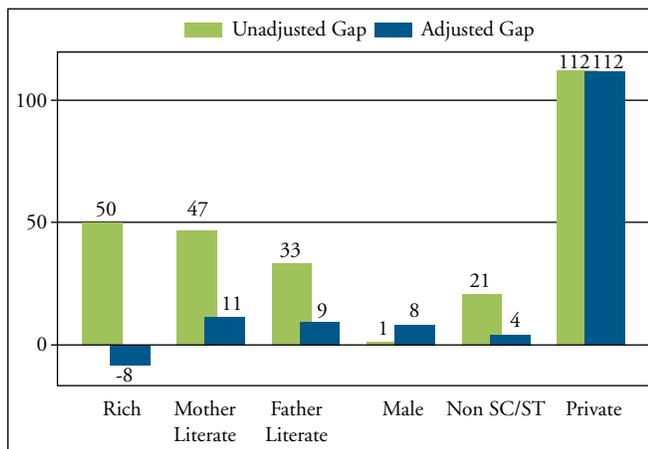
and unaided schools worse. In short, the evidence is somewhat ambiguous. Furthermore, simple comparisons of government and private schools cannot be interpreted as the causal contribution of schools to achievement. Children in private schools are generally richer, from more educated families, and are less likely to be from a scheduled caste or tribe. These characteristics may in turn affect achievement. To disentangle these effects somewhat, adjusted and unadjusted score gaps are presented for wealth, parental literacy, gender, caste, and school type in Figure 3.4. Unadjusted gaps are simple comparisons of means, whereas adjusted gaps are the estimated coefficient from a regression that controls for wealth, father literacy, mother literacy, non SC/ST, gender, school type, age, age squared, and a district fixed effect.

Again, the results from Orissa and Rajasthan differ. In Orissa, both the unadjusted and adjusted gaps follow the normal patterns. Children from families with an asset index in the top third of the distribution score 86 (74) points higher than those from the bottom third, in unadjusted (adjusted) terms. This wealth gap is the largest of any socio-demographic characteristic. While the unadjusted gaps for mother literacy (49), father literacy (42) and scheduled caste/tribe (52) are substantial, the adjusted gaps fall. In terms of adjusted gaps, wealth remains the best predictor of achievement, followed by gender, caste, and school type, although the differences in magnitudes are themselves not significant.

**Figure 3.4: - Adjusted and Unadjusted Score Gaps**  
**ORISSA**



## RAJASTHAN



**Notes:** Gaps are mean differences in the mathematics score defined as: (rich – poor), (literate father–illiterate father), (literate mother – illiterate mother), and (male–female). Rich and poor are defined as families having an asset index in the top or bottom third. Literacy is defined as education beyond the 5th class. Non SC/ST included other backward castes and general castes. The adjusted gaps are the coefficients from an OLS regression that includes wealth, father literacy, mother literacy, non SC/ST, gender, school type, age, age squared, and district.

The picture in Rajasthan could hardly be more different. Once characteristics are controlled for simultaneously, all the gaps across household characteristics vanish. But the gap between public and private schools remains dramatic. Children in private schools score 112 points higher than children in public schools, and this gap remains unchanged after controlling for socio-demographic characteristics. While the radically different relationship between background characteristics and achievement in the two states may seem surprising, other studies also find considerable heterogeneity across states in the relationship between socioeconomic characteristics and enrollment.

For systematic examination of the relationship between school types, socio-economic status and student achievement, a comprehensive study with inclusion of instrumental variables to account for selection bias as well as increased sample size is recommended for future study. More studies like the Orissa-Rajasthan one, and studies of state examinations, should be done in other states in order to inform the debate on teaching, learning, examinations, and curriculum, particularly with respect to their impact on learning outcomes of disadvantaged groups.

### 3.2 Internal Efficiency of Secondary Education

Internal efficiency refers to the average number of years of schooling an education system has to provide to produce one graduate. For secondary education, perfect efficiency would mean the government would need to provide, on average, two years of schooling to produce a 10th grade graduate, or four years to produce a 12th grade graduate. Grade repetition and dropout are the two key variables which affect internal efficiency. Each grade repeated means an additional cost of schooling to the government, and each dropout means wastage of the cost of that child's schooling beyond the last completed level. Low internal efficiency is a proxy for poor quality, although other factors (e.g. household) are important, as well.

Unfortunately, data on secondary school repetition are not collected at the central level, so it is simply not known what percentage of ninth or eleventh grade students are forced to repeat their grade. Dropout data are slightly better; it is possible to compare the cumulative dropout rate for grades 1–10 to the cumulative dropout rate for elementary education (grades 1–8) to calculate the dropout rate for secondary education. Table 3.1 below provides this calculation for 2004-05. To this percentage must be added the percentage of students who appear for but do not pass the 10th grade exam and are forced to leave the system (students are not allowed to repeat 10th grade, although they are permitted to re-take the exam as a private student later and re-join senior secondary education if they pass).

Table 3.1 below suggests that approximately one half of all students who begin lower secondary education fail to complete it. This shows a huge problem of retention and massive loss of potential human capital. Incompletion is even higher among ST/SC students. Viewed another way, in 2004-05 the system provided 23 million years of lower secondary education to produce 8.5 million lower secondary graduates, an extremely inefficient process (perfect efficiency would have required 17 million years of schooling). Six million “extra” years of lower secondary schooling had to be provided, a total annual cost of over Rs. 48 billion (more than US\$1 billion). At the upper secondary level, the system is considerably more efficient. In 2005 there were 5.3 million graduates of upper secondary (pass rate 70

percent) compared to 12.7 million students, and there was little dropout, such that 2.2 million “extra” years of upper secondary schooling had to be provided at an annual cost of Rs. 14 billion (more than US\$350 million).

(percentage)			
	Boys	Girls	Total
Dropout All Students (grades 9–10)	10	13	11
Fail 10th Grade Exam	38	35	37
Total	48	48	48
Dropout Scheduled Caste (grades 9–10)	14	14	14
Fail 10th Grade Exam	47	40	47
Total	61	54	61
Dropout Scheduled Tribe (grades 9–10)	13	14	13
Fail 10th Grade Exam	52	53	49
Total	65	67	62

Source: *Selected Education Statistics, 2004-5, MHRD*

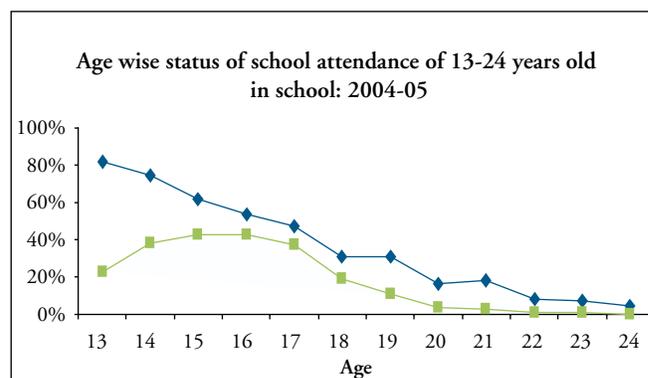
The higher the repetition and dropout rates, and the lower the examination pass rate, the higher are the costs of producing a graduate. At the secondary level (grades 9-10), the cost of producing a graduate in 2004-05 was US\$493; at the uppersecondary level (grades 11-12) it was US\$418. Thus, the total cost for a graduate of both levels of secondary education was US\$911. If secondary education were perfectly efficient this cost would have been US\$692, which means the States are spending approximately 30 percent more than they should to produce the current number of secondary graduates.

That secondary education quality and internal efficiency are poor reflects low levels of learning at both secondary and elementary levels. Baseline and mid-term assessments of Grade 5 student achievement conducted for SSA by the National Council for Education Research and Training (NCERT) in 2002 and 2007 show that, overall, the achievement level is low and the standard deviation is large, particularly for mathematics (although it has improved slightly over time). The findings of low achievement are validated by a more recent “Annual Status of Education Report” (ASER), which is a study conducted by citizen action groups under the leadership of Pratham, a non-governmental organization. In 2007 ASER tested some 700,000 children in 300,000 rural

households in 525 districts (out of a total of nearly 600 districts) to monitor progress of SSA. The same reading and mathematics tests, appropriate for the lower primary education levels, were applied to children in the 6–14 age group. Nationwide, 41 percent of grade 5 children could not read a grade 2 level text, and 58 percent of grade 5 children could not perform simple subtraction and division. It found that an alarmingly high proportion of children in their teens still could not read and solve numerical problems that they are supposed to master in the early primary grades. This, of course, is no measure of the quality of secondary education, but it indicates the “raw material” of incoming students with which the secondary sub-sector has to work. Unless learning of elementary students is improved, graduates from the first stage of education will not have the knowledge and skills they need to handle the curricular demands of the second stage.<sup>24</sup>

High levels of repetition at the elementary level translate into over-age enrollment at the secondary level. Children who progress normally through elementary education should begin lower secondary education at age 13. But Figure 3.5 shows that many students aged 13–15 are still attending elementary education, and some students are still enrolled in secondary education at age 19 and 20. This diversity of ages (from 13–19) poses a challenge for curriculum design and pedagogy because learning aptitudes typically change with age – at what level and speed should teachers “pitch” their

Figure 3.5: Age-wise School Attendance, 2005



Source: *NSS, 61st round*

<sup>24</sup> Many states are now putting in place quality enhancement programs to raise student achievement under SSA.

classes? In most cases, education quality suffers when there is such large heterogeneity in students' ages.

### 3.3 The Quality of Teaching

Policies and programs to improve teaching are fundamental to strengthening the foundation of Indian secondary education. Teachers are the most valuable and expensive resource. And in an education system that is expanding, including more first-generation learners and students from disadvantaged socioeconomic groups, effective teachers play a particularly critical role (Sanders and Rivers, 1996; Wu and others, 2005). The anticipated expansion of secondary education under the next ten years will require training and recruitment of approximately 500,000 new secondary teachers. So, in addition to improving the quality of existing teachers, it is important to identify options to improve pre-service education and teachers' recruitment policies. Finally, the issue of lack of accountability or effectiveness of teachers must be addressed, even if the data on this point are scarce.

#### 3.3.1 Teachers' Pre-service Education

Most Indian states require a secondary school teacher to have both a university degree and teacher education. While not all teachers are recruited from teacher training colleges (some are graduates from universities without professional training), to be considered a professionally trained teacher and receive a commensurate salary grade, a would-be teacher must go through training in a teachers' college. Teachers' colleges include public, government-aided, and a rapidly growing number of unaided colleges.<sup>25</sup>

To improve the quality of secondary education, teachers' colleges, both public and private, have a key role to play. There are approximately 1,082 teacher training colleges nationwide. At present the teacher training industry

<sup>25</sup> In Orissa and Uttar Pradesh, all teacher training institutions that offer the bachelor of education degree (B.Ed.) for preparation of secondary school teachers are in the public sector. In Rajasthan and Delhi there are public, aided, and unaided institutions, all affiliated with universities. In Karnataka, more than half the teacher training institutions that offer the B.Ed. are unaided (Sharma, 2005; Bashir and Siphimalani-Rao 2003; Bashir, 2002).

suffers from widespread problems. Quality standards are poor, the result of an inadequate accreditation and monitoring system. Official guidelines focus on inputs rather than on results. Basic teaching and learning materials are in short supply. There is limited exposure to modern teaching and learning methods and materials. The output of graduates is poorly matched to the demand for teachers, particularly by subject discipline. Equally important, few policies are in place to provide incentives for teacher training colleges to improve. This is a critical issue facing the country as it proposes a massive expansion of secondary education.

#### (i) Weak Accreditation and Monitoring

The National Council for Teacher Education (NCTE) sets the norms and standards for infrastructure, and specifies the required qualifications of teacher educators, for all teacher education colleges.<sup>26</sup> But without effective monitoring by the Council, which lacks the manpower, resources, and capacity for this purpose, teacher training colleges tend to depart from these norms, with potentially serious implications for the quality of teacher preparation and thus for the quality of secondary education. Further, the NCTE norms relate largely to the inputs, rather than to the quality standards or outcomes of teacher education. Thus many graduates of teacher training colleges are simply unprepared to teach.

Most private teacher education programs are financed out of the fees collected; their rapid commercialization responds to a demand but malpractices in these institutions are widely reported.<sup>27</sup> Most of the B.Ed. programs offered by private teacher training colleges are considered to be sub-standard but continue operating.

<sup>26</sup> NCTE is an advisory body for central and state governments on all matters relating to teacher education. It became a statutory body in 1993. Its main objective is to achieve planned and coordinated development of the teacher education system throughout the country, through the regulation and maintenance of norms and standards.

<sup>27</sup> A short survey of 40 unaided institutions recognized by NCTE in Delhi and neighboring states was conducted in 2002. It showed that the owners of these institutions were lawyers, teachers, politicians and businessmen, including timber merchants and hardware dealers, industrialists, and builders.

Recognition of the need for assessment and accreditation of teacher education colleges by an independent body led to the establishment of the National Assessment and Accreditation Council (NAAC) in 2002. NAAC has produced a manual for self assessment and accreditation so that institutions can do their own institutional analysis and strengthen and improve their programs to better match the needs of the market. It is unknown how many institutions are engaged in this process, but it is safe to assume this effort needs to be strengthened and expanded.

### *(ii) Shortage of resources*

India has a centrally sponsored scheme for teacher education, which allows state institutions for teacher education to draw on central funds for improving quality. Even so, many of these colleges are severely under-resourced and offer a poor service. Vacancies in their faculty positions are common; teaching and learning resources are outdated; Internet connections are rarely available; and laboratories lack the supplies they need to be functional. Because of financial constraints, state governments try to limit their spending on teachers' colleges to what can be covered by central funding only; this holds back their spending on both staff and infrastructure, thus affecting quality.

As background for the present study, a survey was conducted in 2005 of 24 public, aided, and unaided teacher training colleges in Delhi, Orissa, and Rajasthan to understand the profiles of teacher educators and students in these institutions. Regional institutes of education in Bhubaneswar (Orissa) and Ajmer (Rajasthan) were also contacted, to gather information on teacher pre-service education. Of 260 trainee teachers who participated in the survey, four out of five reported that they had no access to a pedagogical support services facility, and the others considered the available services as merely "exhibits", unavailable for their use in practice teaching sessions. Fewer than half the trainees had the books they needed. 40 percent of the trainees said that only a limited number of copies of their required books were available in the library, and 11 percent stated that their required books were rarely available.

### *(iii) Isolation and Outdated Pedagogy*

The faculty members of the surveyed teacher colleges seem to work in isolation, without connections to the international community of teacher educators and education researchers. Government colleges offer better opportunities for in-service training and professional development, and between 20 and 60 percent of their faculty members said that they engaged in research (a much higher proportion than in private institutions). But across all the institutions surveyed, fewer than 40 percent of faculty members had a home Internet connection. This signals a lack of the technology base needed to access global knowledge for their professional growth.

Five videotaped teaching sessions that were made with lecturers' consent in a range of different teacher training colleges do not show good models of interaction or activity-based approaches. Traditional frontal teaching was the predominant method, and no trainees took the initiative to ask questions. This is the opposite of what is needed: teacher training colleges need to model student-centered, activity-based learning for student teachers so they can in turn apply these methods in their classrooms when they graduate and begin teaching.

### *(iv) Poor responsiveness to demand for teachers*

In general, teachers' colleges are poorly connected to state education offices, and they lack data on trends in the demand for teachers. As is the case in many countries, too few graduates are produced in mathematics and the sciences. Government-run teacher training colleges also have difficulty filling places that are by law reserved for trainees from disadvantaged groups. In particular, very few trainee teachers from the SC or ST track into math and science subjects. The shortages of SC and ST teachers in these subjects may call for a further lowering of the bar for admitting SC and ST applicants to teachers' colleges, or these reservation policies may need to be modified. Both the central and state governments need to improve their marketing of the teaching profession as a promising avenue of employment, particularly for women and disadvantaged groups in rural areas where they are needed most.

### 3.3.2 *In-service Professional Development*

Professional development should provide working teachers additional knowledge and skills they can use to improve teaching and student outcomes. There is a large unmet demand for in-service training at the secondary level, and a special need to enhance teachers' pedagogical content knowledge — i.e., knowledge about the teaching and learning processes specific to a particular discipline, which is central to a teacher's effectiveness in adapting content to diverse interest and levels.

There is little information available on the content of in-service training and even less on its effectiveness in developing teacher competencies in India. The Union Government has set up institutes of advanced study in

education (IASEs) that offer teachers refresher courses on a variety of subjects. Interestingly, teacher educators have a high regard for the quality of the programs offered, but teachers themselves do not. For elementary school teachers, SSA provides 20 days of training each year, but this is rarely school-based or linked to classroom practice, and provides no follow-up actions. By contrast, for secondary school teachers there is no stipulated number of training days, nor dedicated resources for this with clearly defined objectives. While state councils for education research and training provide some in-service training, this is not systematic nor of high quality. Internet-based independent study is not an option for most teachers, because very few of India's educational institutions have facilities to allow this.

#### Box 3.1: Teacher Education by Distance Learning

Indira Gandhi National Open University (IGNOU) offers a two-year B.Ed. Program that can be completed in six years. The program was approved by the NCTE as well as the Distance Education Council (a statutory body created by IGNOU to maintain standards and norms in distance education programs). It provides an opportunity for working teachers to upgrade their qualifications without leaving the service. Initiated in 2000, the course is only open to serving school teachers who are selected on the basis of an entrance test. Applicants must submit a certificate from the head of their school stating that the school will provide the required facilities during the training period for the school-based training component of the course. State open universities also collaborate with IGNOU's School of Education in offering B.Ed. courses.

The course has both theory and practice components. Every teacher trainee is attached to a study center that enrolls up to 100 teachers. The theory components are provided in print and on video and audio cassettes made available at the Study Center. The practice components take the form of a three-stage training support service. (1) The trainee is attached to a senior teacher at the school where the trainee is serving; this senior teacher acts as a mentor to the trainee and supervises the practice teaching exercises. (2) A teacher educator at a nearby teacher training college observes the mandatory practice teaching lessons and provides necessary academic guidance. (3) Workshops are held to demonstrate lessons and address trainees' individual problems related to practice teaching. A fee of Rs. 12,000/- is charged for the complete training package.

The program is held in high esteem by the faculty of full-time teacher education colleges. However, in interactions with students, the study team was told that the technology component is very limited and not accessible to many students and the practice component is also limited. Although IGNOU guidelines clearly spell out the roles and functions for mentors, teacher educators, and workshop organizers, IGNOU's lack of systematic monitoring of the practice teaching activities has drawn adverse comments from educators. Malpractices have been reported; some schools reportedly sell false service certificates to prospective applicants for the B.Ed. program who are actually not teachers, to allow them to meet the application requirements. The program would benefit from a review of its admission policy and from a better monitoring mechanism to overcome the aberrations that were reported to the study team.

A main constraint on teachers' professional development is institutional capacity. Staffing and resources in the institutions responsible for providing technical support and monitoring, notably the National Council for Teacher Education (NCERT), state councils/institutes of educational research and training (SCERT/SIERT), district institutes of education and training, and institutes of advanced study in education, are simply inadequate, and the research done by these institutions is mostly of poor quality. Along with teacher training colleges, these institutions need investments in technical assistance, training, equipment and revised

incentives to focus their outputs on improved teaching and learning. By contrast, trends in teacher education and professional development in OECD countries are described in Box 3.2.

Student learning outcomes are linked to pedagogy. They are unlikely to improve unless effective teaching skills and practices are acquired and used in classrooms. The simple truth is that reform, improvement and expansion of secondary teacher professional development (both pre-service and in-service) is required to improve quality (and to enable expansion of access).

### Box 3.2: Policy Trends in Teacher Education and Development in OECD Countries

Teachers in OECD countries are typically expected to manage the learning process in outcome-oriented curricula, to keep abreast of the latest developments in their field, to provide remedial help to students, to work and plan in teams, to deal effectively with increasingly diverse and ethnically mixed societies, to include students with disabilities, and to work effectively with parents and communities.

The education systems in many OECD countries use individual teacher profiles to align teachers' education, certification, development, and career paths with performance standards and school needs. Several countries require their teachers to show evidence of their performance according to the defined standards or ask them to do this voluntarily. Several countries use a coherent framework that links pre-service education, induction at the beginning of a teaching career, and professional development to improve teacher effectiveness:

At the pre-service stage, Finland, Ireland, and Korea have made their selection into teacher education more competitive than before. Belgium, the Netherlands, and Sweden provide alternative, flexible part-time programs, distance education, and modular programs to prepare mid-career professionals with diverse experience and varying ages to enter teaching. Pre-service teacher education in Australia, Denmark, Finland, Ireland, Israel, Norway, and Sweden covers not only subject matter, pedagogy, and practical training, but also operational research. These countries tend to provide practical field experience in the first year of studies to expose student-teachers to real experience in school. Notably in England, France, Portugal, the USA, and Wales, accreditation of pre-service programs with a focus on program content and teacher competency is increasingly required. Spain, France, Japan, and Korea require candidates to pass a competitive examination to secure a tenured position. Some US states require teachers to be re-certified after five or ten years by completing a certain number of professional development activities.

Induction into teaching in the first year of service. Having proper school-based support through lesson observation and constructive feedback during the first year of teaching is critical to develop teacher skills, as is recognized by the system in Northern Ireland. New teachers are required to assemble a portfolio of evidence of their professional competence.

Professional development. Most OECD countries provide 40 hours of in-service training per year per teacher, with the Netherlands topping at 169 hours. Denmark, Finland, Hungary, Netherlands, Norway, Sweden, Switzerland transfer funds to schools that let them decide on what development activities to undertake. There is also a trend to link professional development with promotion through linkage with teacher profiles and competencies at different levels. Hungary, the UK, and the Canadian state of Ontario emphasize school-focused research and view the school as a learning, not just a teaching, organization. Coherent pedagogical frameworks, peer review, action research, reciprocal school visits by teachers and principals, and the development of teacher and school networks are increasingly practiced.

*Source: OECD (2005).*

### 3.3.3 Teacher Accountability

Effective teaching requires not only solid pre-service and in-service teacher professional development, but also teacher accountability. Accountability may be measured by indicators such as teacher attendance, actual time spent teaching and preparing lessons during the school day, pedagogical techniques, homework assignment and review, continuous assessment practices, and, ultimately, student learning. Unfortunately, no hard data exists regarding these indicators at the secondary level, unlike at the elementary level where this issue has been given much more attention.<sup>28</sup> As an alternative, it is possible to assess the accountability framework for publicly financed secondary teachers.

Government secondary teachers are civil servants, enjoying the same rights and privileges as other state-level civil servants in terms of job security, pensions, and overall civil servant pay increases (de-linked from performance) which are implemented from time to time. Proposals for recruitment, placement and transfer of government teachers are often subject to political interference, which further reduces accountability. Once hired it is nearly impossible to fire a government teacher, who typically has strong support from teachers unions and immediate recourse to the judicial system to oppose any administrative measures. Indeed, literally tens of thousands of court cases involving teachers are pending across the country, which freeze implementation of the administrative measures, tie up administrators' time in courts, and dissuade any future attempts to enforce teacher accountability. While no study exists, parents and school administrators frequently complain about teacher absenteeism and their inability to do anything about it (NIEPA, 2002).

With respect to private aided schools, teacher accountability has progressively declined. At Independence in 1949, private aided schools were only partly funded by the Government, and had to compete to attract students to succeed. Schools hired, disciplined and fired their own teachers, and teachers

were paid from school revenues, creating a "short route" of accountability. As aided school teachers unionized and exercised their political power, state governments took over direct payment of their salaries and equalized them to government teachers' salaries (late 1960s), and teacher recruitment shifted to a state-appointed body (1982), which converted the "short route" into a "long route" of accountability. Because most states pay private aided school teachers directly (without passing by the school) with no serious consideration of teacher performance from one year to the next, there is a lack of teacher accountability to the state government, the principal and parents. Efforts in the 1990s to increase authority of school managers were effectively opposed by teachers. There are no incentives to compete, expand or improve.<sup>29</sup>

However, in Orissa steps have recently been taken to censure private institutions for low performance; "grants in aid" were discontinued to 21 secondary schools where not a single student had passed examinations during the previous three years. In addition, salary-based grants were replaced by block grants, giving the school headmaster greater flexibility in hiring and resource utilization. It is too early to assess the impact of these actions.

On the other hand, the relative job security of a secondary teacher in private aided schools can lead to abuses, such as the sale of teaching posts. A recent study on financing of secondary education indicated teacher candidates are frequently required to pay between Rs.100,000–200,000 (US\$ 2,500–5,000) in order to be selected (NUEPA, 2008), usually to the school headmaster. In such a situation, the school headmaster is in a poor position to insist on greater teacher accountability, which reveals the weaknesses of unsupervised local hiring.

In summary, while little is known about teacher accountability at the secondary level, the existing arrangements are such that it is fair to assume it is very low. Neither government nor private aided schools have the mechanisms or incentives to enforce it or increase it. This is an issue which calls for increased research and discussion, some of which follows in section 3.5 concerning quality assurance.

<sup>28</sup> Initial estimates in the early 2000s repeatedly showed elementary teacher attendance of around 75-80 percent. However, surveys conducted in 2007 by MHRD and NGO Pratham (ASER) showed 90 and 91 percent teacher attendance, respectively, a remarkable increase and example of how measurement of indicators can lead to their improvement.

<sup>29</sup> Presentation by Geeta Kingdon at "Conference on Quality Education For All", October 2007, New Delhi.

### 3.4 Curricula and Examinations

The core business of secondary education is to ensure that the curriculum and the teaching and learning process adequately prepare children to join the labor market or continue on to higher education. In both cases this means preparing them to face uncertainty and change and to find new solutions to new problems. This section looks at the systemic challenges of balancing the diverse with the standardized in curricula and examinations within a large federal system such as India's. It addresses the following sets of questions:

- ◆ How does the Indian education system preserve its diversity while maintaining unity and upholding quality? How are curricula structured and examinations organized at the central and state levels?
- ◆ How do India's secondary school curricula compare with international curricula in three subjects – English, Mathematics, and Science – that have wide international demand?
- ◆ What are the issues and options for improvement?

#### 3.4.1 Education Boards and Their Curricula

With 14 official regional languages and some 300 effectively spoken languages, India's diversity has posed a challenge to educational policymakers since Independence to maintain unity within multiplicity. This section looks at the 2005 National Curriculum Framework, which was developed through a broad participatory approach and whose principles are in keeping with international trends, and at the choices states have made in curricula, textbooks, examinations, and days of instruction.

#### National Curriculum Framework

The National Curriculum Framework (NCF) provides a set of guidelines for elementary and secondary education across the country, while leaving the states to determine their curricula and examination content within its broad direction and parameters. The NCF 2005 aims to lighten the overloaded curriculum

in India's schools and to shift emphasis from rote memorization to conceptual understanding, synthesis, and application through an integrated and/or thematic approach to teaching and learning. Its approach accords with the worldwide trends in curricula. The NCF is based on the theory of knowledge as a human construct and on the primacy of the child as an active learner, rather than as mastery of objective, unchangeable "facts" which are imparted by teachers. Acknowledging children as active participants in the construction of knowledge should lead to changes in India's current curriculum and teaching practices, although it hasn't yet.

The NCF affirms the aims of education as building commitment to democratic values of equality, justice, freedom, concern for others, secularism, respect for human dignity and rights, and concern for the environment. The NCF emphasizes a three-language approach (using the mother tongue as medium of instruction, learning a regional language, and a foreign language), fostering the competency to think and reason in mathematics; relating science to everyday experience; integrating themes in social science and science; presenting the perspectives of marginalized groups in social science so as to cultivate sensitivity towards gender, tribal, caste and minority issues; and developing aesthetic intelligence and good health through art, music, dance, and physical education. In view of a growing concern regarding intolerance and violence, the NCF emphasizes education for peace as a precondition for national development. It encourages work experience and advocates the integration of work-related education in all subjects from primary grades upwards.

The NCF considers that the prerequisites for improving performance are the availability of minimum infrastructure and material facilities, support for planning a flexible daily schedule, and the provision of space to involve parents and community. An enabling school and classroom environment is one that supports autonomy and offers plurality of learning resources. It emphasizes the need for monitoring of quality, and reaffirms faith in local government. It avers that funds must follow functions. Teacher education should focus on developing

the professional identity of teachers. Examination reform should be pursued, to change the typology of questions so that reasoning and creative abilities are emphasized rather than rote learning.

The four themes upheld by the 2005 NCF underlie the discussion of curriculum and examinations in this chapter: (i) connecting knowledge to life outside the school; (ii) ensuring that learning shifts away from rote methods; (iii) enriching the curriculum to provide for the overall development of young people rather than remaining textbook-centric; and (iv) making examinations flexible and integrated with classroom life. These themes represent a critical, progressive, and

creative approach to reform of the Indian curriculum, the process of teaching and learning, and the function of examinations.

However, the 41 Boards of Education (3 national and 38 state and UT) differ considerably in the extent to which the NCF is adopted. Of the two state Boards whose experience is examined in this study, Rajasthan claims to maintain a more independent profile than Orissa, even though its curriculum choices are guided by the NCF. Ultimately, if examinations are not reformed to reflect this change in curriculum guidelines, the NCF will have limited impact and teachers will continue to “teach to the test”.

### Box 3.3: International Trends in Curricula

Worldwide, in response to globalization and the emergence of the knowledge economy, the role of secondary education is changing from an intermediate stage leading to certification for job search or admission to higher education, to preparing young people for lifelong learning. As changes in economic structure leads to more frequent changes of occupations, the disciplinary tradition of curriculum design is no longer adequate to prepare young people to deal with uncertainty and change. Broader curriculum areas and skill centered approaches that foster “generic competencies”, and the abilities of “learning to think” and “learning to learn”, are considered more appropriate to deal with tomorrow’s world. Technology has made acquisition of knowledge much easier, and enhanced the independence of the learner.

The types of generic competencies that make an individual adaptable are: the ability to access, select, and evaluate information for decision-making; the ability to work and learn in teams; the ability to communicate effectively and to deal with people; the ability to use technology to improve work efficiently; the ability to cope with ambiguous situations, unpredictable problems, and unforeseeable circumstances; the ability to cope with multiple careers, to locate oneself in a job market, and to choose and fashion the relevant education and training. Technology, economics, citizenship education, a second foreign language, environmental education, health education, music, arts, and physical education are increasingly important in secondary education. Learning across cultures, learning to care, learning to serve, social competence, creativity, workplace learning, and leadership learning, all of which are outside the core of academic subjects, are valued. Formal learning is integrated with informal learning.

The trend in reform of secondary education is to blur subject boundaries, create diverse learning activities, introduce moral elements, reform examinations, and provide alternative ways of organizing school learning. To create space in the school day for diversifying experience, there is also a trend to reduce the formal curriculum. For example, Singapore and Japan have reduced their formal curriculum coverage by about 30 percent.

*Sources: Presentations by Kai-Ming Cheng (Hong Kong), Juan Manuel Moreno (World Bank), Keshev Desiraju and Anita Sharma (India), and Christian Cox (Chile) on curriculum trends in the Conference on Secondary Education in Malaysia, September 2005. Minoru, Shoda, “Overview of Trends of Education Policy in Japan.” 2005; Levy and Murnane, 2004.*

## Central and State Boards of Education

In contrast to the National Curriculum Framework, secondary education in India is institutionally diverse, with three National Boards and 38 State and Union Territory Boards.<sup>30</sup> These national and state Boards are statutory bodies with three main functions: formulation of curriculum, supervision of the affiliated institutions, and conduct of examinations to issue certificates for completion of secondary and senior secondary education. Some Boards publish their own textbooks and others publish supplementary and supportive reading material. The Council of Boards of Secondary Education (COBSE) provides coordination and a forum for sharing experiences, information on quality-related issues, and innovative practices across the central and state Boards.<sup>31</sup> Nonetheless, the result is non-comparability of learning outcomes as measured by Board Examinations, between states and over time, a critical weakness in system accountability.

The secondary curriculum covers language, mathematics, natural science, social sciences, art, health and physical education, and vocational education. The first four areas form the core curriculum. Beyond this relative uniformity, the state boards differ in how they tailor the curriculum to the state context and in the subjects they offer. In senior secondary education, streaming takes place. Students choose to major in the humanities, science, or commerce, in addition to taking a language and computer science, which are compulsory subjects.

<sup>30</sup> School boards have a long history in India. During the British administration, secondary schools were often attached to universities and entrance examinations were conducted by universities. The first Board of High School and Intermediate Examination was established in 1921 in Allahabad to formulate syllabi and to conduct examinations, under the guidance of the university. The Central Board of Secondary Education next came into existence in 1929, in western India. Gradually, the then universities transferred the work of secondary education to school boards/councils. Senior secondary education today still continues as a part of colleges in Assam, Andhra Pradesh, Bihar, Kerala, Karnataka, Maharashtra, Mizoram, Nagaland, Orissa, and Uttar Pradesh. Almost every state now has its own board responsible for secondary and senior secondary education.

<sup>31</sup> With all boards as members and with associate members from other countries, COBSE collaborates with the MHRD, NCERT, National Institute of Educational Planning and Administration (NIEPA) and National Council for Teacher Education (NCTE), organizing conferences and working to improve educational standards, curricula, and examinations including internal school-based evaluations. Annual conferences adopt specific themes to deliberate upon and develop consensus.

Most states also offer either a concentration or a parallel certification in vocational education at the senior secondary level. States usually reform their curricula once in five years. In practice, however, the reforms tend to be routine, superficial, cut-and-paste updating exercises. The overemphasis on facts and information has not been replaced by attention to new principles and insights embodied in the NCF.

### Box 3.4: Perceived Irrelevance of Secondary School Curricula

The World Bank's recent global study on secondary education (World Bank, 2005a) found that in many developing countries the secondary curriculum is "profoundly abstract and alien to social and economic needs. It is almost completely driven by high-stakes public examinations that in many of these countries were introduced by the colonial powers and that still hold the key to university access and to elite professional jobs. Abstract, fact-centered, and decontextualized narrative knowledge prevails in the secondary curriculum and continues to be used for selective purposes in a setting of scarce educational and job opportunities, causing high dropout and high failure rates among secondary school students."

The irrelevance of the secondary curriculum is viewed as endemic but also as a resilient cultural artifact. Indian educators, policymakers and parents might well ask themselves if this characterization of secondary education curriculum worldwide applies in their own case.

State Boards of secondary education certify far more schools and students than the national Boards. In 2004-05, 94 percent of all lower secondary students appearing for certification did so before State Boards. In some states, secondary school certification examinations are also provided by universities. In some states, a single Board oversees both Grades 10 and 12 examinations and in other states, two different Boards cater to Grades 10 and 12.

The three national-level Boards are the Central Board of Secondary Education (CBSE), the National Institute for Open Schooling (NOIS), and the Council for Indian School Certificate Examination (CISCE). The influence of

central government policies and guidelines on curriculum formulation is much greater on CBSE and NIOS than on CISCE and the state Boards, largely because the former two cater to institutions that are primarily funded by the central government.

The Central Board of Secondary Education was established by the central government in 1962 to cater to the educational needs of children whose parents are employed in central government organizations and subject to frequent transfers. About 9,500 of India's 150,000 secondary and senior secondary schools, along with a million privately registered students, subscribe to the CBSE curriculum and certificate examination. 38 percent of these schools are actually publicly financed (KV, NV, Delhi Municipal schools), while 62 percent of these schools are private unaided. Since CBSE functions under the overall supervision of MHRD, the CBSE schools use the syllabi and textbooks of the National Council for Education, Research, and Training, which are directly based on the NCF 2005.

Approximately 1,500 schools, most of them private, are affiliated with the Council for Indian School Certificate Examination (CISCE). CISCE was established in 1958 by the University of Cambridge Local Examinations Syndicate with the assistance of the Inter-state Board for Anglo-Indian Education. Its distinctive feature is the conduct of school examinations only in English. CISCE conducts three examinations: the Indian Certificate of Secondary Education (ICSE - Year 10); the Indian School Certificate (ISC - Year 12) and the Certificate in Vocational Education (CVE - Year 12). Although CISCE does not produce textbooks of its own, private publishers cater closely to the ICSE syllabi.

NIOS, being an open schooling system, offers the greatest choice of subjects for study. The NIOS curriculum is an innovation in the Indian secondary school system, catering to non-regular students, school dropouts, and students living in remote areas. NIOS provides flexibility in the choice of subjects/courses, place of learning, and, to ensure continuity, it allows the transfer of credits from and to other systems.

Institutional mechanisms for curriculum and examination development appear to be more established in the central

than in the state Boards. None of the Boards except NIOS has dedicated full-time academic staff either for curriculum development or for examination setting. They use expertise from university departments and other institutions.

### *3.4.2 International Comparison of Curricula*

International comparison is useful in gauging whether a country's curriculum coverage and standards are on par with those of other countries, and in providing benchmarks to inform both national and state policies. In the era of globalization, it is all the more important to ensure that students are equipped with the skills that their counterparts in other countries have. The Indian senior secondary syllabi in English, mathematics, and science, prescribed by CBSE and the Rajasthan and Orissa State Boards, were compared with the Geneva-based International Baccalaureate (IB) and Britain's International General Certificate of Secondary Education (IGCSE). Both IB and IGCSE are widely subscribed to by schools and students in different countries, and schools affiliated with these systems are increasingly present among the elite in India. Universities and employers worldwide consider the IB and the IGCSE curricula to be rigorous (Box 3.5). The comparison focused on English, mathematics, and science because these are global subjects and allow for comparison. The study was qualitative and based exclusively on written curriculum material. The review was not exhaustive and was intended mainly to identify issues for policy discussion and further research; it did not cover the implementation of the different curricula in classrooms.

All three English language curricula – Indian (CBSE, supplemented by Rajasthan and Orissa state curricula), IB, and IGCSE – emphasize the need for oral (listening and speaking) and written (reading and writing) proficiencies. The Indian syllabi emphasize conversational skills, while IB and IGCSE assume that those skills have already been developed. IB places a heavy stress on the appreciation, study, and enjoyment of literature, and incorporates clearly defined higher-order thinking goals by emphasizing the use of language for communication and by focusing on the “close, detailed, and critical examination of written text.”

Overall, language instruction is clearly weaker in the Indian system both in curriculum coverage and level of difficulty. This weakness is exacerbated by the general acceptance across schools in India of drilling, which tends to be rote memorization of textbook content. This is a serious issue as a strong command of language is necessary in order to develop higher-order thinking, not only in language but also in other subjects. In addition, the Indian English syllabi reflect the grammar-based approach that predominated in previous decades. By contrast, most international curricula focus on content-based language learning and communicative competencies, using texts which are task-based and include real life communication-oriented exercises for students.

With respects to mathematics, there is a surprising amount of similarity in the topics and subjects addressed, although each curriculum has its unique features. Concerning the sciences (physics, chemistry and biology), the Indian curricula is distinguished

from the international curricula mainly by the teaching approach and the focus on training rote reproduction skills. Like the Indian mathematics syllabus, the science syllabus is not taught in a thematic manner, and contains an abundance of standard exercises which directly relate to questions on the certification examination. There are few questions that develop the use of contexts, broaden and deepen insights, describe attributed relationships, or develop higher-order thinking or meta-cognitive skills during the learning process. The latter types of skills and competencies can be clearly identified as a goal of the IB and IGCSE mathematics and science curricula.

In conclusion, the comparison of Indian and international curricula highlights the issue of over-emphasis on rote learning of facts as opposed to development of students' higher-order thinking skills. In addition, the sheer volume of facts which students are expected to master in order to succeed on examinations appears to exacerbate this problem, pointing to curriculum overload.

### Box 3.5: International Baccalaureate (IB) and International General Certificate of Secondary Education

The International Baccalaureate Organization (IBO), founded in 1968 in Geneva, is intended to facilitate international mobility of students preparing for universities by providing schools with a curriculum and diploma recognized by universities around the world. The IB's objectives are similar to those of NCF 2005: to promote international understanding; educate the whole person for intellectual, personal, emotional and social growth; develop inquiry and thinking skills, and the capacity to reflect upon and to evaluate actions critically.

The IB now covers education for children from age 3 and above, in three programs – primary years (ages 3–12), middle years (ages 11–15) and diploma (ages 16–17, for students in the last two years of education before university). The IBO has 1,600 schools in 121 countries, and its diploma is recognized by major universities in the world. The IBO provides the following services: detailed curriculum guidelines, teacher training workshops; on-line access to 3,000 educational resources, subject area experts, and discussion with IB teachers around the world, external assessment of IB students' work, and procedures for school-based assessment of students' work.

The IB's Diploma Program covers the last two years of school education. To obtain certification, students study six subjects. At least three of the six subjects selected are taken at higher level (comprising 240 teaching hours), the others at standard level (comprising 150 teaching hours). The choices of higher level subjects are: Language, Second Language, Individuals and Society, Experimental Science, Mathematics and Computer Science, and the Arts. Standard level courses are often inter-disciplinary (e.g., text and performance, ecosystems and societies, and world cultures). Students also must write a Theory of Knowledge paper and an Extended Essay (4000 words) based on independent research. Overall the curriculum encourages schools to develop "Creativity" and Social "Action and Service."

The IGCSE, which is conducted by Cambridge University Local Examination Syndicate, offers the General Certificate of School Examination (GCSE). The GCSE has two levels, the Ordinary Level (O-Level) examination for students who have completed 10 to 11 years of education, and the Advanced Level (A-Level) for those who have 13 years of schooling.

Within the curriculum there is a balanced mix of practical experience and theoretical knowledge. IGCSE and the GCSE do not have as comprehensive a philosophical underpinning as IB, which aims to prepare students for further academic success. With a choice of Core and Extended papers in most subjects, the IGCSE is suitable for students with different levels of ability. The IGCSE is an internally based curriculum, allowing teaching to be placed in a localized context and making it relevant in different regions. It is also suitable for students whose first language may not be English, and this is acknowledged throughout the examination process. IGCSE is taken in over 100 countries worldwide.

*Source: Websites of IB and IGCSE*

### Textbooks and Other Learning Materials

The textbooks of national and state Boards differ widely in their approach to the organization of information and presentation of content. Central Board textbooks are considerably better than state Board textbooks, and among the former, textbooks targeted to the CISCE curricula are of higher quality. CISCE does not produce its own textbooks, leaving teachers and school administrators free to decide what textbooks to recommend to their students. In practice, a number of well-produced private publications that conform closely to the ICSE and ISC syllabi are used widely by students. This element of choice provides an in-built quality control mechanism that is not evident in the other national Boards. The superior quality of privately produced textbooks adopted by CISCE-affiliated schools has been considered as a potential explanation for the very high pass rates of CISCE board students (more than 92 percent) (World Bank, 2002a).

State-level textbooks seem to predominantly address students' examination needs, with even less emphasis on conceptual understanding than in the national Board textbooks. Many of them appear to be designed merely as notes for examinations. In addition, States appear to adjust the content to reflect lower learning expectations compared to CBSE or CISCE textbooks. Also, in an effort to ensure affordability for low-income students, states have compromised on the physical quality and attractiveness of the books.

Primary school textbooks are clearly better than secondary school textbooks in pedagogy and presentation. This is in large part due to the textbook revision process that started with the District Primary Education Program (DPEP) and continues with SSA, whose consultations with teachers help to ensure that primary education textbooks cater

to learners' needs and interests. Such a process has not occurred for secondary education textbooks, whose entire focus appears to be on preparation for Board examinations. Indeed, there is no systematic process or mechanism to enhance quality or introduce new ideas or new presentation of materials. To improve secondary school textbooks and adopt a more learner-centric approach to material development, reforms are needed in the way textbooks are developed and procured.

At the secondary level, other learning materials than textbooks are required, such as laboratory equipment, visual aids, audio-visual equipment, library and reference books, to name but a few. It is not possible within the context of this study of secondary education to assess the availability and quality of these learning materials. Computers and other information and communication technologies (ICTs) have been much heralded over the past ten years as essential new tools to enhance learning and student achievement, as well as to develop the skills and work behaviors required for the global knowledge economy. Given the important contribution of information services to India's economic growth over the last 15 years, India would be remiss to neglect investments in ICTs at the secondary level, for both teachers and students. However, it is necessary to review the experience to date with ICTs and education (Box 3.6), in order to take a measured approach.

This is only a very partial assessment of textbooks and learning materials at the secondary level, meant to flag certain issues related to quality. The diverse realities at the state level, with different Boards and state departments of education following different policies, suggest additional research is needed at decentralized levels to develop appropriate, state-specific policies.

### Box 3.6: The Role of Information and Communication Technologies to Improve Learning and Acquisition of Global, Knowledge-Economy Skills

It is generally believed that ICTs can empower teachers and learners, promote change and foster the development of 21st century skills, but data to support these beliefs are still limited. Proponents argue that ICTs can and will transform teaching and learning processes from being highly teacher-dominated to student-centered, and that this transformation will result in increased learning gains for students, creating and allowing for opportunities for learners to develop their creativity, problem-solving abilities, informational reasoning skills, communication skills, and other higher-order thinking skills. However, there are currently very limited, unequivocally compelling data to support this belief.

One of the enduring difficulties of technology use in education is that educational planners and technology advocates think of the technology first and then investigate the educational applications of this technology only later. ICTs are seen to be less effective (or ineffective) when the goals for their use are not clear. While such a statement would appear to be self-evident, the specific goals for ICT use in education are often, in practice, only very broadly or rather loosely defined.

The positive impact of ICTs is more likely when linked to changes in teachers' pedagogy, which in turn requires focused, iterative teacher professional development to realize changes in classroom practices. In other words, the "humanware" is much more important than the hardware or the software, and this aspect is all too often neglected. ICTs are most effective with student-directed, constructivist pedagogical styles. On the other hand, traditional, lecture-based pedagogy is often more effective than constructivist teaching in preparation for standardized testing, which typically measures ability to recall facts and make calculations. If the objective is success on traditional standardized tests, then ICTs may not be the best strategy. That said, uses of ICTs for simulations and modeling in science and math have been shown to be effective, as have word processing and communication software (e-mail) in the development of student language and communication skills.

In many studies of ICTs there may be a mismatch between the methods used to measure effects and the nature of the learning promoted by the specific uses of ICT. For example, some studies have looked only for improvements in traditional teaching and learning processes and knowledge mastery, instead of looking for new processes and knowledge related to the use of ICTs. It may be that more useful analyses of the impact of ICT can only emerge when the methods used to measure achievement and outcomes are more closely related to the learning activities and processes promoted by the use of ICTs.

Despite the lack of independent impact assessment data which researchers and policymakers would like to have, in studies that rely largely on self-reporting, most users feel that using ICTs make them more effective and self-directed learners. In addition, there appears to be general consensus that both teachers and students feel ICT use greatly contributes to student motivation for learning. Few would dispute the importance of student motivation to improve learning outcomes.

Where to locate ICTs in the school is an important issue. Placing computers in classrooms enables integration with core curricular subjects and greater use of ICTs for 'higher order' skills than placing computers in separate computer laboratories (indeed, fewer computers in classrooms may enable even more use than greater numbers of computers located in separate computer labs). This can be facilitated by use of portable laptops and even "computer labs on wheels" which can move from classroom to classroom as needed. Classroom placement requires appropriate infrastructure investments in electrification, wiring, security, dust-proofing, etc.

*Source: Trucano, Michael. Knowledge Maps: ICT in Education. InfoDEV/World Bank, 2005.*

### 3.4.3 Board Examinations

Public examinations at the end of Grades 10 and 12, conducted by either state or national Boards and covering both general and vocational education, certify the completion of secondary and senior secondary education. The certificates are accepted as entry qualifications to many jobs in the public and private sectors. One in three graduates of secondary and senior secondary school does not proceed for further education. For those who pass and continue their education, the Grade 10 and 12 examinations are extremely high-stakes examinations which are used to rank and select students for the next level. For the most selective colleges and universities, having the school leaving certificate only qualifies students to take additional entrance tests for admission. (Box 3.7 illustrates the complex process involved in conducting examinations for thousands of secondary and senior secondary students.)

The pass mark in Board examinations is a low 33 percent of the maximum marks, suggesting that students are not expected to master the full curriculum. The first division is given to those achieving an aggregate of marks in all subjects of 60 percent or more of the maximum marks, the second division to those achieving between 45/48 percent and 60 percent, and the third division to those who pass with scores below 45/48 percent. To compete for the limited space in the next cycle of education, placement in the first two divisions is important.

In 2005 the average Grade 10 examination pass rate was 64 percent (68 percent for girls and 62 percent for boys), while for Grade 12 it was 69 percent (73 percent for girls and 66 percent for boys). Remembering that the pass mark is just 33 percent of maximum marks, this suggests that the average levels of student achievement are quite low.

A valid examination can provide an equal opportunity for each participant to show his/her level of competence or performance. Examination results can become the key driver for systemic reform, especially of teaching and learning in classrooms. However, as examination performance becomes the only pathway for upward mobility, educators are voicing concern about the negative

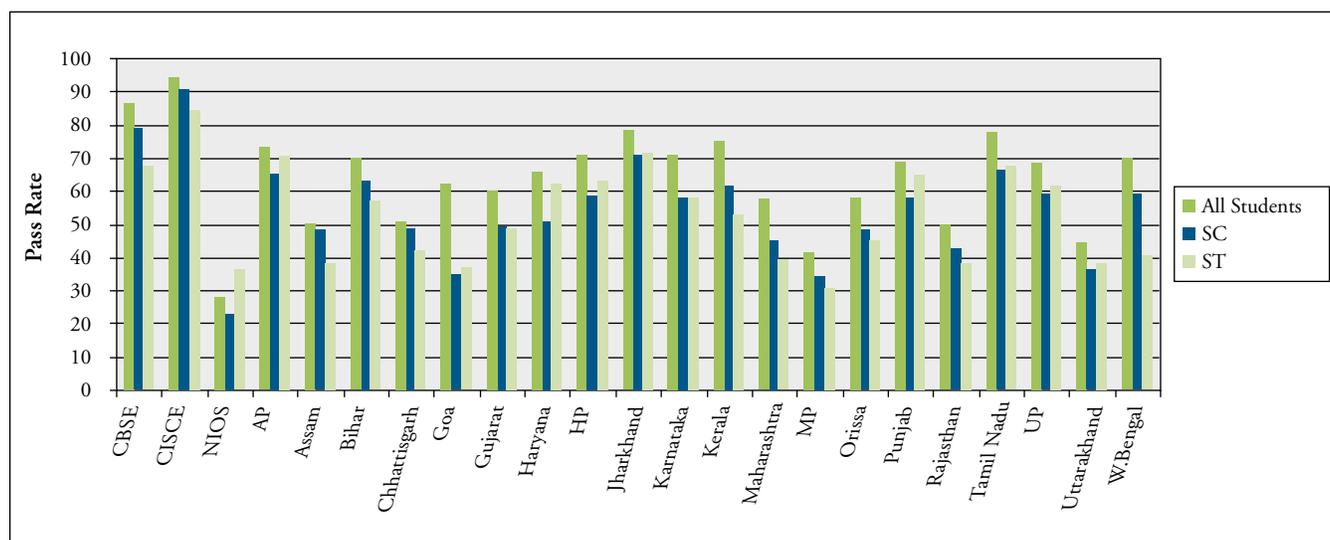
impact on both students and teachers of high-stakes testing. Indeed, the value of the Grade 10 examination is far from apparent.

Various commissions and committees have expressed their concern about variations in the quality standards applied by the different Boards. At present, because the examinations are set by different Boards with different standards for passing, there is no objective indication of which Boards have higher standards or which states offer better education. With the gradual growth in the number of candidates, increased mobility of educated and uneducated people across states, and the need to ensure quality education nationwide, there is an urgent need to assure national uniform standards.

The national boards appear to have an internal process of quality control and are better placed to facilitate inter-state movement of students. This is not the case with the state Boards. The need to achieve comparability in the standards of the different state Boards has been recognized, but no serious effort has been undertaken so far in this direction.

As seen in Figure 3.6, pass rates on secondary Board examinations vary widely across states, from a high of 80 percent in Jharkhand in 2005, to a low of 40 percent in Madhya Pradesh (and even lower in northeastern states). Given the prevailing educational conditions in Jharkhand, however, it is difficult to conclude from this statistic that the quality of Jharkhand's secondary education is much better than that in lower-performing states, or equivalent to the education offered in Tamil Nadu or Kerala (where students also scored highly). This illustrates the limitations of comparing examination pass results across states. Examination pass rates in the CISCE exams, at more than 90 percent on average, are the highest in India. These students attend private, English-medium schools and typically come from relatively wealthy households with well-educated parents. Examination pass rates in CBSE (generally middle class students) are over 80 percent. Students from scheduled castes and scheduled tribes perform much worse, on average, than the general population in all states, 16 percent and 19 percent lower, respectively.

Figure 3.6: 2005 Lower Secondary School Examination Results, by State and Student Type



Source: Selected Education Statistics, MHRD, 2005.

Examination reform has been the topic of many policy documents and reports on education in India.<sup>32</sup> Over the years, both CISCE and CBSE have made efforts to reform their examinations. These include: de-emphasizing rote memorization, eliminating the chance factor, ensuring reliability and validity, making examinations transparent, integrating evaluation with

the overall teaching/learning process, and making evaluations more comprehensive. In an important reform, the CBSE Grade 10 and 12 examinations in 2008 included assessment of higher order thinking skills, as opposed to just rote memorization of textbook content. State boards, too, have also made efforts to reform examinations, although progress has been slow.

<sup>32</sup> As early as 1948-49, the Radhakrishnan Commission condemned the pernicious domination of examinations over the whole system of education and suggested greater emphasis on evaluation of class work. The Secondary Education Commission (1952-53) suggested elimination of external examination for classes below 10th class, introduction of objective tests and an emphasis on school progress report cards based on internal tests. The NPE of 1986 for "Evaluation Process and Examination Reform" reiterated: "Examination should be a valid and reliable measure of student development and a powerful instrument for improving teaching and learning." The NCF 2005 reiterated the same point. It outlines other reforms including (i) Shorter exams with about 25 to 40 percent questions requiring written answers and the rest multiple choice; (ii) Exams to be conducted in the student's own school and changes in dates avoided; (iii) Students should be allowed to pass the examination in a few subjects at a time and not necessarily simultaneously in all the subjects. They may be given three years time to qualify in all the prescribed courses. Rather than categorizing students as "passed" and "failed" the level of proficiency should be examined (with the use of grades rather than marks); (iv) Courses should be offered at two levels (ordinary and advanced) so that the students who do not need advanced level courses in certain subjects may have the option of choosing the lower level course in those subjects; and (v) For students who are not successful, opportunities for re-testing should be reorganized in such a way that they do not lose a year.

By and large, examination reforms have focused on the *process* of conducting examinations rather than on the substance of examinations and alternative methods for testing student learning. The Boards have not made comprehensive efforts to reduce the emphasis on rote learning or to introduce new types of questions. The need to develop question banks with a range of questions, including those assessing more complex skills in different subjects, has been ignored, since paper setting has become a routine exercise based on the pattern of previous years. Paper setters at present do not have the benefit of selecting or adapting good tried-out questions available from a question bank. While different Boards have tried to introduce continuous and comprehensive evaluation, the effectiveness of these attempts is not known.

NIOS is the only Board that has deliberately embarked on innovative strategies for assessment. Exams are conducted

every six months and a learner is given as many as nine chances to appear in public examinations spread over a period of five years. The credits gained are accumulated till

the learner achieves the required credits for certification. NIOS has developed, in a limited way, test item writing and is developing question banks.<sup>33</sup>

### Box 3.7: The Process of Conducting Board Certificate Examinations in India

1. Registration of candidates and fixation of examination centers based on consideration for geographical pooling of examinees, transportation, and infrastructural facilities.
2. Appointment of center superintendent, invigilators, and mobile supervision squads.
3. “Question paper setters” are appointed based on their knowledge of the subject, teaching experience, paper setting experience, and track record for ensuring confidentiality. They are supplied with the syllabi, past question papers with analysis, and blue prints instructions on the type of questions, the proportionate value given to knowledge, understanding, and application in the paper.
4. Printing, dispatch, and distribution of the question papers ensuring secrecy and confidentiality of all examinees. The question paper packets are repacked center-wise in the Board office and kept in safe custody of banks, or at collection centers at the district headquarters.
5. Examinations are conducted according to a pre-determined time schedule and rules and procedures. Superintendents are given magisterial authority to prevent and to deal with incidents of copying. Policemen are deployed outside to restrict entry of strangers and unlawful assembly of people who may try to disturb the fair conduct of examination. Mobile squads visit various centers to check on the process.
6. Evaluation of answer scripts has to be done within prescribed schedule. Detailed instructions are issued to ensure inter-rater reliability to examiners (usually teachers) whose identities are kept secret. 10 to 12 examiners under a deputy head will evaluate about 200 to 250 scripts per day for 7 to 10 days.
7. Marks are recorded on the award list in figures and words. Recording is done either roll number-wise or code-number wise. This marking is done on two or sometimes three foils. One list of marks is sealed with the evaluated scripts. Most of the Boards have now switched over to computer processing.
8. Most Boards moderate results after the percentage of ‘pass’ and ‘fail’ in different subjects are known. For example, if scores are low compared to previous years additional marks are given to all examinees. Grace marks may be added in marginal cases of “pass” or “fail”. Scaling is adopted in certain Boards to bring the marks of different examiners or different subjects to a common scale.
9. Within 40 to 50 days of examination, many Boards declare the results through the press or the Internet. The Supreme Court rules that all results should be declared on June 10, effective from 2005. The mark sheets and certificates are dispatched separately to the schools within 2 to 3 weeks. The result sheet shows subject-wise/compartmental awards, pass or fail or division and total marks. Those who fail in one or two subjects can re-appear for a supplement/compartmental examination within two months or so.
10. Most of the Boards allow post-examination scrutiny of answer scripts to ensure that marks awarded are correctly transferred on to the award sheet before tabulation. This is done for all answer scripts. A few Boards sanction a second review for examinees not satisfied with their results.

*Source: Khandelwal, 2005.*

<sup>33</sup> Figure 3.6 indicates an average NIOS pass rate of 30 percent. But what is reported as the “pass rate” is the percentage of students who successfully completed all five subjects (thus making them eligible for their degree), compared to the total number of students taking individual subject-matter exams. This grossly and unfairly under-calculates the examination pass rate for NIOS. Correcting for this in 2005 and 2006, the Commonwealth of Learning calculated the actual average pass rate in subject-matter exams to be 58 percent at the secondary level and 61 percent at the senior secondary level, comparable to the overall average for India of 64 percent and 69 percent, respectively, for these levels.

### 3.5 Quality Assurance

India lacks a quality assurance mechanism at the secondary level, for government, aided, and unaided schools. Quality assurance is not a luxury but a necessity, to ensure accountability for the use of public funds and a good return on investments, as well as to ensure the physical safety of students, prevent malpractice and waste, and build capacity for school improvement. It allows education stakeholders from outside the system to look in depth at schools, understand their constraints and needs, and recommend improvements. By setting clear standards and guidelines for performance and by providing periodic external validation, it also helps to professionalize the teaching force and school administration (Chachadi, 2002; Lalita, 2002).

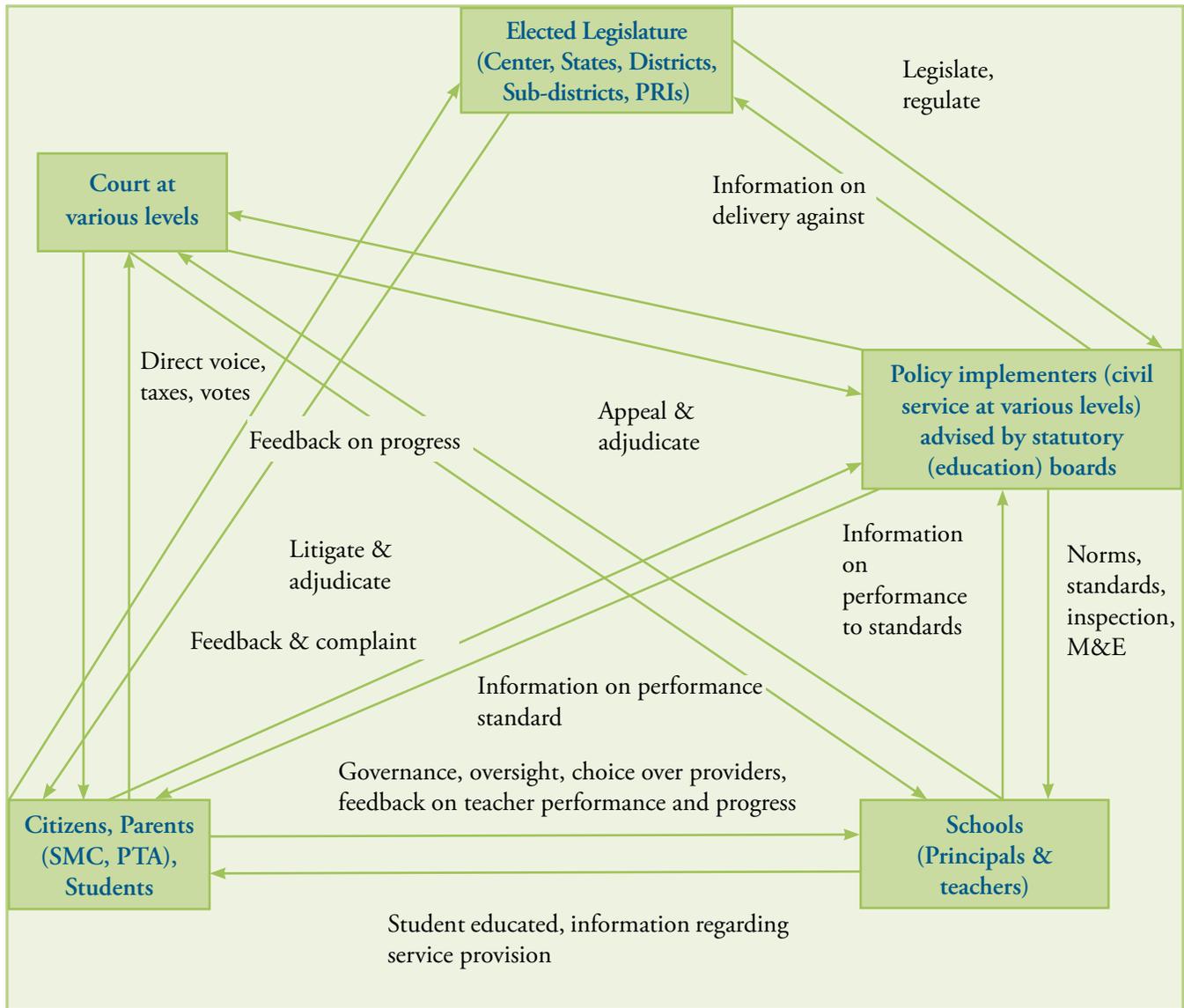
Well functioning social service systems usually have a well defined and well used framework of mutual accountability among policymakers, service providers, and citizens. Accountability can be enforced when citizens express their voice through electing policymakers, and exercise client power for hiring and firing service providers (World Bank, 2003c). In India, this set of relationships involves five sets of actors (Figure 3.7): (i) the legislature, through elected politicians and policymakers at the national, state, district, and subdistrict levels and in local self-government (*panchayati raj* institutions or PRIs), which makes policy and regulations; (ii) the executive branch represented by the civil service, which implements policies and provides

services, working alongside various statutory boards such as school boards; (iii) schools (principals and teachers); (iv) parents and students, and the school management boards (SMBs) and parent-teacher associations (PTAs) that oversee the school; and (v) an independent judiciary that adjudicates disputes between the previous four actors.

For service provision to work well, every actor should be part of two circular flows. A clockwise (outer) flow typically sends resources, support, and information on what is wanted from one actor to another, while a counter-clockwise flow sends information about performance that has been achieved, as well as actual outputs, from one actor to another, except for the court. The court does not take action independently; it only hears cases brought to it and its judgment can empower one actor and stop the action of another.

Elected politicians need the civil service to implement policies, irrespective of whether the civil service is under the *panchayati raj* or the line department. Since elections take place only once every few years, irrespective of the level of government, citizens' leverage over elected politicians is not effective in matters of day-to-day detail. But the interactions between policy implementers, service providers, and service users are more frequent and detailed. Thus, improving service delivery also requires strengthening the mechanism for quality assurance.

Figure 3.7: The Institutional Relationship for Education Service Delivery



A wealth of literature on school effectiveness (Lockheed and Levin, 1997; National Education Association, 2001; Fullan, 2001, 2004) finds that effective schools in a variety of countries share certain common characteristics:

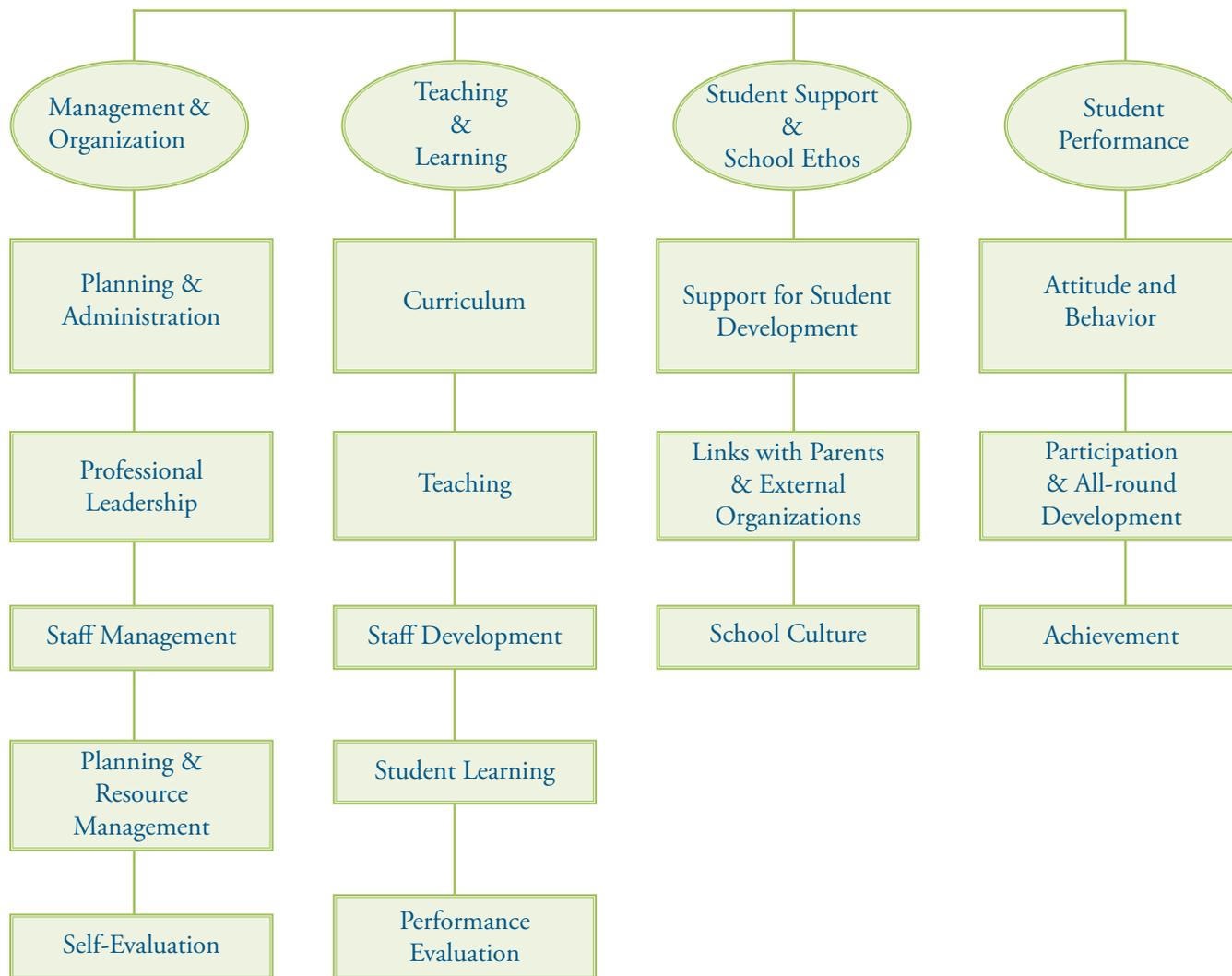
- ◆ The school's mission, vision, policies, and procedures are clear and widely shared. There is clear leadership from the school principal, and a strong focus on good teaching. Teamwork between teachers and school management coalesces around goals. There is space for school autonomy, in principle or in fact.
- ◆ The school is centered on teaching and learning with a strong focus on time-on-task. Evaluation,

supervision, feedback, and improvement are frequent and continuous. Teachers cooperate in planning and exchange information and techniques. Principals or head teachers combine supervision with technical and moral support. Positive reinforcement is used for both teachers and students.

- ◆ With respect to school ethos and student support, students' all-round development is valued and supported by co-curricular activities. Teachers have high expectations for all and provide support to under-performers. Teachers and parents maintain close relationships.

- ◆ The above conditions result in students' engagement, all-round development, and improved cognitive outcomes.
- ◆ School quality assurance takes a whole school approach, treating the school as a learning community and an accountable unit (Figure 3.8).

**Figure 3.8: Framework for Assessing School Performance**



Source: Adapted from Hong Kong Department of Education, *Performance Indicators for Hong Kong Schools, 2002*.

Several countries have introduced and maintained fairly successful accountability mechanisms for school quality assurance. Scotland may have the most mature school inspection system in Europe. England and Wales, Australia, New Zealand, Hong Kong, and Singapore have similar systems.<sup>34</sup> New Zealand's Education Review Office reports directly to the Prime Minister, while in England the inspection report to each school is made

available on the Internet for public scrutiny. Both these countries' performance in the TIMSS Grade 8 science test has improved over time. Both Uganda and Kenya have recently introduced quality assurance systems and the assessment on each school is provided back to the school for feedback (Box 3.8).

Theory and international comparisons aside, accountability in India's education system is weakened by several factors. The growth of the educational administration has not kept pace with that of the school system, particularly

<sup>34</sup> See <http://www.ofsted.gov.uk>; <http://www.hmie.gov.uk/>; <http://www.govt.nz>; <http://www.emb.gov.hk>.

at the district and sub-district levels.<sup>35</sup> In many Indian states, education offices are skeletal and even sanctioned posts are unfilled, for lack of qualified persons or because court cases are pending. In Rajasthan, for example, a study in September 2004 found 63, 55, and 50 percent of the positions of district education officer, joint directors, and additional directors, respectively, were unfilled (Wu and Sankar, 2005). These are key administrative positions, on which the district depends on for leadership and guidance. Administrative staff are often recruited through deputation from other institutions, mostly from state councils for education research and training and from district institutes of teacher training. This practice undermines the functioning of the parent institution and makes it difficult for people on deputation to cultivate a sense of commitment to the job.

As mentioned earlier in the section concerning teachers, administrative staff are often hindered by the large number of pending legal cases regarding transfers, promotions, and pensions, and by lack of computerization. Teachers' service records and student enrollment statistics often are

district offices to monitor key performance indicators at the school, block, or district levels.

School inspectorates' staff numbers and travel budgets are too limited to inspect enough schools. Clarke and Jha (2005) cited a 1996 Rajasthan government study of nine selected districts of that state; this found that only 15 percent of the district education officers (DEOs) were able to monitor 70–100 percent of the schools they were supposed to visit, and that the remaining officers could monitor only about 45 percent. Even if officers visited schools, they went alone instead of in teams with a good mix of expertise, and they focused mainly on compliance, or crisis management, rather than on providing technical and pedagogical advice. The school-to-officer ratio in Rajasthan is more than 100:1, compared to Hong Kong's 15:1. In an extreme case in Orissa, it is more than 1,000:1 (Goyal, 2005). Finally, the gaps between most parents' educational backgrounds and the academic level of secondary education makes community-based school inspection a weak (though still important) alternative. There is a need for professional supervision.

Table 3.2 Teachers' Reports on Frequency of School Inspection and Who They Discussed Problems With in Rajasthan Secondary Schools, 2005						
	Rural Govt.	Rural Private Unaided	Urban Govt.	Urban Private Aided	Urban Private Unaided	Total
Total number of surveyed teachers	57	14	22	6	39	138
How many times school inspector visited class in last three months:						
Never	75%	79%	68%	33%	62%	69%
1 time	16%	7%	27%	50%	26%	21%
2 times	7%	0%	0%	17%	3%	4%
3 times	0%	14%	0%	0%	5%	3%
5 times	2%	0%	5%	0%	5%	3%
Who teacher consults in case of problems						
Colleague	29%	14%	23%	17%	10%	20%
Principal	68%	79%	77%	67%	85%	75%
District Education Officer	0%	7%	0%	17%	0%	1%
School Management Committee	0%	0%	0%	0%	0%	0%
None	4%	0%	0%	0%	5%	3%

Source: Authors' analysis of Surveys of Secondary Schools in Rajasthan and Orissa, 2005.

manually updated and processed, leading to inefficiency and mistakes. Data are not available on a timely basis for

The Rajasthan secondary school survey of 2005 confirmed the infrequency of school inspection (Table 3.2). It also showed that district education officers and inspectors tend to focus on compliance with rules and regulations rather than capacity-building. Teachers tend to discuss problems with their own colleagues or principals, rather than with district education officers.

<sup>35</sup> India's civil service employment is only around 1.2 percent of the population. This is a low figure by international standards; it compares with 1.5 percent in Pakistan, 2.2 percent in South Korea, 2.8 percent in China, 3.2 percent in Japan, 7 percent in the United Kingdom, and 7.1 percent in the USA (Howes and Murgai, 2004; Beschel, 2003).

In elementary education, the academic support provided by block resource centers (BRCs) and cluster resource centers (CRCs) partially makes up for the inadequacy and infrequency of school inspection. Community planning and oversight in SSA is handled through the rural village education committee, urban ward education committee,

school management committee, and parent-teacher association. In secondary education, there is no equivalent of the BRCs and CRCs and there are no structures for community planning and oversight. Private aided and unaided schools are left almost completely unsupervised for all intents and purposes.

### Box 3.8: School Quality Assurance (QA): Hong Kong, Singapore, and Uganda

Hong Kong introduced a school quality assurance system in 1997, after studying the UK and Australia. In Hong Kong's system, schools are asked to develop a three-year plan and are given block grants to realize their plans (excluding salaries). They are required to use evidence to analyze their own performance in management and organization, learning and teaching, student support and school ethos, and student performance, and to develop strategies for improvement. Schools do self-evaluation, to be validated by an external panel. External reviews cover Kindergarten to Grade 12 and special education in public and private schools. Every school is visited at least once within a six-year cycle by a panel comprising four education officers and one principal or teachers from another school, thereby embedding the professional development of administrators and teachers with school quality assurance. The quality assurance system collects data through (i) inspection of facilities, observation of learning activities inside and outside the classrooms; (ii) discussions with members of the school management council, school heads, chairpersons of subject panels, teachers, other staff, parents, students, and alumni; (iii) stakeholders' questionnaires to collect information on how parents view the school, how students view their teachers, and how teachers and non-teaching staff view school management; (iv) scrutiny of students' homework, assignments and projects; and (v) inspections of school documents, records, teacher performance assessment, correspondence with parents, and library borrowing. Schools have to account for improvements and declines in standardized test results, internal assessments, and public examination results. Annual reports of overall quality assurance are published and presented to the legislature. Over time, more schools have improved their performance in the categories rated.

Singapore studied models in the US and Europe before developing its own. Recognizing that excellence can only be engendered by self-directed improvement, Singapore gives autonomy to schools and holds them accountable for results. Schools are expected to set their own targets and conduct self-appraisal. Every five years, one to two officers from the School Appraisal Branch and one or two external reviewers (academic, principals, teachers, or professionals from the private sector) conduct an external validation of public and private schools. The process takes three weeks, of which the first is spent on reading reports and on identifying questions. A site visit takes three days and involves interviewing all teachers and staff in the school including parents and students to discuss issues. The rest of the time is spent on writing a very detailed report. Within six weeks, the appraisal team discusses its findings with the school. Schools are asked to fill out a confidential questionnaire to provide feedback on the external validation. The Ministry monitors the consistency of the findings between the schools and the external review to ensure the process is fair and accurate. The individual school reports are confidential.

Uganda has developed a very cost effective method for QA and public accountability. In 2003, it set up an Education Standards Authority with 20 inspectors with the aim of inspecting all schools in the country within a three-year cycle. The Authority sets aside six weeks each year to inspect one-third of the schools. University lecturers, principals, and teachers are seconded to inspect schools outside their own district. A team of two professionals visit a school for a day to observe classes, and interact with the principal, teachers, students, and the community. They prepare a report which is presented to the school for discussion on how to improve school management and quality. Reports at various levels of aggregation are made public and also provided to Uganda's development partners.

*Sources: Interviews with Mr. Andrew Poon, Principal Assistant Secretary for Education and Manpower, Hong Kong; Mr. Goh Tong Pak, Deputy Director/School Appraisal Branch, Singapore. For Uganda: Ward and others (2005).*

### 3.6 Evaluation and Research

Efforts to improve quality also require the support of evaluation and research, to provide evidence with which to shape policy, training, and practice. Although India's education system is driven by high-stake examinations for the purposes of certification and selection, it does not have a system of formative (diagnostic) and summative (progress tracking) evaluation. There is no institution with a funded mandate to carry out evaluation and research on a regular and systematic basis with national coverage to provide feedback to policymakers, school administrators, teachers, students, and parents so that they can improve their practices.

At least four types of activity are needed: (i) impact evaluation of interventions; (ii) monitoring of student achievement over time and for accountability purposes; (iii) research on teaching, learning, and administration, to inform teacher pre-service and in-service training and classroom practices; and (iv) participation in international and comparative studies that provide useful perspectives on national and state level curricular coverage, standards, and student achievement, as well as strengthening India's technical capacity for testing and analysis.

#### 3.6.1 Impact Evaluation

Impact evaluation is needed to ascertain whether a particular intervention has yielded the desired outcomes. Some impact evaluations in education take an approach common in medical trials; they randomly assign subjects for treatment (e.g. they randomly select a group of students to receive textbooks, or conditional cash transfers) and compare the outcomes with those of an untreated control group. An example of this type of work reports on a randomized experiment in the use of computers for remedial education in two cities in India (Banerjee and others, 2004); some others are ongoing in elementary education.<sup>36</sup> More often, impact

evaluations in education use a quasi-experimental approach, which compares a non-randomly selected group with a treatment group.

#### 3.6.2 Monitoring Student Achievement

A prerequisite for a reliable accountability system is the ability to generate indicators of student and school performance, which can measure either how students are performing at any point in time (e.g. on year-end examinations), or how their achievements are improving or deteriorating over time. Unfortunately, India lacks any national student achievement assessment capacity at the secondary level. The best way to measure the value-added attained in a school or education system would be to track student progress over time while simultaneously accounting for students' initial achievement. To do so requires addressing several issues:

*Choosing performance targets for monitoring.* Many countries are trying to set performance targets and measure student progress for accountability purposes. For example, the USA's "No Child Left Behind" Act of 2001, which aims to ensure all schools meet a performance target by 2014 and contains explicit penalties for those that fail, is a notable example. But there is a risk that school monitoring based on annual performance targets may not correctly depict school performance, for several reasons. First, more heterogeneous schools are more likely to miss these targets (Novak and Fuller, 2003). Second, student performance at any point in time is an accumulation of current and past opportunities to learn. A school's performance is a function both of the cumulative learning over years and of the background of its students. For example, a school where 30 percent of the students are first generation learners will perform less well on average than a school where only 5 percent of students are first generation learners. A model that classifies a school based on that school's average score will not provide a good indicator of school quality, nor will it reflect school policy and practices. Thus policymakers should aim to isolate factors that are within schools' control for purposes of rewards, sanctions, and replicability (Willms and Raudenbush, 1989; Goldstein, and Spiegelhalter, 1996; Linn and Haug, 2002; Rumberger and Palardy, 2004).

<sup>36</sup> Internationally, among the best known impact evaluations are those on Mexico's PROGRESA, which provides cash transfers to families contingent on their children's attendance at school (Schultz, 2001); Colombia's voucher scheme for secondary education (Kremer, 2000); and randomized experiments in Kenya to look at the effects of textbooks, teacher incentives, and de-worming (Miguel and Kremer, 2001; Glewwe, Ilias, and Kremer 2000; Glewwe, Kremer, and Moulin, 1997).

*Measuring growth.* Comparing average school test scores from one year to the next does not measure growth or value-added in education; it is merely a series of static comparisons. A growth model explicitly incorporates student characteristics and connects students' performance from one year to the next. Growth models can monitor either cohorts or individual students as they pass through the grades. Of these two approaches, following individual student scores has more difficult data requirements but is preferable, because students become their own controls (Raudenbush and Bryk, 2002) and this allows aggregate student effects to be disentangled from controllable school effects (Choi, Goldschmidt, and Yamashiro, 2004). "Growth" is the difference between the trajectory based on the student's initial performance and subsequent actual attainment. The student's own trajectory has become his/her own control.

*National assessments* provide benchmarks against which to compare the educational performance of states and subgroups. In national assessments, the performance of states and subgroups (such as boys, girls, social groups, and minorities) can be compared to assess relative standards and to monitor progress in closing gaps between groups. Maintaining the validity, reliability, and comparability of instruments over time is important to ensure that apparent changes in test scores are not due to changes in the test instruments. If a national assessment is accompanied by questionnaires on students, teachers, and schools, the determinants of achievement can be analyzed and interventions designed according to the findings.<sup>37</sup>

Though India lacks measures of national educational standards, as mentioned earlier, the building blocks exist for a more systemic undertaking in the future. The sample-based assessments of student achievement in Grades 3, 5, and 7/8 that were undertaken in 2002-04 as the baseline study for SSA, and repeated in 2007 for Grade 5, with participation from all states, provides the first of a series of measures of national learning outcomes. These assessments will benefit from additional international technical assistance under the second phase of SSA and will be revised between 2008–2010.

<sup>37</sup> Such a national assessment is not tied to schools and cannot be used for accountability purposes.

They are conceptually similar to the USA's National Assessment of Education Progress, which is conducted periodically to track student achievement in various grades over time.

### 3.6.3 Education Research

Education research that focuses on teaching, learning, and administration is necessary to inform teacher training and classroom practices. Successful methods of teaching and learning vary widely among individuals, cultures, and contexts, and teacher pre-service and in-service education increasingly rely on action research. Knowledge of how teachers' characteristics affect their performance can assist the choice of selection criteria for recruiting teachers.

East Asian countries undertake a good deal of education research. One study of research productivity in education (Tsai, 2005) looked at the country of origin of the papers published in three top international science education journals from 1998 to 2004. By numbers of papers published, Taiwan, China ranked seventh, after the USA, UK, Australia, Canada, Israel, and Spain, and followed by South Africa, the Netherlands, and Germany.

Education research in India has been sporadic, particularly at the secondary level. In the more than four decades between 1943 and 1988, only 195 studies appear to have been produced (excluding degree theses) (Sharma, 2005). Education research output increased in the 1990s and 2000s as a result of multi-state interventions such as the District Primary Education Program and SSA. The well-known PROBE report (PROBE, 1999), which assessed the status and issues of primary education, is an outstanding example of how research can provide evidence to induce policy interventions. There is much room for more systematic and comprehensive education research to meet various needs in secondary education.

### 3.6.4 International and Comparative Studies

International studies are useful in interpreting national assessments and can provide guidance for

quality improvement. Indeed, many East Asian and Latin American countries participate in international tests and have used the results to shape changes in their educational practices, although to date India has refrained from participation. Participation in international studies like PISA and TIMSS also helps national researchers to plug into a global network of test-developers, psychometricians, statisticians, and policymakers, and provides the opportunity for training to build technical capacity in assessment. In addition, participation facilitates exchange of information about best practices across countries and has the potential to become a catalyst for improvement of practices.

Equally important, participation in international assessments would allow Indian policymakers and Indian parents to objectively view the quality of learning outcomes at the secondary level, and to measure these outcomes against those of other countries. Such assessments are increasingly used to assess the relative competitiveness of the emerging

labor force in different countries, an important issue in the context of India's integration with the global economy.

### 3.7 Options to Improve Learning Outcomes and Internal Efficiency

The analysis above points to urgent needs to: improve the quality and effectiveness of teacher pre-service and in-service professional development; strengthen the curricular foundation at the elementary level and improve articulation between cycles, including increased emphasis on conceptual understanding in both curricula and examination; provide incentives to align state curricula and examinations with the National Curriculum Framework so learning outcomes can be reliably assessed across states and time; strengthen institutions at the national and state levels, particularly those which enhance quality assurance; and promote additional policy analysis and international benchmarking of student achievement. Each of these is briefly discussed in turn.

#### Box 3.9: How Jordan and Norway Use Results from the Third International Mathematics and Science Studies (TIMSS) to Inform Actions and Improve Student Outcomes

Jordan participated in TIMSS in 1999 and 2003. The average eighth grade science score rose by 24 percent of a standard deviation within these few short years. This improvement is the result of actions informed by the results of TIMSS 1999. Actions taken include: (i) undertaking a comparative study on the performance level of 8th graders in mathematics and science with respect to availability of educational resources; (ii) development of teachers' guides to improve teaching practices and methodologies, based on student errors and misconceptions, and for teacher training; (iii) performing an analysis of the obstacles to science teaching that affect student performance; (iv) conducting a study on personal and family factors that affect achievement; and (v) undertaking an education reform for the knowledge economy, using TIMSS 2003 as a baseline and measuring change by participating in TIMSS 2007.

Norway participated in TIMSS in 1995 and 2003. In spite of the equality of outcomes of its education system, as indicated by small differences between schools and no association of students' economic background with learning outcomes, Norway's mathematics and science scores declined substantially. For example, average eighth grade science score declined by 24 percent of a standard deviation. There has been indirect indication of a decline in teacher competency. This has led to a set of policy actions as follows: (i) curriculum reform with a stronger focus on basic skills and goals for learning; (ii) national action plans for strengthening teacher competencies; (iii) setting up of a new system of quality assessment; (iv) changes in teacher education.

*Source: Presentation by Heiko Sibberns, International Association for the Evaluation of Educational Achievement, in the World Bank, Washington DC on June 7, 2006.*

### 3.7.1 *Improve the quality and effectiveness of teachers*

- ◆ *The scope of the current problems calls for a central policy thrust focusing both on pre-service and in-service professional development.* Major investments are needed to revamp training programs so they respond to the problems that teachers face in the classroom, provide support to teachers new to the job, improve the teaching and learning resources of teacher training institutions, and support action research in teaching and learning practices. The activities of the current centrally sponsored scheme on teacher education should be reviewed and possibly incorporated within this larger effort. What is needed is a well defined package that links pre-service and in-service professional development, on-site support activities, incentives, and a built-in feedback mechanism for improvement.
- ◆ *Publicly-funded pre-service teacher training colleges (TTCs) should raise their standards and provide a minimum degree of quality assurance through accreditation.* All colleges receiving any kind of government support should be required to conduct a thorough self-assessment using NAAC criteria (described above) and develop an institution improvement plan. Subsequent to this, teams of experts (national and international) could independently review these assessment and improvement plans. Acceptable plans could be approved for additional financing. Findings from these teams could be posted on the Internet for public information, so that prospective student teachers could make more informed decisions about the training college they choose, and colleges would face some pressure to improve.
- ◆ *MHRD and States should help TTCs to build their capacity for good teaching* by providing more resources and by improving their links to external sources of knowledge. In addition to allocating additional resources, efforts are needed to break the isolation of India's teachers' colleges, through institutional networking, establishing centers of excellence to model what good teaching could be, and institutional twinning arrangements, including with departments (e.g. of psychology, mathematics, science, languages, or education) in other teacher training colleges and in universities, both nationally and internationally. Subscriptions to electronic versions of peer review journals would help to update trainers' knowledge about pedagogy and education research. Procuring video cameras for micro-teaching would help improve their teaching and learning processes. As a first step, providing Internet access in these institutions and providing training in computer literacy are necessary to give faculty and students the tools they need for communicating beyond their immediate environment.
- ◆ *TTCs need to improve their links with government departments of education,* so that they can modify their intake of trainees and their subject-matter to respond to forecasts of the demand for teachers. It is important for states to conduct regular surveys to ascertain the needs for teachers in various subjects at different levels and encourage the accreditation of teacher training institutions that tailor their activities to these needs.
- ◆ *TTCs should increase the intake of trainee teachers in the reserved categories and for subjects for which candidates are not available.* This would include promotion campaigns in senior secondary schools, especially in rural areas, to encourage youth to become teachers and make them aware of the strong labor market demand for secondary teachers.
- ◆ *In-service Teacher Professional Development (TPD) should be centered in schools, and focused on school-specific issues,* rather than based in disconnected institutions which use a lecture-centered approach. Peer-based, mentor-led networks (pedagogical groups) of teachers should be established across schools so that they can share experiences, discuss ideas and lesson plans for specific topics and disciplines, and observe each others' lessons and practices.
- ◆ *Capacity-building is needed of institutions responsible for providing technical support and monitoring of in-service training,* notably the National Council for Teacher Education, state councils/institutes of educational research and training (SCERT/SIERT), district institutes of education and training, and institutes of advanced study in education.

- ◆ *Assessments of teachers' knowledge and skills should be conducted*, and develop tailored professional development programs to address weaknesses, while offering incentives (salary and non-salary) for their completion (see Text Box 3.10 for an example).
- ◆ *To strengthen teacher accountability, clear teacher performance standards should be defined and used for performance evaluation.* Defining service standards for teachers and linking them with academic and behavioral standards for student performance as well as with schools' service standards, is important to set expectations for all stakeholders, guide behavior, and provide the criteria for performance appraisal. Good teaching or extra, voluntary, efforts to help students should be publicly acknowledged, and also be duly recorded in teachers' performance appraisal reports. These could be given weight in decisions on teachers' promotion or transfer.
- ◆ *Teacher performance standards should be disseminated to all secondary schools* (teachers, administrators and school management committees); train School Management Committees (SMCs) in their role to oversee fulfillment of standards; meeting of standards as certified by SMCs would be condition for contract extensions of recently hired teachers, and/or for existing teachers to obtain promotions.
- ◆ *Studies of teacher attendance and time on task at the secondary level should be conducted*, in government private aided and private unaided schools.
- ◆ *A teacher incentive operational research program* should be carried out, similar to the program at the elementary level in Andhra Pradesh, which links payment of a bonus to teachers whose student improve on independent learning achievement tests.
- ◆ *Teachers' unions need to be engaged in a consultative mode*, in view of the sensitive nature of teacher performance, to work out acceptable procedures for periodic appraisal of teachers and for designing and developing in-service programs for teacher development.
- ◆ More recommendations for teacher accountability are in Section 4.7.2 regarding teacher recruitment and management.

### Box 3.10: INDONESIA – Improving Quality Through Teacher Assessment and Upgrading

In 2005 the Indonesian Parliament passed a law doubling salaries for “certified” teachers. The law laid out some of the standards for certification (such as a 4-year post-secondary degree or equivalent) but left the implementation details to the Ministry of Education. The components of teacher certification have been defined, and teachers are now being assessed using portfolio evaluations conducted by assessors at teacher training institutes and colleges. These assessments either confer certification or help define a teacher professional development program which, if successfully completed, will lead to teacher certification.

#### Components of Teacher Assessment – A Portfolio Approach

In accordance to the Ministerial Regulation of the Ministry of National Education No. 18 Year 2007 on Certification for In-service Teachers, the components of a teacher's portfolio include:

- ◆ academic qualifications
- ◆ education courses and trainings
- ◆ teaching experience
- ◆ lesson planning and presentation
- ◆ appraisal by superior and supervisor
- ◆ academic achievements
- ◆ professional development activities
- ◆ participation in scientific forums
- ◆ organizational experience in education and social sectors and
- ◆ relevant recognitions and awards in education.

*Source: World Bank staff*

### 3.7.2 *Actions to Strengthen the Curriculum and Reform Examinations*

- ◆ *Curricula at primary, upper primary, and secondary levels need to be made more coherent, with smoother transitions between levels.* Gradual introduction of the foundation concepts at the lower levels will help build better comprehension at the upper level without diluting standards. Low student achievement in secondary education has its roots in a weak curricular foundation in primary education. This problem is accentuated by the many short cycles within India's education structure that disrupt the curricular connections between levels. This is a particularly serious problem in states where different departments deal with different levels of education, as in Orissa, where the Board of Secondary Education is responsible for secondary education and the Council of Higher Secondary Education is responsible for senior secondary education, with little apparent connection between the two.
- ◆ *Examination reform needs to change the nature of the questions asked, in order to drive a change in teaching and learning, rather than focus on improving the examination process.* Students should be probed for the following: information-reasoning and problem-solving skills; ability to meaningfully apply curricular subjects to real situations; broadening and deepening of insight; incorporating personal experiences; use of contexts; and observation and reflection (Clark, and others. 2004). To test the skills mentioned above requires changing the emphasis of examination papers and improving the questions, so as to give much more weight to testing higher-order thinking. In addition, throughout the school year, more effective method of assessing and implementing continuous comprehensive evaluation of learning outcomes, supported by remedial education, needs to be introduced.
- ◆ *More fundamentally, center and state educational authorities should reflect on the value and purpose of the Grade 10 examination, which at present is used to determine passage to Grade 11. If*

India wants to increase secondary and higher education enrollment rates, it needs to give more opportunities for students to succeed, rather than apply high-stakes exams which eliminate 35 percent of secondary students from the system. Options could be considered, such as making it optional for purposes of sorting students into academic streams, and offering students who wish to leave school a diploma, but no longer using it as a pass/fail mechanism for entry to senior secondary.

- ◆ *Incentives should be provided to states to align their curricula and examinations with the NCF.* Establishment of national standards in each of the core subjects is necessary to set academic goals towards which teachers and students can strive for, and against which administrators, schools and teachers can be held accountable. This would also help various state boards to calibrate their examination standards. Moreover, national standards facilitate internal and international labor mobility because employers need objective information with which to judge the skills of job applicants. Though it is important to preserve diversity and the distinctiveness of the Boards, there is a need to establish equivalency in examination scoring procedures and in pass standards. This requires building a consensus on rating the curricular content and qualification procedures of both national and state boards. To facilitate the development of strategies to ensure quality and transferability, a comparative assessment should be done of the different curricula offered by the various state and national Boards.
- ◆ *Sample-based achievement testing across all states of students in Grade 10 and 12 should be undertaken in all school types (government, local body, private aided, and private unaided), to monitor achievement levels and standards across states, and to guide interventions for improvement.* Another approach is to use certain common questions/items as “anchors” in the regular certification examinations across all Board examinations in all states, while allowing other questions to vary across states, so that these common items can be extracted

through data analysis to assess whether and how far states have achieved national standards. The center can provide incentives to States to undertake these measures.

### 3.7.3 Strengthen Institutions and Technical Capacity at National, State and District Levels

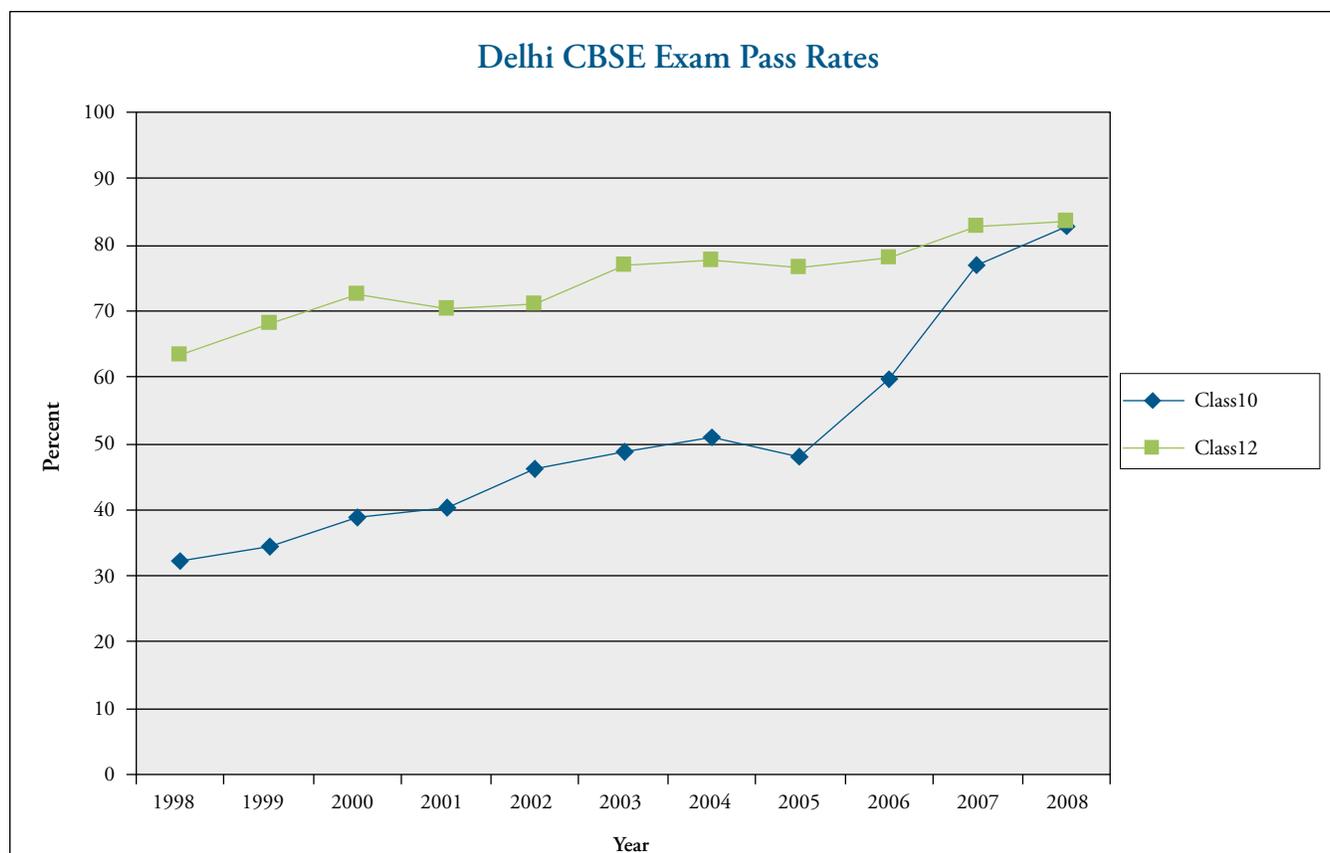
- ◆ *Arrangements for ensuring curriculum quality and easing the transferability of students need to be strengthened.* There is no mechanism to control the quality of curricula, and no national entity systematically monitors curricula and examinations across the country over time. COBSE's role, organization and mandate should be strengthened, to provide greater technical assistance in ensuring that states initiate and sustain curricular reform. As to the transferability of students, NIOS is the only Board which attempts to help students transition from different state Boards and CBSE into their systems.
- ◆ *Simultaneously, each of the state Boards needs to expand its academic wing to establish an effective curriculum development center (CDC), part of whose task would be to review and improve curricula, syllabi, and textbook content and quality.* To change the emphasis of the system from rote to more active forms of learning, the CDC would also need to ensure that schools comply with the chosen curricula, as well as monitoring the instruction that supports this new form of learning. Departments responsible for conducting examinations, by contrast, are well established with adequate staff. But their staff would require exposure and training in the new approach to knowledge that is stipulated in the NCF.
- ◆ *States need to allocate more staff with adequate travel budgets for school inspection/supervision; improvements in school quality assurance do not require major structural changes but do require more resources.* For accountability purposes, and to provide the basis for rewards and sanctions, sample-based surveys are not sufficient. All students and all schools need

to have their performance measured.<sup>38</sup> And to compare differences in school performance under the same state policy calls for a statewide accountability system. It will take a long time, perhaps a decade or so, to develop the needed capacity for quality assurance in India's schools. It will be necessary to start with a small sample of schools and students to build the expertise and the experience from which to launch a larger-scale undertaking in the future. But without this effort, quality in terms of students' learning outcomes is unlikely to improve.

#### Box 3.11: Putting It All Together To Improve Educational Achievement: Case Study of Delhi Department of Education

The Delhi Department of Education offers an inspiring example of what can be achieved when administrators, teachers and students come together in a focused effort to raise educational achievement. A city of 14 million citizens, Delhi is growing at almost 5 percent per year, driven by immigration from all parts of India, placing huge stress on the educational system. Nevertheless, the Department of Education has introduced a comprehensive, holistic approach to improving educational outcomes which combines: improved access and GIS-driven infrastructure; capacity-building of teachers; community participation; better pedagogy and use of ICTs; improved textbooks; innovative evaluation techniques; transparent and proper utilization of budgetary allocations; and special efforts to enroll and retain children. In addition to these inputs, the Department of Education introduced a series of initiatives to improve results, including: accountability at each level, massive computerization, weekly unit testing, teacher incentives, a transparent on-line teacher transfer system, targeted efforts on weakest schools, strict action in cases of indiscipline, and merging evening and morning shift schools. The results have been dramatic, particularly over the past two years, as seen in the figure below which shows CBSE main exam results for Classes 10 and 12 between 1998–2008. Equally impressive, the gap between government and private school exam results has come down from 55 percent in 1997–98 to 14 percent in 2006–07. Furthermore, Delhi Department of Education government schools outperformed the highly respected Kendriya Vidyalaya schools in 2006–07.

<sup>38</sup> Under DPEP and SSA, a number of sample-based student assessments have been conducted, usually at the baseline, mid-term, and terminal stages. These are a series of static measurements and do not account for growth. That said, they have developed the national awareness of the importance of measuring outcomes.



A key initiative was aimed at increasing teacher attendance and accountability. Attendance by all school employees is reported by principals daily via an on-line system in the public domain which allows anyone to see how many teachers are present on any given day, greatly reducing teacher absenteeism. In addition, beginning in 2006-07, teachers were grouped (“graded”) according to their students’ average results on the CBSE exams. Those whose students achieved above a 90 percent pass rate were placed in the “green category” and were given top priority in terms of transfers, external training and other benefits. The top 30 teachers were awarded cash prizes of Rs.11,000 each. Those whose students scored between 60–90 percent exam pass rates were placed in the “yellow category”, and teachers whose students scored below 60 percent on average on the CBSE exam were placed in the “red category”. Teachers in the lower categories are given professional guidance and additional training to improve their results. Teachers who remain in the “red” may ultimately be removed from teaching. Other measures to lessen non-teaching duties, improve security and raise teachers’ self-esteem were also taken, such that teacher effectiveness was improved through a “carrot and a stick” approach.

*Source: Interview with Rina Ray, Secretary of Education, Sports and Culture, Government of Delhi, April 10, 2008, and “Status of Education, A Quick Report, 2007. Department of Education, Delhi Government and SCERT*

### 3.7.4 Support Policy Analysis and International Comparison

- ◆ *Databases maintained by the different Boards need to be linked.* Comparative analysis of data across national and state education boards would provide useful comparative information on their practices. Data on examination results over long stretches of

time could be analyzed to show trends that could point to necessary innovations, and could provide the developers of exams with useful information about benchmarking and about the equivalence of exams. The wealth of data, in combination with questions from policymakers about mechanisms and accountability in education, makes it obvious

that a few low-cost initiatives could have a clear impact.

- ◆ *Curriculum design, syllabus writing and examination preparation should be compared and benchmarked with international practices.* It is not apparent that the breadth of India's curriculum coverage is a worthwhile trade-off for depth. Teams of experts could be appointed for each subject to survey the level of difficulty and the amount of overload, comparing the current curriculum with internationally acclaimed examination programs (IB and ICGSE), along with those in countries such as Finland, Singapore, or Australia. This could give a new perspective on the content for each subject and could fruitfully be done with counterparts in other countries; it could provide a great opportunity for capacity building, taking advantage of the intensive training and online support that are likely to be available during such exercises.
- ◆ *India needs to measure the development of its human capital against global standards.*

This need not be done overnight. With technical assistance from international organizations (e.g. OECD), a critical medium-term road map can be developed, consisting of capacity-building, piloting, "shadow participation", confidential results analysis, feedback into curriculum design and teaching processes, etc., with clear milestones established for policymakers to assess readiness. What is needed now is a public policy commitment to such a path so that the work can begin.

Any discussion of quality and efficiency of secondary education must also consider how secondary schools are managed. Specifically, how do different school management models create incentives and accountability for ensuring students develop the cognitive skills they need to succeed. As mentioned at the outset of this chapter, without quality (as measured by cognitive skills acquisition) simple years of secondary schooling are unlikely to have the desired positive effects on growth, earnings and equity. Management of secondary education is the topic of the next chapter.

## Chapter 4. Management of Secondary Education

At present, secondary education is largely a state-level issue, with relatively limited involvement by either federal or community-level authorities, compared to elementary education. India has a long history of multiple management models at the secondary level, which provides opportunities for further experimentation and reform, particularly with respect to public-private partnership models. Given the diversity at the state level in the mix of government, private aided and private unaided schools for secondary enrollment, no single model will suffice. Analysis of cost-effectiveness of different management types leads to mixed conclusions. Given the overall low student achievement across all schools, policy should go beyond following the least cost-ineffective strategy and should focus on improving quality. To support this, there is a clear need to rapidly increase the number of teachers prepared for secondary education, combined with increased decentralization of hiring (to increase accountability). There is potential to increase school-based management in India's publicly funded secondary schools (both public and private), which can lead to (i) improved decision-making based on better information and (ii) increased community and parental involvement (which can increase accountability of decision makers). Finally, investments are urgently needed to improve basic information collection and analysis for secondary education, key for management at all levels. Each of these issues is discussed in greater depth in this chapter.

### 4.1 The Institutional Context of Secondary Education

India's federal system comprises a Union Government at the center, twenty-eight autonomous states, and seven union territories (UTs). Since 1976, education has been a concurrent responsibility of both the center and states (Table 4.1), although historically the states have played the dominant role, particularly at the secondary level.

The Union Government has responsibility to: (i) formulate policies and a common curriculum framework

through national councils, boards, and commissions;<sup>39</sup> (ii) finance strategically important activities through centrally sponsored schemes (CSS),<sup>40</sup> in addition to providing general purpose fiscal transfers; and (iii) establish apex institutions of research and training,<sup>41</sup> as well as operate central schools<sup>42</sup> and institutions of national importance.<sup>43</sup>

The states bear most of the responsibility for providing and financing education, particularly at the elementary and secondary levels. They build and operate government schools, hire teachers, provide pre-service and in-service training, issue curricula and syllabi, determine the medium of instruction,<sup>44</sup> develop textbooks, organize public examinations to certify students, grant recognition of private schools, provide grants-in-aid to private (aided) schools, and give scholarships. Within the state there are different levels of authority and decision-making, as shown in the table below.<sup>45</sup>

<sup>39</sup> Examples are the Central Advisory Board for Education, the University Grants Commission, and National Council for Vocational Training.

<sup>40</sup> The most important example of a centrally sponsored scheme is Sarva Shiksha Abhiyan (SSA). Secondary education does not have an equivalent scheme, although one is proposed for the XIth Plan, called SUCCESS.

<sup>41</sup> The National Council for Educational Research and Training (NCERT) and the National Institute for Educational Planning and Administration (NIEPA) are such apex institutions.

<sup>42</sup> The central government runs three chains of schools -- Kendriya Vidyalayas (Central Schools) for children of Central government employees, Navodaya Vidyalayas (higher quality residential schools) for talented rural children, and the National Institute for Open Schooling.

<sup>43</sup> The Indian Institutes of Technology, Indian Institutes of Science, and Indian Institutes of Management are prime institutions of higher education but they are financed under the budget for technical education. Indira Gandhi National Open University is another centrally run institution under higher education.

<sup>44</sup> Most states use the regional language as the medium of instruction. The teaching of Hindi is compulsory in all states and UT except in Tamil Nadu, Tripura, and part of Pondicherry. Teaching of English is compulsory in Grades 6–10 in all states and UT, except Bihar.

<sup>45</sup> Decentralized hiring of teachers, which has been implemented in many states at the elementary level, has not occurred at the secondary level.

Responsibilities	State	District	Sub-district
Granting permission to open a new lower or higher secondary school	Education department in consultation with the directorate and the finance department	Inputs also from the district education officer (DEO) – application through the DEO	
Setting curriculum, selecting textbooks, determining class size and school calendar.	Department, directorate, SCERT/Board of secondary education		
Sanctioning of teaching posts, hiring and placement of teachers	At the secretariat level, in consultation with the directorate and departments of planning and finance	Placement and transfer at the revenue/education district level, by deputy director/DEO for government teachers	For aided schools, appointment by school management with approval of DEO
Training teachers	Directorate and SCERT	DIET	Block resource centers
Disciplining and firing teachers	Termination decision only at the state level, scope for appeal to higher authorities or even to the court of law against disciplinary action	Inputs from DEO or <i>zilla</i> parishad in case of ZP schools	Management in case of private schools; if teachers object, the government can intervene; the case can also be taken to the court
Hiring and firing of administrative personnel	Department and directorate	Limited disciplinary powers with the deputy director/DEO	
Allocation, financing and release of budgets to government schools and release of grant to aided schools	Department, with inputs from the directorate, based upon proposals from field level, and in consultation with the finance and planning departments; funds flow from the state level to the region, if any, then to the district level	Requisition for funds from schools scrutinized and approved by the CEO/DEO and then sent across to the regional deputy director, if any, for further approval; the DEO is also the disbursing authority	School management prepares and submits budgetary requirements in case of aid-receiving private schools
Maintenance of schools		DEO and district panchayats	School management, PWD, and sub-district level local bodies

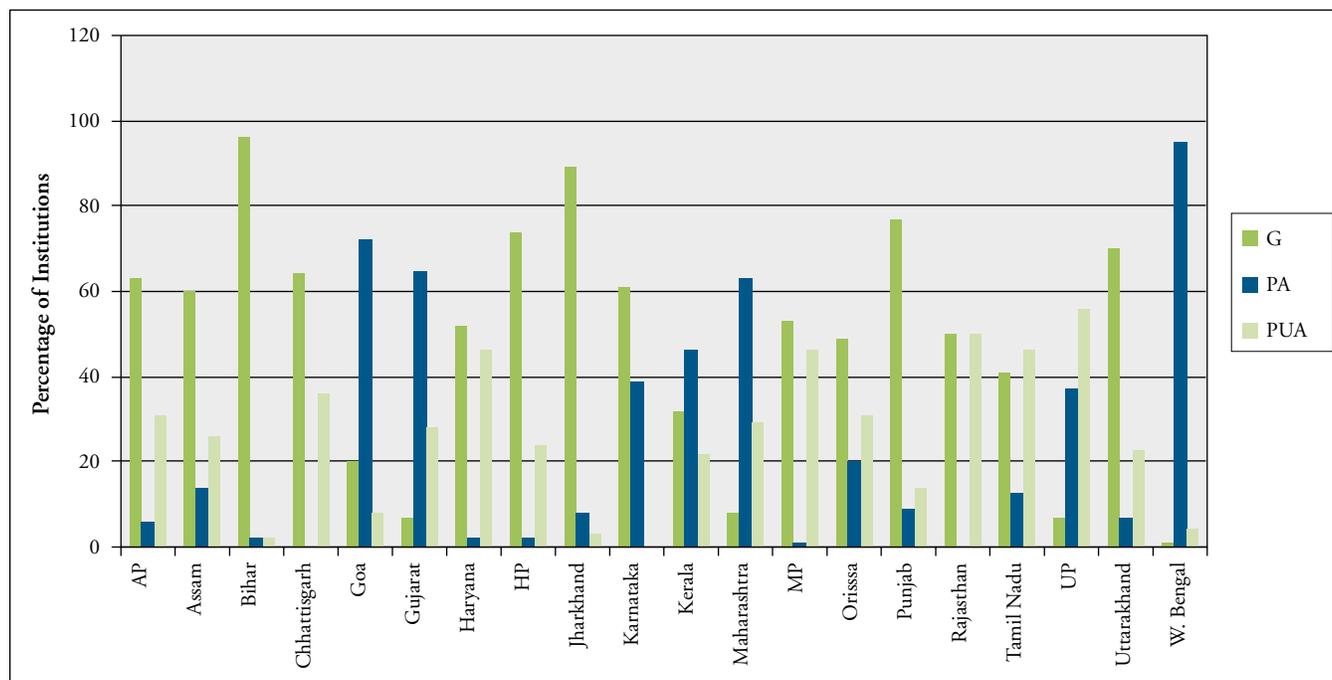
Source: Adapted from Majumdar, 2005.

## 4.2 School Management: Comparing Public, Private Aided and Private Unaided Schools

As mentioned in Chapters One and Two, one of the interesting characteristics of the Indian secondary sub-sector is the large percentage of privately-owned schools. These fall into three categories: aided schools, recognized unaided schools and unrecognized unaided schools. Aided schools are a form of public-private partnership, discussed further below. Unaided schools do not receive any government funding and rely strictly on household financing. Recognized schools offer official transcripts and diplomas, while unrecognized private schools are considered illegal by MHRD and function in the private market.

States vary greatly in their use of aided private schools, in terms of the share of secondary enrollment covered and in terms of allocation of public funding. Figure 4.1 shows the management of secondary education by state. More than 60 percent of secondary schools in West Bengal, Maharashtra, Goa and Gujarat are private aided (PA) schools, whereas government (G) schools are the majority in states such as Andhra Pradesh, Bihar, Chhattisgarh, Himachal Pradesh, Jharkhand, Karnataka and Punjab. More than 40 percent of lower secondary schools in Haryana, Uttar Pradesh, Madhya Pradesh, Rajasthan and Tamil Nadu are private unaided schools (PUA). Unfortunately, the prevalence of unaided, unrecognized secondary schools is not captured in the data below; if the school is not recognized by the state it is simply not considered in education statistics. This is a gap in the knowledge of education supply.

Figure 4.1: Management of Secondary Education by State, 2005

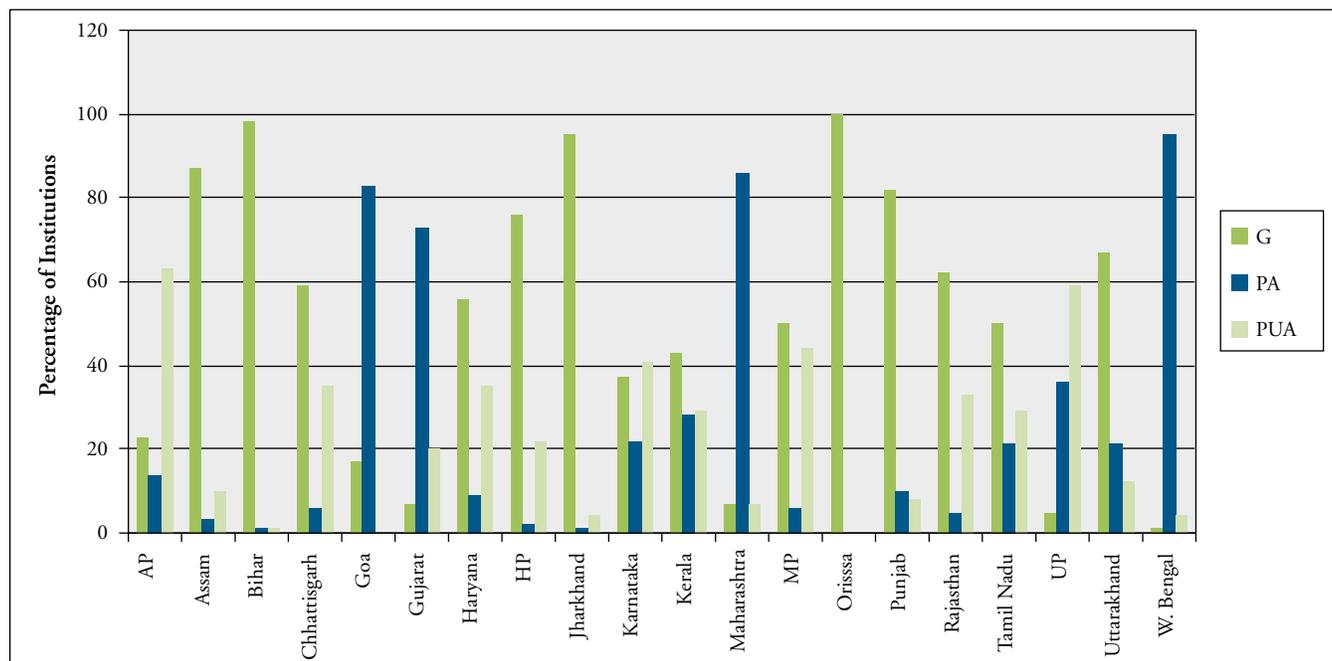


G = Government; PA = Private Aided; PUA = Private Unaided

Source: Selected Education Statistics, 2004-05, MHRD

Figure 4.2 shows the management of senior secondary education by state. It is interesting that several states “flip-flop” in terms of their preference for government or private-managed schools between lower and senior secondary education. Andhra Pradesh leaves most of senior secondary education to the private unaided sector,

Figure 4.2: Management of Senior Secondary Education by State



Source: Selected Education Statistics, 2004-05, MHRD

contrary to lower secondary where government schools predominate. In opposite fashion, Rajasthan shifts to majority government-managed at the senior secondary level, whereas 50 percent of its lower secondary schools are private unaided schools. This makes it much more difficult to harmonize the four grades of secondary education in terms of management and financing. At the senior secondary level, Andhra Pradesh, Karnataka, Madhya Pradesh and Uttar Pradesh rely on private, unaided schools for more than 40 percent of supply. These schools must rely purely on household financing for both operating and capital costs.

### Private Aided Schools

Private aided schools are managed privately by individuals, trusts, societies or corporate bodies, but funded largely by the Government. State education departments finance the operating costs of the schools via a block grant to the schools for non-teaching expenditures and direct payment of teachers, while private managers are responsible for the physical facilities and administration. The number of teachers in a school is in proportion to enrollment and the schools have to submit to substantial public regulation. In other words, this is a supply-side financing mechanism whereby the public sector taps the capacity of the private sector to provide secondary education.

It is essential to engage constructively with private aided schools, as they provide for 30 percent of enrollment in secondary education. On average across the states, private aided schools absorb about 50 percent of public spending on education. In 2000-01, its share in total public expenditure on secondary education was above 50 percent in at least five states – Gujarat (77 percent), Maharashtra (67 percent), Assam (66 percent), and West Bengal (55 percent) – and it was between 30 and 40 percent in six states – Bihar (47 percent), Andhra Pradesh (39 percent), Tamil Nadu (39 percent), Rajasthan (37 percent), Kerala (31 percent), and Haryana (29 percent).<sup>46</sup> In seven Indian states, nearly two-thirds of all secondary students are in such private institutions.<sup>47</sup> In addition, aided schools have

allowed more equitable access than have unaided private schools for SC/ST students and other disadvantaged groups.<sup>48</sup>

### 4.3 Management Cost-Effectiveness

The obvious question for states to ask, when defining their school management strategy, is how do different school management types perform in terms of learning outcomes (measured in terms of examination pass rates) and relative costs. Examination pass rates are not the most reliable measures of quality, as each state sets and grades its own exam, such that they are not directly comparable. However, within each state they are an indicator of quality and certainly influential in terms of how state education authorities formulate their strategies to improve access and quality.

Table 4.2 below shows school management shares and examination pass rates. The bottom line is no clear pattern emerges. Some states (e.g. Karnataka) do better than the national average with large government-managed systems, whereas other states (e.g. West Bengal) do better with large private aided systems. In addition, there is no clear pattern for states with large unaided private systems; some do better than the national average, some do worse. Andhra Pradesh and Uttar Pradesh present interesting cases. In Andhra Pradesh, public schools dominate secondary education and result in above-average examination pass rates, while private unaided schools dominate senior secondary education and result in below-average examination pass rates. In Uttar Pradesh, private unaided schools dominate both levels of secondary education and produce above-average pass rates.

States clearly differ in terms of their relative income and the socio-economic characteristics of their student bodies, which a simple comparison of examination pass rates does not consider. Work in Uttar Pradesh has been carried out using data from 1990s which attempts to address student selectivity bias by relating 15 student-specific variables to learning achievement scores in mathematics and reading

<sup>46</sup> For more details see “A Policy Note on the Grant-in-Aid System of Indian Education,” SASHD, Report No. 3, The World Bank, 2003.

<sup>47</sup> *Ibid.*

<sup>48</sup> See Majumdar, Manabi (2005), “Schooling and ‘Skilling’ of the Country’s Youth, Secondary Education in Four Indian States,” *Economic and Political Weekly*, Vol. XL: 22 & 23.

	Secondary				Sr. Secondary			
	School Management			Exam	School Management			Exam
	G	PA	PUA	Pass Rate	G	PA	PUA	Pass Rate
AP	63	6	31	73	23	14	63	46
Assam	60	14	26	50	87	3	10	58
Bihar	96	2	2	70	98	1	1	71
Chhattisgarh	64	0	36	51	59	6	35	70
Goa	20	72	8	62	17	83	0	78
Gujarat	7	65	28	60	7	73	20	77
Haryana	52	2	46	66	56	9	35	63
HP	74	2	24	71	76	2	22	76
Jharkhand	89	8	3	78	95	1	4	87
Karnataka	61	39	0	71	37	22	41	60
Kerala	32	46	22	75	43	28	29	75
Maharashtra	8	63	29	58	7	86	7	62
MP	53	1	46	42	50	6	44	80
Orissa	49	20	31	58	100	0	0	70
Punjab	77	9	14	69	82	10	8	74
Rajasthan	50	0	50	50	62	5	33	69
Tamil Nadu	41	13	46	78	50	21	29	69
UP	7	37	56	68	5	36	59	89
Uttarakhand	70	7	23	45	67	21	12	68
W.Bengal	1	95	4	70	1	95	4	68
			<b>Average</b>	<b>63</b>			<b>Average</b>	<b>71</b>

G = Government; PA = Private Aided; PUA = Private Unaided

Source: Selected Education Statistics, 2004-05, MHRD

(Kingdon, 1996).<sup>49</sup> Raw and standardized achievement scores were tracked and compared by school management type. The results are shown in Table 4.3 below. The analysis suggests that private unaided schools do better than both government and private aided schools, but not by nearly as much as is implied by the raw scores which do not take into account student selectivity bias. Government schools do better than private aided schools, but not by a large margin.

In terms of average unit costs at the secondary level by management type, states spent an average of US\$163 per student in government schools in 2004-05, versus US\$183 per student in private aided schools.<sup>50</sup> (Note: there is no reliable information regarding average unit costs in private

<sup>49</sup> Presentation at Conference on Quality Education For All, October 2007, New Delhi, India

<sup>50</sup> Selected Educational Statistics, 2004-05, MHRD

	Achievement Points			Achievement Advantage Points		
	G	PA	PUA	PUA-G	PUA-PA	PA-G
	(a)	(b)	(c)	(c-a)	(c-b)	(b-a)
<b>Mathematics</b>						
Raw	8.97	8.37	17.09	8.12	8.72	-0.60
Standardized	11.38	10.09	12.80	1.42	2.71	-1.29
<b>Reading</b>						
Raw	9.77	10.86	16.85	7.08	5.99	1.09
Standardized	13.78	13.73	13.82	0.04	0.09	-0.05
<b>Combined</b>						
Raw	18.74	19.23	18.94	15.20	14.72	0.48
Standardized	<b>25.16</b>	<b>23.82</b>	<b>26.62</b>	<b>1.46</b>	<b>2.80</b>	<b>-1.34</b>

Source: Kingdon (1996)

unaided schools.) Initial reflection would suggest that private aided schools are less cost-effective than government schools, but this does not appear to be the case in the example below.

A somewhat similar exercise as above, which does not correct for selectivity bias, was conducted in Orissa and Rajasthan in Grades 9 and 11. The average salaries of teachers of government, aided and unaided schools were compared with the average student achievement of these schools.<sup>51</sup> Table 4.4 shows that in Rajasthan, Grade 9 teachers in government schools earned 3.7 times as much as those in unaided schools. However, because government schools have higher PTR, after

2.5 times, still quite large. Since Rajasthan government schools' average score (grade 9) is lower than unaided schools' average, unaided school teachers are better able to produce higher student achievement, and hence, are more cost effective. A similar logic would apply to Rajasthan Grade 11 and Orissa Grade 9. In Orissa Grade 11, however, the test scores both aided and unaided private schools are much lower than those of government schools.<sup>52</sup> In both states and both grades, aided private schools were less expensive (when measured by average teacher salaries) and performed better than government schools, with the exception of Grade 11 in Orissa.

Table 4.4 / Comparison of Teachers' Salaries and Test Scores of Government, Aided and Unaided Schools, 2005 Average Salary per						
	Month (Rupees)	Gov't Teacher Salary as a multiple of Private Teacher's	Pupil to Teacher Ratio	Salary Adjusted for Pupil to Teacher Ratio	Adjusted Salary Differential (Govt as a multiple of Private)	Average Test Score
<b>Rajasthan Grade 9</b>						
Government	10,300		21	490		28.3
Aided	6,480	1.6	23	282	1.7	34.1
Unaided	2,790	3.7	14	199	2.5	40.7
<b>Rajasthan Grade 11</b>						
Government	14,280		24	595		37.6
Aided	8,280	1.7	65	127	4.7	44.7
Unaided	4,820	3.0	28	172	3.5	47.9
<b>Orissa Grade 9</b>						
Government	9,718		24	405		35.2
Aided	4,741	2.0	22	216	1.9	38.2
Unaided	2,364	4.1	20	118	3.4	37.1
<b>Orissa Grade 11</b>						
Government	13,276		10	1328		51.9
Aided	8,560	1.6	8	1070	1.3	37.6
Unaided\1	2,000	6.6	9	222	6.0	30.1

\1: There is only one school in the sample.

*Source: Authors' Analysis of the Rajasthan and Orissa Secondary School Survey 2005.*

adjusting for it, the salary differential between government school teachers and aided school teachers was reduced to

In summary, the analysis of cost-effectiveness produces ambiguous, inconclusive results. Furthermore, comparing relative costs and test scores across school management types, reveals very low test scores across the board, such that this exercise is really a comparison of the *least*

<sup>51</sup> The full cost of each type of schools, it is not available. The reason is that government schools receive a lot of inputs in kind and the cost of land and building of various school types is not available. Since recurrent cost of teachers' salary is a very significant component of the total cost, the comparison is made for teachers' salary across school type.

<sup>52</sup> This is in stark contrast to the situation in Orissa at the grade 4 level, where recent research showed a very substantial private school achievement advantage over govt. schools (Goyal, 2007).

*cost-ineffective* among the three. Expanding the least cost-ineffective schools may not lead to India's goal of improving the achievement of its students as a means to improve the skills of its future workforce. Piloting a range of alternative interventions and evaluating their cost-effectiveness are needed to explore a better way forward. Several alternatives, which involve partnership between the public and private sectors, merit additional attention.<sup>53</sup>

#### 4.3.1 Regulation of Private Schools

Whether partnership models are developed or not, the government has an important role to play in the regulation of the private sector, such that it serves the public good. To begin with, by ruling of the Supreme Court, all private schools in India must be non-profit in nature (although in practice this appears to be an unenforceable and widely ignored ruling). Secondly, only private schools which are "recognized" (i.e. certified by government) are able to issue officially recognized transcripts, exam scores and diplomas. Recognition is a state-level matter (not central), subject to norms and regulations which are quite extensive, so much so that they appear to discourage the establishment, registration and recognition of private schools. Estimates of unrecognized private schools at the secondary level vary between 10–15 percent of all schools, lower than in elementary schools.

In practice, however, the shortage of inspectors and weak governance structures enables private school managers in many cases to obtain official recognition whether they satisfy all regulation criteria or not. This jeopardizes the government's efforts to ensure minimum levels of school quality in private schools, although there is little data to support this. Perhaps more importantly, it makes it difficult for parents to distinguish between acceptable- and low- quality private schools.

<sup>53</sup> Many students in government secondary schools come from private elementary schools so it is difficult to attribute the raw mean achievement of government schools to the effectiveness of their teaching. There are real difficulties of inference unless there is good data on past educational experience, which is rare.

#### 4.4 Teacher Recruitment Criteria and Methods

Perhaps the most important management issue in the education sector is teacher recruitment, given that teacher salaries consume the largest share of education budgets and the quality of teaching is the most important factor in student achievement. Common problems in teacher recruitment in India are insufficient objectivity, a shortage of candidates with the necessary attributes, and a high frequency of court cases arising from disputes on selection.

Each state has its own academic and professional standards for teachers in government schools. The standards are generally quite high, though they vary somewhat across states. In secondary education, a university degree plus a Bachelor of Education (B.Ed) degree is typically the minimum requirement. In senior secondary education, the requirement is usually a post-graduate degree.

Each state has its own recruitment practices. Many states split their recruitment of secondary teachers for government schools into two quotas, promoting 50 percent from work at lower grades and recruiting 50 percent directly. Use of objective recruitment criteria is vital, not only for obtaining the best teachers but also for ensuring that the process is perceived as fair. Recruitment by interview only was the prevalent method in the public sector until quite recently, and is still favored by private schools. But face-to-face interviews are highly subjective, and in the interest of objectivity and transparency more and more states are beginning to adopt merit-based recruitment, based on examinations. State-level recruitment examinations are often conducted by civil service commissions rather than by departments of education. Since the standards of teacher training institutions vary, recruitment by examination has the advantage of providing some minimum assurance of teachers' academic capability. However, recruitment examinations are not necessarily specific to the education level and subjects that the applicants are expected to teach,<sup>54</sup> and where an applicant's subject competency is not tested, quality assurance is compromised.

Often, due to a lack of candidates with the necessary attributes, and a heavy demand for science and mathematics

<sup>54</sup> This was the situation in Rajasthan and Karnataka. In Rajasthan, the first recruitment of teachers by examination, in 2004, has resulted in protracted litigation brought by applicants.

teachers, schools waive the requirement for professional training and make appointments subject to the candidate acquiring a teaching degree within a stipulated time. To conform to certain equity-oriented recruitment policies (e.g. favoring scheduled castes, scheduled tribes, or women), minimum education criteria are often lowered.

Subjectivity, reservation policies and political interference in teacher recruitment has led to tens of thousands of lawsuits across the country. This has a substantial impact on the school system, because once litigation on a recruitment case has started a court injunction prohibits any recruitment of civil service teachers until the lawsuit is settled. Contention usually centers on the method of recruitment (for example, whether it is appropriate to use the same examination to recruit teachers for upper primary and secondary education), or on the conversion of contract teachers' jobs to established positions. These cases are holding up the hiring of thousands of teachers. Given the potential far-reaching consequences of such legal disputes, it is important to improve dialogue with teachers' unions, and to have procedures in place to address teachers' grievances without resorting to litigation.

#### 4.4.1 Deployment: Matching Supply and Demand

Several factors lead to a mismatch between the supply and demand of secondary school teachers: shortfalls in recruitment; inflexible norms for the deployment of teachers in government and aided schools; teachers' reluctance to work in rural areas; and the politicization

of teacher transfers. These features of the system already cause difficulties. The proposed expansion of secondary education and related requirements in teacher recruitment will only increase the management challenges.

#### (i) Shortfalls in recruitment

Many schools face a shortage of candidates with the necessary qualifications. In the government school system, following civil service practice, the Indian Constitution reserves a certain proportion of teacher positions for women and members of the SC, ST, and Other Backward Castes (OBC), often in proportion to the share of these groups in a state's population. Though experience varies across states, many schools have difficulty recruiting enough suitably qualified teachers in the reservation categories. The problem is more marked in rural areas, in slums, and in English, mathematics, and science. In Karnataka, for example, out of 2,030 secondary school teacher posts advertised during the 2001-02 recruitment drive, only 43 percent could be filled. The shortfall is related to the highly specific requirements for combinations of language and subject specialty.

Rural schools in much of India have particular difficulty finding subject teachers in English, mathematics, and science because few qualified teachers wish to work there. It is not accidental that contract teachers form a larger share of teachers in the rural areas (Table 4.5). In addition, rural schools also have a much smaller percentage of female teachers compared to urban areas, resulting in fewer role models for girls in secondary education.

	Full-time Teachers\1	Of which	Contract teachers	Of which	Part-time Teachers	Of which	All Teachers	
	Total	Female	Total	Female	Total	Female	Total	Female
Rural	90,126	50,987	23,971	7,379	9,191	2,388	623,288	60,754
Urban	367,978	213,399	13,979	8,386	10,198	5,336	392,155	227,121
Total	958,104	364,386	37,950	15,765	19,389	7,724	1,015,443	387,875
Rural	62%	41%	63%	47%	47%	31%	61%	41%
Urban	38%	59%	37%	53%	53%	69%	39%	59%
Total	100%	100%	100%	100%	100%	100%	100%	100%

\1: including Principal/Headmaster

Source: Authors' analysis of the Seventh All-India Survey, 2002.

Several other factors contribute to the shortfalls in recruitment. First, fiscal constraints and litigation on teacher recruitment often delay the filling of vacancies – the former through hiring freezes or reductions of grants-in-aid, and the latter through court injunctions against recruitment while litigation is in progress. Second, too many newly qualified teachers fail the exams for merit-based recruitment. In Karnataka, for example, some of the applicants for teaching positions scored as low as 0.33 percent in the employment examinations. Third, good data is frequently unavailable to make effective projections for the demand, supply, and financial requirements for teachers, and lack of professional capacity for human resource management further aggravates the problem (Box 4.1). Fourth, teacher training institutions do not plan their student intake on the basis of demand forecasts, producing too many graduates in some subjects (such as humanities and social sciences) and too few graduates in others, notably mathematics, science, and English. Furthermore, they do not yet train enough graduates in the reserved categories. Lack of coordination between education departments and teacher training institutions contributes to the mismatch between demand and supply.

#### (ii) Norms for deployment of teachers in schools

Norms for the deployment of teachers in government and aided schools, often based on pupil-teacher ratios (PTRs), in practice prevent schools from making the best use of resources. Norms are set by the National Council for Teacher Education, although states vary in their adoption of these norms. The norms in force for government secondary schools (Table 4.6) do not take sufficient account of the enormous variations in enrollment and class distributions that result from subject specialization and the allocation of students per section within each grade. Where enrollment is small, as it often is in rural schools, the application of the norms causes teachers to be underutilized. Where enrollment is large, teachers tend to be overloaded.

To some extent, India could overcome teacher shortfalls in secondary education by relaxing the current norms and raising pupil-teacher ratios, as it did for elementary education. As elementary education expanded, the number of primary and upper primary school teachers grew (Figure

Table 4.6 / General Norms for Deployment of Teachers in Government Schools	
Secondary Level	1 language teacher who also teaches Social Studies 1 English teacher who also teaches Social Studies 1 or 2 Science teachers to cover Physics, Chemistry and Mathematics Due to the three language approach, if the state language is not Hindi, a Hindi teacher (may be part-time) is needed. The exception is Tamil Nadu which does not teach Hindi. Part-time teachers teaching crafts and physical education.
Senior Secondary Level	1 more arts teacher 1 full time Hindi teacher 1 full time crafts teacher and 1 full time physical education teacher. If a class has an additional section beyond 60 students, one additional teacher is provided and the priority is given to arts teacher.

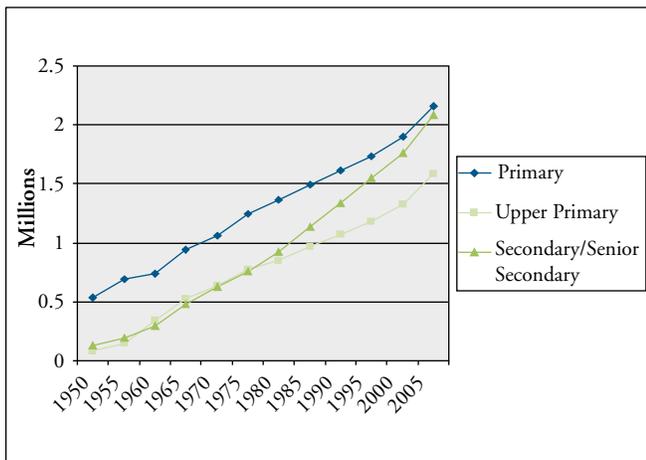
*Source: Modification from Bashir and Sipahimalani-Rao, 2002.*

4.3), but so did the pupil-teacher ratio (PTR) (Figure 4.4). In elementary education, international consensus considers 40:1 an optimal ratio and this is indeed the GoI's norm for SSA.<sup>55</sup> By contrast, the PTR at the secondary level has stabilized at about 33; international experience suggests this could be increased somewhat with little or no adverse impact on student learning.

Optimal pupil-to-teacher ratios in secondary education are more difficult to establish. Since 1950 the overall PTR in public secondary schools has risen from 21:1 to 33:1. Because secondary education requires far more subject specialists than elementary education, PTRs naturally tend to be lower than in elementary education. Internationally, the PTR in secondary education ranges from the mid-teens in Japan to more than 40:1 in low-income countries. When East Asia was industrializing in the 1970s and 1980s, the PTR in secondary education was quite high, for example reaching 39:1 in South Korea in 1980 (UNESCO Statistical Yearbooks,

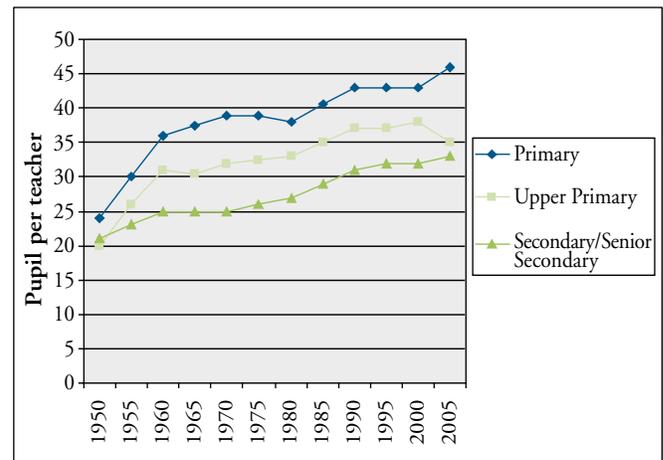
<sup>55</sup> See the Indicative framework of the Education for All Fast Track Initiative. <http://www1.worldbank.org/education/efafti/overview.asp>

**Figure 4.3: Teachers by Education Level, 1950–2005**



Source: MHRD, *Selected Education Statistics, 2004-05*.

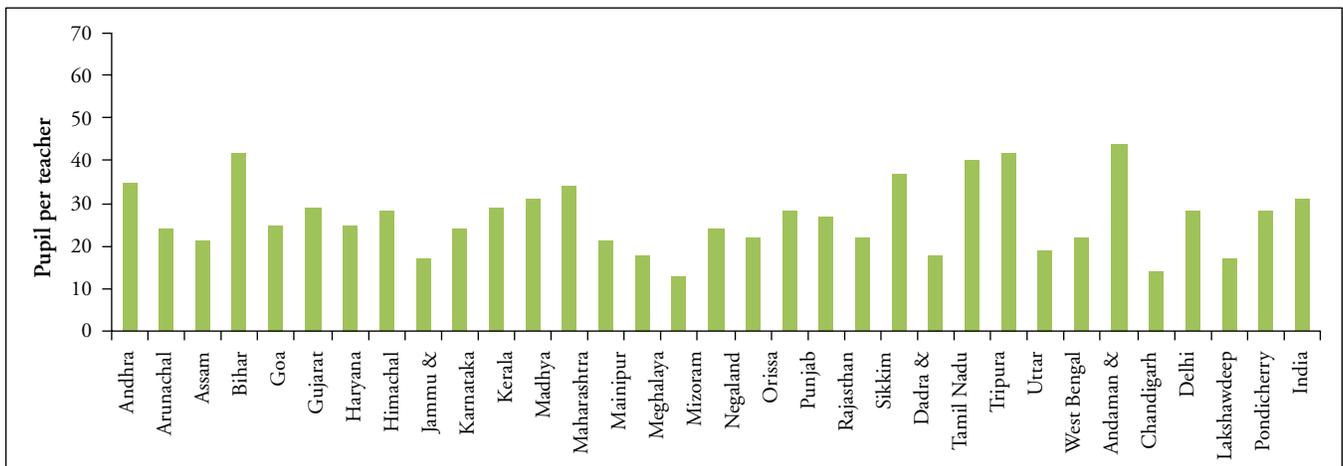
**Figure 4.4: Pupil:Teacher Ratios in Government Schools, 1950–2002**



various years). Only after the East Asian countries had developed and gone through the demographic transition did their PTRs decline. Currently, PTRs in government secondary schools vary quite widely across and within Indian states (Figure 4.5). The range goes from a low of 13:1 in Mizoram to a high of 42:1 in Bihar. Within states, there is also tremendous variation between rural and urban areas and across districts. The average PTRs in rural and urban areas are 28:1 and 44:1, respectively, reflecting the fact that rural schools serve more dispersed populations than urban.

PTRs also vary widely by subject; three times as many students choose the arts stream as choose the science stream, and mathematics and science classes at the senior secondary level are particularly small. PTRs also tend to be lower in senior secondary than in secondary classes: in Orissa, for example, the PTRs at the secondary level range from 11:1 to 20:1; by the senior secondary level, they fall to between 6:1 and 9:1 (Secondary School Surveys in Rajasthan and Orissa, 2005). In view of the anticipated expansion of secondary education, redeployment of teachers from senior secondary to secondary schools would appear to be a viable, if partial, solution.

**Figure 4.5: Pupil-to-Teacher Ratios in Government Secondary and Senior Secondary Education across States, 2001**



Source: MHRD, *Selected Education Statistics, 2002*.

### Box 4.1: Teacher Management in Karnataka and Uttar Pradesh

Karnataka has been a front-runner among Indian states in introducing many pioneering reforms in teacher recruitment and transfers. In 1993, it introduced a merit-cum-reservation based recruitment system to improve objectivity and transparency in selection. Districts select teachers from a merit list of qualified candidates. In 1999–2000, clear priorities for postings and computerization of the system were introduced.

Uttar Pradesh has faced an acute shortage of qualified teachers, especially in elementary education but also in secondary education. But demand for teachers is estimated by applying statutory norms on pupil teacher ratios to the total enrollment in schools, without taking account of class sizes or making systematic enrollment projections. The estimates use inadequate data, which are mostly at the level of the school, rather than the class/section and subject. Data relating to teachers in schools, additional requirements, vacancies, and shifts in vacancies, transfer data, and teacher posts for reserved categories and subjects are patchy. Nor is the database regularly updated.

Both states have made ad hoc decisions to hire contract teachers and freeze teacher transfers in elementary education. In the long run, however, the policy on norm-based deployment of teachers should be modified to allow schools to make flexible hiring and transfer decisions that fit specific circumstances. Demand forecasting could be improved by using school mapping, and a comprehensive and regularly updated database covering enrollments, teacher availability, and retirement. Projections of teacher requirements need to be made by region, subject, and enrollment. The capacity of teacher training institutions should be aligned to projected teacher requirements. Both states would be well advised to put in place a comprehensive human resource management system for secondary education to inform decisions related to teacher posting and transfers.

*Source: Bashir and Sipahimalani-Rao (200)3; Bashir (2002).*

#### (iii) Politicization of teacher transfers

As in many other countries of the world, rural schools are disadvantaged because secondary school teachers are often reluctant to work in rural areas. Teachers' requests for transfers from rural to urban schools are frequent, leaving many rural schools seriously short of subject specialists. Government teachers have the right to request a transfer to another location or school, and it is not uncommon for new recruits to accept a posting in rural areas and then quickly apply for transfer to a city or another district. When transfers occur in the middle of the school year, with no replacement for the rest of the year, there is enormous disruption of learning.

States typically have clear rules and specifications for transfer, although weak enforcement mechanisms. For example, teachers who have served in rural areas for a certain period of time, those who have health problems, those whose spouses have died in the armed forces in the line of duty, and those whose spouses work in different localities may be given preferential consideration for transfer. To get around

the rules, teachers often cultivate good relations with local politicians in order to obtain their help in transferring to more favored locations. The politicization of transfers has enormous implications for teacher motivation and morale, for the viability of rural schools, and for governance. To address this problem requires a policy—strictly enforced—that no transfer should take place in the middle of the school year, so as to avoid disrupting classes. Teachers' contracts should also specify that at least during the first three years of their service, they should remain on post without transfer. An increasing number of states, including Rajasthan, are adopting versions of this policy.

#### 4.4.2 Terms and Conditions of Service for Teachers

Within the broad guidelines set by states, teachers' terms and conditions of service differ according to the type of school they work in. Different terms and conditions encourage different behavior and attract different types of people to the teaching profession, which has different policy implications.

Teachers in government schools are civil servants. In addition to teaching, they are required to help organize elections, update electoral rolls, and conduct population and household censuses. In many states, they are also required to help immunize children and participate in campaigns for family planning.<sup>56</sup> This takes away from teachers' "time on task", which has been shown at the elementary level to be clearly correlated with student learning outcomes (Sankar, 2007). If hired on a statewide basis, they can be transferred to whichever locality or school requires their service, although they can also request a transfer to a school of their choice. Pay in government schools depends on academic qualifications rather than on the educational level where teachers work. Starting monthly salary is around Rs.6,000 (US\$ 150) and the top scale is around Rs.15,000-20,000, with the average around Rs.12,000 (US\$ 300), again with variations across states. Government teachers are entitled to pension and healthcare benefits.

Teachers in aided schools are entitled to the same salary scale and subject to similar terms and conditions of service

as teachers in government schools, except in three respects. First, they are not civil servants, so they are not required to perform public duties and they can take secondary jobs. Second, because they are hired by the organization that manages the school, they cannot be transferred by the government across schools or across localities. Third, they are not subject to a reservation system. In reality, as seen in Table 4.3, actual salaries often do not match entitlements for teachers in aided schools, particularly in states under fiscal stress which have drastically reduced their grants-in-aid (GIA). Orissa, for example, has reduced its GIA to 40 percent of the original allocation. This has led to salary cuts for teachers in the aided schools and the employment of contractual teachers, who receive lower pay and are employed on contracts lasting less than a year.

Recognized, private, unaided schools are required to follow the conditions laid out by the National Council for Teacher Education (NCTE) with regard to teachers' educational and professional qualifications, while the states set salaries. Many states' education laws also

Table 4.7 Teachers' Salaries and Secondary Job Income by School Type in Rajasthan and Orissa, 2005						
	Rural Gov't	Rural Aided	Rural Unaided	Urban Gov't	Urban Aided	Urban Unaided
<b>Rajasthan Grade 9 Teachers</b>						
Teachers who have secondary jobs	23%	-	107%*	5%	67%	67%
Hours spent on secondary job per month	11	-	18	18	24	23
Gross salary/month (Rs.)	9,779	-	3,071	11,710	5,138	2,711
Average monthly income from secondary job for those with one	2,277	-	1,940	1,500	1,667	3,107
Combined monthly income from primary and secondary jobs	12,056	-	5,011	13,210	6,805	5,818
<b>Orissa Grade 9 Teachers</b>						
Teachers who have secondary jobs	28%	22%	77%	0%	20%	14%
Hours spent on secondary job per month	17	7.5	17	0	12	8
Gross salary/month (Rs.)	9,801	1,858	4,657	9,377	4,893	5,110
Average monthly income from secondary job for those with one	1,186	1,108	800		1,000	3,000
Combined monthly income from primary and secondary jobs	10,987	2,966	5,457	9,377	5,893	8,110

\* Teachers reported to work in both private tutoring and agriculture

Source: Authors' analysis of Surveys of Secondary Schools in Rajasthan and Orissa, 2005.

<sup>56</sup> For example, Rajasthan teachers receive a quota to persuade at least one woman a year to undergo a hysterectomy.

require unaided schools to offer teachers the same terms and conditions of service as in government schools. But

in the absence of a rigorous monitoring mechanism, these laws are not observed, particularly among non-elite private schools, such that salaries typically reflect basic supply and demand in the teacher labor market (Table 4.7). The study on Rajasthan and Orissa found that, for teachers in Rajasthan's unaided schools, the typical salary is Rs.2,000–3,500 for 24 days of work. This suggests a daily wage roughly at par with the minimum wage per day (sample size for this survey is quite small). By contrast, teachers working in the elite Delhi Public Schools system (actually, a private school system) earn approximately Rs.12,000 per month.

There are several plausible reasons why teachers accept lower pay in unaided schools. Greater social acceptability and prestige comes with teaching in English-medium private unaided schools. Private schools' easier and faster recruiting process also seems to be attractive, particularly for teachers who are not selected for government service. There are far more teachers from the "general" population category, and fewer from lower castes, in the private aided and unaided schools. At the same time, teachers in private schools can work in secondary jobs to supplement their income, while gaining experience to strengthen their competitiveness for the next round of recruitment for

jobs in government schools. However, the younger average age and high proportion of unaided school teachers being unmarried (compared to government teachers) suggest that teaching may be only a transitional job for them.

Tables 4.8 and 4.9 use National Sample Survey data from 2000 and 2005 to compare government and non-governmental secondary teachers' salaries with those of non-teachers, by educational level. On a weighted average basis, government secondary teachers earned about 75 percent more than their non-governmental colleagues in 2005, almost Rs. 9,000 per month versus Rs. 5,000 per month. This gap increased from 2000, when the difference was about 35 percent (Source: NSS, 55th round). (Note: the National Sample Survey 61st round showed roughly equal distributions of secondary teachers across educational levels, with 71 percent of government teachers with university degrees versus 69 percent for non-government teachers. Different average educational levels between public and private teachers do not explain salary differentials between the two types, as can be seen further in Table 4.10 below.) As mentioned earlier, government teachers are civil servants. The fact that their salaries are higher than teachers in private schools reflects public sector salaries overall,

Table 4.8 / Average Monthly Salaries of Secondary Teachers and Non-Teacher Salaried Workers, by School Management Type and Educational Level, 1999–2000 (Rupees)				
Education Level	Government Secondary Teacher	Non-Government Secondary Teacher	Government Salaried Worker	Non-Government Salaried Worker
Secondary or below	5,117	3,251	4,938	3,351
Senior Secondary	5,111	3,141	5,430	3,955
University and above	6,209	4,685	7,031	5,448

Source: Authors' analysis of National Sample Survey, 55th round.

Table 4.9 / Average Monthly Salaries of Secondary Teachers and Non-Teacher Salaried Workers, by School Management Type and Educational Level, 2004–05				
Monthly Salary in Indian Rupees, 2004-05				
Education Level	Government Secondary Teacher	Non-Government Secondary Teacher	Government Salaried Worker	Non-Government Salaried Worker
Secondary or below	4,884	2,332	8,044	5,904
Senior Secondary	7,672	4,704	12,100	11,444
University and above	9,872	5,680	15,152	13,180
Weighted Average	8,868	5,018		

Source: Authors' analysis of National Sample Survey, 61st round.

which are periodically increased through the GoI's Pay Commission. Interestingly, average government salaries for non-teachers are higher than those of teachers at all educational levels.

The labor market for teachers ultimately depends on the supply and demand of teachers. To date, the limited employment opportunities in many sectors and in many states have enabled private schools to hire teachers at a much lower salary than government school teachers. This situation is likely to change when the rate of expansion of secondary education outstrips the supply of teachers, while other sectors also expand to compete for people with similar skills, particularly in mathematics and science. Indeed, the rapid growth in private sector salaries for university graduates (seen comparing the right columns of Tables 4.8 and 4.9 above) suggests that prospective teachers who are required to earn university degrees may choose not to pursue teaching as a career given the much higher (and increasing) salaries in the private sector. In addition, some states (for example, Rajasthan) have recently introduced the subject of English in the

## 4.5 Qualifications of Private Aided and Unaided Teachers

It is frequently argued that private schools are pay lower salaries than public schools because they recruit less qualified people as teachers, and hence offer a lower quality educational experience. To explore that issue, a representative sample survey of 1,440 private aided and unaided schools was carried out in nine states spread around the country in March 2008. Among the issues examined were the qualifications of private teachers and their salaries. The findings are below.

### 4.5.1 Academic Qualifications of Private Aided and Unaided Teachers

Contrary to popular opinion, as Table 4.10 shows, the academic qualifications of teachers in both private aided and unaided schools (both secondary and senior secondary) are roughly the same. A majority of secondary school teachers are graduates of higher education, while a majority of the senior secondary teachers are post-graduates.

Qualification	Aided- Secondary	Aided-Senior Secondary	Unaided-Secondary	Unaided-Senior Secondary
Less than Senior Secondary	2	1	1	0
Senior Secondary	3	3	2	3
Graduate	54	25	54	25
Post Graduate and above	42	72	43	72
Total (%)	100	100	100	100
No. of schools	487	277	306	260

*Source: "Feasibility Study for an Operational Partnership Between the Public and Non Public Sectors in Non-Elementary Education", ORG Centre for Social Research, August 2008.*

first grade, instead of in Grade 5 as before. If this policy is adopted across all states, the demand for English teachers will surge. At that stage, private schools are likely to have to pay increased wages in order to attract and retain teachers with marketable skills. Rural schools will face even greater difficulty attracting and retaining subject teachers unless they can offer stronger financial or other incentives to serve there.

### 4.5.2 Professional Qualifications of Private Aided and Unaided Teachers

At the secondary level, there is virtually no difference in the professional qualifications of teachers in aided and unaided schools. 95 percent of unaided secondary school teachers are trained, identical to the percentage of trained aided secondary school teachers. However, at the senior secondary level, teachers in aided schools were more likely

Professional Qualification	Aided		Unaided	
	Secondary	Senior Secondary	Secondary	Senior Secondary
Untrained	5	3	5	20
Diploma in School Teaching	5	4	5	2
B.Ed.	80	81	81	65
M.Ed.	4	7	5	9
Others	6	5	5	4
Total (%)	100	100	100	100
No. of schools	487	277	764	306

*Source: "Feasibility Study for an Operational Partnership Between the Public and Non Public Sectors in Non-Elementary Education", ORG Centre for Social Research, August 2008.*

to have professional training than their counterparts in unaided schools.

#### 4.5.3 Years of Experience of Private Aided and Unaided Teachers

According to the 2008 survey of 1,440 private secondary schools, the average experience of teachers in aided secondary schools (16.7 years) and aided senior secondary schools (18.8 years) is greater than the experience of the teachers in unaided secondary schools (10.1 years) and unaided senior secondary schools (11.5 years). On one hand, this highlights a potential retention problem in private unaided schools, at both secondary and senior secondary levels. On the other hand, it shows that teachers in unaided schools possess, on average, quite significant teaching experience, perhaps more than is commonly supposed. Ten years is more than enough time to acquire sufficient experience.

#### 4.5.4 Average Salaries of Private Aided and Unaided Teachers

According to this same 2008 survey of private secondary schools, the salaries of teachers in aided schools are approximately three times greater than those of teachers in unaided schools. On average, an aided secondary school teacher earns about Rs. 13,800 per month, whereas a private unaided school teacher receives just Rs. 4,200 per month. At the senior secondary level, an aided school teacher earns about Rs. 15,200 per month on average, whereas a private unaided school teacher

receives Rs. 5,700 per month. In fact, about one half of unaided secondary school teachers and about one third of unaided senior secondary school teachers earn less than Rs. 3,000 per month, compared to just 6 percent and 2 percent of teachers in aided secondary and senior secondary schools, respectively (Table 4.12). Sharply differing salary structures between teachers of aided and unaided schools may negatively affect satisfaction levels of unaided school teachers, which may in turn negatively affect quality (although this does not appear to the case from student academic performance data). On the other hand, this shows greater cost effectiveness of unaided schools relative to aided schools, in that they achieve similar (if not superior) academic results while paying their teachers much less.

The salary differential between the public and private teachers has two major implications for policy. On the positive side, the expansion of enrollment in secondary education in India in the last two decades through the growth of private education has freed up public resources so that they could be used for elementary education. The possibility of recruiting teachers at lower salaries has enabled more private schools to come into operation to meet the demand of the middle class. This has had a very important equity effect. On the negative side, there is a strong incentive for unaided school teachers to take a secondary job to supplement their income. The relatively high percentage of teachers with secondary jobs in Rajasthan reflects such a need. The long hours that private teachers spend working at secondary jobs suggest that they may expend less effort

Table 4.12

Monthly Average Gross Salary of Teachers (in Rs.)

States	Aided		Unaided	
	Secondary	Senior Secondary	Secondary	Senior Secondary
Less than Rs. 3000	6	2	52	32
Rs. 3001 to Rs. 6000	7	9	27	39
Rs. 6001 to Rs. 9000	8	5	10	12
Rs. 9001 to Rs. 15000	33	28	8	9
Rs. 15001 to Rs. 20000	34	36	2	6
More than Rs 20000	11	18	1	2
Did not reveal	1	1	0	0
Total (%)	100	100	100	100
No. of schools	487	277	306	260

*Source: "Feasibility Study for an Operational Partnership Between the Public and Non Public Sectors in Non-Elementary Education", ORG Centre for Social Research, August 2008.*

on teaching, which may affect the school climate and students' overall development (although this is not captured in achievement results).

#### 4.6 Teacher Performance Appraisal and Incentives

Officially, the performance of government teachers is appraised through annual confidential reports. This process has potential but in reality is carried out in a very mechanical and perfunctory manner so as to avoid controversy (and litigation). Many states provide awards to teachers as performance incentives, but the implementation of these schemes leaves much scope for improvement. Teachers worthy of awards should ideally be nominated by parents and students on the basis of their performance and their helpfulness to students with the

nominations validated by a committee of reviewers, but in practice teachers themselves have to apply for awards and justify their own selection. This makes the process non-transparent and highly subjective, allowing for nepotism and other malpractices.

Fiscal constraints may prevent the use of merit pay on a sustained basis, and the evidence is mixed as to whether paying teachers a bonus based on improvements in student test scores effectively improves teachers' performance (Box 4.2). Recent efforts to link teachers' pay and student learning outcomes at the elementary level in Andhra Pradesh, however, suggests that Indian teachers do respond to incentives in ways which improve students' learning as measured by test scores. There is certainly scope for increased experimentation with this at the secondary level in India, combined with rigorous experimental evaluation to assess its impact.

### Box 4.2: Performance-based Incentives: Some National and International Experience

Performance-based incentives are rewards paid to teachers or schools for meeting pre-defined student outcomes. They can take the form of merit pay to individual teachers, or awards of various kinds to schools as a whole. The empirical evidence to date on its effectiveness is limited and mixed.

In Andhra Pradesh, a pilot program has been underway for two years (since 2005), consisting of a randomized evaluation of a teacher incentive program implemented across a representative sample of government-run rural primary schools. The program provides bonus payments to teachers based on the average improvement of their students' test scores in independently administered learning assessments (with a mean bonus of 3% of annual pay). At the end of two years of the program, students in incentive schools performed significantly better than those in control schools by 0.28 and 0.16 standard deviations in math and language tests, respectively. They scored significantly higher on “conceptual” as well as “mechanical” components of the tests, suggesting that the gains in test scores represented an actual increase in learning outcomes. Incentive schools also performed better on subjects for which there were no incentives. No significant differences can be seen in the effectiveness of group versus individual teacher incentives. Incentive schools performed significantly better than other randomly-chosen schools that received additional schooling inputs of a similar value. (Karthik Muralidharan and Venkatesh Sundararaman, (2007). “Performance Pay for Teachers: Experimental Evidence from India”. Mimeo. World Bank)

A number of school districts in the USA have offered teachers several thousand dollars (or 10 percent or more of their annual salaries) in extra pay if their students improve on state and national tests (AP, January 12, 2006). Chile has used a school-based performance award since 1996 to provide cash to top-performing schools based on standardized tests in Spanish and Mathematics in Grades 4, 8, and 10, adjusted for rural/urban location, educational level, and the socioeconomic status of parents; 90 percent of the cash award goes to the teachers and 10 percent to the schools (World Bank 2003c). Over time, more schools meet the better performance criteria. The outcomes of these programs, however, have not been carefully evaluated.

Programs that have been evaluated yielded mixed results. Levy's (2002) study on Israeli school-level group incentives found positive effects on student outcomes. Jacob and Levitt (2002) found that performance incentives were associated with cheating in Chicago, particularly among lower-performing and poverty-stricken schools and students. Glewwe, Ilias, and Kremer's randomized trial of a performance-based incentive in Kenya (2003) found that test scores improved but that the incentive led to “teaching to the test”, and that the improvement in performance did not outlast the incentive. Clotfelter and others (2004) found that providing a cash bonus to schools that met growth targets for test scores resulted in significantly higher teacher turnover in low-performing schools. Murnane and Cohen (1986) identified two frequent distortions associated with merit pay: teaching only the topics measured on the test and focusing teacher attention on those students most likely to improve test scores. More favorably, Atkinson et al (2004) found that performance-related pay schemes had a substantial positive impact on student performance in England.

Given the potentially high fiscal and administrative costs of incentive programs, if pilots are undertaken at the secondary level to provide performance-based incentives to teachers, it is essential to carefully evaluate their impact. However, if such an incentive program is undertaken in the context of an overall civil servant pay increase, the fiscal cost can be quite small or even nil, and the administrative costs may be quite cost-effective relative to other investments to improve student learning.

#### 4.7 School-Based Management and Decentralization

Related to the issue of teacher recruitment, deployment and evaluation is the role of school-based management (SBM) at the secondary level. This is a particularly compelling topic given the need to address access, quality and equity concerns simultaneously, not sequentially, at the secondary level. SBM typically involves the transfer of authority for a range of activities, including budget allocation; hiring and firing of teaching and non-teaching personnel; procurement of textbooks and other learning materials; infrastructure improvement; and monitoring of teacher and student performance.

Internationally, SBM has flourished over the last twenty years in both OECD and developing countries, largely as a means to improve quality, and there is an extensive literature on it. While the evidence regarding the results of SBM in terms of learning outcomes is mixed (see Box 4.3), there is a strong rationale for it insofar as it tightens and renders more transparent the relationship between the service provider (the school) and the client (parents/students). Furthermore, in the context of efforts to improve school quality and learning outcomes, it places the school clearly as the agent of change, for which it is responsible and accountable to both parents and policymakers. Short of SBM, decentralization of key resource allocation and administrative decisions to lower education administration levels can also increase alignment with local needs for more efficient, better targeted resource allocations to improve quality.

It is an irony of the Indian secondary system that most states require privately-managed schools (aided and unaided) to have school-level management committees (composed of the head teacher, parents, teachers, etc.), while public schools are not so obligated. Government schools are controlled at the state and district levels, with little community involvement. In this sense, private schools are more accountable to the public than are government schools.<sup>57</sup> It is important to point out that this is very different from policies at the elementary

education level, where Village Education Committees in public schools are standard.

In government and private aided secondary schools, teacher qualifications are fixed, with little or no involvement of school principals in teacher recruitment. The main difference is that teachers in the private aided system are appointed to specific schools rather than to the system overall, so that there is at least the presumption of increased teacher accountability (if not the reality).

The experience of SSA at the elementary level with empowerment of Village Education Committees is certainly instructive. VECs manage funds from SSA for infrastructure improvements, purchases of teaching and learning materials, and are charged with verifying teacher and student attendance. Transferring funds to the people who will own the assets which are financed has been a positive experience. The recently completed Implementation Completion Report for SSA I concluded that the capacity of these institutions has been strengthened through the key role they have played in community mobilization, and in implementing civil works. In addition, VECs in some states have played a role in recruitment and/or monitoring of teachers, or running of alternative schools, although in general they have yet to play the desired role of deeper community participation and engagement in schools. This points to the importance of training of VEC members on roles, responsibilities and mechanisms to ensure quality in schools. In addition, recent evaluations of VECs in Uttar Pradesh (Pandey 2007 and Khemani, 2007) show that such training can increase the likelihood of parent and community engagement to some degree, but that the impact on student learning has been very limited so far, although it may be too soon to expect any results.

Compared to the primary level, it is more difficult at the secondary level for parents to judge the quality of schools, to compare them, or advise them. There are greater gaps between the average parent's education and that of secondary teachers and principals, a secondary school's structure and organization is more complex, and secondary schools are more "regionally monopolistic" (fewer of them, less choice) (World Bank, 2005a). All of these factors increase the challenge of improving accountability through parental and community involvement, but they do not offset the potential benefits of SBM.

<sup>57</sup> The exception to this are the Kendriya Vidyalaya Sangathan (KVS) schools, which are operated by the national (not state) government. KVS has proposed school management committees which can generate additional resources and appoint teachers on an ad hoc basis, while devolving to the principal financial responsibilities and authority to hire support service personnel.

### Box 4.3: What do we know about School-Based Management?

Recent analytical work by the World Bank assessing the impact of school-based management around the world since 1995 identified many methodological issues which suggest caution in drawing definitive conclusions. The sample of carefully documented, rigorous impact evaluations is quite small. Nevertheless, it is possible to provide some important findings about the impact of SBM, based on the more rigorous analyses:

1. Some studies found that SBM policies actually changed the dynamics of the school, either because parents got more involved or because teachers' actions changed (King and Ozler 1998; Jimenez and Sawada 1999; and Gunnarsson et al. 2004).
2. Several studies presented evidence that SBM had had a positive impact on repetition rates, failure rates, and, to a lesser extent, dropout rates (di Gropello and Marshall 2005; Jimenez and Sawada 2003; Gertler et al. 2006, Paes de Barros and Mendonca 1998; and Skoufias and Shapiro 2006).
3. The studies assessing impact of SBM on standardized test scores presented mixed evidence (Jimenez and Sawada 2003; King and Ozler 1998; and Sawada and Ragatz 2005).

Research in the United States suggests that SBM reform needs at least five years of implementation before any fundamental changes can be observed at the school level, and eight years before changes can be seen in test scores.

Finally, there is a lack of cost-benefit analyses of SBM. While SBM may involve political costs and administrative expenses for capacity-building, SBM is essentially just a change in the locus of decision-making and does not require any increase recurrent funding. It can be considered a very low-cost intervention in financial terms.

*Source: "What do we know about school-based management?" The World Bank, 2008.*

## 4.8 Secondary Education Management Information System (SEMIS)

At central levels there is a real lack of timely information regarding secondary education. This void exists from basic input indicators such as number and deployment of teachers, availability of learning materials and conditions of infrastructure, to output indicators such as enrollment, repetition, dropout and examination pass rates by management type and social group. (While MHRD's "Selected Education Statistics" produces some of this information, it is released with at least a two-year delay.) Key financial information at state, district and school levels is also not collected.

School mapping, which juxtaposes the geographic distribution of the secondary level target age group with available infrastructure, is not carried out, so that central

and state officials cannot maximize efficiency when deciding where to local new schools or build additional classrooms.

The vacuum of basic timely information at the secondary level prevents the preparation of indices (similar to the Education Development Index at the elementary level) which reveal state- and district- level performance. In addition, it prevents MHRD from being able to make strategic and tactical resource allocation decisions on a needs-basis in a timely fashion. Finally, cross-referencing of inputs, outputs, resource allocation and examination results at the district level is not possible in any systematic fashion, so MHRD is hard pressed to push for accountability, much less quality improvements.

By contrast, great strides have been made in all states in the use of household surveys and the District Information

System for Education (DISE) under SSA, but this only covers elementary education. DISE offers a tried, tested and regularly used mechanism which could be extended to the secondary level with relative ease.

## 4.9 Options for Improving Management of Secondary Schooling

### 4.9.1 *Optimal Mix of Public, Private and PPP Schools*

Clearly, given the diversity among the states, there is no single strategy for all of India in terms of secondary school management. States whose secondary education is predominantly government-financed and government-provided cannot expect private providers to be able to immediately absorb all increased demand, even with public subsidies. However, such states can certainly begin to pilot and evaluate alternative strategies, such as public per student subsidies to attend accredited private unaided schools. States which have heavily relied on private schools to provide enrollment cannot shift overnight to a public-dominated system; it would take too long and be too costly. Each state needs to define its own medium-term strategy relative to school management and its impact on improved access, equity, quality and financing of secondary education. This reflection must consider the evolving labor market demand, which is specific to each state. As part of this process, states should consider alternative models for school management which have shown promise in industrialized and developing countries around the world.

#### *PPP Models*

As mentioned in Chapter 2, PPPs can be structured in many different ways, with varying degrees of private sector risk and responsibilities, ranging from facility services (e.g. building maintenance, catering, etc.) to a full PPP model where the private sector partner is contracted to provide all teaching and non-teaching services (including constructing and capital financing a new public school). It is worth emphasizing that PPPs do NOT mean privatization; the public sector retains regulatory, financing and quality assurance roles, with the ability to suspend the partnership if the private sector does not perform to agreed-upon standards. PPPs can actually increase the public sector's influence over the private sector. More

specifically, governments may contract with the private sector to: build/maintain public schools; provide non-educational services; provide curricula and educational materials; provide teaching and non-teaching services at public schools; or provide teaching services to publicly-funded students at privately-owned and managed schools.<sup>58</sup> A mix of these strategies is also possible.

For example, a state department of education could simply contract with private schools to provide a certain number of places as an agreed per student cost. Or, states could contract out management and teaching services of public schools to the non-public sector, with payments based on agreed-upon per student unit costs and satisfaction of performance criteria (quality of inputs, retention rates, examination pass rates, etc.). External independent monitoring could provide quality control, in addition to the MHRD inspectorate. Educational services (hiring and professional development of teachers, provision of textbooks, etc.) and non-educational services (catering, maintenance) would be the responsibility of the non-public entity. Government could also specify whether the school could charge parents additional fees above the per student subsidy, in which case it could also offer scholarships to students least able to pay.

At a minimum, new models of PPPs ought to be piloted. Whatever new models for PPPs are chosen for piloting, the key is to include in the contracts incentives for efficient capacity utilization and improved learning outcomes, along with external monitoring of school performance. These contracts should clearly specify minimum quality inputs (infrastructure, teachers, service delivery), outputs (physical and learning achievement oriented), and responsibilities of all parties, including maximum delays for public sector monitoring and payment. As mentioned earlier, additional critical factors for success include the use of transparent, competitive and open public bidding processes to generate value for money, especially for new schools. There is a wide experience from both OECD and developing countries spanning the globe which demonstrates the potential for PPPs to improve secondary education. Box 4.4 below provides some such examples, but others exist in Latin America, Asia, Africa, Europe and North America.

<sup>58</sup> "Global Public-Private Partnership Models: Options for Private Participation in Public Education, International Finance Corporation, World Bank Group, 2007.

### Box 4.4: Public Private Partnerships for Education

One of the key features of the Dutch education system is freedom of education – freedom to establish schools, organize teaching and to determine the principles. This makes it one of the oldest – if not the oldest – national systems of school choice. Almost 70 percent of schools in the Netherlands are administered by private school boards, and all schools are government-funded equally. A family is entitled to choose any school, whether public or private, for its child and the state pays for the education. For each child enrolled, the schools receive a specified amount that is equivalent in both public and private schools; in addition schools receive funding that will cover specified amounts of teacher salaries and other expenses. While private schools can also charge ancillary fees, this right is severely limited and a school cannot refuse to admit a child if the parents cannot or do not want to pay this additional fee. Public schools also charge a small fee during the compulsory school stage. The schools are fully accountable towards the parents for the use of the fees collected. Additionally, schools are required to disseminate information to the public and school report cards ensure that information about quality in schools is available to all. Achievement in terms of learning outcomes is very high. The Netherlands does exceptionally well in international academic achievement tests. In the Third International Mathematics and Science Study (TIMSS) Netherlands is one of the world's best performers and achieves relatively high scores in comparison to other countries even when controlling for level of national income (as well as expenditure per student). Thus, the system is not only high achieving, but also cost-effective, attaining good results at relatively low cost.

In 1999, the city of Bogotá, Colombia introduced an educational program called Concession Schools to broaden the coverage and quality of basic education, where private schools provide public education to children from the lowest income households in the city. The municipal government provides the infrastructure for concession schools, selects the students from poor neighborhoods, and pays a pre-agreed sum per full-time student per year (approximately \$520 which is higher than what regular public schools receive, at \$430 per student). Private providers, however, enjoy flexibility in terms of contracting administrative and teaching staff, and can freely implement their pedagogic model. The private school commits itself to performance standards (on quality and quantity) set by the municipal government. For instance, each school commits to surpass the mean score of standardized tests in similar schools. These schools are built in extremely poor areas of the city and in areas where the demand for basic education is higher than the city's supply. Children in these poor zones, in general, face several problems, both physical and psychological. Given these difficulties, one of the main objectives of the concession schools is to provide an environment of affection and psychological counseling to students. Several concession schools have their own food program, which complements the public school feeding program. In addition, concession schools work closely with the community in which they operate. Several of them have an open door policy during weekends, and encourage family visits on a regular basis. Six years into the program the concession schools are performing very well. Rigorous impact evaluation shows that dropout rates in concession schools are lower than in similar schools in the city. In addition, test scores from concessions schools are higher than scores in similar public schools.

*Source: Harry Patrinos, World Bank.*

#### *Reform Financing of Private Aided Schools*

The system for public financing of private schools needs to be streamlined and made more transparent and accountable. For example, public financing of private schools on a year-to-year basis could be made conditional on achievement of specific outputs, such as minimum

levels of student and teacher attendance, student retention rates, and examination pass rates. Public financing could be transferred to school management committees, which would allocate funds as needed, rather than go directly to payment of teachers' salaries. Private aided schools would also have to submit audited annual financial statements as a condition for continued funding.

*Per Student Subsidies (Capitation grants)*

As an alternative to the current grant-in-aid system, a carefully designed funding formula that links grants given to schools to the number of students and the nature of their learning needs could be effective in enhancing the learning environment in schools. A capitation grant system is akin to a voucher system in which funding follows students; for example, it can be used to pay private aided and unaided schools for each additional

disadvantaged student enrolled. It can provide schools with the flexibility to spend the money they receive on what they consider to be priorities. Such grants can also have the positive effect of making schools work towards attracting more students and therefore, taking actions that respond to students' learning needs, while allowing parents some choice as to where they enroll their children. Box 4.5 reviews an array of international experience with funding formulas for capitation grants for aiding private schools.

### Box 4.5: Formula Funding of Private Schools: An International Perspective

In the 1990s, Uganda embarked on a substantial reform of primary education. Apart from the increased resources allocated to this sector, the reform also made money directly available to schools in the form of a per-student capitation grant for their non-wage expenses. The goal was to allow schools to determine how to spend the money in order to enhance and enable their learning environments. Between 1991 and 1995, though, due to corruption and leakage of funds, only 13 percent of total funds were received by the schools. This was uncovered by a public expenditure tracking survey. To remedy the situation, a large information campaign was conducted, whereby records of the monthly disbursements of grants to districts were published in the main newspapers. As a result, the leakage of funds fell to 20 percent in 2001. On the positive side, due to these education sector reforms, students' test scores rose in districts that were highly exposed to the program (Bjorkman, 2004) and students' enrollments in primary schools also increased. Currently, the program is being implemented in all the districts of Uganda and is considered to be functioning well. Tanzania introduced a similar program in 2002.

In Chile, most schools are subsidized by the government in the form of a monthly payment per student. The formula for determining the value of the payment includes a base amount expressed in monetary units linked to salary inflation, and an additional subsidy that varies by level and type of school. The subsidy for secondary schools varies according to whether the school is general-academic or vocational-technical, with the latter receiving on an average 30 percent more funding than the former. Rural schools and small schools receive higher subsidies, as do schools that have students with special needs. Payment of subsidies is related to daily attendance and enrollment, with the former being audited by inspection and misreporting subject to penalties. Schools also have the option of a "shared funding" approach whereby they can charge mandatory fees but must reserve certain places free of cost for poor and/or minority students.

In Colombia, the PACES program is a secondary school voucher program introduced in 1992 and targeted at poor students. Under this program, vouchers are issued to entering sixth grade students under the age of 16. To be eligible, the students must reside in a low-income neighborhood, have gained admission to a participating secondary school, and have previously attended a public primary school. Vouchers are subject to renewal every academic year until the student graduates from secondary school. The voucher is set at maximum level to cover an annual matriculation fee and ten monthly payments of the tuition fee, both of which may vary across schools. At higher cost schools, students have to pay the difference out of pocket. Actual demand for the program exceeded expectations, so vouchers were assigned on a lottery basis. Overall, the program has succeeded in enabling lottery winners to attend better private schools, reduced repetition (as failing a grade leads to ineligibility), and helped students to attain more years of education and better performance on exams.

Since 2002, Nicaragua has followed a funding formula for transferring resources to autonomous secondary schools. Schools are divided into three categories: Category A with more than 1,500 students, Category B with between 501 and 1,500 students, and Category C with 500 or fewer students. Per capita cost for each item of school operation is assigned on the basis of the category the school belongs to. The total financial transfer to a school is then the per capita cost for that school category multiplied by the number of registered students minus drop-outs.

Another approach might be to combine a block grant with a capitation grant. A block grant can help a school cover at least part of its fixed costs, while capitation grants have the potential to take account of the heterogeneity of the population both within schools and across schools.

Decisions on how large a capitation grant per student should be given to schools are complex, and made more difficult by the lack of appropriate data. Few studies look at unit costs in government and aided schools, and very little data exists regarding private unaided schools, such that there is limited evidence regarding costs and effectiveness in India (Kingdon, 1996). Nevertheless, experience suggests that unless the subsidies given to schools cover most teacher costs and some operational costs the quality of schooling tends to be poor, or else the schools cater to the non-poor who can pay the fees that schools charge to raise additional resources.

From the point of view of equity, there is a case for setting a per student capitation grant equal to the level of per capita recurrent public expenditure. Clearly, setting the grant at this level is not a way to generate savings. But if private schools are more cost effective than government schools, this option can be both equitable and efficient. In general, it would be wise to use a resource cost model that reflects the cost of education delivery in a particular area.

That said, it is necessary to recognize the limitations of capitation grants as a means to increase enrollment, particularly in rural areas. Few private providers are willing to establish schools in remote places, where they would not attract enough students to make their services viable, or qualified teachers willing to work there. In addition, private schools may feel that many poorer children who would benefit from such capitation grants would not be able to keep up academically with their peers, which might detract from the learning experience for all students.<sup>59</sup> Such schools may be reluctant to admit poorer students even if they are fully subsidized by the government. In these cases, the government will probably remain the provider of last resort.

<sup>59</sup> A strong advocate of capitation grants and vouchers stated to the author that children attending government schools are unable to keep with their peers in unaided private schools after grade 5.

### *Voucher Systems*

Many countries have experimented with a tax-funded voucher system whereby payments are made to families to enable their children to attend a public or private school of their choice. The payments either go directly to families or to the schools that families have selected. The objectives of a voucher system are mainly to create a quasi-market in education in order to foster competition and efficiency, to increase parental choice, and to enable students from low-income families to attend private schools. For developing countries, another pertinent objective of a voucher system is to encourage greater private supply of education.

What are the pros and cons of a voucher system? In most countries, education is a publicly provided good and therefore its production is not exposed to the rigors of efficiency imposed by competition. Critics of public education also argue that free public education can crowd out private spending on education, leaving students (and their parents) worse off than if they could have chosen a different (presumably better) education quality in the private market. Critics also argue that education produced under a public monopoly is inefficient: private providers would provide the same quality at lower cost, or higher quality for the same cost (Friedman, 1977; Chubb and Moe, 1990). But without help, low-income families generally cannot afford to send their children to private schools. A voucher system can in principle overcome all these shortcomings by increasing parental choice, by forcing inefficient schools to improve their performance or risk losing students and concomitant funding, and by enabling poor families to send their children to a private school of their choice. In India (Delhi), a small voucher program is being piloted in 2006-7 by the Campaign for School Choice, involving about 400 students, but there are no evaluation results yet.

Opponents of a voucher system, on the other hand, have argued that vouchers will eventually lead to the demise of the government school system, encourage student segregation and school specialization, and lead to over-regulation of the private school receiving vouchers, thereby defeating the purpose of school choice. Also, since

education provision is characterized by economies of scale, it may be inefficient to have many small voucher schools offering choice, especially in urban areas. Moreover, if poorly performing schools have to close down, for lack of enough students, then those students who are not motivated to choose a different school may drop out of school altogether.

The evidence regarding the effects of vouchers is inconclusive, in both developed and developing countries (Angrist, 2005). In the United States, Rouse (1998) analyzed the large-scale Milwaukee voucher program and found that though students in voucher schools improved their math test scores by 1-2 percent, there was no difference in their reading scores. Cullen, Jacob, and Levitt (2003) analyzed the Chicago school choice plan and found no improvement in test scores or in the probability of finishing high school. The evidence is mixed from developing countries as well. Angrist and others (2003) studied Colombia's PACES program and found that students who won vouchers were 10 percent more likely to finish eighth grade and scored significantly higher on standardized tests than did those who did not win vouchers. On the other hand, Carnoy and McEwan (2000) studied the nationwide voucher system in Chile and concluded that Chile's system increased school choice only for a certain fraction of students and improved education service delivery for a very small fraction of families and students. Thus, evidence from both developed and developing countries regarding the success of education vouchers has been mixed.

What could be the rationale for introducing a voucher system in India, and how well could such a system work in the Indian context? The fiscally strained position of many Indian states may favor the introduction of a voucher system that will allow higher quality education to be delivered at the same or lower price, and provide incentives to lower-income families to send their children to secondary school. Some caveats would need to be taken care of for the system to have a fair chance of success:

- ◆ A voucher system is information- and administration-intensive, and both these factors are likely to be handicaps in the Indian context.

State governments would need to put into place a good management information system that provides comprehensive and timely data.

- ◆ In practice, a typical voucher system administratively results in subsidization of schools of choice in strict proportion to their enrollments. This can give schools incentives to exaggerate their reported enrollments. Thus, governments would need to verify actual enrollments regularly, through mechanisms such as unannounced visits by school inspectors, or through independent monitoring institutions. For this, the state would need an inspection mechanism that is adequately staffed, which would add to the costs of the voucher system.
- ◆ A voucher system can increase inequity as schools can select where to locate, and admit students selectively. The latter risk could be taken care of by restricting vouchers to low-income families. But to get high quality schools to serve lagging areas may require issuing higher value vouchers, and therefore the system may not be as cost-effective in practice as in theory. Also, restricting high value vouchers to low-income families may not be very feasible from a political economy point of view.
- ◆ On the demand side, the education market may well remain non-competitive as parents may have no means of knowing the distribution of school quality on offer. Even if parents had the required information and were motivated enough to use the voucher system, the school of their choice might be too far away. Providing a subsidized transport system along with larger schools may be more efficient than allowing many small voucher schools to operate.

On balance, a voucher system seems likely to be beneficial for India, and indeed, a few small scale pilots of voucher programs are underway at the primary level. It would be worth piloting such a system at the secondary level on a small scale in several places (urban and rural), and rigorously evaluating the experience before consideration is given to scaling it up.

#### 4.9.2 Options for Improving Teacher Recruitment and Management

- ◆ *Improve the teacher selection criteria and process.* States can achieve greater transparency and objectivity, while also paying attention to applicants' personal characteristics, if they combine entrance exams with interviews. Examinations of prospective teachers should test not only for general but also for subject-specific knowledge. Introducing state-wide competition could enlarge the pool of candidates from which district or school management committees could select. Merit-based recruitment that rests solely on test scores is likely to provide an incomplete profile of a candidate, particularly in terms of personality and behavioral traits, which can be critical attributes of a good teacher. Combining examination and interviews may be the best selection method, with recruitment at the district level to increase accountability and reduce pressure for transfers to urban areas (Sharma, 2005; Bashir, 2002; Bashir and Sipahimalani-Rao, 2002).
- ◆ *Allow more flexible recruitment in government schools.* Within the broad guidelines of existing norms for allocation and deployment of teachers, government schools need contextual flexibility to allow them to better meet their needs for teachers. This suggests a need for the states to set aside some funds and empower school management committees or block-level officers to hire temporary teachers to meet needs caused by illness, death, transfer, or maternity leave, as well as to address the problems caused by the shortages of teachers in specific subjects. Where suitable candidates cannot be found in the reserved categories, state governments should seek waivers from SC and ST commissions so that they can use contract teachers against the roster vacancies until candidates are available. Provided that safeguards are observed in their hiring, so as to protect academic and teaching standards, and provided they are fairly paid, contract teachers serve the public need much better than unfilled vacancies. Allowing more flexibility does not mean comprising on the quality of teachers or undercutting teachers on regular appointments: the need is to allow more use of contract teachers to fill temporary gaps, but to select them rigorously and to pay them fairly, so they can be held accountable for quality work.
- ◆ *Existing norms that require a Bachelor's degree in education to teach secondary school could be waived* for those who have other tertiary education degrees. Academic attainment and subject knowledge at the time of recruitment should be emphasized as a means to control quality, combined with enhanced opportunities for new recruits to earn teaching credentials on the job and for continuous professional development. Another option is to encouraging mid-career professionals to join the sector. This could bring new experience and energy into the profession. This is being tried out in other countries, such as the United States, Belgium, the Netherlands, and Sweden.
- ◆ *Provide financial, non-financial and career incentives for teachers to work in schools that do not attract sufficient candidates.* This will be particularly important to encourage teachers in rural areas. This policy is used by many countries around the world.
- ◆ *Allow more flexible deployment of teachers.* Options to improve the deployment of teachers are to expand enrollment to make more efficient use of available teachers; to commit supporting resources that can enable a teacher to teach a different subject closely related to his/her own—for example, so that a mathematics teacher can teach science; and dropping the requirement for schools to offer vocational subjects with a high degree of specialization.
- ◆ *Commit supporting resources, including Internet-based resources, which can enable a teacher to teach a different subject closely related to his/her own.*
- ◆ *Transfers.* A policy—strictly enforced—is needed to prevent transfers from taking place

in the middle of the school year, so as to avoid disrupting classes. Teachers' contracts should also specify that at least during the first three years of their service, they should remain on post without transfer.

- ◆ *Introduce renewal contracts for teachers.* To ensure that teachers keep abreast of their field and serve their students well, state governments could consider introducing a system of five-yearly contract renewal for newly recruited teachers. Renewal would be based on demonstration of successful completion on a minimum number of hours of in-service professional development.

#### 4.9.3 Regulation of Private Schools

Private schools which do meet government regulations have an interest in differentiating themselves from schools which do not, in order to attract more students. That is, higher quality schools lose in a situation of weak governance. In many countries private schools have responded to this by forming associations on their own, which agree on minimum standards and conduct "peer-based" accreditation. In India, private schools have also formed associations and franchises to ensure minimum levels of quality and their ability to signal that quality to parents. This may be a better approach than assuming the public sector has the capacity and independence to regulate private schools objectively.

That said, the public sector has an important role to play in providing information to the public regarding the quality of secondary schools (and at a minimum, their physical security). The criteria for private school recognition should be readily available on the Internet to interested citizens, as should the accreditation assessments done by school inspectors. All private schools should be encouraged to undertake self-assessments, based on national accreditation criteria issued by the NAAC, and accreditation reports prepared by school inspectors should also be available on the Internet. Random samples of accreditation assessments should be selected for secondary visits by senior inspectors to confirm the integrity of the recognition process, and forceful actions should be taken against those who issue recognition without full justification.

#### 4.9.4 School-Based Management and Decentralization

There are many factors (both school and household related) which help explain why private, unaided schools generate higher levels of student achievement. Nonetheless, because parents finance the costs of private unaided schools they, in accordance with state regulations, participate on school management committees, in key decisions and oversee the school principal. The private, unaided school principal, in turn, has significant authority to make decisions aimed at delivering the outcomes for which parents pay. This "short route" of accountability is powerful, as seen in the consistently higher achievement scores of students from private, unaided schools. There certainly appears to be considerable scope for strengthening the roles of school management committees in government schools at the secondary level, and for giving school principals the increased autonomy they need to produce results. A strategy which emphasizes school-based management would, of course, have to include extensive capacity-building of both school principals and school management committees.

#### 4.9.5 Management Information Systems

To manage the secondary level efficiently it is essential to establish a computerized management information system which captures key input and output information at the school level (inputs would include students, teachers, infrastructure, learning materials; outputs would include repetition, retention, examination pass rates), and aggregates this at district, state and central levels. Ideally, this would be web-based, so that the information is available to all interested stakeholders, including parents. This MIS system should be linked to information regarding both recurrent and investment financing flows, and to databases which capture standardized learning achievement results. This would enable central and state education officials to make better resource allocation decisions, and school officials to make the changes needed at their level. Feedback and discussion at local, state and central levels of school results, compared to flows of financial and material resources, would help to shift the focus from inputs to overall system performance. The current District

Information System for Education (DISE) provides an existing platform which could be extended to cover secondary education relatively easily.

#### 4.10 Conclusion

State departments of education and MHRD have a variety of options to consider for increased effectiveness of secondary school management. The process begins with the acknowledgement that current management structures have not produced the desired results in terms

of creating incentives and strengthening accountability to improve access, equity and quality. It continues with a willingness to pilot and rigorously evaluate on a small scale alternative management strategies and techniques. Based on the evaluation of these pilots, states can revise their strategies and scale them up gradually, being careful to pay attention to the capacity-building needs of the managers of secondary schools at all levels. All efforts to improve the management of secondary education are inextricably linked to the financing of secondary education, a topic which is treated in the next chapter.

## Chapter 5. Financing Indian Secondary Education

This chapter first describes historical patterns of education financing by central and state governments, for the sector overall and at the secondary level, in relation to GDP, total public spending, unit costs and incidence of benefits. Next, information from case studies in Rajasthan and Orissa is analyzed to review the sources and uses of funds at the school level, differentiated by types of school management. Finally, simulations are presented to project financial requirements for the expansion and qualitative improvement of secondary education over the next decade, and their affordability.

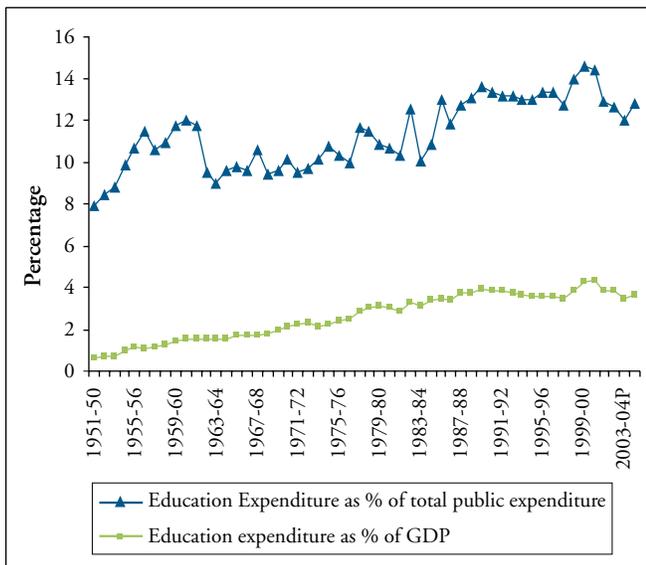
### 5.1 Secondary Education Spending in its Sectoral Context

India's public spending on the education sector as a whole, at 3.7 percent of GDP (US\$24 billion) in 2004,

(World Bank, 2004c).<sup>60</sup> As a share of total public expenditure, education spending was 12.8 percent in 2003-04 (Figure 5.1). In absolute terms, total public spending on education in 2006 was almost US\$30 billion, including both investment (plan) and recurrent (non-plan) spending by both the central and state governments combined. The bulk of public expenditure on education comes from state governments; in 2006, the states accounted for about 75 percent of total public expenditure on education. Distinguishing between Plan (largely investment) and non-Plan (largely recurrent) expenditures, however, the balance is somewhat different: more than 50 percent of Plan spending comes from the central government (Figure 5.2).

Private sources, mostly households, supplement public expenditure and supply nearly 30 percent of the nation's

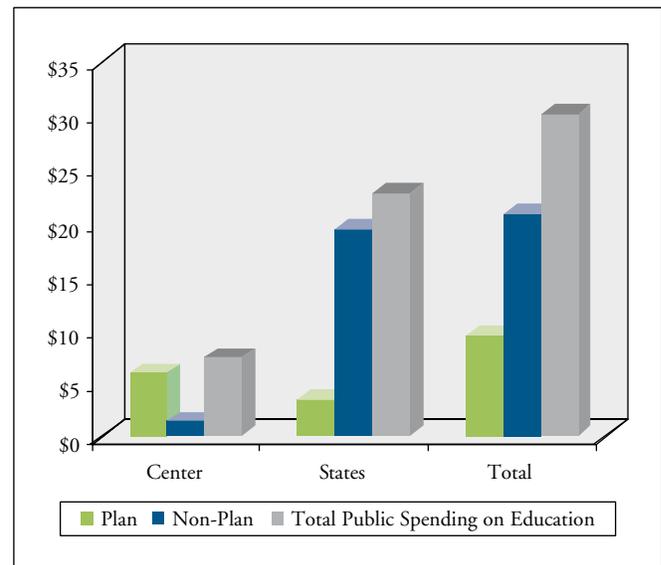
**Figure 5.1: Public Expenditure on Education as % of Total Public Expenditure and as % of GDP, 1951–2004**



Source: MHRD website. [www.education.nic.in](http://www.education.nic.in)

is higher than average education spending of 3.3 percent of GDP among low-income countries, but just over half the typical share in OECD countries (5–6 percent)

**Figure 5.2: Central and State Governments' Shares of Plan and Non-Plan Expenditure on Education, 2006 (US\$ Billion)**



Source: MHRD, *Analysis of Budgeted Expenditure on Education, 2006*.

<sup>60</sup> It is also higher than China's (3.3 percent), but India's demographic structure differs from China's. With the success of the one-child policy, China's total fertility rate is below replacement level and its under-25 population accounts for less than 40 percent of its total population, whereas India's comparable figure is 52 percent of the population.

total education spending, compared with 24 percent in Indonesia and only 7 percent on average in the OECD countries (Table 5.1). Indian household spending on education was estimated at around 1.4 percent of GDP in 1995-96<sup>61</sup> – slightly above the OECD level of 1.3 percent in the same period (OECD, 1998). This figure is almost certainly higher now given the rapid expansion of private unaided schooling over the past ten years.

India pursued the drive to universal elementary education, since 2000 the share of investment financing for secondary education has declined significantly (Figure 5.3). The distribution of recurrent spending among different levels of education remained quite stable, however, declining only slightly in recent years (Figure 5.4). These expenditures cover the operating cost of the system, of which the largest share comprises salaries

Table 5.1 Relative Proportions of Public and Private Expenditure on Education for Primary, Secondary, and Post-Secondary, Non-Tertiary Education, 2002				
Private sources				
	Public sources	Household expenditure	Expenditure of other private entities	All private sources
<i>OECD Country mean</i>	92.8	6.1	2.6	7.2
France	93.0	5.5	1.5	7.0
Germany	81.7	9	16.8	18.3
Japan	91.7	7.4	0.9	8.3
Korea	77.4	20.8	1.7	22.6
United Kingdom	86.5	13.5	n	13.5
United States	91.6	8.4	n	8.4
<i>OECD Partner countries mean</i>	75.3	23.9	1.5	24.7
India	70.7	27.0	2.2	29.3
Indonesia	76.2	22.3	1.4	23.8

*Source: Authors' compilation from OECD, Education at a Glance, 2005.*

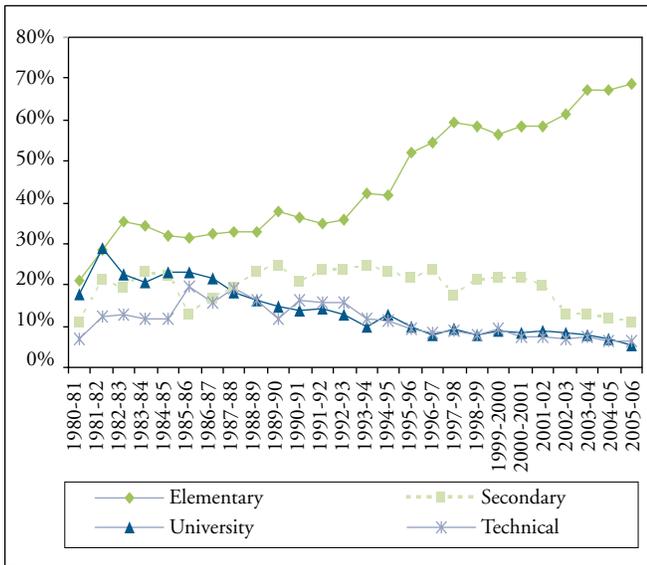
### 5.1.1 Public Spending on Elementary versus Secondary Education

India has no centrally sponsored scheme in secondary education equivalent to SSA in elementary education; the expansion of secondary enrollment over the last decade largely took place in the private sector. While

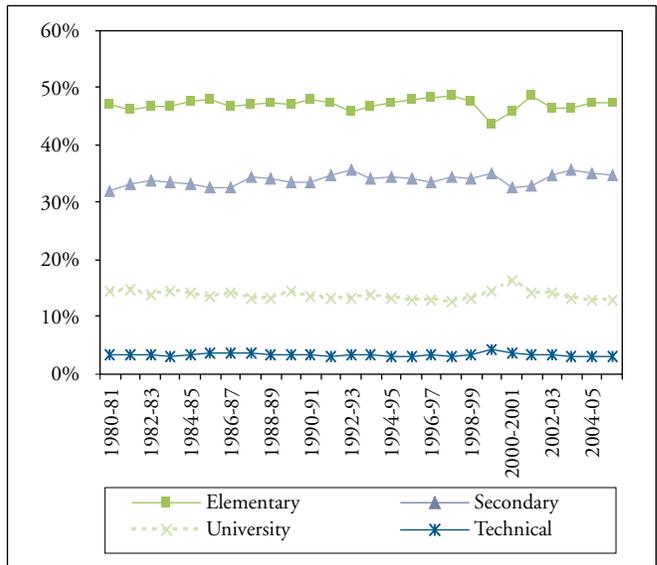
and wages. The share of spending at each level in 2004-5 for elementary (Grades 1–8), secondary (Grades 9–12) and higher education were 52 percent, 30 percent and 18 percent, respectively (Figure 5.5); this has remained relatively stable. In absolute terms, total public spending on secondary education amounted to about US\$7.2 billion, equivalent to 1.11 percent of GDP.

<sup>61</sup> Based on estimates of the 52nd Round of the National Sample Survey, which has an expanded education module. Because there has not been any expanded education module of the National Sample Survey after 1995-96, there is no updated information on household expenditure on education.

**Figure 5.3: Intra-Sectoral Allocation of Investment Spending on Education, 1980–2006**



**Figure 5.4: Intra-Sectoral Allocation of Recurrent Spending on Education, 1980–2006**

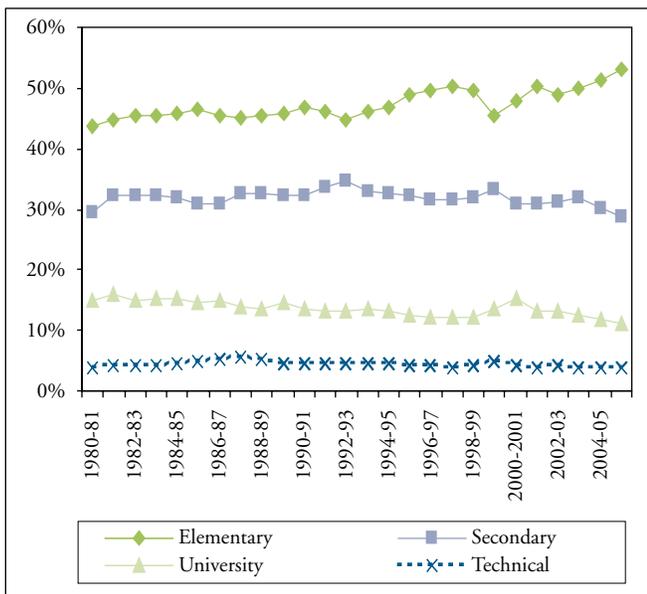


Source: MHRD, *Analysis of Budgeted Expenditure on Education, various years.*

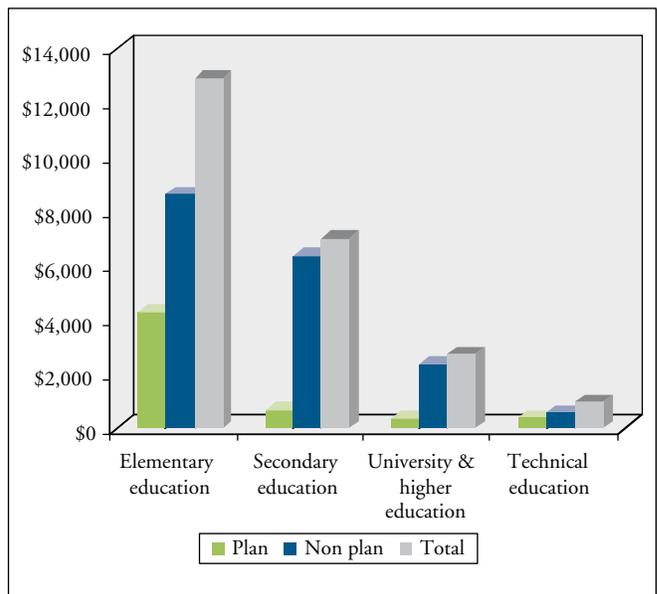
In 2006, combining both recurrent (non-plan) and investment (plan) spending, elementary education accounted for just over half of total public spending on education, secondary education for about 30 percent, tertiary education for 12 percent, and technical education

for 4 percent (Figure 5.5). As a share of total expenditures, elementary education has increased steadily since 2000, while secondary education has declined slightly. Figure 5.6 juxtaposes the large investments in elementary education with the small investment at the secondary level in 2006.

**Figure 5.5: Intra-Sectoral Allocation of Investment and Recurrent Spending on Education, 1980–2006**



**Figure 5.6: Public Expenditure on Education by Level, 2006 (US\$ Million)**



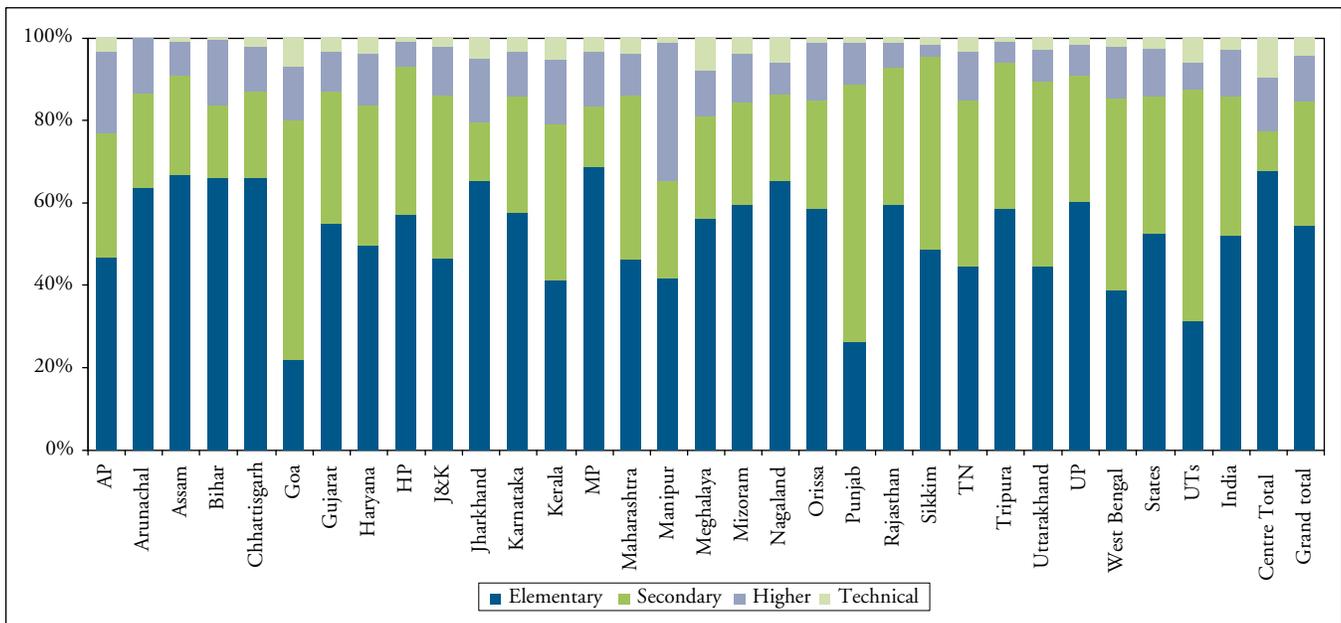
Source: MHRD, *Analysis of Budgeted Expenditure on Education, various years.*

### 5.1.2 Differences across States

In most states, elementary education takes a relatively large share of public education spending which is not surprising (Figure 5.7), the exceptions being Goa, Punjab, and West Bengal. States have to trade off investing in and sustaining elementary education against investing in other levels of

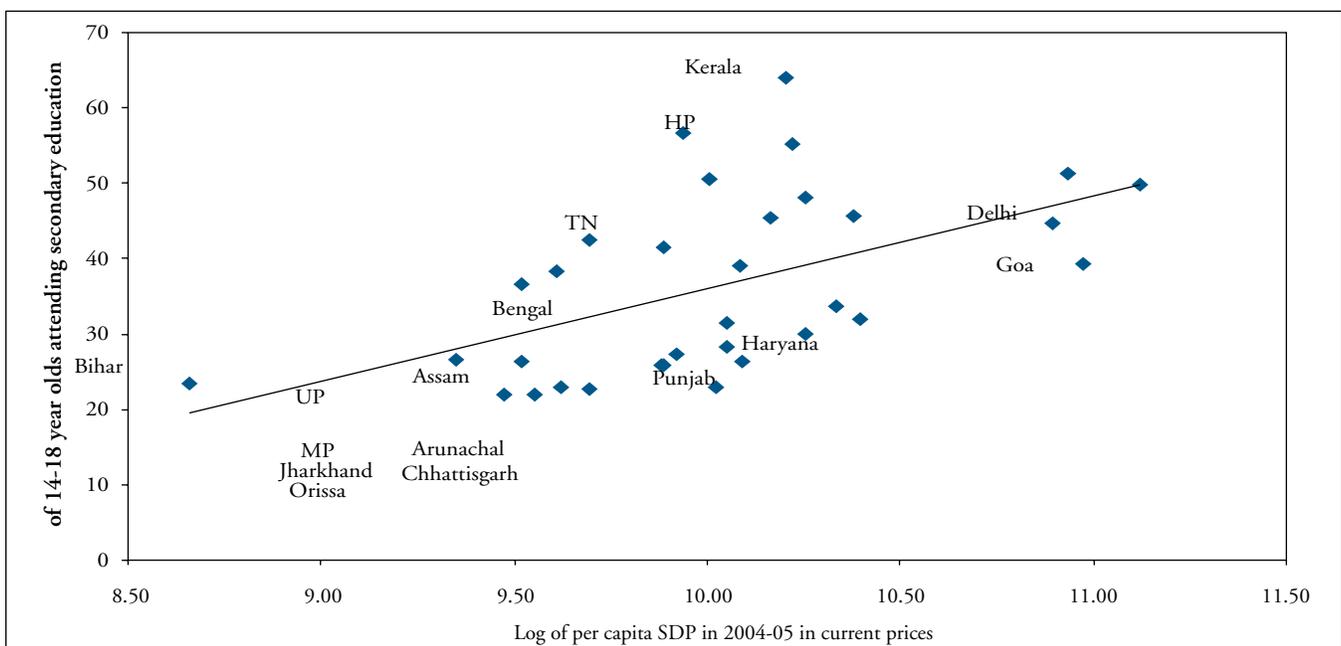
education. In addition, lower-income states do show lower attendance rates in secondary education (Figure 5.8). If secondary education is to expand nationwide, the central level will need to provide proportionately more funds to lower-income states, for both investment and recurrent financing.

**Figure 5.7: Intra-Sectoral Resource Allocation across States, 2006**



Source: Authors' compilation based on MHRD, *Analysis of Budgeted Expenditure on Education, various years*.

**Figure 5.8: State Per-Capita GDP and Secondary Enrollment Rates, 2004-05**



Source: Authors' analysis of MHRD's enrollment and expenditure data.

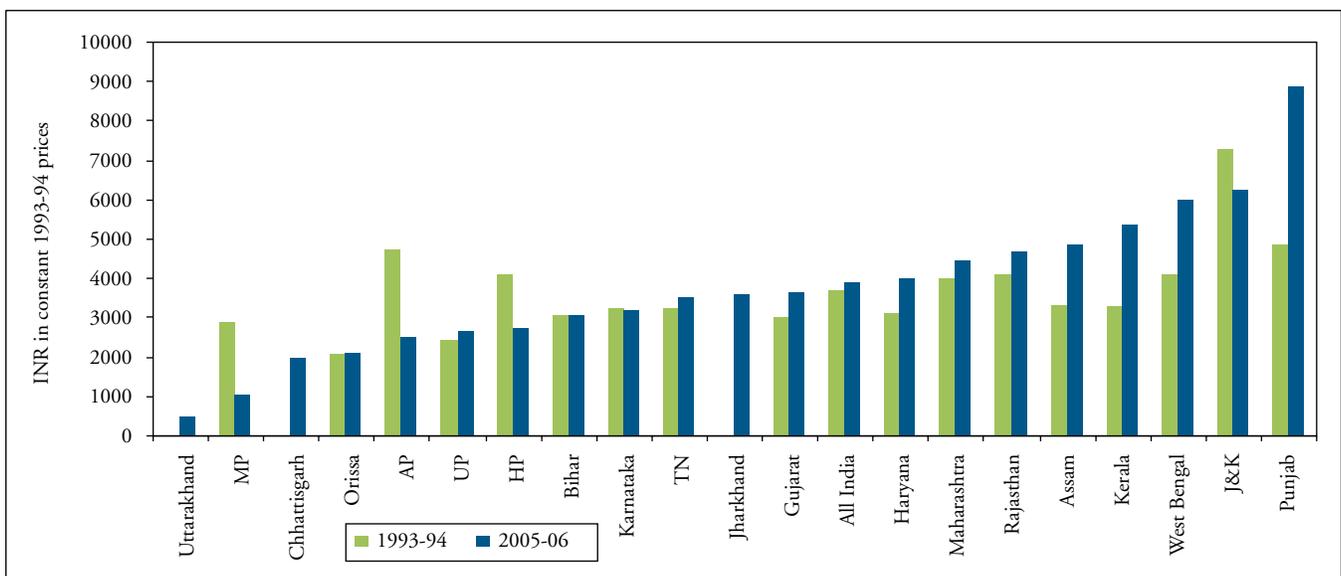
Over the decade from 1993–2006, almost all states increased their spending on secondary education, both in real terms, and as a share of state gross domestic product (SGDP), but most states still spend less than one percent of their SGDP on secondary education. In addition, over the past decade most states increased their spending per student in secondary education in real terms (Figure 5.9), partly because economic growth made higher spending possible but also because the private unaided sector absorbed much of the expansion in numbers of students

involve matching grants from the state in ratios that are specified in the respective schemes.

### 5.2.2 Uses of Public Spending on Education

Central government expenditures in secondary education are mainly for centrally run schools or national institutions. A large proportion is earmarked for *Kendriya Vidyalaya Sangathan* (KV schools), which were set up in 1965 for children of government employees, and for *Navodaya Vidyalaya Samiti* (NV schools), which were

**Figure 5.9: Variation across Major States in Secondary Level Per Student Expenditure, in Government and Aided Schools, 1993-94 and 2005-06 (In Constant 1993-94 Rupees)**



Source: Authors' calculation based on MHRD, *Analysis of Budgeted Expenditure on Education, various years*.

## 5.2 Sources and Uses of Public Spending on Secondary Education

### 5.2.1 Sources of Public Spending on Secondary Education

In 2005, the states and UTs supplied about 75 percent of total public spending on secondary education, leaving about 25 percent to be supplied by the Union Government. The states' revenue for education comes from multiple sources: (i) the state's own tax and non-tax revenues; (ii) statutory transfers from the Union Government; (iii) the block grant for the state plan; and (iv) centrally sponsored schemes (CSSs) of the central line ministry, such as computer education in secondary education. These CSSs

established to educate talented rural children. Between 2001 and 2003, expenditure on KVs increased from 41 to 45 percent of central government spending on secondary education, and the share of NV increased from 36 to 41 percent. NCERT and the vocationalization of secondary education received almost equal shares, each of less than 4 percent. NIOS, which was set up in 1989 to provide distance education to students who could not continue within the mainstream institutions, received a paltry 1 percent.

Recurrent (non-Plan) expenditure takes the vast majority of the states' spending on secondary education. Some 95 percent of this spending goes to government, local body, and private aided schools (and is used mostly for salaries). The allocation to these three types of schools is not

proportional to their shares of enrollment: private aided schools receive 50 percent of the allocation but account for only 34 percent of all secondary schools, while government schools receive 35 percent of the allocation, less than their 42 percent share of the schools (Table 5.2).

Individual states' allocation of their spending by school type differs widely from the national average, and reflects the relative numbers of government, local body, and private aided secondary schools. Where the private sector

is large (e.g. Kerala, Tamil Nadu, Goa, Maharashtra, Gujarat, and West Bengal), grants-in-aid account for a much larger share of secondary education spending (Figure 5.10). Over the last 15 years, almost all states have reduced their spending on grants-in-aid in an effort to control expenditures. The established patterns within states indicate a need for differentiated financing policies, with more or less emphasis on government schools or aided private schools in the drive to expand access and improve quality of secondary education.

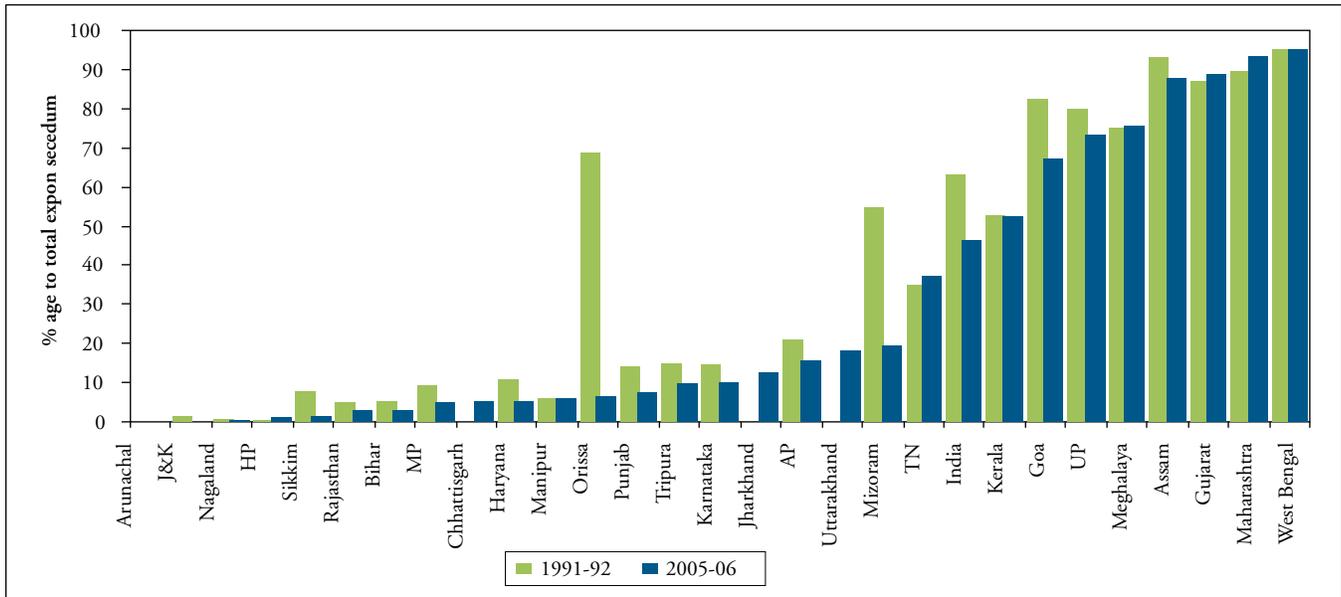
Table 5.2

### State Public Spending by Category, as a Percentage of Total Spending on Secondary Education

	Gov't Schools	Administration and Inspection	Grants in Aid to Private Schools	Aid to Municipal schools	Teacher Training	Text-books	Scholarships	Other	Non-formal education
AP	12	0.1	16	63	1	5	0.1	4	
Assam	5	2	88		0.5		0.1	5	
Bihar	94	2	3				0.2	1	
Chhattisgarh	91		5	1	1	1	0.1	1	1
Goa	9	0.0	67				0.1	24	
Gujarat	4	0.3	89	5	0.1	0.1		2	
Haryana	89	2	5		0.3		1	2	
HP	87	3	1					9	
Jharkhand	82	3	13					3	
Karnataka	10	1	10	75	0.1	1	0.2	3	
Kerala	37	3	52	0.2	3			4	
MP	77	0.2	5	16	1	1			
Maharashtra	0.2	0.4	93	6	0.5				
Manipur	86	1	6	2	0.4		0.5	4	
Meghalaya	19	4	76		0.6	0.1	0.4	1	
Mizoram	68	2	19		1		3	5	2
Nagaland	69	27	0.4			1	0.4	2	
Orissa	89	1	6		2		0.1	2	
Punjab	91	1	7					0.5	
Rajasthan	88	2	3				2	6	
Sikkim	91	6	1			1		1	
Tamil Nadu	59	2	37		0.3		0.1	2	
Tripura	89	0.1	10	0.2	1		0.2		
Uttarakhand	76	4	18				0.1	2	
UP	8	1	73				0.1	18	
West Bengal	1	2	95		0.2			1	
<b>All India</b>	<b>35</b>	<b>3</b>	<b>47</b>	<b>9</b>	<b>0.4</b>	<b>0.4</b>	<b>0.2</b>	<b>6</b>	<b>0.0</b>

Source: Analysis of Budgeted Expenditure on Education, MHRD, 2006.

**Figure 5.10: Variation across States in Spending on Grants-in-aid as a Percentage of Total Spending on Secondary Education, 1991-92 and 2005-06**

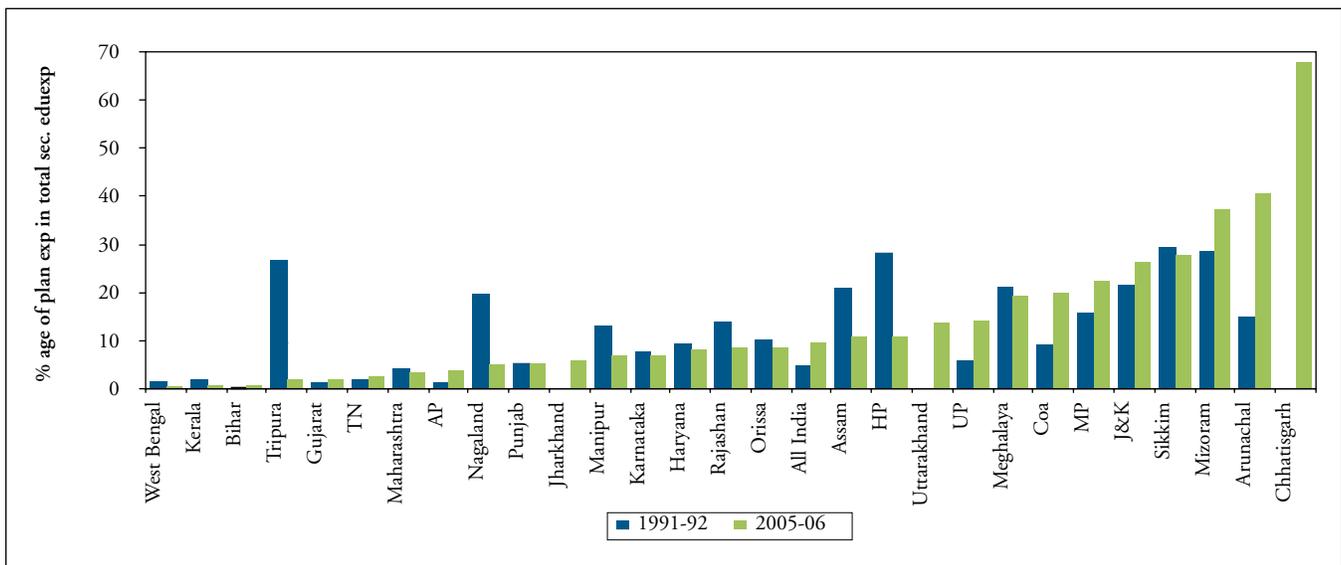


*Source: Authors' compilation based on MHRD, Analysis of Budgeted Expenditure on Education, various years.*

In most states, the share of investment expenditures in secondary education spending is quite small, at less than 10 percent, and is spent on developing government schools. Not surprisingly, states with large private systems (e.g. West Bengal, Gujarat and Kerala) spent miniscule

amounts on expanding public provision. However, many states with predominantly public systems (e.g. Bihar, Punjab, Andhra Pradesh) also spent very little. Overall, Figure 5.11 shows extremely limited public investment in secondary education by the states, with a few exceptions.

**Figure 5.11: Share of Investment (Plan) Expenditure in Total Secondary Education Expenditure, by States, 1991-92 and 2005-06**



*Source: Authors' compilation based on MHRD, Analysis of Budgeted Expenditure on Education, various years.*

### 5.3 Measures of Relative Costs and Efficiency of Spending

#### 5.3.1 Per Student Spending, by School Type

Data on per-student spending give a sense of how much money is needed to achieve a year of enrollment. These data also enable comparisons of spending at different levels of education and across countries and states, when they are converted to a common basis such as per student spending as a percentage of per capita GDP. And in a time series, they provide important information on what happens to per student costs as enrollment in an education system increases.

	Primary	Secondary	Tertiary
Fast-growing economies	11	18	55
Slow-growing economies	13	24	265
India (2004-05)	8	27	60

India's estimate is based on authors' calculation from Selected Education Statistics, 2004-05, MHRD.

*Source: International comparison is reproduced from World Bank, 2005a.*

As seen in Table 5.3, compared with international benchmarks, India's per student public spending as a percentage of GDP per capita is somewhat high in secondary education (27 percent versus 18 percent for fast-growing economies). In addition, Table 5.4 shows that India's per-student public spending on secondary education is relatively high as a ratio of per student spending on primary education (2.9), and double the average for fast-growing economies (1.4). In absolute terms, however, secondary level per student spending is calculated at US\$173 per year (Table 5.5), which is not high by international standards. By comparison, spending per student in secondary education ranges from \$577 in Latin America and the Caribbean to \$257 in Sub-Saharan Africa to \$117 in South Asia (Binder, 2006).

Which type of school spends most per student? To judge this with certainty would require up-to-date information

Table 5.4 Typical Per-student Cost Pattern by Education Level and Economic Growth Record

	Fast-growing economies	Slow-growing economies
Per-student spending on secondary education as a ratio of per-student spending on primary education	International: 1.4 India: 2.9	International: 2.2
Per-student spending on tertiary education as a ratio of per-student spending on secondary students	International: 3.0 India: 3.2	International: 11.0

*Source: International benchmark is reproduced from World Bank, 2005a, p. 143. Indian figures are authors' estimates.*

on enrollment and spending by all school types, including in private unaided schools – which is not available. It is safe to assume that private schools in urban areas serving the upper income quintiles have unit costs considerably higher than these averages, while those in rural areas serving poorer households have lower unit costs than these averages, given their ability to hire teachers at lower salaries than those in public schools. Table 5.5 present information for just publicly-funded schools, both public and private. Government schools appear to spend the least per student, while local body schools (representing a relatively small fraction of total enrollment) spends the most per student. Private aided per student costs are approximately 25 percent higher than in government schools.

	Enrollment	Unit Cost (Rs.)	Unit Cost (US\$)
Government	11,325,984	6,722	148
Local Body (Municipal)	2,116,743	11,003	283
Private Aided	14,479,627	8,306	183
		Weighted Average	173

*Source: Selected Education Statistics, 2004-05, MHRD.*

### 5.4 Measures of the Equity of Public Spending on Education

In many countries, overall public spending on education favors the rich, because a high proportion of it goes to higher education, where most of the students are from

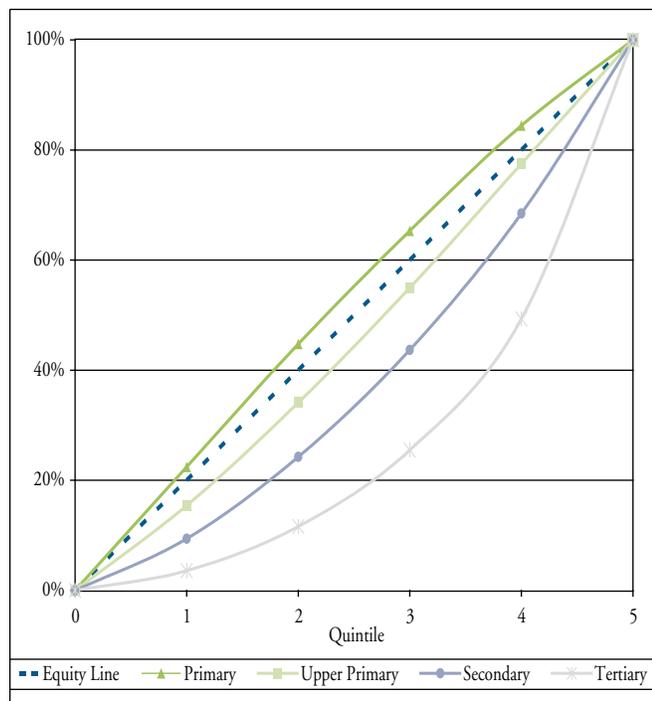
relatively wealthy families. By contrast, India's current weighting of education spending towards elementary education is pro-poor. The poor tend to have more access to elementary education than tertiary education, poor families also typically have more children than rich families, and universal enrollment in elementary education means that even the poorest can attend school. The higher the enrollment ratio in public elementary education, the more equitable is public spending.

Figures 5.12 and 5.13 show that India's public spending on education has become more progressive as the poor have increased their enrollment in government elementary and secondary schools, and wealthier students have moved out of government schools into private schools. Within secondary education, the distribution of public subsidies has improved but remains unequal, in large part because of

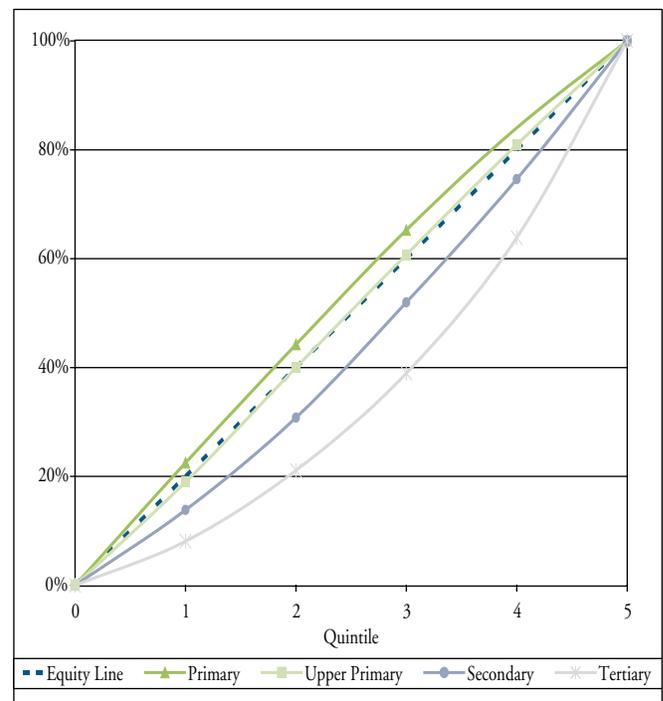
the very low enrollment ratio among poor young people. Tertiary education shows a similar pattern.

The Lorenz curves for states at contrasting ends of the secondary education spectrum—Kerala and Rajasthan—illustrate that the equity of spending depends on the stage of development of the education system (Figure 5.14 and Figure 5.15). Kerala, with a gross enrollment ratio of 62 percent in secondary education, has the most equal distribution of public spending on secondary education among all the states. Its subsidies are distributed almost equally between urban/rural areas and among girls and boys, and among students from all consumption quintiles. The curves in Rajasthan, whose gross enrollment rate in secondary education is 40 percent, show that rural girls are distinctly disadvantaged, as very few of them participate in secondary education.

**Figure 5.12: Lorenz Curve – Distribution of Public Expenditure on Education by Level and by Quintile, 1999**



**Figure 5.13: Lorenz Curve – Distribution of Public Expenditure on Education by Level and by Quintile, 2004**



*Source: Authors' analysis of National Sample Surveys, 55th and 60th rounds.*

*Note:* The 45 degree line of equity in these two graphs represents equal distribution of public spending on education to students in each of the five household per capita consumption quintiles. The closer the Lorenz curve to the line of equity, the more equitably spending is distributed. A curve above the line of equity indicates that more public spending is distributed to the poorer households.

Figure 5.14: Lorenz Curves in Kerala, 1995

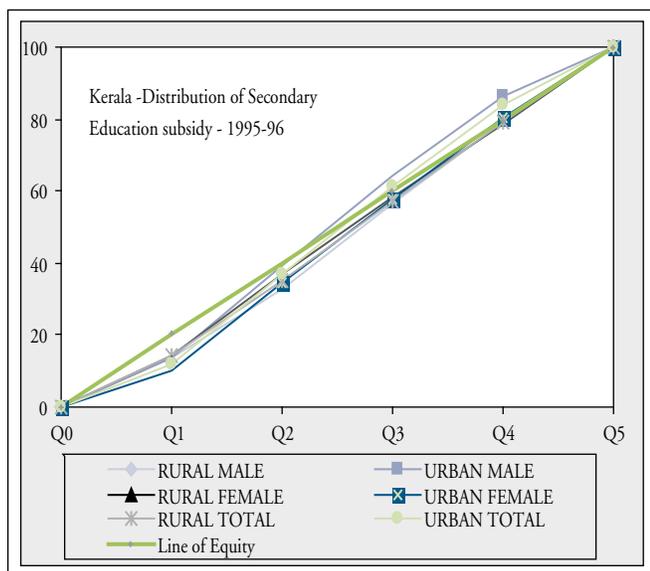
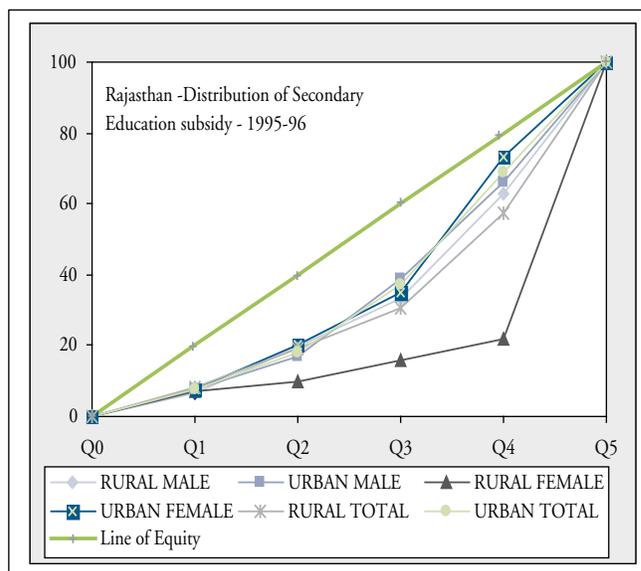


Figure 5.15: Lorenz Curves in Rajasthan, 1995



Source: Authors' analysis of the National Sample Survey, 52nd round.

In summary, because of uneven access to secondary education, state subsidies for secondary education are distributed inequitably. The trend is improving, however, and further expansion of public secondary schooling will encourage a more equitable use of public resources, as has been happening in elementary education.

## 5.5 School-level Finance

This section is based on the authors' analysis of data from the surveys of secondary schools in Rajasthan and Orissa of 2005.

### 5.5.1 Schools' Sources of Funds

Schools obtain funds from three major sources: (i) government allocations in cash or in kind; (ii) school-raised funds or donations by individuals, community, or corporations; and (iii) student fees.

*Government allocations.* The Rajasthan and Orissa school surveys found that almost all government and private grant-in-aid schools receive subsidies from government in one form or other; one-fourth of the private unaided schools also reported receiving some help from government. Government funds supply more than 98 percent of the resources for government schools, 67 percent of the recurrent expenditures

in private aided schools, and 10 percent of the total funds in private unaided schools. While private unaided schools may not receive any direct funding from government, they often receive tax exemptions, land at concessional costs, subsidies in different forms (such as teacher in-service training and curriculum guides), and a variety of other incentives. These indirect subsidies are rarely taken into account in comparing the cost efficiency of public and private schools. Government funds may come either directly from state ministries or be channeled through local education departments. While funds for salaries often come from state ministries, funds for school maintenance and construction come partly from local governments. Aided schools receive funds for salaries from the state but must finance their own land and infrastructure.

*Student fees.* Unlike for elementary education, India has no constitutional commitment to provide free education at the secondary and post-secondary levels.<sup>62</sup> User fees are prevalent in secondary education, in government, aided, and unaided schools alike. The most prevalent user charges are tuition fees. Other types include: one-off admission or entry fees to a school; monthly tuition fees; semester or annual examination fees; charges for using library, laboratory, or sports materials; and charges for participating

<sup>62</sup> The Directive Principles of State Policy (Article 45) of the Indian Constitution direct the state governments to provide free and compulsory elementary education.

in school activities such as the National Service Scheme or the Boy and Girl Scouts.

For user fees in government schools, the secondary education departments of the states have the prerogative to fix the amount and the periodicity of collection, but government schools are required to remit to the state department of education all the fees they collect. Aided schools are required to remit part of their fees to government, but they are allowed to keep funds that they have raised for construction/repair or other specified activities. Fee levels in private aided schools are decided by

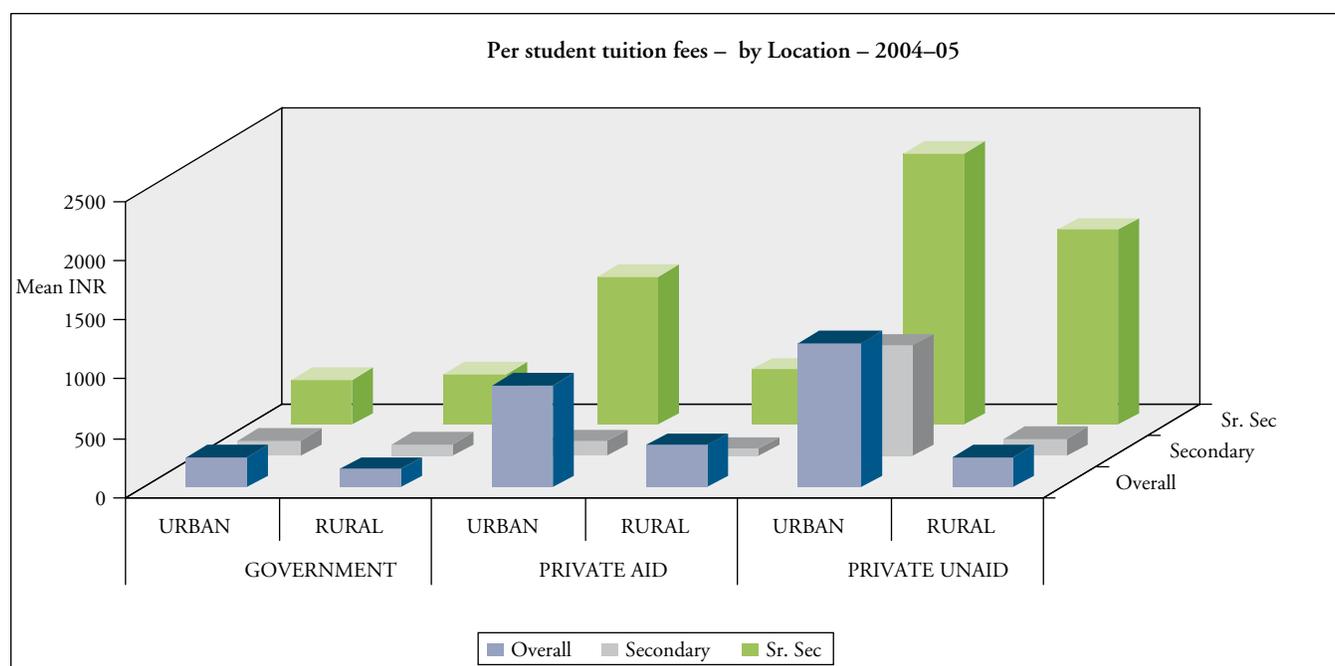
the school boards that manage these schools; student fees become part of school revenue. While government and most of the aided schools make ends meet, unaided schools usually make a profit from the fees and funds they raise.

Student fees vary across school types and the level of secondary education (Table 5.6). Tuition fees charged per student are highest in the private unaided schools, followed by private aided schools. Not surprisingly, urban private unaided secondary schools charge higher tuition fees than their counterparts in rural areas (Figure 5.16).

Table 5.6	Monthly Tuition Fees in Rupees in Public and Private Secondary and Senior Secondary Schools in Rajasthan and Orissa (Standard Deviation in Parenthesis), 2005			
	Secondary Schools		Senior Secondary Schools	
	Rajasthan	Orissa	Rajasthan	Orissa
Government	49 (132)	30 (38)	49 (46)	82 (-)
Aided	239 (N/A)	50 (60)	1917 (1127)	84 (116)
Unaided	809 (726)	78 (176)	1603 (1008)	2186 (3084)

Source: Authors' analysis of the surveys of secondary schools in Rajasthan and Orissa, 2005.

Figure 5.16: Per-student Tuition Fees by School Type and by Urban and Rural Location, 2005



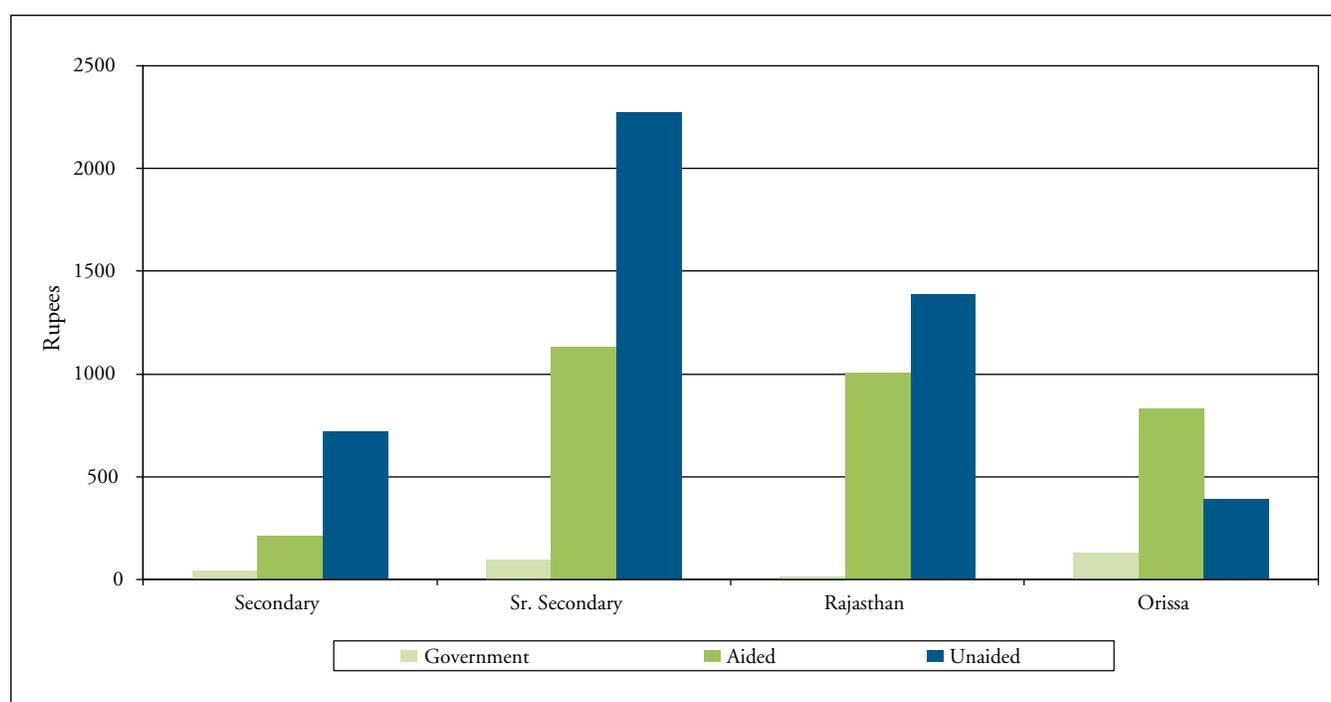
Source: Authors' analysis of the surveys of secondary schools in Rajasthan and Orissa, 2005.

*Private donations or school-raised funds.* Schools receive private funds from individual donors, companies, religious organizations, and from their own campaigns to raise funds from parents and communities. Government schools are much less successful at raising private funds than are private aided and unaided schools; the average per-student private resources raised by schools ranges from around Rs.50 in government schools to slightly above Rs.1,000 in private unaided schools. Senior secondary schools raise twice as much as secondary schools (Figure 5.17).

### 5.5.2 Schools' Uses of Funds

Schools use funds to cover the full range of capital and recurrent costs. These include school construction, staff salaries, maintenance grants, school supplies, teaching and learning materials, classroom supplies, text books, teacher-guides, other reading-writing materials, sports equipment, materials/substances required for laboratory use, library books, student fellowships and stipends (Table 5.7). Private schools in general spend more on teacher development and on other items such as fees paid to school owners/managers, reflecting the profit made by these schools. These findings

**Figure 5.17: Per-Student Private Funds Raised by Schools, 2004-05**



*Source: Authors' analysis of Surveys of Secondary Schools in Rajasthan and Orissa, 2005.*

(Percentage)							
School Type	Salaries	Utilities & supplies	Teacher Development	Student Stipends	Repair & Maintenance	Other Items	Total
Government	95	1	0	1	1	2	100
Aided	80	4	8	1	1	6	100
Unaided	23	12	24	1	2	38	100

*Source: Authors' analysis of Secondary School Survey from Rajasthan and Orissa, 2005.*

are consistent with those of other studies (Duraiamy and Subramanian, 2000 and Qamar Zahid, 2000 in Mukhopadhyay, ed., 2002; Kingdon 1996).

*Salaries:* Salaries constitute the largest cost component of spending by government and aided schools. In government schools, they account for 95 percent of the expenditure, and in aided schools, which receive around 30 percent of their funds from private sources, salaries absorb 80 percent of overall expenditures. Regulations in most states require that teachers in aided schools be paid on par with those in government schools, though this is not always observed. Teachers in unaided schools are paid much less than teachers in government and aided schools, where job opportunities are restricted by a merit-cum-reservation method of selection. In unaided schools, salaries account for less than a quarter of spending, on average (where the largest proportional expenditures are in unknown “other items”).

## 5.6 Options to Increase Financing For Secondary Education

Five options are discussed below for increasing financial resources for secondary education.<sup>63</sup>

### Option (1): Increase overall allocations to the education sector, including to secondary education

This option is already under implementation, with very large increases in education spending committed by the GoI in the 11th Five-Year Plan (2008–2012). In August 2007 GoI publicly committed to increasing their spending on education from 3.7 to 6.0 percent of GDP during this period (in collaboration with the states), which in a period of rapid economic growth translates into truly massive increases in education funding. For accelerating public expenditure, the Central Budget 2004 introduced a cess of 2 percent on major central taxes/duties for elementary education, and the Central Budget of 2007 introduced a cess of 1 percent for secondary and higher education. Total

11th Plan central government spending on education is forecast at Rs. 2.70 lakh crore (US\$67.5 billion), 20 percent of which (US\$13.5 billion) is for secondary education. Indeed, the question to be asked is whether these resources can be absorbed efficiently at the state level and produce the desired results.

### Option (2): Shift resources from other levels within the education sector

This option looks the least promising, given the urgent need to continue investing in elementary education to achieve Education for All and the MDGs. Reaching the remaining out-of-school children and improving the quality of elementary education will not come cheaply. In addition, the current shares of education spending by level are well-balanced by international standards, with elementary, secondary and higher education receiving 52 percent, 30 percent and 18 percent, respectively, of the education budget. Higher education is also being targeted by the GoI for a major expansion, with the goal of increasing enrollment from 10 to 20 percent by 2020. This suggests that there will be little margin for increasing the share of secondary education in total education spending.

### Option (3): Reduce Unit Costs and Improve Efficiency

There appears to be considerable potential for this option, given that unit costs are calculated to be 27 percent of GDP/capita (compare with the figure of 10 percent in Sri Lanka in Box 5.1). Indeed, countries which have expanded secondary education successfully over the past 20 years have maintained balanced ratios of per-student public spending across the three levels of the education system, whereby spending per secondary student averages only 1.4 times more than spending per primary student (versus 2.9 times more in India).<sup>64</sup>

Strategies to reduce unit costs include increasing the pupil-teacher ratio and class size, improving teacher utilization and efficiency of time, increasing teachers' workloads, reducing average teaching costs (by aligning salaries of new hires more closely to market rates, and/or hiring assistant teachers at

<sup>63</sup> The five options in a generic sense are drawn from “Financing Secondary Education in Developing Countries: Strategies for Sustainable Growth”, by Keith Lewin and Francoise Caillods, UNESCO, 2001. Their application to the case of India is based on the authors' own analyses.

<sup>64</sup> Expanding Opportunities and Building Competencies for Young People: A New Agenda for Secondary Education”, World Bank, 2005.

lower salaries combined with larger classes), limiting non-salary costs (e.g. boarding and food expenditures), and increasing school size. Efficiency can be improved by reducing dropout and repetition, strengthening teacher management (e.g. through MIS systems) to ensure that all teachers are rationally deployed and to eliminate “ghost teachers” from the payroll, and introducing needs-based or formula-based funding systems. In addition, teacher absenteeism can almost surely be reduced through better community and/or principal oversight, leading to more pupil time on task and increased school effectiveness. Almost all of these actions require improved school leadership.

Reducing capital costs is another key area for improvement. Earlier discussion of public-private partnerships gave examples of how capital costs for construction and equipment of secondary schools can be spread out over the medium- to long- term; competitive bidding processes can lower the final unit costs of this approach compared to current practices. Alternatively, the public sector can encourage communities to mobilize the capital financing themselves, with the promise of public financing for operational costs, or the government can transfer funds to the community to finance all or a portion of these capital costs. Experience with SSA suggests that communities can finance simple infrastructure for less than what central public bidding procedures can achieve, although secondary level infrastructure is more complicated than that for the primary level. Adding secondary classrooms to existing secondary (or upper primary schools) would reduce capital costs for land, enclosures, etc.

Double-shifting allows enrollment capacity to be doubled at a minor marginal cost, especially in urban areas. (This is almost universally practiced in Latin America – some schools even triple shift.) Alternating morning and afternoon shifts, hiring separate staff, increasing maintenance budgets and other strategies can overcome some of the drawbacks of such a system. Such a system can also allow youth who need to work continue their education, in the afternoons or evenings.

#### Option (4): Cost Recovery

This section reviews some indicative data on cost recovery before discussing pros and cons of seeking to recover more of the public costs of secondary education.

#### Box 5.1: Case Study from Sri Lanka

Sri Lanka’s success in expanding secondary education is mainly due to its ability to maintain unit costs of schooling at relatively low levels, averaging around 10 percent of GDP per capita. Interestingly, this is achieved not through high pupil:teacher ratios (which average about 26:1), but rather by maintaining salary levels low relative to GDP. Secondly, many elementary schools include secondary sections, which mean both levels can benefit from economies of scale on fixed costs, and even sharing of staff and learning supplies for greater efficiency of operational costs. Teachers are often fungible between upper elementary and secondary. As a result, the costs of secondary school are on average no more than twice those for primary education.

*Source: Lewin and Caillods, “Financing Secondary Education in Developing Countries”, UNESCO/IIEP, 2001.*

India has not used tuition fees as a significant source of financing public education. As seen in the analysis above, official fees in the government schools are low. The contribution of private sources to financing for publicly provided secondary education has been shrinking. In the 1950s, government recovered about 20 percent of its spending on secondary education from student fees, but by the mid-1990s, this share had declined to less than 4 percent ( Table 5.8).

(Percent)					
Year	Gov’t	Local Bodies	Student Fees	Others	Total
1950-51	57	11	20	12	100
1961-62	68	6	17	8	100
1970-71	76	6	13	6	100
1980-81	82	5	8	5	100
1987-88	86	7	4	3	100
1989-90	84	10	4	3	100
1995-96	90	2	4	5	100

*Source: Based on Education in India (various years); till 1989-90, cited in NIEPA (2002).*

Note: The figures are rounded and may not add up to 100.

One school of thought considers that raising or implementing school fees is a viable policy option for generating revenues for expansion and for improving quality. Free provision of elementary education is generally justified by its high social rates of return, and also by merit-good reasons. But in secondary education, cost-recovery through user fees in education can be justified based on the higher private returns to education at this level. Detractors argue that imposing fees would lead a substantial group of students to withdraw from school, and would deter young people at the margin from participating in education, and that the disadvantages would fall disproportionately on poor households.

In practice, households in all income classes spend large amounts on secondary education, as was seen in Chapter 2. The most recent national data, which unfortunately are for 1995-96, show that for a rural household at the 50th percentile, the average cost of sending a child to secondary school was almost half of average annual per capita household income; for the poorest rural households, this share was as high as 87 percent. According to the 55th round of the National Sample Survey (1995-96), the average private cost of sending a child to a secondary school in India was Rs. 1,619 a year in 1995-96. This figure does not take into account the opportunity costs such as forgone earnings, which tend to increase with a student's age.

Without proper panel data, it is not possible to estimate the own-price elasticity of demand for education. However, the high expenditures on education by all income quintiles can be taken to signify a low price elasticity of demand for secondary schooling, conditional on enrollment.

In general, the impact of user fees on household spending on education will depend on income distribution and on household tastes and preferences. We can think of households divided into three categories of preferences: A, B, and C. Category A households are those who will reduce their spending on schooling when user fees are imposed, because education is now a relatively expensive good and they will have to forgo a large amount of consumption on other goods to buy public

education of a given quality. Category B households may increase their expenditure on education because they would have spent relatively highly on education without free public education, but whether they will choose to remain within the public education system or leave it in favor of better quality private education is an empirical question. Category C households will not be affected because they were using the private sector even in the presence of free public education. Cost-recovery via imposing or raising fees can be justified if it leads to net positive returns, i.e., a large number of students do not cross over from the public to the private sector, and the reduction in demand for secondary schooling by the poorer households (category A) is mitigated by targeted scholarships to the households in that category.

Imposing user fees in secondary education is less regressive than doing so in primary education. Using Roy's identity, it is possible to interpret enrollment rates as first-order approximations of welfare incidence for small changes in school costs or fees.<sup>65</sup> Table 5.9 shows the attendance ratios for elementary (6-14 years) and secondary (15-18 years) education for students from the first and the fifth household consumption quintiles in selected Indian states, using data from the 43rd (1987-88) and 55th (1999-2000) rounds of the National Sample Survey. In both years, the average difference in attendance ratios between the first and fifth quintiles is smaller for elementary than for secondary education, even though the difference for secondary education varies widely across states. This table supports the argument that charging fees in secondary education is not as likely to hurt the poor as much as charging fees in elementary education; fewer students from the poorest quintile receive secondary education and their needs can be addressed through targeted financial assistance.

Based on estimates of the minimum monthly salary for a qualified private secondary school teacher in the current labor market (estimated at Rs. 6,000), additional minimum non-salary expenditures at the secondary level (estimated at 30 percent of a teacher's salary), and minimum number of students per class (30), it is possible to calculate a theoretical

<sup>65</sup> For large changes, such an interpretation would overstate the reduction in private welfare as students dropped out.

State	Primary and Secondary Attendance Ratios, First and Fifth Quintiles, Selected Indian States 1987-88 and 1999-2000							
	Elementary				Secondary			
	1987-88		1999-2000		1987-88		1999-2000	
	Q1	Q5	Q1	Q5	Q1	Q5	Q1	Q5
Andhra Pradesh	43	72	67	82	12	31	16	54
Assam	61	80	70	90	28	59	42	73
Bihar	24	61	34	74	20	43	17	52
Gujarat	55	87	70	95	18	49	29	60
Haryana	61	84	69	95	23	58	22	70
Karnataka	48	77	68	90	16	39	23	48
Kerala	89	97	91	95	36	67	48	78
Madhya Pradesh	37	68	56	86	17	40	24	62
Maharashtra	60	88	81	96	27	55	40	68
Orissa	29	77	53	90	9	40	24	57
Punjab	53	86	74	93	24	45	29	72
Rajasthan	37	66	56	85	18	39	21	57
Tamil Nadu	65	87	87	94	15	46	27	68
Uttar Pradesh	31	71	61	84	15	45	31	58
West Bengal	38	80	59	90	17	54	19	61

*Source: Authors' estimates from National Sample Surveys, 43rd Round and 55th Rounds.*

minimum unit cost for a private secondary school of approximately Rs. 2,600 per year (US\$65), or Rs. 260 per month per child. Comparing that minimum monthly school fee with average consumption quintiles (disaggregated by urban and rural) provides a rough estimate of to what extent secondary education could be financed exclusively by households, under the assumption that households (particularly poor ones) will be unable to spend more than 5 percent of total household consumption on one child's

schooling (note: average household size suggests multiple children in school, as well). Table 5.10 below indicates that even using minimum estimates of the cost of private secondary schooling, it is unaffordable without public subsidization for households in the lowest three consumption quintiles (perhaps the lowest four quintiles in rural areas). This suggests that the limit of private unaided secondary schooling in India is 35-40 percent of total secondary enrollment (compared to 30 percent today).

Table 5.10	Calculation of Affordability of School Fees (Indian Rupees, 2004-05), by Consumption Quintile, Urban and Rural				
	Q1 (lowest)	Q2	Q3	Q4	Q5 (highest)
Rural Household Average Monthly Consumption\1	1,299	1,786	2,230	2,845	5,378
Minimum Monthly Schooling Fee (Rs. 260) as % of Average Rural Household Consumption\2	20%	15%	12%	9%	5%
Urban Household Average Monthly Consumption\1	1,772	2,717	3,734	5,351	11,570
Minimum Monthly Schooling Fee (Rs. 260) as % of Average Urban Household Consumption\3	15%	10%	7%	5%	2%

\1: Per Capita Consumption Quintiles from NSS, 61st round, 2004-05;

\2: Average Rural Household Size: 4.9 (NFHS III)

\3: Average Urban Household Size: 4.6 (NFHS III)

Whether cost recovery is a viable option for expanding coverage and improving quality in secondary education is ultimately an empirical question, whose answer will vary from state to state. Implementing user-fees also has political implications, and widespread political support would no doubt be required for this option to become policy. At a minimum, policies should be articulated such that schools which generate revenue through fees are allowed to retain them at the school, to be invested in quality improvement.

#### Option (5): Mobilize External Assistance

While India's financial needs for the expansion and improvement of secondary education are enormous, the Government of India has indicated its intention to allocate significantly increased domestic financing for this purpose under the 11th Five-Year Plan (2008–2012). Realistically, the estimated GoI allocation of US\$13.5 billion for secondary education dwarfs whatever external assistance could be mobilized from external sources, whether multilateral, bilateral or a combination of the two. Nonetheless, external financial assistance is a promising strategy for secondary education for several reasons.

First, external financial assistance can be used to pilot innovations and new models of secondary education more easily than can be done with government financing. Such external financing removes any trade-off between alternative uses of government financing which reduces opposition to pilots. In addition, external financing of pilot interventions typically comes with technical assistance and close monitoring to assess the implementation and impact of the pilots, which can increase the chances of success of the pilot and the generation of lessons learned for possible scale-up using government funds in a second phase.

Second, external finance can mobilize international best practice and technical assistance more effectively than domestic financing. This will be particularly important for initiatives designed to improve the quality and assessment of secondary education. Third, external assistance often brings a rigor in fiduciary oversight, which can be helpful when the central government is increasing its financing of programs implemented by the states and would benefit from application of international norms in financial

management, procurement and auditing. In other words, external assistance can increase the accountability of the states vis-à-vis the central government, and the effectiveness of overall public spending on education. Thus, while the amount of external assistance for improvement of secondary education may be small relative to domestic financing, it can be of very high value.

Finally, external financing for India's education system can still be mobilized on very favorable terms (grant basis for bilateral assistance or IDA-type terms for multilateral assistance). From an economic perspective, it would be better to use low-cost financing for secondary education if it is available, which would free up domestic funds for other uses (for which such low-cost financing may not be available). India's economic growth is such that these favorable terms may not be available much longer (for example, if India's GDP/capita surpasses US\$750 it may become ineligible for IDA financing for education), which is a good argument for mobilizing these funds sooner rather than later.

## 5.7 Simulations of Future Secondary Education Expenditures and Affordability

Secondary education builds on the foundation of elementary education, and is meaningful to students only if they have mastered the requisite skills at the previous level. Universal secondary enrollment only becomes a realistic goal once universal completion of elementary education is achieved. The expansion of secondary education enrollment and expenditures will depend in large part on how fast the National Program for Universal Elementary Education, *Sarva Shiksha Abhiyan* (SSA), can achieve universal coverage and improve quality at the elementary level, so that graduates from Grade 8 can participate in secondary education and benefit from it. The speed with which these goals are achieved in elementary education, and the way secondary education is financed, will affect the resources needed for secondary education within the next two Plan periods.

### 5.7.1 Resource Implications

Incremental resources are needed to finance the additional students entering secondary education. More specifically, additional resources are needed to finance recurrent

expenditures such as teacher salaries, inspection, maintenance, and learning resources, and capital expenditures for additional classrooms, teacher pre-service education, teacher in-service training, laboratories, and other facilities.

Table 5.11 presents estimates of additional resource requirements to fund the additional students, under four scenarios that assume different rates of improvement of elementary and secondary education, assuming an annual GDP growth rate of 6.5 percent between 2007–2017.<sup>66</sup> The first scenario simply extrapolates from recent historical trends in enrollments in elementary and secondary education. The second scenario assumes that elementary level efficiency targets established by Sarva Shiksha Abhiyan are achieved by 2012 (retention rate increases from 71 to 75 percent; and the transition rate from primary to upper primary increases from 83 to 89 percent), which would increase the numbers of Grade 9 entrants. The third scenario integrates scenario two and

and eliminates the “gate keeping” function of the Grade 10 exam, which increases the transition rate from secondary to senior secondary education from 75 to 90 percent.

The baseline is India’s GDP in 2005, at factor cost of Rs. 28,439 billion (US\$ 653 billion), and total public spending on secondary and senior secondary education equivalent to 2005 Rupees 31.5 thousand crore (US\$7.2 billion) or 1.11 percent of GDP in 2005.<sup>67</sup> Viewed from a national perspective, if GDP continues to grow at 6.5 percent over the next decade, the additional resource requirements for all four scenarios are affordable, although spending at the secondary level in real terms would need to increase significantly between 2008–2015 to attain scenarios three and four. However, given the wide variation in state GDP growth rate projections, and the fact that states with lower secondary enrollment rates tend also to be poorer states with lower state SGDP growth, it cannot be assumed that all four scenarios would be affordable for all states. The so-called “lagging states” (Uttar Pradesh, Bihar,

Table 5.11

## Additional Resource Requirements to Finance Expansion of Secondary Education

	Scenario 1			Scenario 2		
	Total (recurrent and investment) Spending on Secondary (2005 Rs. Crore)	Annual Real Increase in Secondary Spending	Total Secondary Spending as a % of GDP	Total (recurrent and investment) Spending on Secondary (2005 Rs. Crore)	Annual Real Increase in Secondary Spending	Total Secondary Spending as a % of GDP
2008	32,258	8.9%	1.00%	32,258	8.9%	1.00%
2009	34,712	7.6%	1.01%	34,712	7.6%	1.01%
2010	35,300	1.7%	0.96%	35,300	1.7%	0.96%
2011	37,209	5.4%	0.95%	37,209	5.4%	0.95%
2012	40,078	7.7%	0.97%	42,924	15.4%	1.03%
2013	43,127	7.6%	0.98%	45,159	5.2%	1.02%
2014	45,368	5.2%	0.96%	47,393	5.0%	1.01%
2015	45,262	- 0.2%	0.90%	46,499	- 1.9%	0.93%
2016	43,520	- 3.8%	0.82%	45,819	- 1.5%	0.86%
2017	40,589	- 6.7%	0.71%	41,915	- 8.5%	0.74%

assumes improvements in the internal efficiency of secondary education, as well (decrease in repetition and dropout). The fourth scenario incorporates the second and third scenarios

Orissa, Rajasthan, Jharkhand and Chhattisgarh), in particular, would find it difficult to finance either the third or fourth scenario. A state-specific analysis is required of secondary and senior secondary enrollment projections, compared to current levels of recurrent spending and projected growth rates.

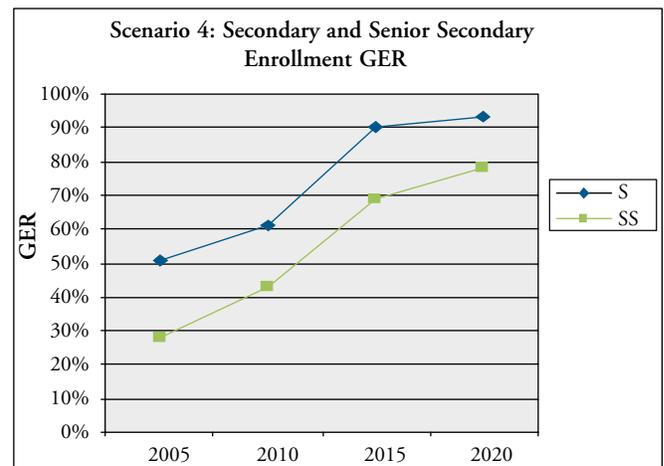
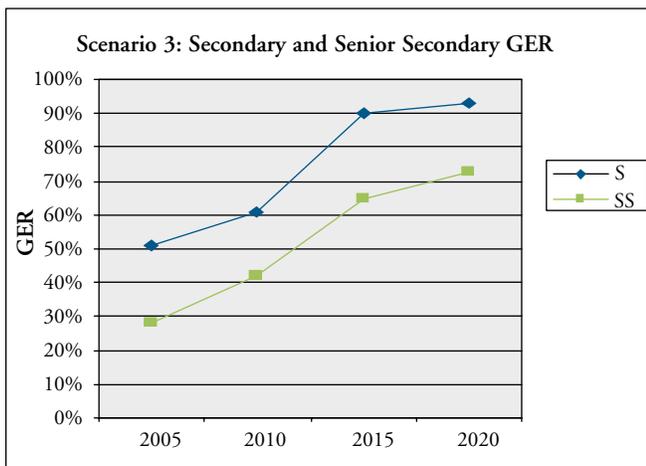
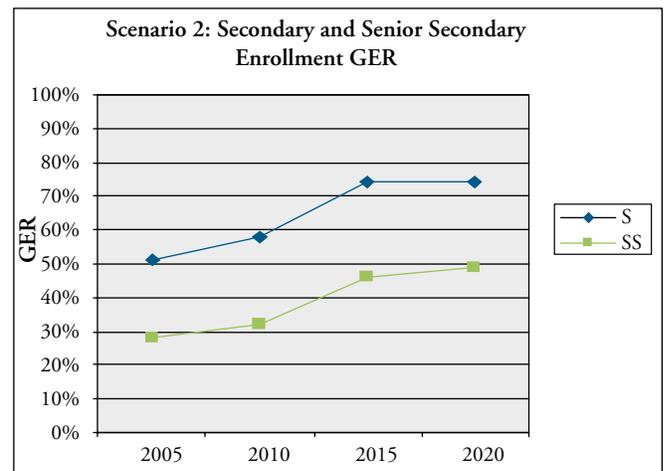
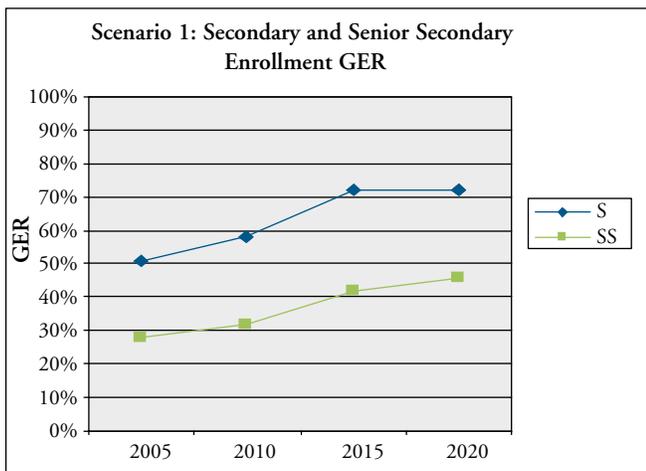
<sup>66</sup> Based on the CAFE committee’s analysis, an additional quarter of one percent of GDP on average will be required to improve the access and quality of secondary education.

<sup>67</sup> See Selected Educational Statistics, 2004-05.

	Scenario 3			Scenario 4		
	Total (recurrent and investment) Spending on Secondary (2005 Rs. Crore)	Annual Real Increase in Secondary Spending	Total Secondary Spending as a % of GDP	Total (recurrent and investment) Spending on Secondary (2005 Rs. Crore)	Annual Real Increase in Secondary Spending	Total Secondary Spending as a % of GDP
2008	38,760	24.6%	1.20%	39,913	28.4%	1.24%
2009	39,687	2.4%	1.16%	41,643	4.3%	1.21%
2010	41,176	3.6%	1.13%	44,532	6.9%	1.22%
2011	44,737	8.7%	1.15%	48,426	8.7%	1.24%
2012	47,544	6.3%	1.15%	51,370	6.1%	1.24%
2013	57,642	21.2%	1.15%	61,801	20.3%	1.4%
2014	58,703	1.8%	1.30%	65,256	5.6%	1.39%
2015	57,842	-1.5%	1.25%	64,666	-0.9%	1.29%
2016	59,965	3.7%	1.15%	64,325	-0.5%	1.2%
2017	56,561	-5.7%	1.12%	60,124	-6.5%	1.1%

Source: Author's calculations, based on Selected Education Statistics, 2004-05.

Figures 5.18–5.21: Projections of Secondary and Senior Secondary Gross Enrollment Rates, 2005–2020



The figures above show the estimated enrollment impact at secondary and senior secondary levels under the four scenarios. The first scenario shows the likely impact if historical trends at elementary and secondary levels continue (although this is unlikely without investment in secondary education), and projects gross enrollment rates for secondary and senior secondary education at about 70 percent and 45 percent, respectively. The second scenario projects improvements in retention and completion rates at the elementary level linked to SSA, with the result that projected enrollment rates for secondary and senior secondary education reach about 75 percent and 50 percent, respectively, by 2020.

The third scenario incorporates scenario two and includes internal efficiency and expanded supply at the secondary level, such that projected enrollment rates for secondary and senior secondary education reach about 90 percent and 70 percent, respectively, by 2020, a significant jump compared to scenario two. The fourth scenario incorporates scenario three, but also assumes a higher transition rate from secondary and senior secondary (for example, if the Grade 10 exam was eliminated), such that senior secondary enrollment reaches 80 percent by 2020. In no scenario does secondary education become “universal”, because it is assumed there will always be children who drop out because of academic or economic reasons, at elementary and secondary levels.

The financial implications of universalizing opportunity for secondary education, combined with needed investments in educational quality, reforms in public-private partnership models, and increased cost recovery, are manageable given India’s forecasted strong economic growth and revenue generation over the next ten years. All four plausible scenarios for secondary level expansion are affordable so long as growth remains at least 6 percent per year or so. However, given the predominant role of the states in financing the recurrent costs of secondary education, sustainable expansion may not be affordable for those predominantly agricultural states whose growth is lagging behind the rest of the country (which typically also have relatively low secondary enrollment rates). In these cases the center will have to increase financial

transfers to cover recurrent costs associated with the expansion of secondary education, or expansion will need to proceed at a slower pace.

## 5.8 A Centrally Sponsored Scheme for Universal Secondary Education

The 11th Five-Year Plan (2007–2012) envisions a centrally sponsored scheme like SSA for universalizing secondary education, called SUCCESS. Certain features of SSA have proven to be very useful, and could serve to inform the design of SUCCESS: household surveys to identify school-age children, bottom-up planning aggregated to the district level; community oversight; academic support to schools through cluster resource centers and block resource centers; MHRD coordination; center-state partnership in funding, mobilization of external funding, implementation support and independent supervision; and transparency of the process through web-based public information on minutes of the board meetings, resource allocation, aide memoirs of semi-annual review missions and audits.

However, not all the features of SSA are applicable—for two reasons. First, there is a difference in the age-group. Many of India’s youth aged 14–18 simply need to work, to contribute to their families’ income. It is not be feasible to make secondary education compulsory at this stage of national development, which would be necessary to make it universal. Second, SSA allocations are largely norm-based for public schools (for classroom construction, teacher allocation, days of training), applied nationwide with limited variation by state. The needs of secondary education are more diverse, and the situation in the states, particularly in terms of the mix of public, private aided and private unaided, calls for state-specific strategies. Thirdly, the greater complexity of resources required for secondary schools, and their wider demographic catchment areas, makes them less amenable to a community-based planning approach. Finally, SSA was preceded by almost a decade of experiments in education and then district primary education programs (DPEPs), where interventions were gradually scaled up. The same type of trial and improvement may be required for secondary education.

## 5.9 Conclusion

Slow (if steady) improvement in elementary education completion rates, uneven institutional and financial capacity at the state level, and less than satisfactory quality in elementary and secondary education, provide real constraints on the pace and strategies to improve secondary education. Nonetheless, given that the number of Grade 8 graduates is projected to increase from 16 to 22 million per year between 2007–2017, and that the total number of secondary students (grades 9–12) is projected to increase from roughly 40 to 60 million over the same period, the way forward must be planned.

The next four to five years will be the critical period to make the necessary long-lead time investments—in curriculum and textbook development; teacher education and training; educational technology development; improved teacher management and accountability; student assessment and examination reform; and enhanced quality assurance mechanisms—that are needed in order to strengthen the foundation for more rapid expansion of secondary education.

More concretely, with Central government objectives and financing intentions in place, states need to prepare their own secondary education development plans, which would: cover both levels of secondary education; address both supply- and demand- side issues related to access; set concrete targets for improvements in access, quality and equity, and outline the strategies to achieve

those targets; include both recurrent and investment financing needs over a five-year time frame; and identify what could be financed by the states and households themselves and what would need to be financed by the Center. Careful sequencing of the actions proposed is also important, as many of the measures designed to improve quality and to pilot demand-side financing mechanisms will take time to bear fruit before they can be scaled up. The sooner states engage in this strategic thinking for the development of secondary education, the better.

A recent global study on secondary education (World Bank, 2005a) led to conclusions which are perfectly applicable to India today. India needs to develop “a mass secondary education that (a) is responsive to the country’s socioeconomic needs and capabilities, (b) can respond effectively to increased and diversified demand by expanding access to secondary education, (c) is able to retain enrolled students in secondary education, and (d) helps students graduate with the knowledge, skills, attitudes and experiences needed to exercise their choices beyond secondary education.” Precisely how to do that will need to be determined by each Indian state, in collaboration with the Ministry of Human Resources Development. It is hoped that this study will contribute to the dialogue regarding secondary education in India, and lead to the formulation and implementation of policies and programs which make the vision of such a mass secondary education system a reality.

## References

- Acharya, Poromesh. 2002. "Education: *Panchayat* and Decentralization: Myths and Reality". *Economic and Political Weekly*. February 23.
- Aggarwal, D. D. 2003. *History and Development of Secondary Education in India*. Volume 1–3. New Delhi: Sarup and Sons.
- Aitkin, M., and Longford, N. 1986. "Statistical Modeling Issues in School effectiveness Studies", *Journal of the Royal Statistical Society*, 149(1), 1–43.
- Alderman, H., J. Behrman, S. Khan, D. Ross and R. Sabot, 1996a, "The Income Gap in Cognitive Skills in Rural Pakistan." *Economic Development and Cultural Change*, 44.
- Alderman, H., J. Behrman, S. Khan, D. Ross and R. Sabot, 1996b, "The Returns to Endogenous Human Capital in Pakistan's Rural Wage Market." *Oxford Bulletin of Economics and Statistics*.
- Alderman H and Gertler P. 1997. "Family resources and gender differences in human capital investments: the demand for children's medical care in Pakistan." In Haddad L, Hodinott J, Alderman H (Eds.). *Intrahousehold resource allocation in developing countries: models, methods, and policy* Baltimore Johns Hopkins University Press for the International Food Policy Research Institute.
- Alderman, H. and King, Elizabeth M., 1998, "Gender differences in parental investment in education", *Social Change and Economic Development* 9(4): 453–468
- Andrabi, Tahir, Jishnu Das, Asim Ijaz Khwaja, Rar Vishwanath, Tristan Zajonc, 2007. "Pakistan: Learning and Education and Achievements in Punjab Schools (LEAPS)," *World Bank Discussion Paper*, page xvii.
- Angrist, Joshua, Eric Bettinger, Erik Bloom, Elizabeth King, and Michael Kremer. 2002. "Vouchers for Private Schooling in Colombia: Evidence from a Randomized Natural Experiment," *American Economic Review* 92.
- Atkinson, Adele, Simon Burgess, Bronwyn Croxson, Paul Gregg, Carol Propper, Helen Slater and Deborah Wilson. 2004. "Evaluating the Impact of Performance-Related Pay for Teachers in England." CMPO Working Paper 04/113, University of Bristol, Bristol.
- Banerjee, Abhijit; Shawn Cole, Esther Duflo, and Leigh Linden. 2004. "Remedying Education: Evidence from Two Randomized Experiments in India." National Bureau of Economic Research (NBER) Working Paper 11904.
- Barr, Nicholas. 1993. *The Economics of the Welfare State*. London: Weidenfeld and Nicolson.
- Barro, Robert, and Jong-wha Lee. 2000. "International Data on Educational Attainment Updates and Implications." National Bureau of Economic Research (NBER) Working Paper Series No. 7911.
- Barro, Robert, and Xavier Sala-i-Martin. 2003. *Economic Growth*. 2nd Edition. Cambridge, Massachusetts: MIT Press.
- Barrow, Lisa, and Cecilia Elena Rouse. 2005. "Causality, Causality, Causality: The View of Education Inputs and Outputs from Economics." Federal Reserve Bank of Chicago, WP 2—5–15.
- Bashir, Sajitha. 2003a. *A Policy Note on the Grant-in-Aid System of Indian Education*. The World Bank. South Asian Human Development Sector Report No. 3.
- \_\_\_\_\_. 2003b. "Uttar Pradesh Teacher Management Study." Draft Report.
- Bashir, Sajitha, and Vandana Sipahimalani-Rao. 2002. "Karnataka Teacher Management Study." Draft.
- Batra, Poonam. 2005. "Voice and Agency of Teachers: Missing Link in National Curriculum Framework 2005." *Economic and Political Economy Weekly*. October: 4347.
- Becker, Gary. 1964. *Human Capital*. New York: Columbia University Press.
- Behrman, J.R., Birdsall, N., and Szekely, M. 2003. "Economic policy and wage differentials in Latin America." Working Paper No.29. Washington, DC: Center for Global Development.
- Bils, Marks, and Peter J. Klenow. 2000. "Does Schooling Cause Growth?" *American Economic Review* 90(5) December: 1160-83.
- Binder, Melissa, 2006. "The Cost of Providing Universal Secondary Education in Developing Countries." In

- Educating All Children: A Global Agenda*, ed. Joel E. Cohen, David E. Bloom, and Martin B. Malin. Cambridge, MA: The MIT Press.
- Bhargava, Alok, Matthew Jukes, Damaris Ngorosho, Charles Khilma, and Donald A.P. Bundy. 2005. "Modeling the Effects of Health Status and the Educational Infrastructure on the Cognitive Development of Tanzanian Schoolchildren." *American Journal of Human Biology* 17:280–292.
- Blossfeld, H.P., Shavit, Y. 1993. *Persistent Inequality: Changes in Educational Opportunities in Thirteen Countries.* Boulder CO: Westview Press.
- Bouhuijs, Peter, and Peter Edelenbos. 2005. "Indian Curricula and Syllabi Compared to International Standards". Commissioned by the World Bank for this study on Secondary Education in India. Draft.
- Burstein, Leigh. 1980. "The Analysis of Multi-Level Data in Educational Research and Evaluation", *Review of Research in Education* 4: 158–233.
- Campbell, Donald Thomas, and Julian Stanley 1963. *Experimental and Quasi-Experimental Designs for Research.* Boston: Houghton Mifflin.
- Carnoy, Martin, and McEwan Patrick. 2001. "Does Privatization Improve Education? The Case of Chile's National Voucher Plan." Stanford University School of Education Paper.
- Card, David, and Alan Krueger. 1995. *Myth and Measurement: The New Economics of the Minimum Wage.* Princeton, N.J.: Princeton University Press.
- Chaudhury, Nazmul, Dilip Parajuli, 2006. "Conditional Cash Transfer and Female Schooling: Impact of the Female School Stipend Program on Public School Enrollments in Punjab, Pakistan", World Bank.
- Choi, Kilchan, Pete Goldschmidt, and Kyo Yamashiro. 2005. "Exploring Models of School Performance: from Theory to Practice." In Joan Herman and Ed Haertel, eds., *National Society for the Study of Education* 104 (2).
- Choi, Kilchan, Michael Seltzer, Joan Herman, and Kyo Yamashiro. 2004. *Children Left Behind in AYP and Non-AYP Schools: Using Student Progress and the Distribution of Student Gains to Validate AYP.* CSE Report 637. Center for the Research on Evaluation, Standards, and Student Testing, University of California, Los Angeles (CRESST/UCLA).
- Chubb, John E., and Terry M. Moe. 1990. *Politics, Markets, and America's Schools.* Washington, DC: The Brookings Institution.
- CIA World Fact Book. <<http://www.cia.gov/cia/publications/factbook/geos/in.html>>
- Clarke, Prema. 2003. *Secondary Education in India.* The World Bank, South Asia Human Development Sector Report No. 2. Washington, DC.
- Clotfelter, Charles, Helen Ladd, and Jacob Vigdor. 2004. "Teacher Sorting, Teacher Shopping, and the Assessment of Teacher Effectiveness." Sanford Institute of Public Policy, Duke University.
- Clotfelter, Charles., Helen Ladd, Jacob Vigdor, and Roger Aliaga Diaz. 2004. "Do School Accountability Systems Make It More Difficult for Low-Performing Schools to Attract and Retain High-Quality Teachers?" *Journal of Policy Analysis and Management* 23 (2): 251–71.
- Cohen, Daniel, and Marcelo Soto. 2002. "Why are Poor Countries Poor? A Message of Hope which Involves the Resolution of a Becker/Lucas Paradox." Center for Economic Research Paper (CERP) Discussion Paper Number 3528. September.
- Craig, Helen, "Teacher Education Quality Assurance: Teacher Certification" (DRAFT), World Bank Policy Brief, January 2009.
- Croninger, R. G., and Lee, V. E. 2001 "Social Capital and Dropping Out of High School: Benefits to At-Risk Students of Teachers' Support and Guidance." *Teachers College Record* 103, no. 4 548–581.
- Cullen, J., Jacob, B. and Levitt, S. (2003). "The Effect of School Choice on Student Outcomes: Evidence from Randomized Lotteries." NBER Working Paper #10113.
- Dahlman, Carl J., and Anuja Utz. 2005. *India and the Knowledge Economy: Leveraging the Strengths and Opportunities.* Washington, DC: World Bank.
- Darling-Hammond, L. (Ed.). 1994, *Professional development schools: Schools for developing a profession.* New York: Teachers College Press.
- Darling-Hammond, L. 1990, "Achieving our goals: Superficial or structural reforms?" *PHI DELTA KAPPAN*, 72, 286-295. EJ 418 155.

- Das, Deepa. 2006. "Review of Learning Assessment Strategies Under SSA." Draft.
- Das, Jishnu. 2008, Comments on draft report, "Secondary Education in India: Universalizing Opportunity".
- Das, Jishnu and Tristan Zajonc, 2008. "India Shining and Bharat Drowning: Comparing Two Indian States to the Worldwide Distribution in Mathematics Achievement", Draft.
- Denison, Edward. F. 1967. *Why Growth Rates Differ: Post-War Experience in Nine Western Countries*. Washington, D.C.: Brookings Institutions.
- Deon Filmer, Elizabeth M. King, and Lant Pritchett, 1998 "Gender Disparity in South Asia: Comparisons Between and Within Countries Dataset", The World Bank.
- Dreze, Jean and Amartya Sen (1995): "*INDIA: Economic Development and Social Opportunity*." Oxford University Press.
- Drèze, J. and Geeta Gandhi Kingdon. 2001. "Does Cost of Primary Education Matter: Evidence from Rural India", Planning Unit, Indian Statistical Institute, New Delhi.
- Duraisamy, P. 2002. "Changes in Returns to Education in India, 1983-94: by gender, age-cohort and location." *Economics of Education Review* 21: 609–622.
- Duraisamy, P. (1988) "An Econometric Analysis of Fertility, Child schooling and Labor Force Participation of Women in Rural Indian Households." *Journal of Quantitative Economics* 4(2): 293–316.
- Easterly, William. 2002. *The Elusive Quest for Growth: An Economist's Adventures and Misadventures in the Tropics*. Cambridge, Massachusetts: MIT Press.
- Elena Glinskaya and Michael Lokshin, 2005 "Wage Differentials between the Public and Private Sectors in India", The World Bank.
- Elmore, Richard, and Deanna Burney. 2000. *Understanding Comprehensive Reform: An In-Depth Look at the Eleven Components*. SERVE Center at University of North Carolina at Greensboro.
- Elmore, Richard. 2002. "Bridging the Gap between Standards and Achievement: The Imperative for Professional Development in Education." Albert Shankar Institute.
- EDUSAT INDIA. <http://www.edusatindia.org/>
- Filmer, D., E. M. King and L. Pritchett (1998) "Gender disparities in South Asia: Comparisons between and Within Countries". World Bank Working Paper Series 1867. World Bank, Washington DC.
- Friedman, Milton. 1955. "The Role of Government in Education." In R. A. Solo, ed., *Economics and the Public Interest*. New Brunswick, NJ: Rutgers University Press.
- Fullan, Michael. 2001. *The New Meaning of Educational Change*. New York, NY: Teachers' College Press.
- \_\_\_\_\_. 2004. *Leadership and Sustainability: System Thinkers in Action*. Thousand Oaks, California: Corwin Press.
- Galiani, Sebastian, Paul Gertler, and Ernesto Schargrotsky. 2005 "School Decentralization: Helping the Good Get Better but Leaving the Rest Behind". <http://www.preal.cl/FIE/pdf/lopbc/Galiani.pdf>
- Gertler P and Glewwe P. 1992. "The Willingness to Pay for Education for Daughters in Contrast to Sons: Evidence from Rural Peru." *World Bank Economic Review* 6:171–88.
- Glewwe, Paul, Michael Kremer, and Sylvie Moulin. 2001. "Textbooks and Test Scores: Evidence from a Perspective Evaluation in Kenya." [http://www.usaid.gov/locations/sub-saharan\\_africa/newsletters/docs/sda/absspr97.pdf](http://www.usaid.gov/locations/sub-saharan_africa/newsletters/docs/sda/absspr97.pdf)
- \_\_\_\_\_. 1997. "Textbooks and Test Scores: Evidence from a Prospective Evaluation in Kenya." [Unpublished Manuscript.
- Glewwe, Paul, and Hanan Jacoby. (1994). "Student Achievement and Schooling Choice in Low-Income Countries: Evidence from Ghana." *The Journal of Human Resources*, 29(3), 843–864
- Glewwe, Paul, and Michael Kremer. 2003. "Schools, Teachers, and Education Outcomes in Developing Countries." In *Handbook on the Economics of Education*. [Forthcoming].
- Glewwe, Paul, Michael Kremer, Sylvie Moulin, and Eric Zitzewitz. 2000. "Retrospective vs. Prospective Analyses of School Inputs: The Case of Flip Charts in Kenya." National Bureau of Economic Research (NBER) Working Paper 8018. Forthcoming in *Journal of Development Economics*.

- Glewwe, Paul, Nauman Ilias, and Michael Kremer. 2003. "Teacher Incentives." National Bureau of Economic Research (NBER) Working Paper 9671.
- Goldstein, Harvey, and David J. Spiegelhalter. 1996. "League Tables and Their Limitations: Statistical Issues in Comparisons of Institutional Performance." *Journal of the Royal Statistical Society Series A* (159): 384–443.
- Government of Hong Kong, Special Administrative Region, China. 2002. "Performance Indicators for Hong Kong Schools: For Secondary, Primary, and Special Schools." Quality Assurance Division, Education Department.
- Government of India. 1996. "Population Projection for India and States 1996–2016." Registrar General, Ministry of Home Affairs.
- \_\_\_\_\_. 1989. Project Document: Mahila Samakhya-Education for Women's Equality, Department of Education, March.
- \_\_\_\_\_. 2001. "Size, Growth Rate and Distribution of Population." in *Census of India 2001*. Series 1, Paper of 2001. Census of India. <http://www.censusindia.net/data/chapter3.pdf>
- \_\_\_\_\_. (2002). Seventh All Indian Education Survey. New Delhi, India.
- \_\_\_\_\_. 2003a. *Sarva Shiksha Abhiyan Framework of Implementation*. The Ministry of Human Resources and Development (MHRD). New Delhi, India.
- \_\_\_\_\_. 2003b. "Learning Achievement of Students at the End of Class V." Department of Educational Measurement and Evaluation. National Council of Educational Research and Training (NCERT). New Delhi, India.
- \_\_\_\_\_. 2005a. "Free and Compulsory Education Bill and Other Issues Related to Elementary Education." Central Advisory Board of Education (CABE). New Delhi, India.
- \_\_\_\_\_. 2005b. "Girls' Education and the Common School System." Central Advisory Board of Education (CABE). New Delhi, India.
- \_\_\_\_\_. 2005c. "Universalization of Secondary Education." Central Advisory Board of Education (CABE). New Delhi, India.
- \_\_\_\_\_. 2005d. "Autonomy of Higher Education Institutions." Ministry of Human Resource Development.
- Department of Secondary and Higher Education. New Delhi, India.
- \_\_\_\_\_. 2005e. "National Curriculum Framework 2005." National Council of Educational Research and Training (NCERT). New Delhi, India.
- \_\_\_\_\_. Department of Women and Child Development. New Delhi, India. <http://www.wcd.nic.in>.
- \_\_\_\_\_. Various Years. National Council of Educational Research and Training (NCERT). Fourth *All Indian Education Survey* (1982), Fifth *All Indian Education Survey* (1992), and Sixth *All Indian Education Survey* (1998), Seventh All Indian Education Survey. New Delhi, India. <<http://www.7thsurvey.ncert.nic.in>>
- \_\_\_\_\_. Various Years. *Selected Educational Statistic*. Ministry of Human Resource Development (MHRD). New Delhi, India.
- \_\_\_\_\_. Ministry of Human Resource and Development (MHRD). <[www.education.nic.in](http://www.education.nic.in)>
- \_\_\_\_\_. National Council of Educational Research and Training (NCERT).
- \_\_\_\_\_. Census of India. <[www.censusindia.net](http://www.censusindia.net)>
- Government of Rajasthan. 2004. "Pragati Partivedan." (Progress Report). Department of Secondary Education. Rajasthan, India.
- Gross, W. 1993, "Early mathematics performance and achievement: Results of a study within a large suburban school system." *Journal of Negro Education*, 62(3), 269–287).
- Gruber, Jonathan. 2005. *Public Finance and Public Policy*. New York: Worth Publishers.
- Hammermesh, Daniel S. 1995. "What a Wonderful World this Would Be," *Industrial and Labor Relations Review* 48(4): 835–838.
- Hanushek, Eric. A. 1979. "Conceptual and Empirical Issues in the Estimation of Education Production Functions," *Journal of Human Resources* 14 (3): 351–388.
- \_\_\_\_\_. 1995. "Interpreting Recent Research on Schooling in Developing Countries", *World Bank Research Observer* 10 (2): 227–46.

- \_\_\_\_\_. 2003. "The Failure of Input-based Schooling Policies", *Economic Journal* 113 (February): F65-F98.
- \_\_\_\_\_. 2005. "Why Quality Matters in Education," *Finance and Development* 42 (2): 15–19.
- Hanushek, Eric A., and Dennis D. Kimko. 2000. "Schooling, Labor Force Quality, and the Growth of Nations." *American Economic Review*. 90(5: December): 1184–1208.
- Hanushek, Eric A., and Steven G. Rivkin. 2004. "How to Improve the Supply of High Quality Teachers." In *Brookings Papers on Education Policy*: 2004. Washington, DC: Brookings Institution Press.
- Haridias, M. [undated]. "Differential Performance of Secondary Schools" in *Local-Level Planning for Improving Educational Standards*. Kerala Research Project on Local-Level Development. Thiruvananthapuram, India.
- Hawley, Willis D., and Donald C. Rollin (eds). 2001. *The Keys to Effective Schools: Educational Reforms as Continuous Improvement*. National Education Association.
- Heckman, J.J., and Li, X. 2003. "Selection bias, comparative advantage, and heterogeneous returns to education." NBER Working Paper No. 9877. Cambridge, MA: National Bureau of Economic Research.
- IMRB International. 2005. A Report on Out-of-School Children. Draft.
- Hoff, Karen and Priyanka Pandey (2004). "Belief Systems and Durable Inequalities: An Experimental Investigation of Indian Caste." World Bank Policy Research Working Paper 3351, Washington, DC.
- International Association for the Evaluation of Educational Achievement (IEA). 1996. *TIMSS: Mathematics Achievement in the Middle School Years*. Boston College, Chestnut Hill, Massachusetts.
- \_\_\_\_\_. 2003. "IEA's Third International Mathematics and Science Study (TIMSS): TIMSS 2003 International Mathematics Report – Findings from IEA's Trends in International Mathematics and Science Study at the Fourth and Eighth Grade."
- \_\_\_\_\_. 2003. "PIRLS 2001 International Report: IEA's Study of Reading Literacy Achievement in Primary Schools in 35 Countries." <<http://www.cie.org.uk/CIE/WebSite/home.jsp>>
- Jackson, K. W. 1982, "Achievement differences in mathematics: A search for causal explanations." Paper presented at the annual meeting of the National Council of Black Studies, Chicago.
- Jacob, Brian A., and Steven D. Levitt. 2002 "Rotten Apples: An Investigation of the Prevalence and Predictors of Teacher Cheating" Unpublished paper, Kennedy School of Government, Harvard University, April.
- Jimerson, S. R. 1999. "On the failure of failure: Examining the association between early grade retention and education and employment outcomes during late adolescence." *Journal of School Psychology*, 37, 243–272.
- Jishnu Das., Priyanka Pandey., Tristan Zajonc. 2006. "Learning Levels and Gaps in India and Pakistan" The World Bank.
- Kathryn Anderson., Elizabeth King., Yan Wang., "Market returns, transfers and demand for schooling in Malaysia, 1976-89" *Journal of Development Studies*, Volume 39, Number 3, February 2003, pp. 1–28(28)
- King, Elizabeth M and M. Anne Hill. 1993. "Women's Education in Developing Countries: Barriers, Benefits, and Policies. Baltimore." John Hopkins University Press.
- Kingdon, Geeta. 1996. "The Quality and Efficiency of Private and Public Education: A Case Study of Urban India." *Oxford Bulletin of Economics and Statistics* 58 (1): 57–81.
- \_\_\_\_\_. 2002. "The Gender Gap in Educational Attainment in India: How Much can be Explained?" *The Journal of Development Studies* 39(2): 25–53.
- \_\_\_\_\_. 2005. "Private and Public Schooling: The Indian Experience." Paper presented to the conference on Mobilizing the Private Sector for Public Education, Kennedy School of Government, Harvard University.
- \_\_\_\_\_. 2008. "Private and Public Schooling: The Indian Experience", in Chakrabarti, R. and P. Peterson (eds.) *School Choice International: The Latest Evidence*, MIT Press. Forthcoming.
- Kingdon, Geeta, and Jeemol Unni. 2001. "Education and Women's Labor Market Outcomes in India." *Education Economics* 9 (2).
- Kingdon, Geeta, and Mohd Muzammil. 2003. *The Political Economy of Education in India: Teacher Politics in*

- Uttar Pradesh*. New York: Oxford University Press.
- Kingdon, Geeta, Robert Cassen, Kristy McNay, and Leela Visaria. 2004. "Education and Literacy." In Tim Dyson, Robert Cassen, and Leela Visaria, eds., *21st Century India: Population, Environment, and Human Development*. New York: Oxford University Press.
- Khandelwal, B.P., 2005. "A Study on Secondary Examination in India." Commissioned by the World Bank for this Study on Secondary Education in India. Draft.
- Kozol, J. 2000, Forward. In J. Cohen & J. Rogers (Eds.), *"Will standards save public education?" Boston*: Beacon Press.
- Kremer, Michael, Karthik Muralidharan, Naxmul Chaudhury, Jeffrey Hammer; and F. Halsey Rogers. 2004. "Teacher Absence in India: A Snapshot". *Journal of the European Economic Association* (Resubmitted Version).
- Krueger, Alan, and Mikael Lindhal. 2000. "Education and Growth: Why and for Whom?" National Bureau of Economic Research (NBER) Working Paper 7591.
- Lam, D., and Leibbrandt, M. 2003. "What has happened to inequality in South Africa since the end of apartheid?" Unpublished manuscript, University of Michigan.
- Lazear, Edward Paul. 2003. "Firm-Specific Human Capital: A Skill-Weights Approach." National Bureau of Economic Research (NBER) Working Paper 9679.
- Levin, Henry, and Marlaine Lockheed (eds). 1993. *Effective Schools in Developing Countries*. Stanford Series on Education and Public Policy.
- Lewin, Keith, "Secondary Education in India: Managing Expansion With Affordable Costs", Policy Guidance Note, Draft, July 31, 2008.
- Lewis, Maureen. 2005. "Decentralizing Education: Do Communities and Parents Matter?" Center for Global Development, Draft.
- Linn, Robert L., and Carolyn Haug. 2002. "Stability of School-Building Accountability Scores and Gains." *Educational Evaluation and Policy Analysis* 24 (1): 29–36.
- Lloyd, C. B. (ed.). 2005. *Growing Up Global: The Changing Transitions to Adulthood in Developing Countries*. Washington, D.C.: The National Academies Press; and UNFPA. 2005a.
- Majumdar, Manabi. 2005. "Schooling and 'Skilling' of the Country's Youth: Secondary Education in Four Indian States." *Economic and Political Weekly* 4: 2351–2363. May 28–June 4.
- McDonnell, L. M. 1995, "Opportunity to learn as a research concept and policy instrument." *Educational Evaluation and Policy Analysis*, 17 (3), 305–322.
- Mehta, Arun. 2005. *Elementary Education in Unrecognized Schools in India: A Study on Punjab-Based on DISE 2005 Data*. National Institute of Educational Planning and Administration. New Delhi.
- Meyer, Robert H. 1996. "Value-Added Indicators of School Performance." In E. A. Hanushek and D.W. Jorgenson (eds.), *Improving America's schools: The role of incentives*. Washington, DC: National Academic Press.
- Miguel, Edward, and Michael Kremer. 2001. "Worms: Education and Health Externalities in Kenya." National Bureau of Economic Research (NBER) Working Paper 8481.
- Mincer, Jacob. 1974. *Schooling, Experience, and Earnings*. National Bureau of Economic Research (NBER). Distributed by Columbia University Press, New York.
- Minoru, Shoda. 2005. "Overview of Trends of Education Policy in Japan." Draft.
- Mukhopadhyay, Marmar (ed.) 2002. *Secondary Education: The Challenges Ahead*. National Institute of Educational Planning and Administration. New Delhi.
- Mulligan, Casey B. 1999. "Galton versus the Human Capital Approach to Inheritance." *Journal of Political Economy* 107 (6), December: S184–S224.
- Murnane, Richard, and Frank Levy. 1996. *Teaching the New Basic Skills: Principles for Educating Children to Thrive in a Changing Economy*. New York: Free Press.
- Murnane, Richard, J., John B. Willet, Yves Duhaldeborde, and John H. Tyler. 2000. "How Important are the Cognitive Skills of Teenagers in Predicting Subsequent Earnings?" *Journal of Policy Analysis and Management* 19 (4) Fall: 547-68.
- Murnane, Richard and David Cohen. 1986 "Merit Pay and the Evaluation Problem: Why Most Merit Pay Plans

- Fail and a Few Survive,” *Harvard Educational Review* 56 (February): 1–17.
- Murphy, Paud, Vincent Greaney, Marlaine E. Lockheed, and Carlos Rojas. (eds.) 1996. *National Assessments: Testing the System*. Economic Development Institute of the World Bank. Washington DC.
- Narain, A. 2005. *Labor Force Participation and its Determinants in India*. Draft Working Paper prepared for a Study on Labor Markets in India.
- National Institute of Educational Planning and Administration (NIEPA). 2002a. *India Education Report: A Profile of Basic Education*. New Delhi, India.
- \_\_\_\_\_. 2002b. *Secondary Education: The Challenges Ahead*. New Delhi, India.
- \_\_\_\_\_. 2004. *Elementary Education In India: Where Do We Stand?* New Delhi, India.
- \_\_\_\_\_. 2005e. “Financing of Higher and Technical Education.” New Delhi, India.
- \_\_\_\_\_. 2005f. District Information System for Education (DISE): Elementary Education in India: Where Do We Stand? New Delhi, India.
- National University of Education Planning and Administration (NUEPA), 2008. *Financing of Secondary Education in India*, edited by Jandhyala B. G. Tilak.
- Nayar, Usha (2002) “Education of Girls in India: An Assessment” in Govinda, R.,(Ed.) *India Education Report: A Profile of Basic Education*. National Institute of Education Planning and Management, New Delhi.
- Nelson, Richard R., and Paul M. Romer. 1996. “Science, Economic Growth, and Public Policy.” *Challenge* (March-April): 9–21.
- Novak, John R, and Bruce Fuller. 2003. “Penalizing Diverse Schools? Similar Test Scores, but Different Students Bring Federal Sanction.” PACE Policy Brief. Berkeley, California: Policy Analysis for California Education.
- Oakes, J. 1985, *Keeping track: How schools structure inequality*. New Haven, CT: Yale University Press.
- ORG Centre for Social Research, “Feasibility Study for an Operational Partnership Between the Public and Non Public Sectors in Non-Elementary Education”, August 2008.
- Organization for Economic Cooperation and Development (OECD), 1998. *Education at a Glance*. Paris.
- \_\_\_\_\_. 2003. *Literacy Skills for the World of Tomorrow – Further Results from PISA 2000*. Paris.
- \_\_\_\_\_. 2005. *Teachers Matter: Attracting, Developing, and Retaining Effective Teachers*. Paris.
- OECD and UNESCO Institute of Statistics, 2001. *Teachers for Tomorrow’s Schools: Analysis of the World Education Indicators*.
- The Probe Team 1999. PROBE: *The Public Report on Basic Education in India*. New Delhi, India: Oxford University Press.
- Population Reference Bureau. 2005. “2005 World Population Data Sheet.” Washington, DC.
- Prasad S.N., 2005. “Curriculum and Textbooks in the Indian Secondary School System”. Commissioned by the World Bank for this study on Secondary Education in India. Draft.
- Pratham. 2005. “Annual Status of Education Report.” New Delhi. ([www.Indiatogether.org](http://www.Indiatogether.org)).
- Prichett, Lant. “Improving School Effectiveness”, 2007. World Bank.
- \_\_\_\_\_. 2001. “Where Has All the Education Gone?” *World Bank Economic Review* 15 (3): 367-91.
- Psacharopoulos, George, and Harry A. Patrinos. 1993. *Indigenous People and Poverty in Latin America*. The World Bank. Latin America and Caribbean Technical Department, Regional Studies Program. Washington, DC.
- Ramachandran, Vimala, Madhumita Pal, Sharada Jain, Sunil Shekar, and Jitendra Sharma. 2005. “Teacher Motivation in India.” United Kingdom Department for International Development (DIFID). Draft.
- Raudenbush, Stephen W. 2004. “What are Value-Added Models Estimating and What Does This Imply for Statistical Practice?” *Journal of Educational and Behavioral Statistics* 29 (1), 121–129.

- Raudenbush, Stephen W., and Anthony S. Bryk. 2002. *Hierarchical Linear Models: Applications and Data Analysis Methods*. 2nd edition. Newbury Park, California: Sage Press.
- Raudenbush, Stephen W., Yuki Fai Cheong, and Randall P. Fotiu. 1994. "Synthesizing Cross-National Classroom Effects Data: Alternative Models and Methods." In *Methodological Issues in Comparative Educational Studies*. The United States Department of Education. National Center for Education Statistics.
- Rivkin, Steven G., Eric A. Hanushek, and John F. Kain. 2005. "Teachers, Schools, and Academic Achievement", *Econometrica* 73 (2), March: 417-58.
- Romer, Paul M. 1986. "Increasing Returns and Long Run Growth", *Journal of Political Economy* 94: 1002-38.
- Rouse, Cecilia 1998. "Private School Vouchers and Student Achievement: An Evaluation of the Milwaukee Parental Choice Program" *Quarterly Journal of Economics* 113.
- Rumberger, Russel W., and Gregory J. Palardy. 2004. "Multilevel Models for School Effectiveness Research." In D. Kaplan, ed., *Handbook of Quantitative Methodology for the Social Sciences*. Thousand Oaks, California: Sage Publications.
- Rumberger, R. 1995. "Dropping out of middle school: A multilevel analysis of students and schools." *American Educational Research Journal* 32 (3): 583-625.
- Sankar, Deepa. 2005a. "Rate of Returns to Secondary Education in India : Evidence from NSS Household Surveys in 1880s and 1990s". Paper commissioned for this study on Secondary Education in India. Draft.
- \_\_\_\_\_. 2005b. "Public Expenditure in Secondary Education in India: Benefit Incidence Analysis Using NSS 52nd Round." Commissioned for this study on Secondary Education in India. Draft.
- Schultz, Theodore W. 1961. "Investment in Human Capital", *American Economic Review* 51 (1): 1-17.
- \_\_\_\_\_. 1970. *Investment in Human Capital: The Role of Education and Research*. New York: The Free Press.
- Sanders, W.L., & Rivers, J.C. (1996). *Cumulative and residual effects of teachers on future student academic achievement. Research Progress Report*. Knoxville: University of Tennessee Value-added Research and Assessment Center.
- Schultz, T. Paul. 2001. "School Subsidies for the Poor: Evaluating the Mexican Progresa Poverty Program." Economic Growth Center, Center Discussion Paper No. 834. Yale University.
- Schultz, T.P. 2003. "Evidence of returns to schooling in Africa from household surveys: Monitoring and restructuring the market for education." New Haven, CT: Yale University.
- Seltzer, Michael, Kilchan Choi, and Yeow Meng Thum. 2003. "Examining Relationships Between Where Students Start and How Rapidly They Progress: Implications for Conducting Analyses that Help Illuminate the Distribution of Achievement Within Schools," *Educational Evaluation and Policy Analysis* 25 (3): 263-286.
- Sen, Amartya. (1992) *Inequality Reexamined*. Oxford University Press.
- Sengupta, Piyali, and Jaba Guha. 2002. "Enrollment, Dropout and Grade Completion of Girl Children in West Bengal." *Economic and Political Weekly*, April 28: 1621-1637.
- Sharma, A.K. 2005. "Teacher Education and Management in Rajasthan, Orissa, and Delhi." Commissioned for this Study on Secondary Education in India. Draft.
- Singer, Judy, and John Willet. 2003. *Applied Longitudinal Data Analysis: Modeling Change and Event Occurrence*. Oxford and New York: Oxford University Press.
- Sipahimalani-Rao, Vandana, and Prema Clarke. 2003. "A Review of Educational Progress and Reform in The District Primary Education Program (Phases I & II)", Report No.1 South Asia Human Development Sector Discussion Paper series.
- Snijders, Tom A. B., and Roel J. Bosker. 1999. *Multilevel Analysis: An Introduction to Basic and Advanced Multilevel Modeling*. London: Sage Publishers.
- Sperling, Gene, and Rekha Balu. 2005. "Designing a Global Compact on Education." *Finance and Development* 42 (2):38-41.
- Suddhasil Siddhanta. & Debasish NandyGender., 2003 "Gap in Education: A Fresh Exploration" University of Kalyani.
- Sujatha, K. 2002. "Distance Education at the Secondary Level in India: National Open School." Working Paper. UNESCO International Institute for Educational Planning, Paris.

- (2002). "Education Among Scheduled Tribes." India Education Report. R. Govinda. Eds. New Delhi. Oxford University Press.
- Tharoor, Shashi. 1997. *India: From Midnight to the Millennium*. New York: Arcade Publishing, Inc.
- The PROBE Report. 1999. *PROBE: The Public Report on Basic Education in India*. New Delhi, India: Oxford University Press.
- Tilak, Jandhyala B. G. 2002. "Determinants of Household Expenditure on Education in Rural Areas." National Council of Applied Economic Research Working Paper Series No. 88.
- \_\_\_\_\_. 1996b, "How Free is 'Free' Primary Education in India?" *Economic and Political Weekly*, 31(6), 355-366.
- \_\_\_\_\_. 1996a, "How Free is 'Free' Primary Education in India?" *Economic and Political Weekly*, 31(5), 275-282.
- \_\_\_\_\_. 2003. "Financing Education in India" National Institute of Educational Planning and Administration. Ravi Books, New Delhi, India.
- \_\_\_\_\_. 2003. "Education, Society and Development –National and International perspectives." National Institute of Educational Planning and Administration. New Delhi, India.
- \_\_\_\_\_. 2004. "Public Subsidies in Education in India". *Economic and Political Weekly*, 39 (4)343–359.
- Tooley, James, and Pauline Dixon. 2005. "Private Schools Serving the Poor: A Study from Delhi, India." The Center for Civil Society, University of Newcastle upon Tyne, United Kingdom.
- Tsai, C. C. 2005. "Science Education Research in Taiwan from 1998 to 2004: An Analysis of Three International Journals". Draft.
- Tahir Andrabi., Jishnu Das., Asim Ijaz Khwaja., 2006. "Students Today, Teachers Tomorrow? The Rise of Affordable Private Schools" Draft, The World Bank.
- Sanders, W., and J. Rivers. 1996. *Cumulative and Residual Effects of Teachers on Future Student Academic Achievement*. Knoxville, TN: University of Tennessee Value-Added Research and Assessment Center.
- UNESCO. 2004. *Education for All (EFA) Global Monitoring Report 2005 - Education for the Quality Imperative*. Paris, France.
- \_\_\_\_\_. 2005. *Global Education Digest 2004: Comparing Education Statistics across the World*. Montreal, Canada.
- \_\_\_\_\_. Statistical Yearbooks, various years
- Uribe, Claudia, Richard J. Murane, and Marie-Andree Somers. 2005. "Expanding School Enrollment by Subsidizing Private Schools: Lessons from Bogota." National Bureau of Economic Research (NBER) Working Paper 11670.
- Velkoff, Victoria. 1998. "Women's education in India." U. S. Department of Commerce, Economics and Statistics Administration. Bureau of the Census. WID/98-1.
- Ward, Michael; Alan Penny, and Tony Read. 2005. *Education Reform in Uganda 1997 to 2004: Reflections on Policy, Partnership, Strategy and Implementation*. United Kingdom Department for International Development (DFID). In Press.
- Willms, J. Douglas, and Stephen Raudenbush. 1989. "A Longitudinal Hierarchical Linear Model for Estimating School Effects and their Stability," *Journal of Educational Measurement* 26 (3): 209-232.
- World Bank. 1993. Bangladesh - *Female Secondary School Assistance Project. Project Appraisal Document*. Report 11386-BD. Washington, DC: World Bank.
- \_\_\_\_\_. 1996. "India Primary Education Achievement and Challenges." South Asia Country Department II. Report No. 15756.IN. Washington, DC, The World Bank.
- \_\_\_\_\_. 2000. *India: Scientific and Technical Manpower Development in India*. Education Sector Unit, South Asia Region. Washington, DC: World Bank.
- \_\_\_\_\_. 2002a. "India – Karnataka: Secondary Education and the New Agenda for Economic Growth." South Asia Human Development Sector. Report No. 24208-IN. Washington, DC, The World Bank.
- \_\_\_\_\_. 2002b. Bangladesh Female Secondary School Assistance Project-II. Project Appraisal Document. Report No: 23594-BD.

- \_\_\_\_\_. 2003a. *Secondary Education in India*. Discussion Paper Series. South Asia Human Development Sector, Washington, DC: World Bank.
- \_\_\_\_\_. 2003b. *Project Performance Assessment Report. Bangladesh: Bangladesh - Female Secondary School Assistance Project*. Operations Evaluation Department (OED). Washington, DC: World Bank.
- \_\_\_\_\_. 2003c. *World Development Report 2004: Making Services Work for Poor People*. New York: Oxford University Press.
- \_\_\_\_\_. 2003. *India: Sustaining Reform, Reducing Poverty*. Washington, DC: World Bank.
- \_\_\_\_\_. 2004. "Project Appraisal Document: Elementary Education Project". Report No. 27703-IN. Washington, DC.
- \_\_\_\_\_. 2004a. *Country Strategy for India*. Washington, DC: World Bank.
- \_\_\_\_\_. 2004b. *Karnataka School Quality Assessment Organization (KSQAO): Framework, Components, and Implementation Guidelines*. Human Development Sector, South Asia Region. Washington, DC: World Bank.
- \_\_\_\_\_. 2004c. *Elementary Education Project (SSA). Project Appraisal Document*. Report 27703-IN. Washington, DC: World Bank.
- \_\_\_\_\_. 2004d. Russia E-Learning Support Project. Project Appraisal Document. Report 27757-RU. Washington, DC: World Bank.
- \_\_\_\_\_. 2005a. *Expanding Opportunities and Building Competencies for Young People: A New Agenda for Secondary Education*. Washington, DC: World Bank.
- \_\_\_\_\_. 2005b. *Incentives to Improve Teaching: Lessons from Latin America*. Washington, DC: World Bank.
- \_\_\_\_\_. 2005c. "Skill Development in India: The Vocational Education and Training System." Draft Sector Report.
- \_\_\_\_\_. 2006a. "India's Employment Challenge: Creating Jobs, Helping Workers." Draft.
- \_\_\_\_\_. 2006b. *India Development Policy Review: Inclusive Growth and Service Delivery: Building on India's Success*. World Bank.
- \_\_\_\_\_. 2006c. "Domestic Regulation and Global Movement of Skilled Professionals: A Case Study of Indian Professional in the United States." Draft Policy Note
- \_\_\_\_\_. "Knowledge Assessment Methodology." <<http://www.worldbank.org/kam>>
- Wu, Kin Bing, Pete Goldschmidt, Christy Boscardin, and Deepa Sankar, 2008. "International Benchmarking of the Performance of Two Indian States in Secondary School Mathematics: A Preliminary Assessment". Draft.
- Wu, Kin Bing, Pete Goldschmidt, Christy Boscardin, and Deepa Sankar. 2005. Report on the Surveys of Public and Private Secondary Schools in Rajasthan and Orissa. Draft.
- Wu, Kin Bing, and Deepa Sankar. 2005. "Rajasthan Education Report." Draft.
- Wu, Kin Bing, Pete Goldschmidt, Christy Kim Boscardin, and Deepa Sankar. 2006. "Student Achievement in Mathematics and Its Determinants in Rajasthan and Orissa: Report on The Survey of Public and Private Secondary and Senior Secondary Schools." Draft. 2006.
- Walsh and Jacobs, "Alternative Certification Isn't Alternative", National Council of Teacher Quality, Thomas Fordham Institute, September 2007.