Educational inequality in rural and urban India

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ABSTRACT

This paper presents estimates of educational inequality for the major Indian states. We compute the education Gini index separately for the rural and urban sectors and examine the changes in inequality during past two decades. The estimates show the high extent of educational inequality; though the inequality declined between 1993 and 2009 the Gini index is above 50% in 2009. Using the analysis of Gini (ANOGI), a technique to decompose overall inequality into the inequality within- and between-sectors, we find that a large part of overall educational inequality is accounted for by intra-sector inequality. Further, intra-sector inequality has increased and inter-sector inequality has narrowed during the above period.

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1. Introduction

Education is an important ingredient of human development.[1] It contributes to well-being of individuals *instrumentally* by improving income and standard of living and *intrinsically* by raising capabilities and individual freedoms.[2] Education also affects welfare of the future generations through intergenerational transmission and better educated parents have more educated and healthier children (Drèze and Sen, 2002, pp. 38–40). Education also affects welfare of other members of the society because of the positive externalities that it generates (Tilak, 2008). Education, through its spillover effect, creates new assets and improves social welfare without making anyone worse off (Thomas et al., 2001).

However, limitations of the average as an indicator of educational attainment have long been recognized.[3] This is especially so for developing countries like India, where marked disparity in educational attainment exists between the rural and urban population, between males and females, and among social groups and religions. Educational infrastructure is distributed unequally between rural and urban areas. Students in rural areas suffer from scarcity and inadequate accessibility of schools, as well as the poor quality of education, and are forced to travel large distances. Concentration of secondary and higher educational institutions in urban areas limits the participation of rural people in schooling. There are substantial variations in educational outcomes across the states. In light of the above, it is important to have reliable estimates of inequality in educational attainment.

Educational inequality matters for a number of reasons. A skewed distribution of education implies a large social welfare losses resulting from underutilization of potential human capital (Thomas et al., 2001). Uneven distribution of education tends to affect per capita income negatively. López et al. (1998) find positive and significant effect of average schooling on per capita income controlling for the distribution of education while ignoring the distribution may result in insignificant and even negative effects. The importance given to improving educational attainment and eliminating the disparity, therein both at international and national levels, is visible in the respective policy documents. For instance, the Millennium Development Goals (MDGs) target complete primary education for all children and elimination of gender inequality on a global level. The National Policy on Education of the Indian government emphasizes removal of disparities and equalization of educational opportunities across all sections of the society (Government of India, 1998, p. 7).

Nevertheless, the promotion of even basic education has not received much attention in India: "[t]he remarkable neglect of elementary education in India is all the more striking given the widespread recognition, in the contemporary world, of the importance of basic education for economic development" (Drèze and Sen, 2002, p. 38). Ward (2007, p. 310) also argued: "[u]ntil the mid to late 1990s India's performance on basic education was less impressive than its policy statements. Lack of real political will, insufficient resources, bureaucratic complacency, and pervasive

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[1] Education is one of the three achievements being used by the United Nations to compute the Human Development Index (HDI) (UNDP, 1990).

[2] Drèze and Sen (2002, pp. 38–40) emphasize value of education (and health) to the freedom of a person in five different manners as: intrinsic importance, instrumental personal roles, instrumental social roles, instrumental process roles, and empowerment and distributive roles.

[3] Recognizing the importance of addressing distributional concerns, the United Nations' Human Development Report 2010 introduced the Inequality-adjusted Human Development Index (IHDI). The IHDI adjusts HDI for inequality in distribution of each dimension, viz., life expectancy, years of schooling and income, across the population (see UNDP, 2010, pp. 85–90, 215–25).

Table 1
Number of villages and persons surveyed in different rounds of survey.

Particulars	1993–1994	1999–2000	2004–2005	2009–2010
Number of villages	6983	6208	7999	7402
Number of urban blocks	4670	4176	4602	5252
Number of rural households	69,230	97,986	79,306	59,129
Number of urban households	46,179	67,258	45,374	41,128
Number of rural persons	356,351	509,779	398,025	281,327
Number of urban persons	208,389	309,234	204,808	178,457

Source: Government of India (1997, 2001, 2006, 2011).

social exclusion kept over half of all children from completing a meaningful basic education".

This paper, using the concept of the Gini index, quantifies the extent of and analyzes changes in educational inequality for the major states of India. We examine pure inequality in education, also referred to as univariate inequality in education, which is different from socio-economic inequality in education.[4] We use the analysis of Gini (ANOGI) to decompose the overall inequality into intra- and inter-group components. This helps us to find out the extent to which the observed inequality is a result of inequality between the rural and urban sectors or a consequence of inequalities within the rural or urban sectors.

The remainder of the paper is organized as follows. Section 2 describes the dataset. Section 3 discusses methodology; the section briefly discusses the education Gini index and outlines the decomposition method. Section 4 presents the results. Section 5 highlights some major issues and concerns in the Indian education system. Section 6 discusses case of two Indian states, viz., Kerala and Himachal Pradesh, from a policy perspective. Section 7 briefly mentions some of the major policy initiatives taken by the Indian government in the past two decades, and the final section concludes.

2. Data

This paper utilizes unit level information from household surveys conducted by the National Sample Survey Organisation (NSSO) of India. The NSSO conducts large scale surveys on employment and unemployment once every five years. This study uses four rounds of the survey, viz., 50th, 55th, 61st and 66th which were conducted respectively in years 1993–1994, 1999–2000, 2004–2005 and 2009–2010 (referred to as 1993, 1999, 2004 and 2009 in the paper). The surveys provide a wealth of information at the household and individual levels. Each round includes information on household characteristics such as: household residence (rural or urban), membership of a social group, religion, monthly household consumption expenditure; and demographic characteristics of individuals such as: age, education, marital status and sex.

The survey also provides information on level of general and technical education attained, current attendance in educational institutions and type of institution. The NSSO classifies information on educational attainment of an individual into one of the following 10 categories: (i) not literate, (ii) literate without formal schooling,[5] (iii) literate below primary, (iv) primary, (v) middle, (vi)

secondary, (vii) higher secondary, (viii) diploma/certificate holder, (ix) graduate, and (x) postgraduate and above.[6]

The NSSO surveys are nationally representative household surveys, and follow stratified multi-stage sampling design. The first stage units are the census villages for rural areas and the NSSO urban frame survey blocks for urban areas. Hamlet-groups (or sub-blocks) constitute the intermediate stage. The ultimate stage units are households both in the rural and urban areas (Government of India, 2006). Table 1 is a description of the datasets and shows the number of households and individuals surveyed in rural and urban areas in the four rounds of the survey.

The scope of this paper is confined to 18 major states of the country.[7] The major states cover more than 98% population of the country. The analysis in the paper is conducted for the individuals aged 15 and above. Most studies on human capital generally consider age group of 15 and above since this age group matches well with the labor force (see for instance, Barro and Lee, 1996; Castelló and Doménech, 2002). All estimates have been generated using the survey weights as provided in the survey.

3. Methodology

3.1. Educational attainment rate

Educational attainment rate is defined as the percentage of population (aged 15 and above) with a particular educational level. To examine the attainment rate, we classify the individuals into seven educational levels as follows: (i) illiterate and literate with non-formal schooling, (ii) below primary (grade I–II), (iii) primary (III–V), (iv) middle (VI–VIII), (v) secondary (IX–X), (vi) higher secondary (XI–XII), and (vii) graduation and above.[8]

3.2. Measurement of educational inequality

To measure educational inequality, we use the education Gini index which is analogous to income Gini. The Gini index is a well known and most widely used measure of inequality. The index satisfies four important principles: anonymity, population independence, scale independence, and transfer principle (Ray, 1998). The measure has linkages with Lorenz curve which is a graphical representation of inequality. The Gini coefficient has a natural geometric interpretation; it is equivalent to the ratio of the area between Lorenz curve and the 45° line of equality (egalitarian line) to the total area under the egalitarian line.

The education Gini index (G_E), which is based on educational attainment of individuals, is defined as (López et al., 1998; Castelló

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[4] Socio-economic inequality in education (or health) measures inequality in outcomes by an indicator of socio-economic status such as income. Univariate approach ranks individual by education attainment and not by the indicator of socio-economic status (Sahn and Stifel, 2003).

[5] This category is further sub-divided into the following three: (a) Non-formal Education Courses or Adult Education Centers or Education Guarantee Scheme, (b) Total Literacy Campaign, and (c) others.

[6] Information on attainment for 'post graduate and above' is only available in the 61st and 66th rounds. In the earlier two rounds the information is combined with its predecessor category ('graduate and above').

[7] These are: Andhra Pradesh, Assam, Bihar, Delhi, Gujarat, Haryana, Himachal Pradesh, Jammu and Kashmir, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh, and West Bengal. In 2000, three new states Chattisgarh, Jharkhand and Uttaranchal (now Uttarakhand) were carved out of Madhya Pradesh, Bihar and Uttar Pradesh, respectively. These three states are included under their respective parent state.

[8] Diploma and certificate courses, which are below graduation level, are included with higher secondary level.

and Doménech, 2002):

$$G_E = \left(\frac{1}{2\mu} \sum_{i=1}^{n} \sum_{j=1}^{n} p_i |y_i - y_j| p_j \right) \tag{1}$$

where $\mu = \sum_{i=1}^{n} p_i y_i$ is the average years of schooling, p_i and p_j are the proportions of population, y_i and y_j represent years of schooling for individuals with educational levels i and j, respectively, n is the number of educational levels as discussed above, and $i = 1, 2, \ldots, 7$.[9] It is assumed that an individual spends 0, 2, 5, 8, 10, 12 and 15.5 years, respectively in those educational levels.[10]

The education Gini measures the ratio to the mean (average years of schooling) of half of the average schooling deviations between all possible pairs of people (Thomas et al., 2001). Like the conventional Gini index, the education Gini index ranges between the values 0 (0%) and 1 (100%). A Gini index of zero represents perfect equality, while an index of one represents perfect inequality. The higher the value of the index, the greater is the inequality.

The Gini coefficient is more sensitive to changes in the middle of the distribution. The coefficient gives equal weight to those at the bottom and those at the top of the distribution.

The index allows comparison across sub-groups of population and over time, and provides a complete picture on the educational development of a country or state (Thomas et al., 2001). This measure could be used to complement other indicators for well-being, in particular, indicators of access, average levels, and the quality of education.

However, the Gini index also has some limitations. The index is neither easily decomposable nor additive across the population sub-groups. The Gini coefficient gives total amount of inequality and does not indicate how the inequality is distributed, i.e., what is happening in different quintiles of the distribution. In certain situations two countries/states with very different income (or education) distributions can have the same Gini index. For instance, the Lorenz curves can have different shapes and in those cases when Lorenz curves cross each other, we can have the same value of Gini index.[11]

3.3. Decomposition of educational inequality

Overall inequality can be expressed as the sum of 'within-group' (intra-group) and 'between-group' (inter-group) components (Shorrocks and Wan, 2005). Such decomposition can be carried out for rural and urban population groups. It may be noted that the decomposition (in the two-components) is valid for certain inequality indices such as the Theil index and the log mean deviation. Other inequality indices, such as the Gini coefficient, require a third term that reflects 'interactions' or 'overlaps' between the subgroups distributions.

We use the analysis of Gini to decompose the Gini coefficient (Frick et al., 2006).[12] The Gini of the entire population can be decomposed into three different components: the intra-group Ginis, the inter-group Gini, and the overlapping of the distributions (Yitzhaki, 1994). Following Yitzhaki (1994), the Gini decomposition by subgroups can be written as:

$$G = \sum_{i=1}^{n} s_i G_i O_i + G_b \tag{2}$$

where s_i is the population share of group i, G_i is the Gini coefficient within group i, O_i is the overlapping index of group i with the entire population, and G_b is the between-group Gini.[13]

The overlapping index can be further decomposed as (Frick et al., 2006):

$$O_i = \sum_{j} p_j O_{ji} = p_i + \sum_{j \neq 1} p_j O_{ji} \tag{3}$$

where p_i is the share of group i in the total population, and O_{ji} is the index of overlapping of group j by group i.[14] Frick et al. (2006) show that Eq. (2) can be expressed in the following way:

$$G = \left(\sum_{i=1}^{n} s_i G_i + \sum_{i=1}^{n} s_i G_i ((O)_i - 1) + G_{bp} + (G)_b - G_{bp} \right) \tag{4}$$

The four components in Eq. (4) can be divided into two types: (i) components parallel to ANOVA (Analysis of Variance), and (ii) additional components. The components parallel to ANOVA include intra-group component (first term) which is a weighted average of groups' Ginis, and between-group component based on Pyatt (third term) which measures between group inequality assuming a complete stratification. The additional components include the effects of overlapping on intra-group (second term) and on between-groups components (fourth term).

4. Results and discussion

4.1. Educational attainment rate

Table 2 shows the proportion of population (aged 15 and above) by educational levels in years 1993, 1999, 2004 and 2009. Although one can see the progress made by the Indian educational system, two deficiencies are clearly visible. First, in 2009, 31.7% of the population is still illiterate.[15] Second, only 7.3% of the population has graduate and above degrees. Illiteracy declined at a meager rate of about 1% per annum. Among the literates, below primary and primary schooling constitute a major proportion in all the years. The marginal decline in the proportion of people in primary education may be due to the increase of proportion in other levels of schooling.

There is substantial disparity in the attainments of rural and urban residents. In urban areas, the share of illiterate population is less than half of that in rural areas in all the years. In 1993 primary (and below primary) education accounted for 21% of the total

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[9] The average attainment is defined as a total stock of formal schooling therefore non-formal schooling is clubbed with illiterate category. See, Appendix for average years of schooling in all the major states of the country.

[10] The years of schooling (duration in education level) is not the same in all states. For example, in the state of Maharashtra, primary schooling is of four years. This fact has been accounted for while assigning years of schooling to different states.

[11] It is worth mentioning that the ordering provided by Lorenz curves is a partial ordering; when Lorenz curves cross, we cannot say which distribution is more unequal but the Gini remains the same.

[12] While measures such as the Theil index are sub-group decomposable, we prefer the Gini index. This is because the Theil index (and some other indices as well) is not defined if we assign zero year of schooling for the first category, that is, illiterate and literate with no formal schooling. To avoid the above problem, it may be argued, one year of schooling can be added to each of the educational level. However, in the Indian case this is not a correct adjustment since the country has a very high illiteracy. Such an adjustment will mask the true picture of the distribution.

[13] The decomposition of the Gini coefficient given by Yitzhaki (1994) is based on a different formula of the Gini (which is not the same as the education Gini index). Yitzhaki uses the following formula: $G = (2\text{cov}(y, F(y)))/\mu$, which is twice the covariance between income (y) and the rank ($F(y)$), standardized by mean income(μ). The between-group Gini (G_b) is twice the covariance between the mean incomes of subgroups and the subgroups' mean ranks in the overall population. However, Pyatt (1976) defines the between-group component (G_{bp}) as the covariance between mean income in each subgroup and its rank among the mean incomes of subgroups.

[14] Overlapping index: $O_{ji} = (\text{cov}_i(y, F_j(y)))/(\text{cov}_i(y, F_i(y)))$. For the properties of the overlapping index, see Frick et al. (2006) and Yitzhaki (1994).

[15] This figure does not include the individuals with non-formal education whereas the figure 32.18 as shown in Table 2 includes those.

Table 2
Proportion of population across educational levels.

Educational level	1993	1999	2004	2009
All population (rural and urban)				
Illiterate (and non-formal)	49.12	44.79	40.46	32.18
Below primary	9.80	8.91	7.72	8.28
Primary	11.36	11.07	12.85	12.80
Middle	12.71	14.77	16.05	16.85
Secondary	8.61	10.16	10.17	13.30
Higher secondary	4.41	5.26	7.08	9.26
Graduation and above	3.99	5.04	5.67	7.33
Rural				
Illiterate (and non-formal)	56.96	52.51	47.69	38.34
Below primary	10.09	9.45	8.38	9.31
Primary	10.94	11.03	13.04	13.76
Middle	11.39	13.72	15.25	17.03
Secondary	6.27	7.77	8.24	11.48
Higher secondary	2.73	3.42	4.87	6.84
Graduation and above	1.62	2.10	2.53	3.24
Urban				
Illiterate (and non-formal)	26.78	24.01	21.30	17.15
Below primary	8.97	7.47	6.00	5.74
Primary	12.55	11.17	12.33	10.45
Middle	16.47	17.59	18.17	16.41
Secondary	15.26	16.61	15.28	17.75
Higher secondary	9.20	10.21	12.94	15.17
Graduation and above	10.77	12.94	13.98	17.33

Source: Author's calculations from the unit record data of the 50th, 55th, 61st and 66th rounds of the NSSO for individuals aged 15 and above.

population in both the sectors; in 2009 this proportion remained almost the same in rural areas, while it has declined in urban areas. More striking spatial disparity are observed in higher education. The proportion of individuals with graduation and above is abysmally low in rural areas. Although this may be due to migration of better educated people from rural areas to urban areas, this also indicates inequity in distribution of educational infrastructure and resources.[16]

4.2. Educational inequality

Table 3 shows the Gini index of educational attainment for the major Indian states. The Gini index at the national level was 65% in 1993, which declined to 61% in 1999, 57% in 2004 and further to 51% in 2009.[17] Nevertheless, the extent of inequality is still very high. In 1993, Kerala had the lowest Gini coefficient followed by Delhi (see also Fig. 1). In 2004, both the states had the same index; for Delhi, the decline was much higher (eight percentage points) compared to that in Kerala (one percentage point). In 2009, Delhi has the lowest index followed by Kerala. Among the major states, inequality is higher in Bihar, Rajasthan, Andhra Pradesh, Uttar Pradesh, Madhya Pradesh and Orissa. The table clearly shows interstate disparity in the distribution of educational attainment; on one side the Gini index in Kerala and Delhi is 30%, on the other, it is 60% in Bihar and Rajasthan. The education Gini coefficients declined in all the states during 1993–2009. Himachal Pradesh
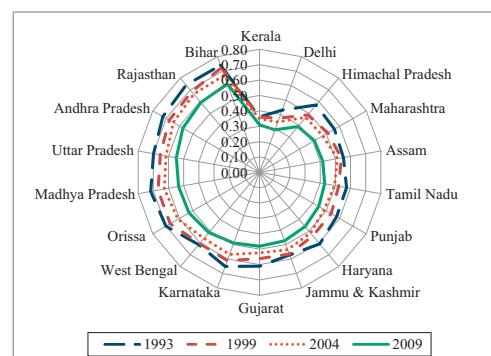
[16] People residing in rural areas often migrate to urban areas for education, in search of employment and for several other reasons. A high demand for skilled labor in urban areas might induce out-migration of higher educated persons from rural areas. During the study period, which extends to more than a decade, people may have migrated from one state to another or from rural to urban areas. Data limitations do not allow us to control for migration in this paper.
[17] We also compute the standard deviation of schooling to measure educational inequality. It shows an inconsistent pattern across the states. As Thomas et al. (2001) suggest the standard deviation of schooling may not provide a consistent picture of the changes in distribution of education and seems to be a more volatile and sometimes a misleading indicator. It may be noted that while the Gini is a relative measure of inequality, the standard deviation is an absolute measure.

Fig. 1. Changes in educational inequality: major Indian states. *Note*: Educational inequality is measured by the Gini index of education.
Source: Author's calculations from the unit record data of the 50th, 55th, 61st and 66th rounds of the NSSO for individuals aged 15 and above.

showed an improvement of about 18 percentage points during this period.

Fig. 2 shows the educational Lorenz curve. The figure shows an improvement in the distribution of education over time. The figure depicts that 10% of the population has approximately 25% of the total accumulated years of schooling in India in the year 2009.

We now examine educational inequality in the rural and urban sectors separately (Table 3). The Gini index is higher in the rural sector than in the urban. In 2009, most of the states in the rural sector have the index greater than 50%. In the rural sector, inequality is highest in Andhra Pradesh, Bihar and Rajasthan, and in the urban sector the same is true in Bihar, Rajasthan and Uttar Pradesh. The inter-sectoral (rural–urban) gap in the index is 18 percentage points at the national level. The gap is highest in the states of Andhra Pradesh, Bihar, Rajasthan, Karnataka and Madhya Pradesh. The gap declined by five percentage points during the period 1993–2009. The improvement in the distribution (decline in the index) is highest in Himachal Pradesh for the rural sector and in Delhi, Andhra Pradesh and Madhya Pradesh for the urban sector. While the inequality in Himachal Pradesh increased in the urban sector between years 1999 and 2004, it declined substantially after 2004.[18]

4.3. Decomposition of educational inequality

Table 4 presents results of the Gini decomposition. About 90% of overall educational inequality is due to intra-sector (within) inequality. Thus, the inter-sector (between) inequality contributes a very small proportion to the overall inequality. We observe that between 1993 and 2009 contribution of each of the components to overall inequality remained nearly the same. There is a marginal increase in the intra-sector component due to an increase in intra-rural Gini. The intra-rural Gini increased from 59.2% in 1993 to 61.2% in 2004.

Table 5 presents the results of the decomposition by states. The table shows intra-state inequality contributes a major share (96%) of the overall inequality. Both intra- and inter-group components remained almost the same between 1993 and 2004, though after 2004 there is a marginal increase in the intra-group Gini in a relative term.

[18] The inequality in the urban sector also increased in Jammu and Kashmir during 1993–2004, but it fell after 2004. It is important to note that the survey in Jammu and Kashmir was confined only to three (out of 14) districts: Jammu, Kathua and Udhampur in 1993 whereas in 1999 and 2004, Leh (Ladakh) and Kargil districts were excluded.
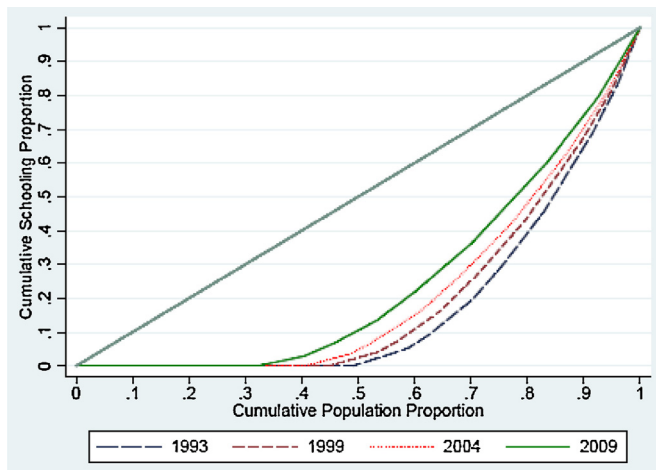
Fig. 2. Education Lorenz curve, India: 1993, 1999, 2004 and 2009.
Source: Author's calculations from the unit record data of the 50th, 55th, 61st and 66th rounds of the NSSO.

Within (rural or urban) inequalities could be driven by demographic factors. For instance, in both rural and urban areas, female and male populations have dissimilar educational distribution. Similarly, social groups such as Scheduled Tribes (STs), Scheduled Castes (SCs) and other remaining groups; and religious groups such as Hindus, Muslims and Christians. have entirely different distribution within rural or within urban sectors. In general, females, STs, SCs and Muslims groups have low educational attainment in both the sectors. There are also inequalities within these demographic groups. For example, females belonging to ST group and females belonging to general (or non-scheduled caste) group will have a different educational distribution in the rural as well as in the urban sectors.

Another important reason is income inequality among the rural and urban households. Individuals from low-income group or poor households in both the rural and urban sectors are more vulnerable. The poor households are unable or unwilling to send their children to school because of various reasons such as: financial constraints, for taking help in domestic work (e.g., cattle feeding) and occupational activities (e.g., agriculture). In many households girls stay at home to take care of their siblings when their parents go out for work. The poor households often face credit constraints which prevent them financing education of their children particularly at higher levels of education. Though elementary education is free in government schools but there are always hidden costs associated with it (also see Tilak, 1996). The private education is costly and beyond their approach.

Similar reasons hold for within state inequalities. Some states, such as Rajasthan, have the high proportion of SC and ST populations. These groups have very low educational attainment. A large proportion of these groups do not have access to schooling within a reasonable distance. Though about 90% of the population might have acquired access to (primary) schooling in rural areas, around 10–15% of the SC/ST groups are still deprived of schools (Mehrotra, 2006, p. 20). This proportion of these groups is also higher in the states of Madhya Pradesh and Uttar Pradesh.

Within the states, there is a considerable heterogeneity in government schools in quality of physical infrastructure and the teachers. An important reason behind this is the difference in funding; local body schools and schools under the state department do not have the same kind of funding (De et al., 2011, p. 22). The spatial distribution of colleges and universities is skewed across the states. Many states do not have a single central university. The distribution of colleges and Industrial Training Institutes/Centers is also highly uneven across the states (Agarwal, 2009, p. 52; Agrawal, 2012). In addition, climatic, geographical, and political conditions, and policy interventions are quite different across states.

5. Major issues and concerns

In this section, we review some of the major factors which affect participation of students in schools. These factors are helpful in explaining the rural–urban inequalities and also in explaining the much higher extent of inequality in the rural sector.

Household economic factors, school environment including quality of physical and human infrastructure and quality of instruction, and social and cultural factors are three important factors that influence participation in schooling (Tilak, 2009, p. 37). In rural areas, there is a limited access to educational institutions particularly at higher levels of education. Schooling infrastructure in terms of classrooms, drinking water and toilets is not good. Many schools do not have enough class rooms and students are forced to sit in an open area. During the rains, schools become flooded and do not function. Students often face poor access to information and technology. However, in urban areas accessibility of educational institutions, better infrastructure and good quality of education are some important incentives which motivate students to participate in schools.

The prevalence of cultural and traditional factors in rural areas also deters participation of boys and girls. In villages the traditional customs, like marriage at an early age, are still persistent which affect their participation and especially girl students suffer more.

Teacher absenteeism is another major problem. A study by Kremer et al. (2005), based on a nationally representative sample of government primary schools in India, finds that 25% of teachers were absent from school, and only half of the teachers were engaged in teaching during unannounced visits to the primary schools.[19] The teacher absence rate in India was the second-highest among the eight countries that they surveyed. The rate was highest in the states of Jharkhand (41.9%) and Bihar (37.8%) and lowest in Maharashtra (14.7%).

Teachers are involved in other official and non-official duties, collection of data (for example, Census), staffing polling stations during national, state or local elections or conducting immunization campaigns (Kremer et al., 2005; Tilak, 2009, p. 50). Therefore, they do not attend schools on all working days. Teachers have responsibility for the supervision of the 'Mid-Day Meal' scheme and completing the attendance register. They report on other incentive schemes and work closely with the community in education committees (De et al., 2011, p. 31). Ramchandran (2009, p. 135) mentions that in the state of Andhra Pradesh, many male school teachers remain involved with labor/construction contractors, traders, suppliers of construction material etc.

Lack of teachers despite the growing demand for education is another issue in many states. Many schools are functional with only one or two teachers. The proportion of such single-teacher schools at the primary level is quite high in the states of Madhya Pradesh (22%), Bihar (16%) and Uttar Pradesh (12%) (Mehrotra, 2006, p. 20).

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[19] This study covered 20 Indian states. Three unannounced visits were made to each of 3700 government-run primary schools. Though the survey focused on government-run primary schools, it also covered rural private schools and private-aided schools located in villages where government schools were surveyed.

Table 3
Gini index of education: major Indian states.

States	All				Rural				Urban			
	1993	1999	2004	2009	1993	1999	2004	2009	1993	1999	2004	2009
Andhra Pradesh	0.72	0.68	0.65	0.57	0.79	0.75	0.70	0.63	0.54	0.49	0.48	0.40
Assam	0.55	0.54	0.51	0.42	0.57	0.56	0.52	0.42	0.36	0.36	0.35	0.29
Bihar	0.74	0.72	0.67	0.61	0.77	0.76	0.70	0.64	0.51	0.49	0.42	0.42
Delhi	0.43	0.38	0.35	0.29	0.47	0.44	0.37	0.40	0.42	0.35	0.35	0.29
Gujarat	0.61	0.56	0.52	0.48	0.68	0.63	0.60	0.55	0.46	0.41	0.37	0.36
Haryana	0.61	0.54	0.52	0.46	0.66	0.59	0.56	0.49	0.45	0.42	0.38	0.39
Himachal Pradesh	0.57	0.49	0.47	0.39	0.59	0.50	0.47	0.40	0.34	0.30	0.36	0.26
Jammu & Kashmir	0.57	0.57	0.54	0.47	0.63	0.60	0.57	0.50	0.35	0.41	0.42	0.38
Karnataka	0.65	0.61	0.57	0.49	0.72	0.69	0.64	0.56	0.46	0.40	0.39	0.35
Kerala	0.36	0.36	0.35	0.31	0.37	0.37	0.35	0.31	0.34	0.32	0.32	0.29
Madhya Pradesh	0.72	0.67	0.63	0.53	0.78	0.72	0.68	0.57	0.49	0.47	0.42	0.36
Maharashtra	0.56	0.51	0.47	0.41	0.64	0.59	0.54	0.48	0.41	0.39	0.37	0.31
Orissa	0.70	0.67	0.61	0.53	0.73	0.70	0.64	0.55	0.47	0.48	0.43	0.39
Punjab	0.58	0.54	0.49	0.44	0.64	0.59	0.53	0.48	0.42	0.42	0.37	0.36
Rajasthan	0.74	0.68	0.66	0.59	0.80	0.74	0.71	0.64	0.54	0.48	0.50	0.42
Tamil Nadu	0.57	0.52	0.49	0.43	0.64	0.58	0.57	0.49	0.45	0.40	0.37	0.35
Uttar Pradesh	0.70	0.65	0.62	0.55	0.74	0.69	0.65	0.58	0.53	0.51	0.48	0.42
West Bengal	0.61	0.60	0.56	0.51	0.66	0.65	0.61	0.54	0.45	0.44	0.40	0.38
All India	0.65	0.61	0.57	0.51	0.70	0.66	0.62	0.55	0.47	0.43	0.41	0.37

Source: Author's calculations from the unit record data of the 50th, 55th, 61st and 66th rounds of the NSSO for individuals aged 15 and above.

Table 4
Decomposition of educational inequality by sector.

Group	Population share	Mean education	Education Gini	Overlapping	Contribution to total Gini	Percentage contribution
1993						
Intra-group	–	–	–	–	0.57	88.79
Rural	0.74	2.77	0.70	0.98	0.38	59.24
Urban	0.26	6.29	0.47	0.92	0.19	29.55
Inter-group	–	–	–	–	0.07	11.21
Total	1.00	3.69	0.65	–	0.65	100.00
1999						
Intra-group	–	–	–	–	0.61	89.00
Rural	0.73	3.26	0.66	0.97	0.36	59.68
Urban	0.27	6.89	0.43	0.93	0.18	29.32
Inter-group	–	–	–	–	0.07	11.00
Total	1.00	4.24	0.61	–	0.61	100.00
2004						
Intra-group	–	–	–	–	0.51	89.76
Rural	0.73	3.73	0.62	0.97	0.35	61.19
Urban	0.27	7.30	0.41	0.94	0.16	28.56
Inter-group	–	–	–	–	0.06	10.24
Total	1.00	4.71	0.57	–	0.57	100.00
2009						
Intra-group	–	–	–	–	0.46	90.30
Rural	0.71	4.59	0.55	0.96	0.31	60.97
Urban	0.29	8.11	0.37	0.97	0.15	29.33
Inter-group	–	–	–	–	0.05	9.70
Total	1.00	5.61	0.51	–	0.51	100.00

Source: Author's calculations from the unit record data of the 50th, 55th, 61st and 66th rounds of the NSSO for individuals aged 15 and above.

In Andhra Pradesh agrarian distress has resulted in ruining the education of children, particularly girls. Many girls have to work as a wage labor and also support their mothers in household duties. There is a steady increase in the numbers of children working in cottonseed farms, sunflower harvesting and cotton farms (Ramchandran, 2009, p. 139). Although the 'Mid-Day Meal' programme has been resulted in a marked difference in the enrollment figures, children work before and after school and during vacations. In the peak agricultural season, they take leave and in some schools, they come just in time for the noon meal.

Table 5
Decomposition of educational inequality by state.

Component	1993		1999		2004		2009	
	Gini	Percentage contribution	Gini	Percentage contribution	Gini	Percentage contribution	Gini	Percentage contribution
Intra-group	0.62	95.53	0.58	95.72	0.55	95.82	0.49	96.15
Inter-group	0.03	4.47	0.03	4.28	0.02	4.18	0.02	3.85
Overall Gini	0.65	100.00	0.61	100.00	0.57	100.00	0.51	100.00

Source: Author's calculations from the unit record data of the 50th, 55th, 61st and 66th rounds of the NSSO for individuals aged 15 and above.

6. Experience of Himachal Pradesh and Kerala

The state of Kerala is exemplary in human development not just in India but for other developing countries too. After the formation of the state in 1956, the main priorities of the government were education, food security, health and land reform (Probe Team, 1999, p. 13). Various policy measures such as compulsory and free school education, basic education, direct payment of salaries of private school teachers by government, reduction of intercommunity and interregional differences in school access, promotion of female education, school-feeding, promotion policies and travel concessions to students have helped the state in achieving the total literacy by 1991 (Government of India, 2008, p. 255). An interesting fact is that the high level of literacy was attained at a rather low level of per capita income.[20] Schools opened by the Christian missionaries in the early 19 century also helped in achieving high levels of literacy. The missionaries targeted education of the disadvantaged groups like the fishermen communities of the coast (Tharakan, 1984; Mathew, 1999).

The share of privately managed schools in Kerala is comparatively larger than in other states; about 56% schools are in the private sector (Government of India, 2008, p. 265). The quality of education as indicated by qualification of the teachers, drop-out and grade repetition rates, and examination results is good. The availability of schools in the rural sector is much more; around three-fourths of the schools are in the rural sector (Government of India, 2008, p. 271). This could be one of the reasons for a small rural–urban gap in attainment in the state. We notice that intra-sector inequality is lowest in Kerala where the difference in the Gini coefficients of the two sectors is only two percentage points (Table 3).

Basic education in the state of Himachal Pradesh is also a success story. The educational experience of the state shows the critical role that the state policy and public action play in advancing an institutional context within which universal education can become a reality (De et al., 2011, p. 93). The Himachal experience serves lessons for other states on how to improve education delivery and outcomes.

In fact, the state was considered as the most educationally backward state of the country at the time of the independence when the literacy rate in the state was only 8%. The evolution of elementary education from mass illiteracy in Himachal Pradesh has been more notable than Kerala's progress in many ways. The evolution has occurred over a shorter period than in Kerala. In this success there was a little contribution from private institutions, missionary organizations and related institutions; mainly government schools played a major role in educational expansion. Further, 'topography' and 'settlement pattern' (for example, one-third of the rural population stays in villages with a population of less than 300) in the state are also not propitious. In the state economy, child labor was an important feature. A number of households in Himachal Pradesh depend on environmental resources, and quite a good proportion of females work outside the household (Drèze and Sen, 2002, p. 177; Probe Team, 1999, pp. 115–116). Despite these challenges, the state has made a spectacular progress.

The state government made primary education compulsory for achieving universalization of education by declaring the 'Himachal Pradesh Compulsory Primary Education Act, 1997'. The focus of the first six 'Five Year Plans' in the state was on education; most of the development expenditure was used on expansion projects like opening new schools, and provision of facilities for free and universal education (Government of India, 2005, p. 136). In fact state initiatives, public response, community participation, parental demand, official commitment and social equality can be attributed to 'schooling revolution' in Himachal Pradesh (Drèze and Sen, 2002, p. 183; De et al., 2011, p. 95). Community involvement has been a significant feature of the schooling system in the state. Parents have a positive attitude toward schooling. They want their children to study as far as possible or as long as child wishes. Children of all social backgrounds study together in local schools.

In sum, state intervention, market mechanism and cooperative action are important institutions which have been seen in success of both the states. For instance, provision of free schooling facilities (state action), missionary schools (cooperative action) and private-aided schools in Kerala, and cooperative efforts, like cooperation by village communities in building extra rooms in the local schools in Himachal Pradesh have played a vital role in successful schooling (Drèze and Sen, 2002, pp. 59, 180). The experience of the two states is indeed exemplary for the rest.

7. Major government initiatives

There have been many policy initiatives to improve the education system in India particularly in the last two decades. Some of the major initiatives are: District Primary Education Programme (DPEP), Mid Day Meal Scheme and Sarva Shiksha Abhiyan (SSA).[21] DPEP was a Centrally sponsored scheme launched in 1994. The main objective of this program was to universalize primary education (I–V) to get all children into school. Later, in 2001–2002, it was replaced by SSA which is aimed at achieving universalization of elementary education (I–VIII) and is being implemented in partnership with state governments in all districts of the country. The focus areas of SSA are to increase access, enrollment and retention of all children and to reduce school drop-outs. The stress of SSA is also on offering quality education to all children including life skills. The Government of India introduced the National Program of Nutritional Support to Primary Education (NP-NSPE) in 1995 with a view to improve primary schooling by increasing enrollment, retention and attendance and simultaneously improving nutritional levels among students. The Mid Day Meal Scheme is the world's largest school feeding program and provides for free of cost lunch to school children on all working days in government and aided schools. Recently, India has joined the group of those countries where education is a fundamental right of every child. The Indian Parliament passed the 'Right of Children to Free and Compulsory Education Act' or Right to Education Act (RTE) which came into effect on April 1, 2010. The RTE Act makes education a fundamental right of every child in age group 6–14 and specifies minimum norms in elementary schools.

8. Conclusions

This paper examines educational attainment rate and educational inequality in India between the years 1993 and 2009. In 2009, about 32% of the population of the country in age group 15 and above is illiterate and merely 8% have obtained higher and above education. There is a marked disparity in educational attainments of the population in rural and urban areas, and across the states. Using the education Gini index, we estimate inequality in educational attainment. Although inequality declined by 14 percentage points between 1993 and 2009, the extent of inequality remains high (above 50% in 2009). There is a clear regional

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[20] For instance, literacy rate in 1981 was 81.6 per cent (based on Census-1981) and per capita income was around Rs. 1312 (in 1980–81) which was lower than Rs. 1571, the average per capita income of India (Tharakan, 1984).

[21] 'Sarva Shiksha Abhiyan' is a Hindi phrase which means 'the education for all movement'.

contrast; the index in the rural sector is higher by 18 percentage points than in the urban sector in 2009.

We carry out a decomposition analysis which shows that intra-sector inequality contributes a major proportion to the overall inequality. We also find that within rural inequality has increased over the period. A high contribution of intra-group inequality in the rural sector suggests that the government should give more attention on education in rural areas.

In the rural sector, a large number of the households are associated with agricultural and allied activities, and their children too are more likely to attach with similar types of occupation at the early stage of schooling or without schooling to bear the household responsibilities. As Kumar (2009) comments: "no matter how long it (RTE act) has taken, it is a great achievement for a nation in which the educated middle class does not mind using children as domestic servants, and where little girls are taught to regard marriage and motherhood as the ultimate goal of a woman's life. No wonder the struggle to widen the system of education and to reform it has been so tough." It is important to make children and their parents recognize the importance of education.

The Public Report on Basic Education (PROBE) in India gives discouraging view of the education system in the rural sector of some states – 'dilapidated' infrastructure, 'demotivated' teachers, 'paralysing' curriculum and 'irresponsible' management (Probe Team, 1999). The revised PROBE report, which is based on the findings of a survey conducted in 2006, states that nothing had changed in this respect; half of the government schools still had no teaching activity (De et al., 2011). While many positive changes have taken place over the past decade, many fundamental problems including low class room activity, the poor quality of education and discrimination due to social disparities in schooling opportunities remain to be addressed.

Better infrastructure facilities and good quality of education are essential to motivate the children in rural areas. Elementary schooling facilities should be provided within each habitation so that the children from remote areas could also benefit. Education-ally backward states (states with low levels of educational attainment) which include Andhra Pradesh, Bihar, Madhya Pradesh, Orissa, Rajasthan and Uttar Pradesh should be on the highest priority for the policy makers. Government initiatives and schemes on education which have been put in place in other states, such as Kerala and Himachal Pradesh, could also be helpful.

Acknowledgements

Appendix: Average years of schooling, India: 1993–2009

States	All				Rural				Urban			
	1993	1999	2004	2009	1993	1999	2004	2009	1993	1999	2004	2009
Andhra Pradesh	2.78	3.54	3.87	4.95	1.88	2.37	2.95	3.81	5.29	6.33	6.42	7.80
Assam	4.03	4.40	4.49	5.55	3.62	3.91	4.08	5.07	7.27	7.76	8.00	9.19
Bihar	2.81	3.05	3.53	4.28	2.35	2.49	3.00	3.79	5.99	6.53	7.31	7.36
Delhi	7.63	8.29	8.54	9.29	5.89	6.33	7.28	6.95	7.83	8.79	8.63	9.43
Gujarat	4.00	4.59	5.15	5.78	2.94	3.44	3.90	4.24	6.16	6.85	7.48	7.99
Haryana	4.19	5.00	5.55	6.32	3.31	4.16	4.72	5.68	6.56	7.01	7.68	7.82
Himachal Pradesh	4.30	5.35	5.87	6.98	3.90	4.96	5.63	6.73	8.30	9.01	8.02	9.77
Jammu & Kashmir	4.57	4.66	5.01	6.01	3.44	4.00	4.33	5.43	7.95	7.25	6.89	7.77
Karnataka	3.64	4.23	4.69	5.89	2.53	2.97	3.44	4.50	6.29	7.27	7.39	8.30
Kerala	6.04	6.33	6.84	7.72	5.76	6.02	6.54	7.44	6.83	7.19	7.79	8.52
Madhya Pradesh	2.96	3.50	4.01	5.16	1.96	2.53	3.03	4.21	6.18	6.59	7.36	8.30
Maharashtra	4.57	5.22	5.83	6.93	3.15	3.85	4.57	5.47	6.80	7.22	7.61	8.83
Orissa	2.85	3.31	4.02	5.01	2.32	2.74	3.54	4.56	6.23	6.13	6.98	7.73
Punjab	4.55	5.13	5.86	6.42	3.57	4.16	4.85	5.54	6.92	7.05	7.90	8.02
Rajasthan	2.76	3.41	3.65	4.61	1.86	2.43	2.83	3.64	5.59	6.50	6.12	7.47
Tamil Nadu	4.30	5.06	5.56	6.53	3.36	3.96	4.24	5.35	6.00	7.01	7.55	7.97
Uttar Pradesh	3.29	3.86	4.29	5.18	2.64	3.22	3.64	4.47	5.85	6.16	6.62	7.54
West Bengal	3.89	4.13	4.59	5.08	2.93	3.21	3.51	4.10	6.62	6.98	7.34	7.83
All India	3.69	4.24	4.71	5.61	2.77	3.26	3.73	4.59	6.29	6.89	7.30	8.11

Source: Author's calculations from the unit record data of the 50th, 55th, 61st and 66th rounds of the NSSO for individuals aged 15 and above.

References

Agarwal, P., 2009. Indian Higher Education: Envisioning the Future. Sage Publication, New Delhi.

Agrawal, T., 2012. Vocational education and training in India: challenges, status and labour market outcomes. Journal of Vocational Education & Training 64 (4) 453–474.

Barro, R.J., Lee, J.W., 1996. International measures of schooling years and schooling quality. The American Economic Review, Papers and Proceedings 86 (2) 218–223.

Castelló, A., Doménech, R., 2002. Human capital inequality and economic growth: some new evidence. Economic Journal 112 (478) C187–C200.

De, A., Khera, R., Samson, M., Kumar, A.K.S., 2011. Probe Revisited: A Report on Elementary Education in India. Oxford University Press, New Delhi.

Drèze, J., Sen, A., 2002. India: Development and Participation. Oxford University Press, New Delhi.

Frick, J.R., Goebel, J., Schechtman, E., Wagner, G.G., Yitzhaki, S., 2006. Using analysis of Gini (ANOGI) for detecting whether two subsamples represent the same universe. Sociological Methods and Research 34 (4) 427–468.

Government of India, 1997. Employment and unemployment in India, 1993–94. Report No. 409. National Sample Survey Organisation, Department of Statistics, Government of India, New Delhi.

Government of India, 1998. National Policy on Education 1986. New Delhi. .

Government of India, 2001. Report No. 458(55/10/2), National Sample Survey Organisation, Ministry of Statistics and Programme Implementation. National Sample Survey Organisation, Ministry of Statistics and Programme Implementation, Government of India, New Delhi.

Government of India, 2005. Himachal Pradesh Development Report. Planning Commission, Government of India, New Delhi.

Government of India, 2006. Employment and Unemployment Situation in India 2004–05. Report No. 515 (61/10/1) National Sample Survey Organisation,

Ministry of Statistics and Programme Implementation, Government of India, New Delhi.

Government of India, 2008. Kerala Development Report. Planning Commission, Government of India, New Delhi.

Government of India, 2011. Employment and Unemployment Situation in India 2009–10. Report No. 537 (66/10/1) National Sample Survey Organisation, Ministry of Statistics and Programme Implementation, Government of India, New Delhi.

Kremer, M., Chaudhury, N., Rogers, F.H., Muralidharan, K., Hammer, J., 2005. Teacher absence in India: a snapshot. Journal of the European Economic Association 3 (2–3) 658–667.

Kumar, K., 2009. India 62: soaring high? The Hindu August 16. Available at: http://www.thehindu.com/arts/magazine/article3735.ece (accessed 06.08.11).

López, R., Thomas, V., Wang, Y., 1998. Addressing the education puzzle: the distribution of education and economic reform. In: Policy Research Working Paper Series No. 2031. The World Bank.

Mathew, E.T., 1999. Growth of literacy in Kerala: state intervention, missionary initiatives and social movements. Economic and Political Weekly 34 (39) 2811–2820.

Mehrotra, S., 2006. What ails the educationally backward states? The challenge of public finance, private provision and household costs. In: Mehrotra, S. (Ed.), The Economics of Elementary Education in India: The Challenge of Public Finance, Private Provision and Household Costs. Sage Publication, New Delhi, pp. 11–53.

Probe Team, 1999. Public Report on Basic Education in India. Oxford University Press, New Delhi.

Pyatt, G., 1976. On the interpretation and disaggregation of Gini coefficients. The Economic Journal 86 (342) 243–255.

Ramchandran, V., 2009. Systemic barriers to equity in education. In: Rustagi, P. (Ed.), Concerns, Conflicts, and Cohesions: Universalization of Elementary Education in India. Oxford University Press, New Delhi, pp. 125–149.

Ray, D., 1998. Development Economics. Oxford University Press, New Delhi.

Sahn, D.E., Stifel, D.C., 2003. Urban–rural inequality in living standards in Africa. Journal of African Economies 12 (4) 564–597.

Shorrocks, A., Wan, G., 2005. Spatial decomposition of inequality. Journal of Economic Geography 5 (1) 59–81.

Tharakan, P.K.M., 1984. Socio-economic factors in educational development: case of nineteenth century Travancore. Economic and Political Weekly XIX (45) 1913–1928.

Thomas, V., Wang, Y., Fan, X., 2001. Measuring education inequality: Gini coefficients of education. In: Policy Research Working Paper Series 2525. The World Bank.

Tilak, J.B.G., 1996. How free is 'Free' primary education in India? Economic and Political Weekly 31 (6) 355–366.

Tilak, J.B.G., 2008. Higher education: a public good or a commodity for trade? Commitment to higher education or commitment of higher education to trade. Prospects 38 (4) 449–466.

Tilak, J.B.G., 2009. Universalizing elementary education: a review of progress, policies and problems. In: Rustagi, P. (Ed.), Concerns, Conflicts, and Cohesions: Universalization of Elementary Education in India. Oxford University Press, New Delhi, pp. 33–71.

UNDP, 1990. Human Development Report 1990. Oxford University Press, New Delhi.

UNDP, 2010. Human Development Report 2010. Available at: In: http://hdr.undp.org/en/reports/global/hdr2010/chapters/en/ (accessed 06.08.11).

Ward, M., 2007. Rural education. In: India Infrastructure Report 2007. Oxford University Press, New Delhi, pp. 286–317.

Yitzhaki, S., 1994. Economic distance and overlapping of distributions. Journal of Econometrics 61 (1) 147–159.