Perspectives

Uneven Distribution of Education in Maharashtra

Rural-Urban, Gender and Caste Inequalities

There is a strikingly significant unevenness in the distribution of education across regions, gender and caste groups in Maharashtra. The most disadvantaged group is the scheduled caste/tribe rural females who on an average get less than a third of the schooling as the best positioned group, the non-backward class males. At the same time, gender and caste inequalities in access to education consistently decline with a rise in the average age of schooling.

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It is now recognised that knowledge-based jobs and hence value added human resources will play a pivotal role in the present millennium. Planning of education in general and higher education in particular will acquire greater significance. The state of Maharashtra, with a literacy rate of 77 per cent, is perceived as one of the more advanced in the field of education. Steps such as free education for girls up to higher secondary level and freeships for the economically and socially backward up to the tertiary level have contributed to widening the base of education in general and higher education in particular.

At stage I-X in the state, the proportion of students from all backward classes is 55 per cent and that of girls is 47 per cent. Even at degree college level, these proportions are 40 per cent and 43 per cent respectively [Datanet India 2003]. However there are disturbing disparities in the educational attainment of the population that are based on regional, gender and caste inequalities. Utilising the tools of Gini index and Lorenz curve, we make a detailed analysis of the uneven distribution of education in Maharashtra.[1]

Measurement of Education Inequality

Enrolments merely measure the access to education. They are insufficient to measure the stock of human capital and hence inappropriate to measure education inequality [Thomas et al 2000]. As far as the measurement of education inequality is concerned, standard deviation of years of schooling has been used to measure absolute dispersion of distribution of education. The UNDP also has developed an index of education (IOE) based on a weighted average of literacy and average years of schooling [Tilak 1999].

The education Gini index is an indicator to measure relative inequality in distribution of education. This indicator was developed by Lopez, Thomas and Wang [cited in Thomas et al 2000] and is based on educational attainment. Using the education Gini index, coefficients have been calculated for 85 countries for the period from 1960-90. The authors have observed that inequality declines with higher average years of schooling, lower gender gaps and higher per capita GDP increments. Specifically, in India in 1960 the education Gini and average years of schooling were 0.79 and 1.09 years, respectively. The same had changed to 0.69 – among the highest in the world – and 2.95 years respectively by 1990.

The mathematical expression developed by Thomas, Wang and Fan, to calculate education Gini by direct method is:

$$\text{Gini} = \frac{1}{\mu} \sum_{i=2}^{n} \sum_{j=1}^{i-1} p_i |y_i - y_j| p_j \qquad (1)$$

where, Gini = Education Gini index; μ equals the average years of schooling for the concerned population; y_i and y_j are the years of schooling at different education attainment levels; p_i and p_j are the proportions of population with certain levels of education; and n is the number of levels in education attainment.

The average years of schooling is obtained as $\mu = \sum_{i=1}^{n} p_i y_i$ \qquad (2)

We have utilised this method to calculate education Gini coefficients using data from the NSSO tables of the 55th round, for the population aged seven and above, separately for males and females in rural and urban Maharashtra, separately for the different social groups, viz, backward classes (BC) – SC/ST/OBC and non-backward classes in Maharashtra. Educational attainment of the population is categorised into seven levels.

Educational Attainment Levels

The distribution of population as per 55th round of NSSO (1999-2000) for population aged seven years and above, by educational attainment levels for each social group is available, separately by region and gender. We have obtained the years of schooling at each of the seven education attainment levels as shown below:

(i)   Illiterate $y_1 = 0$
(ii) Literate (below primary)
      $y_2 = y_1 + \frac{1}{2} Cp = 2$
(iii) Primary $y_3 = y_1 + Cp = 4$
(iv) Middle $y_4 = y_3 + \frac{1}{2} Cs = 7$ \qquad (3)
(v)   Secondary $y_5 = y_3 + Cs = 10$
(vi) High secondary $y_6 = y_5 + C_{HS} = 12$
(vii) Graduation and above
      $y_7 = y_6 + C_G = 15.5$

Table 1: Education Gini Coefficients (1999-2000), Maharashtra

		ST	SC	OBC	Non-BC	All
Rural	Male	0.5863	0.4984	0.4489	0.4261	0.4714
	Female	0.7332	0.6513	0.6012	0.5769	0.6208
	All	0.66	0.5769	0.5268	0.5042	0.5475
Urban	Male	0.3961	0.3946	0.3597	0.3498	0.3615
	Female	0.516	0.5086	0.4847	0.4334	0.4594
	All	0.4543	0.4513	0.4181	0.3881	0.4072

where,
Cp = cycle of primary education = 4 years
Cs = cycle of secondary education = 6 years
CHS = cycle of high secondary education = 2 years
CG = cycle of graduation and above = 3.5 years.[2]

Rural-Urban and Gender Disparities

The education Gini coefficients and the average years of schooling computed by us for, both, urban and rural males and females in each social group[3] are listed in Tables 1 and 2 respectively. The education Gini can also be estimated from a conventional Lorenz curve that is constructed as a plot of cumulative percentage of schooling years against cumulative percentage of population. We obtain a Lorenz curve for any group by taking Q_i (cumulative per cent of population) on the horizontal axis and S_i (cumulative per cent of schooling years) on vertical axis.

It should be noted that

$$Q_i = \sum_{j=1}^{i} p_j \text{ and } S_i = \left(\frac{\sum_{j=1}^{i} p_j \, y_j}{\mu}\right) \times 100$$

Figures 1 and 2 are plots of the Lorenz curves for each of SC, ST and non-BC groups in rural and urban Maharashtra. The 45 degree line is the education egalitarian line where Gini = 0. The ratio of area between Lorenz curve and the education egalitarian line to the area of the egalitarian triangle gives an estimate of Gini. In case of complete inequality the Lorenz curve will coincide with the egalitarian triangle and Gini will be equal to unity.

The Gini values and the Lorenz curves bring out the strikingly significant unevenness in the distribution of education across regions, gender and social groups. We can see that the most disadvantaged group is SC/ST rural females who on an average get less than a third of the schooling as the best positioned group, namely, the non-BC urban males. At the
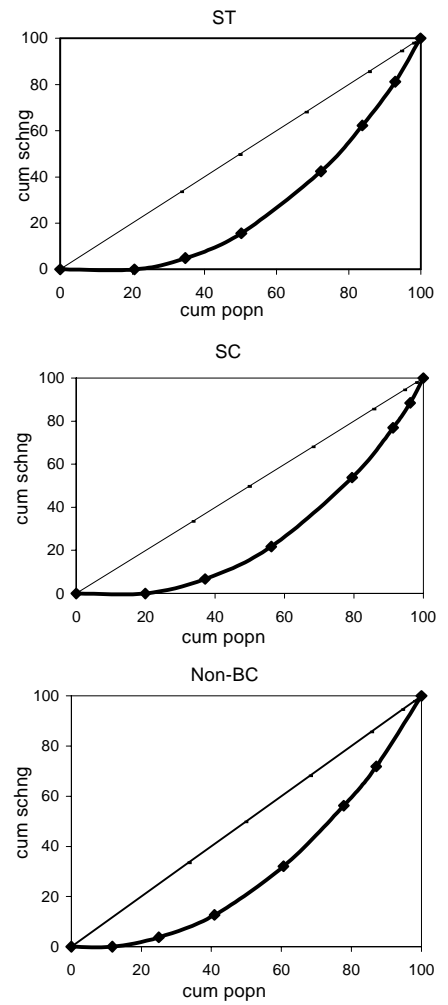
Table 2: Average Years of Schooling (1999-2000), Maharashtra

		ST	SC	OBC	Non-BC	All
Rural	Male	3.2	4.3	5.0	5.6	4.9
	Female	1.7	2.5	3.1	3.5	2.9
	All	2.5	3.4	4.0	4.5	3.9
Urban	Male	6.7	5.8	6.6	7.7	7.2
	Female	4.8	4.3	5.0	6.4	5.8
	All	5.8	5.1	5.8	7.1	6.6
All		3.86	4.10	4.80	5.62	5.02

Figure 1: Lorenz Curves (Rural Maharashtra)

ST

SC

Non-BC
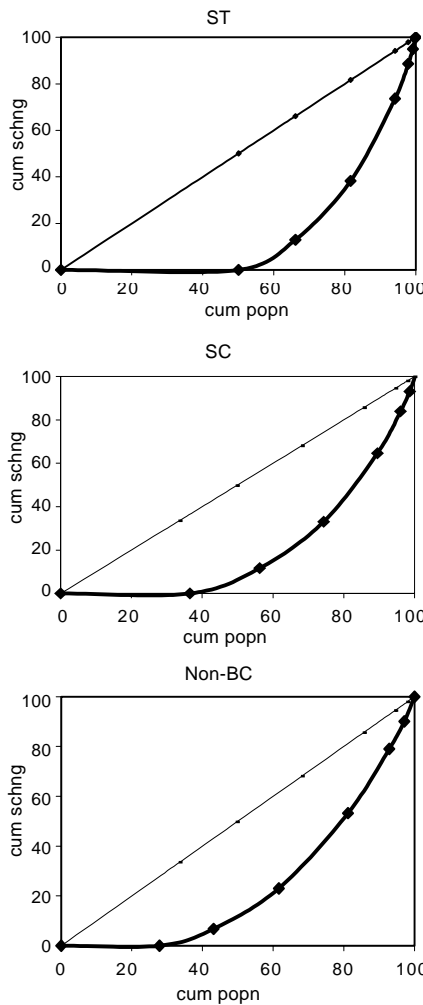
Figure 2: Lorenz Curves (Urban Maharashtra)

ST

SC

Non-BC

same time Gini consistently falls with rise in the average years of schooling. The maximum education inequality is among the rural ST females while the urban males form the least disparate group. Irrespective of the region, female Ginis are at least 25 per cent higher than the male Ginis.

A simultaneous perusal of the Lorenz curves in Figures 1 and 2 highlights the following features of the disparities in educational attainment in Maharashtra.

– The social group based inequality appears to be very acute in the rural areas, as seen in Figure 1.

– The Lorenz curve in the first panel (rural ST) of Figure 1 is far away from the line of equality. This happens because half the population received no education, 80 per cent of the population received one-third of the cumulative education and barely 5 per cent of the population attained more than 75 per cent of the cumulative education.

– At the same time, the first panel (urban ST) of Figure 2 shows better spread of education since the Lorenz curve has shifted closer to the egalitarian line. Here, the proportion of population receiving no education drops drastically to 20 per cent; 80 per cent of the population received more than 50 per cent of the education and the proportion of population receiving at least 75 per cent of the cumulative education doubles to 10 per cent.

– In the second panel (rural SC) of Figure 1, the Lorenz curve has become less steep as compared to panel 1. In this case, 37 per cent of the population received no education, 80 per cent of the population received 40 per cent of the cumulative education and 7 per cent of the population attained more than 75 per cent of the education.

– Comparatively, the second panel (urban SC) of Figure 2 shows a spread similar to panel 1 in the same figure.

– As we move down to the third panel (rural non-BC) of Figure 1, the Lorenz

curve moves closer to the line of equality indicating greater spread of education. The illiteracy rate has dropped to nearly less than half of its value in the first panel and proportion of higher secondary and above has jumped more than three times. Here too, as in panel 1 of Figure 2, more than 50 per cent of the cumulative education is received by 80 per cent of the population and more than 75 per cent of the cumulative education is received by 10 per cent of the population. Yet, the Lorenz curve shows more steepness. It may be noted that in this case 28 per cent of the population, as against 20 per cent in first panel of Figure 2, received no education.

– The Lorenz curve in panel 3 (urban non-BC) of Figure 2 is closest to the line of equality, indicating least disparity in spread of education. Here, less than 15 per cent received no education and 15 per cent received more than 75 per cent of cumulative education.

– Overall, as compared to Figure 1, the panels of Figure 2 reveal lesser education inequality, both, within each social group and within urban region as a whole. In fact, the Lorenz curves in the panel for urban ST and SC are closer to the line of equality even when compared to that for rural non-BC. This happens due to much lower levels of illiteracy and higher proportion of above secondary, particularly graduation.

– From the rural ST to urban non-BC, the Lorenz curve moves from near extreme right to closest to line of equality. A sharp drop in illiteracy by nearly four times and a rise in the proportion of secondary and above by nearly seven times from the former to the latter, as seen in Figures 4 and 5, explains this phenomenon.
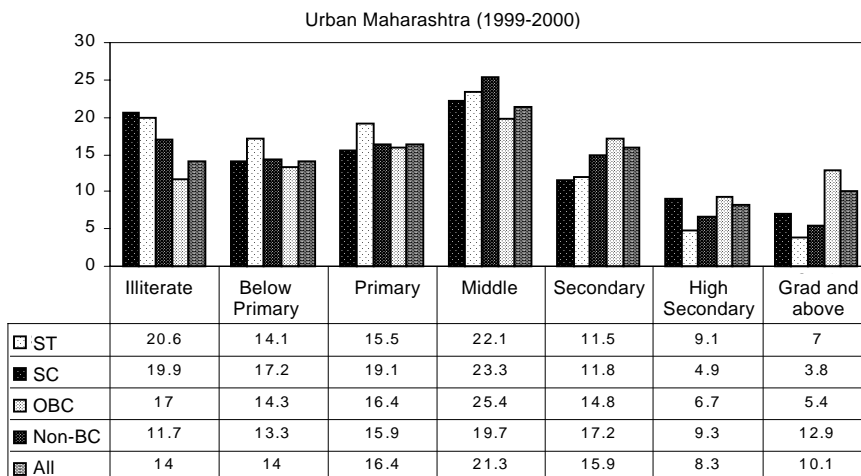
Lopez and others have estimated the gender gap for each country as difference in male and female illiteracy. We have similarly estimated the gender and region based caste gap, separately for illiteracy

Figure 3: Distribution of Population (Seven Years and Above) by Education in Urban Maharashtra

Urban Maharashtra (1999-2000)

	Illiterate	Below Primary	Primary	Middle	Secondary	High Secondary	Grad and above
ST	20.6	14.1	15.5	22.1	11.5	9.1	7
SC	19.9	17.2	19.1	23.3	11.8	4.9	3.8
OBC	17	14.3	16.4	25.4	14.8	6.7	5.4
Non-BC	11.7	13.3	15.9	19.7	17.2	9.3	12.9
All	14	14	16.4	21.3	15.9	8.3	10.1

Figure 4: Distribution of Population (Seven Years and Above) by Education in Rural Maharashtra

Rural Maharashtra (1999-2000)

	Illiterate	Below Primary	Primary	Middle	Secondary	High Secondary	Grad and above
ST	50.1	16	15.6	12.5	3.7	1.3	0.8
SC	36.5	19.7	18.1	15.2	6.5	2.6	1.5
OBC	31	16	19.8	18.5	8.9	3.9	1.8
Non-BC	27.8	15.3	18.5	19.6	11.7	4.2	2.9
All	33.5	16.2	18.4	17.5	8.9	3.4	2

Note: The figures are percentages for each social group.
Source: NSS Report No 473: Literacy and Levels of Education in India, 1999-2000.

and graduation and above levels. The caste gap for any group is defined by us as difference between highest proportion and lower proportion across the castes, e g, for rural females, caste gap = 62 (ST) – 38.9 (non-BC) = 23.1 for illiteracy. The resultant figures are given in Table 3.

The graph of education Gini by caste gap, in Figure 5, reveals that Gini rises with increasing caste gap for illiteracy. However, for graduation and above level the Gini declines with increasing caste gap. This is possibly due to the fact that when overall proportion of illiterates is very high, as in rural areas, the base of higher education is very narrow and the caste gap narrows at graduation level. Similarly, when overall illiteracy is low, as in urban areas, the base for higher

education broadens. At this stage, the caste-based inequality becomes predominant and shows up in the form of higher caste gap at graduation level.

At this stage, it is pertinent to note some of the salient features of the NSS report on the employment and unemployment situation among social groups in India during 1999-2000 [Government of India 2001b]. These are as follows:

– In rural Maharashtra, while 60 to 70 per cent of SC/ST HHs are engaged in agriculture labour, the same proportion in case of non-BC HHs is 38 per cent.
– In urban Maharashtra, majority of the HHs from BC as well as non-BC groups draw their major income from wage employment. However, casual labour is more frequent among BC HHs – varying from 15 to 20 per cent – than among the

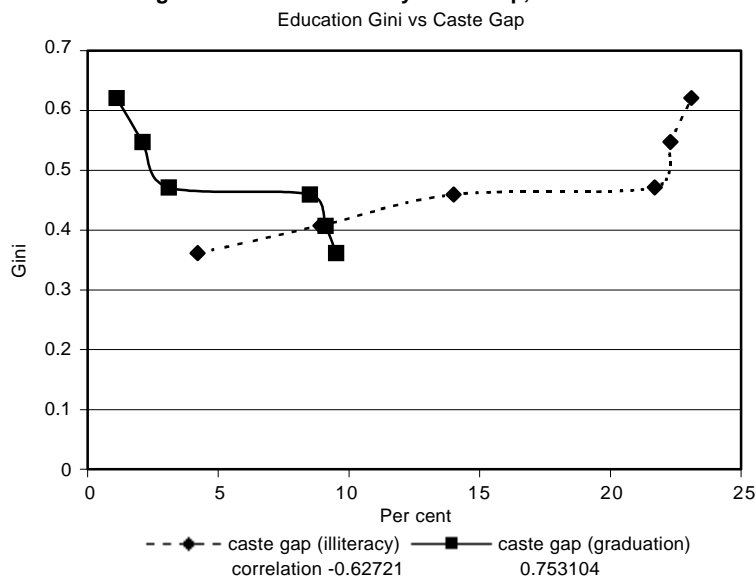**Table 3: Caste Gap at Levels of Illiteracy and Graduation and Above (1999-2000), Maharashtra**

		Caste Gap (Per Cent)		Gini	Average Schooling (Years)
		Illiteracy	Gradn and Above		
Rural	Male	21.7	3.1	0.4714	4.9
	Female	23.1	1.1	0.6208	2.9
	All	22.3	2.1	0.5475	3.9
Urban	Male	4.4	9.5	0.3615	7.2
	Female	14	8.5	0.4594	5.8
	All	8.9	9.1	0.4072	6.6
All*				0.4886	5.02

Note: * Estimated as weighted averages of the rural and urban measures, the weights being the rural and urban population proportions.

Figure 5: Education Gini by Caste Gap, Maharashtra

Education Gini vs Caste Gap

- - ◆ - - caste gap (illiteracy)   —■— caste gap (graduation)
correlation -0.62721   0.753104

non-BC HHs, where it is only 8 per cent.
– In both rural and urban areas, proportion of persons in lower MPCE classes is higher among the SC/ST HHs than others.
– Among urban males proportion of chronically unemployed was highest in the SC group. However, this feature did not vary much across various social groups in females.

These features when seen in the background of the extremely disparate distribution of education in Maharashtra not only drive home the close correspondence between levels of educational attainment and some indicators of substantive employment, but also reveal the disadvantaged position of the backward sections, particularly the SCs and STs.

Summary

Our analysis highlights the following results:

(a) The distribution of education is extremely skewed, particularly in the rural regions and specially, among the socially backward sections.
(b) The inequality in spread of education, as measured by Gini, is much higher among females than males in, both, rural and urban regions.
(c) The caste-based inequality is sharper in rural areas.
(d) Urban males show the least disparity, while rural females show the highest disparity in educational attainment.
(e) Gini values are higher when average schooling levels are lower. Moreover, Gini falls when fall in illiteracy is supplemented by a rise in attainment of higher
levels of education, particularly post-secondary. This result is noteworthy in the context of the current nationwide debate on caste-based reservations in higher education.

For the last several decades, there has been a neglect of education in India due to inadequate budgetary allocations for education. This has resulted in "education poverty" manifest through unequal access to education and low levels of educational attainment [Tilak 2002]. The full impact of the present policy, of reduced funding and increased fees, on the educational attainment of the marginalised sections of students, will be known only in another few years. ▣

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Notes

1 This article is based on the original work done for a chapter of the doctoral thesis of this author [Paranjape 2005].
2 CG varies from three to five years but is weighted more towards graduation.
3 Detailed tables and an illustrative calculation, for obtaining an education Gini coefficient and a Lorenz curve, are shown in the thesis.

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