Article

Education at Secondary Grade in India: A Spatial View

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Abstract

The research paper attempts to highlight the status of education at secondary grade by sex, residence, spatial pattern at district level and intra-regional disparity as revealed in the Census 2011. The study finds that 37.72 per cent persons at age 16 year had completed secondary education. This proportion had increased from 25.68 per cent in 2001. Arunachal Pradesh, Assam, Nagaland in the north-east and Rajasthan displayed high intra-regional disparity, which was low in states of south India namely Goa, Kerala, Tamil Nadu and Andhra Pradesh. Spatial disparity also existed. The male-female gap was insignificant. In fact, a large area of country had high percentage of secondary educated females than males. The gap between urban and rural was high. Southern side half part of country as well as Punjab, Haryana, NCT of Delhi, Chandigarh, Himachal Pradesh, West Bengal and Manipur were forward while mostly north and north-eastern states contained high backwardness. Percentage of households which have no matriculate and above, agriculture workers, percentage of married women who married under 18 year and illiterates were found important in predicting educational backwardness at secondary grade.

Keywords: Intra-regional disparity, spatial pattern, dimension index, regression

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Introduction

Secondary education serves as a link between the elementary and higher education and plays a very important role in this respect. A child's future depends a lot on the type of education received at the secondary grade. Providing secondary education to all, both boys and girls, with a focus on quality education assumes greater meaning today, when we consider the emerging challenges in our society. The recent significant development namely, Universal Elementary Education (UEE) being achieved through Sarva *Shiksha Abhiyan* (SSA) and also the impact of globalization and rapid growth of new technologies have led to reassessment of India's preparedness to generate required technical manpower, develop new knowledge and skills as well as remain competitive at global level. The secondary education system has a key role to play in enabling the nation to move towards these objectives. Secondary education spreads over the ages of 14 and 16 in the secondary grade and then to 16 to 18 in the senior secondary grade.

This study attempts to highlight the status of education at secondary grade by sex, residence, spatial pattern at district level and intra-regional disparity as revealed in the Census (2011).

Objectives of the study

- To examine the persons who are secondary educated at age 16.
- To find out intra-regional disparity.
- To represent spatial pattern at district level.
- To identify disparity by sex as well as by residence.
- To find out the educational backwardness at secondary grade.
- To examine the relationship between educational backwardness at secondary grade and selected socio-economic indicators.

Data and methodology

For this study, data had collected from Table C-8, Educational Level by Age and Sex for Population age 7 and above, Social & Cultural Tables, published by Office of the Registrar General & Census Commissioner, India as well as various secondary sources. Education Statistics from the website of DISE (District Information System for Education) published by NUEPA (National University of Educational Planning and Administration, 2011).

Absolute figures had converted into percentages as well as ratios and these percentages and ratios had been processed for necessary cartographic representations and interpretation. Requisite maps had been drawn with the help of Arc GIS software. Stepwise method of multiple regression was run with the help SPSS software. Intra-regional disparity was computed as co-efficient of variability

$$\text{Co-efficient of Variability (C.V.)} = \frac{\text{Standard Deviation}}{\text{Mean}} \times 100$$

Sopher's Disparity Index (1980) modified by Kundu and Rao (1986) as given below had been used to compute disparity by sex as well as by residence.

$$Ds = \text{Log}(x_2/x_1) + \text{Log}\ (200\text{-}x_1/200\text{-}x_2)$$

Here,

$$X_2 \geq X_1$$

The following formula had been used to measure the educational backwardness at secondary grade -

$$\text{Dimension Index} = \frac{\text{Actual value} - \text{Minimum value}}{\text{Maximum value} - \text{Minimum value}}$$

Education at Secondary Grade in Persons: A General View

At national level, 37.72 per cent population at age 16 year was secondary educated, that is 10th standard pass. This proportion had increased from 25.68 per cent in 2001.

Nagaland, Arunachal Pradesh, Assam and Rajasthan had high intra-regional disparity as some areas of these states are highly urbanized containing very high percentage of such persons while this disparity was low in Goa, Kerala, Tamil Nadu, and Andhra Pradesh (Fig. 1).

Spatial disparity also existed. Percentage of secondary educated persons (10th standard pass) varied from 3.70 per cent in Shajapur district of Madhya Pradesh to 83.99 per cent in Kanniyakumari district of Tamil Nadu. North-east part of the country was noted for less than 1/5th secondary educated at age 16 year. Madhya Pradesh and Chhattisgarh too fell in this category. Less than 30 percent population was secondary educated in West Bengal, Bihar, and Jharkhand. Among the union territories, Dadra & Nagar Haveli (27.21 per cent) as well as Lakshadweep (36.07 per cent) showed low percentages.

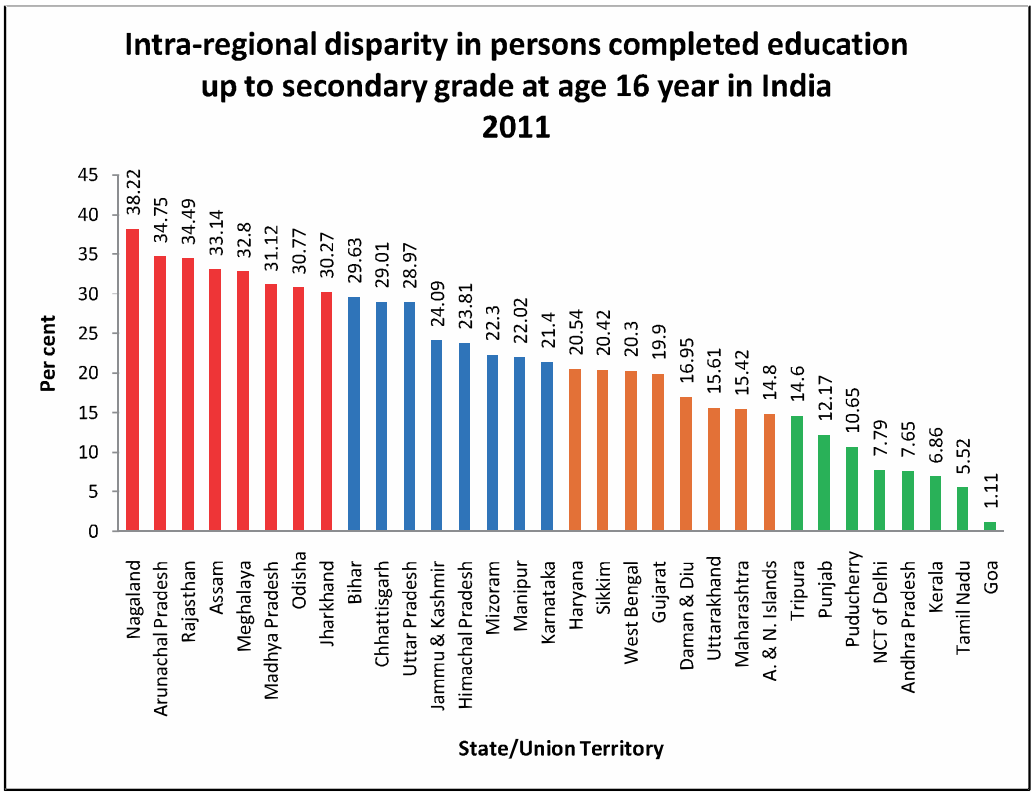
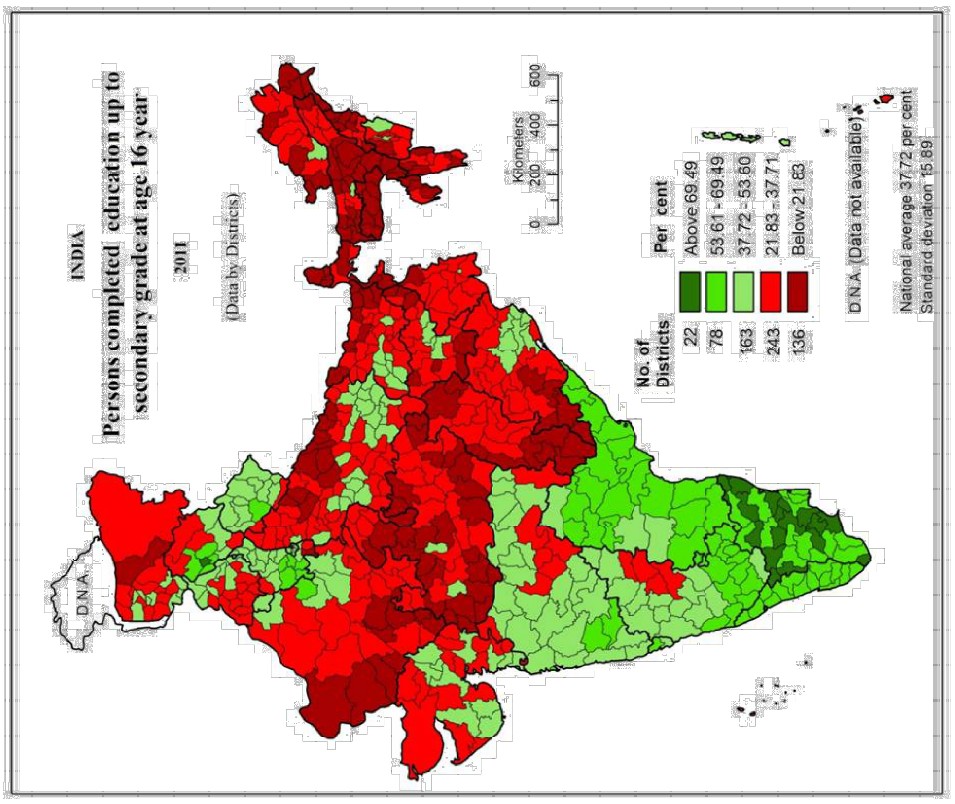


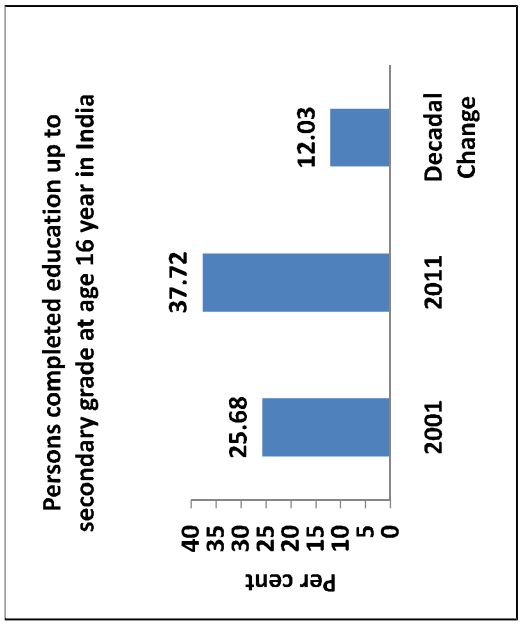
Fig. 1

Southern India as well as socio-economically developed regions of north India were found better placed due to more diversified economy, better transport network, high degree of urbanization and industrialization, better educational facilities as well as awareness of people for education.

Education at Secondary Grade by Gender

37.60 per cent males at age 16 year were secondary educated in 2011. This proportion had increased from 26.42 per cent in 2001.The corresponding figures for females were 37.86 per cent in 2011 and 24.85 per cent in 2001.





Top Forward Districts		
State	District	Score
Tamil Nadu	Kanniyakumari	83.99
Tamil Nadu	Namakkal	78.65
Tamil Nadu	Coimbatore	77.04
Tamil Nadu	Chennai	76.37
Tamil Nadu	Thiruvallur	74.42

Top Backward Districts		
State	District	Score
Madhya Pradesh	Shajapur	3.70
Nagaland	Mon	6.88
Meghalaya	South Garo Hills	7.36
Meghalaya	East Garo Hills	8.30
Madhya Pradesh	Alirajpur	8.62

Fig. 2

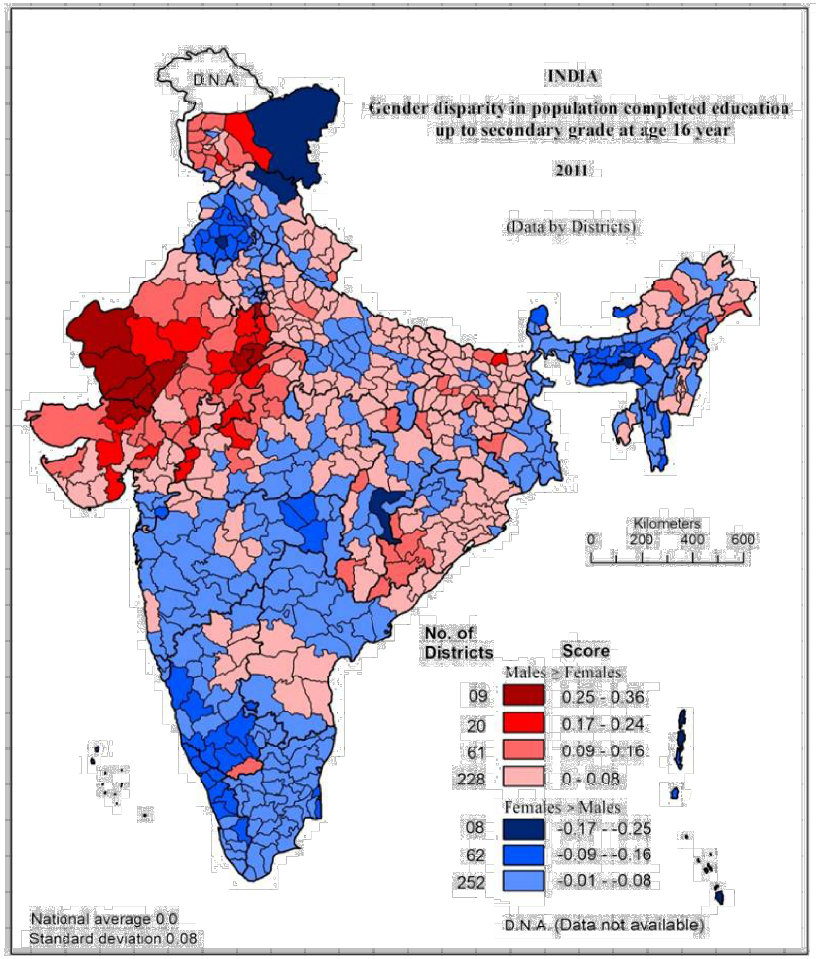
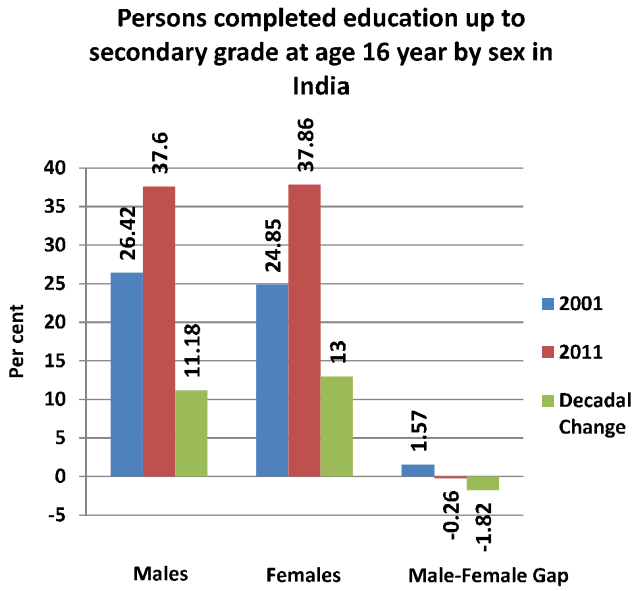


Fig. 3



Low Gender Disparity; a large part of country contains high percentage of secondary educated females than males.

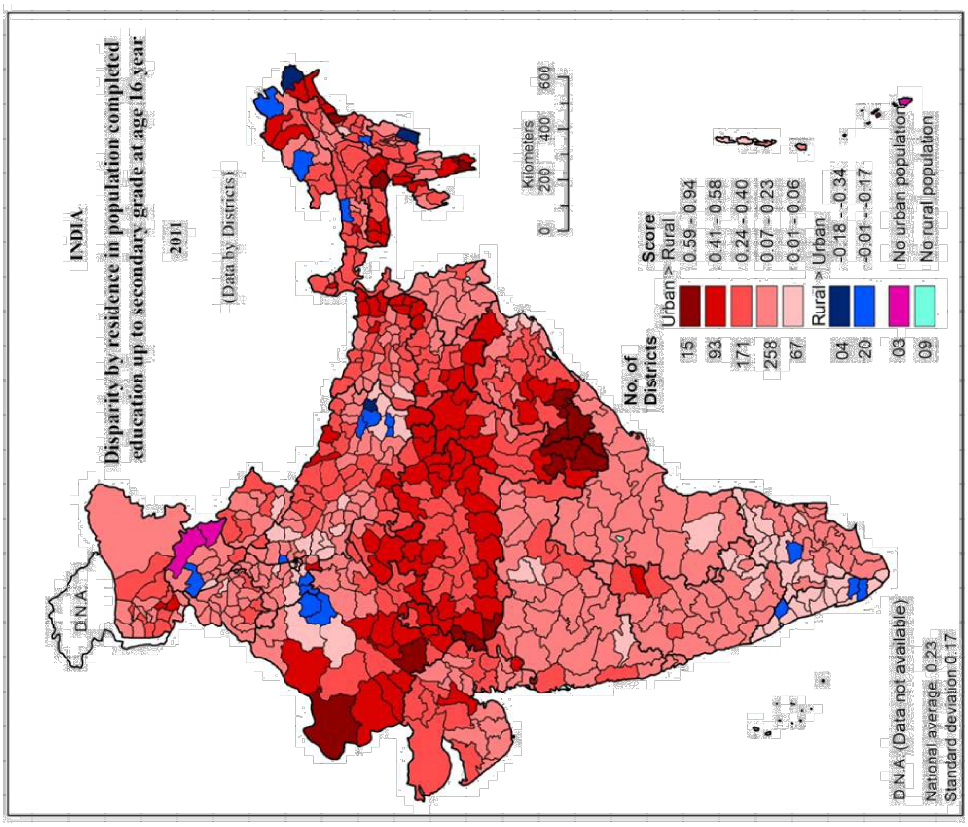
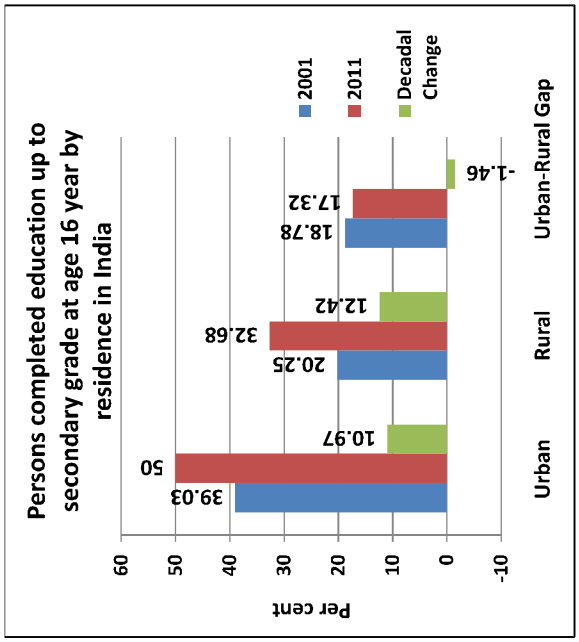


Fig. 4



Urban-Rural Disparity

State	District	Score
Chhattisgarh	D. B. Dantewada	0.94
Madhya Pradesh	Alirajpur	0.82
Chhattisgarh	Narayanpur	0.82
Madhya Pradesh	Jhabua	0.80
Meghalaya	Jaintia Hills	0.78

Rural-Urban Disparity

State	District	Score
Arunachal Pradesh	Anjaw	-0.34
NCT of Delhi	East	-0.32
Manipur	Chandel	-0.24
Uttar Pradesh	Mau	-0.20
Arunachal Pradesh	Dibang Valley	-0.16

A higher proportion of females had educated in comparison to males. This had led to male-female gap at -0.26 per cent at national level while in 2001 census it was 1.57 per cent.

The highest gap was found in Rajasthan (9.27 per cent) followed by Gujarat (5.88 per cent), Jammu & Kashmir (4.63 per cent) and Bihar (2.29 per cent).

17 states and six union territories had recorded negative values of male-female gap which show high percentage of secondary educated females than males such as Daman & Diu (-18.84 per cent), Andaman & Nicobar Islands (-9.73 per cent), Kerala (-8.91 per cent), Lakshadweep (-8.24 per cent), Puducherry (-7.88 per cent), Goa (-6.34 per cent), Punjab (-6.20 per cent), Tamil Nadu (-5.67 per cent) etc. So, a large area of country had high percentage of secondary educated females than males while large part of Jammu & Kashmir, entire Rajasthan, northern districts of Gujarat and western districts of Madhya Pradesh contained moderate gender disparity (Fig. 3).

Education at Secondary Grade by Residence

50.00 per cent urban persons were secondary educated at age 16 in 2011 increasing 10.97 per cent during last decade from 39.03 per cent in 2001.

Almost states and union territories had recorded significant increase during last decade except Meghalaya (0.9 per cent) and Sikkim (4.64 per cent) indicated low increase. These also have low percentage of such persons. Assam (-2.67 per cent), Daman & Diu (-4.97 per cent) and Nagaland (-12.09 per cent) had recorded decline in secondary educated such persons during same decade.

Sikkim had lowest percentage (26.72 per cent). Besides, Assam, Meghalaya, Nagaland, Mizoram and Tripura had percentages below 35 per cent. In union territories, except Andaman & Nicobar Islands and Puducherry, remaining union territories fell below national average.

The corresponding proportion for rural areas was 32.68 per cent having increased from 20.25 per cent in 2001.

Large number of states and union territories had recorded significant increase during last decade. However, Dadra & Nagar Haveli (4.36 per cent), Odisha (5.43 per cent), Sikkim (5.54 per cent), Meghalaya (5.85 per cent), Tripura (6.05 per cent), Gujarat (7.29 per cent), Madhya Pradesh (7.62 per cent) and Chandigarh (7.70 per cent) depicted low increase.

Assam (-1.03 per cent) and Nagaland (-1.40 per cent) had recorded decline in secondary educated rural persons during same decade.

Meghalaya (11.06 per cent) had lowest percentage. Besides, Sikkim, Assam, Nagaland,

Mizoram, Tripura, Madhya Pradesh and Chhattisgarh contained the percentages less than 20. Among the union territories; Dadra & Nagar Haveli (17.55 per cent) had lowest percentage.

Urban-rural gap in secondary educated persons was 17.32 per cent at national level while in 2001 census, it was 18.78 per cent. When we see the status of gap by state; Madhya Pradesh (23.68 per cent) had highest gap followed by Jharkhand (22.46 per cent), Odisha (21.71 per cent), Chhattisgarh (20.35 per cent), Arunachal Pradesh (18.67 per cent) etc. Among the union territories; Dadra & Nagar Haveli (25.46 per cent) had highest gap while Daman & Diu (-11.48 per cent) recorded negative value of urban-rural gap.

Some states and union territories had recorded significant decline in the gap during last decade but Mizoram had recorded high increase in gap during same decade (10.28 per cent in 2001 to 17.43 per cent in 2011). High disparity was found in northern border districts as well as north-eastern part of country. A clear belt of high disparity districts was raised from western Rajasthan to Odisha. Southern part of country had low disparity (Fig. 4).

Educational Backwardness at Secondary Grade and Its correlates

Following 17 indicators employed to measure educational backwardness at secondary grade-

X_1 = Persons did not complete education up to secondary grade at age 16

X_2 = % schools without integrated science laboratory

X_3 = % schools without parent-teacher association

X_4 = % schools without computer lab (secondary only)

X_5 = % schools without library (secondary only)

X_6 = % schools without boundary wall (secondary only)

X_7 = % Schools without electricity connection (secondary only)

X_8 = % schools without ramp (secondary only)

X_9 = % schools without toilet for teachers (secondary only)

X_{10} = % schools without toilets for girls (secondary only)

X_{11} = % schools without drinking water (secondary only)

X_{12} = % schools without building (secondary only)

X_{13} = % single-teacher schools (secondary only)

X_{14} = % single-classroom schools (secondary only)

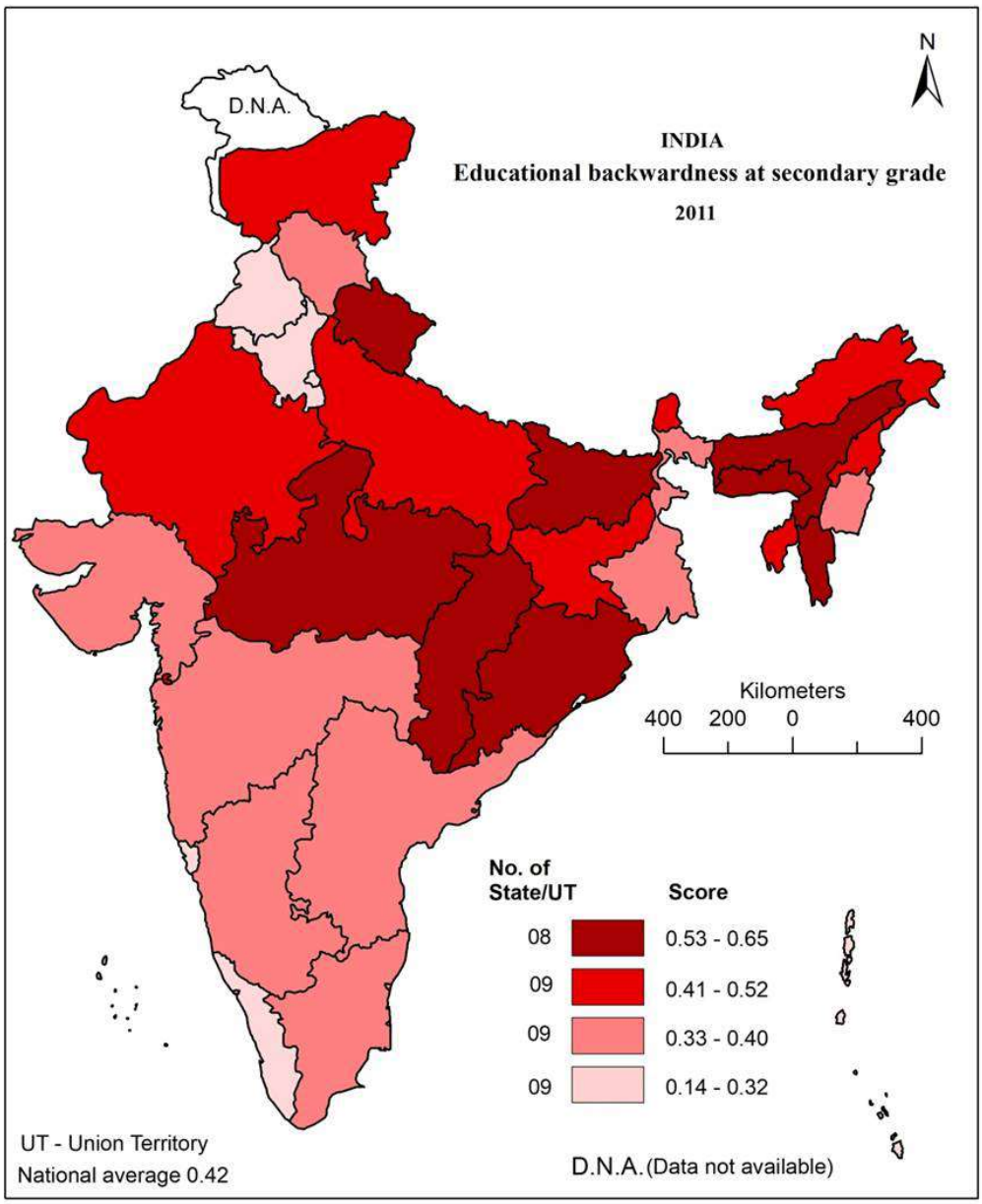
X_{15} = Student-classroom ratio (SCR)

X_{16} = % contractual teachers

X_{17} = Percentage of repeaters

Dimension index calculated for each indicator separately and the next step, the average of all dimension indexes of the state had been worked out. Same process applied for all states and union territories. Southern side half part of country as well as Punjab, Haryana, NCT of Delhi, Chandigarh, Himachal Pradesh, West Bengal and Manipur were found forward while mostly north and north-eastern states contained high backwardness (Fig. 5).

To determine the best linear combination of various predictors with educational backwardness at secondary grade, multiple regression using stepwise method was run. The indicators employed were: illiterates, percentage of households which have no matriculate and above, rural per cent, per cent share of SC, ST and Muslim Population, agriculture workers, per thousand disabled population, workers per thousand population in 5-14 age group (child workers), % persons below poverty line, houseless population per lakh population, per cent married women who married under 18 year, unemployment rate (per 1000) age 15 years & above current daily status approach and % households which have source of lighting without electricity and solar. As stepwise regression considers a relative correlation coefficient between predictors and dependent variable, four predictors viz. percentage of households which have no matriculate and above, agriculture workers, percentage of married women who married under 18 year and illiterates were found significant at 0.05 significant level with adjusted R squared value .758. It means that these four variables were capable enough in explaining 75.8 per cent of variance in educational backwardness at secondary grade.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D.N.A.
INDIA
Educational backwardness at secondary grade
2011
Kilometers
400 200 0 400
No. of State/UT
Score
08 0.53 - 0.65
09 0.41 - 0.52
09 0.33 - 0.40
09 0.14 - 0.32
UT - Union Territory
National average 0.42
D.N.A. (Data not available)

Fig. 5

Table 1 Summary of Multiple Regression Analysis for predicting Educational Backwardness at Secondary Grade

Variable	B	SEB	β	t	Sig.
Percentage of households which have no matriculate and above	.006	.001	.654	5.008	.000
Agriculture workers	.003	.001	.565	3.997	.000
Per cent married women who married under 18 year	-.054	.020	-.249	-2.738	.010
Illiterates	-.005	.002	-.308	-2.454	.020
Constant	.182	.049			

Note: B= Unstandardized Beta Coefficient, SEB= Standard Error of the Unstandardized Beta Coefficient, β = Standardized Beta Coefficient, t = t test, Sig. = Level of Significance

The beta weights suggested that percentage of households which have no matriculate and above along with agriculture workers were more important in predicting educational backwardness at secondary grade (Table 1).

Conclusion

37.72 per cent population at age 16 year had completed education up to secondary grade. This proportion had increased from 25.68 per cent in 2001.

Arunachal Pradesh, Assam, Nagaland in the north-east and Rajasthan displayed high intra-regional disparity, which was low in southern states namely Goa, Kerala, Tamil Nadu and Andhra Pradesh.

At the district-level, percentage of secondary educated persons varied from 3.70 per cent in Shajapur district of Madhya Pradesh to 83.99 per cent in Kanniyakumari district of Tamil Nadu. North-east parts of the country were noted for less than 1/5th secondary educated at age 16 year. Madhya Pradesh and Chhattisgarh too fell in this category. Less than 30 percent population was secondary educated in West Bengal, Bihar and Jharkhand. Among the union territories, Dadra & Nagar Haveli (27.21 per cent) as well as Lakshadweep (36.07 per cent) had low percentages.

Southern India as well as socio-economically developed regions of north India were better placed due to more diversified economy, better transport network, high degree of urbanization and industrialization, better educational facilities as well as awareness of people for education.

A higher proportion of females was secondary educated at age 16 in comparison to males. This had led to male-female gap at -0.26 per cent at national level while in 2001 census it was 1.57 per cent. Large area of country had high percentage of secondary educated females than males while large part of Jammu & Kashmir, entire Rajasthan, northern districts of Gujarat and western districts of Madhya Pradesh exhibited moderate gender disparity.

Urban-rural gap in secondary educated persons had slightly reduced to 17.32 per cent at

national level in 2011 from 18.78 per cent in 2001. High disparity was found in northern border districts as well as north-eastern parts of the country. A clear belt of high disparity districts could be seen from western Rajasthan to Odisha. On the other hand, southern parts of the country displayed low disparity.

Southern side half part of country as well as Punjab, Haryana, NCT of Delhi, Chandigarh, Himachal Pradesh, West Bengal and Manipur were forward while mostly north and north-eastern states contained high backwardness.

So, a remarkable increase was recorded in education at secondary grade during last decade yet we are far behind from universalisation of secondary education. There is need to focus on backward areas for socio-economic development. Illiteracy and low level of education, low status of female, engagement of high share of workers in primary activities are also the main reasons of educational backwardness at secondary grade.

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