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SPATIAL AND TEMPORAL VARIATIONS IN EDUCATIONAL ATTAINMENT IN INDIA

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Abstract

The present study aims at examining the progress in levels of educational attainment in India during 1991-2011. The study is entirely based on secondary data collected from Census of India and educational reports of Ministry of Human Resource Development. In order to examine the progress in educational attainment percentage method has been used. The study shows remarkable increase in the growth rate of highly educated people as compared to elementary and secondary educated persons. The study reveals that the share of secondary educated persons increased from 18.60 per cent in 1991 to 24.10 per cent in 2011. Although the share of higher educated persons has increased from 5.67 per cent in 1991 to 8.90 per cent in 2011, yet India is passing through the teething stage of educational attainments where merely 8.90 per cent out of the total literates are highly educated. The study also reveals that educational attainment in India happens to be uneven at the state level which is attributed mainly to the varying educational and developmental infrastructures. The states and union territories equipped with better availability of educational institutes, gross enrolment ratio, urbanization and less poverty fared well in regard to educational attainment.

Keywords: Education, Attainment, Determinants, Spatial Variations, India.

Introduction

The level of education is one of the major indicators of welfare, prosperity and security of people in any society. The quality of education influences the quality of human resource for the societal benefits (Yadav, 2018). The countries with higher educational enrolments achieve higher growth rates than the countries with lesser educational enrolments (Aftab, 1977). Thus, literacy and education play a decisive role in the deve-

lopment process of a nation. India has experienced epochal shifts in her teaching and learning environment since ancient period. The heritage of Indian philosophy, knowledge and academic climate has been subject to indigenous thoughts, fine tunings, restructuring and rejuvenation introduced through time to time. At the time of attainment of independence in 1947, India had only 20 universities and less than 500 colleges.

After independence, education sector

received a concerted attention both by the central and state governments. With the advent of new economic reforms in 1991, entire educational scenario underwent changes. Under liberalization, privatization and globalization (LPG), many private schools, colleges, universities and other institutes surfaced up in the country. Indeed, the onset of post-reforms period saw the demand for skilled and educated people which led to visible improvement in educational attainments at almost all the stages throughout the country. Many scholars, including geographers, conducted researches on different facets of education in India. Various researchers like Ram (1990), Chaudhary (2009), Panda (2011), Gakhar and Kour (2012), Ahmed (2013), Sharma and Sharma (2017) have studied educational expansion and schooling inequality, determinants of primary schooling, education of girls, scenario of present higher education in India.

Besides, a few studies have been conducted on the levels of educational attainment. Ahuja and Filmer (1995) have assessed the educational attainment in developing countries and projected that currently south Asia, is the least educated part of the world. Filmer and Pritchett (1999) have analysed the effect of household wealth on educational attainment for 35 countries. Mukherjee (2004) has examined the trends and patterns of educational attainment in India excluding the union territories, by focusing on the indices of literacy, enrolment in schools, dropout before completion of study and completion of school stages. Alam and Raju (2007) have assessed the gendered literacy and educational disparities in rural Bihar among various religions. Desai and Kulkarni (2008) have studied the changing inequalities in educational levels among various social groups of India. Husain and Sarkar (2011) have examined the gender disparities at each of the main educational levels in the Indian education system. Khan and Butool (2013) have analyzed the state-wise educational status of Muslims in India.

Although these studies address a spectrum of issues relating to literacy and education in India, yet the issues and progress of educational attainment at different educational standards among states and regions remain unattended. This necessitates to undertake a geographical study on level-wise educational attainment in India. This also raises an academic curiosity to examine how the educational attainment at different levels varies over space and time during the post-liberalization period of 1990-2011.

Objectives of the Study

The major objectives of the study are:

- to examine the spatio-temporal variations in educational attainment at elementary, secondary and higher levels of education and
- to study the reasons of varying pattern of educational attainment.

StudyArea

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Covering an area of $32,87,263 \text{ km}^2$, India supported 1210 million population as per 2011 census. It covers 2.4 per cent of the total geographical area and 17.64 per cent of the total world's population. Geographically, it extends from 8° 4' to 37° 6' north latitudes and 68° 7' to 97° 25' east longitudes. India has had a long history of organized education. The Gurukul system of education has been one of the oldest on earth. Gurukuls are considered the traditional Hindu residential schools of learning, typically in the teacher's house or a monastery (Pajankar and Pajankar, 2010). With the passage of time, the education system in India started expanding during the reign of various dynasties in India. The modern school system has been introduced by the Britishers in India. The Macaulay's Minute of 1830s is the prominent one. The Wood's Despatch of July 19, 1854 has been the landmark in the history of education in British India as it has laid down the broad principles and programmes for educational development. In the post-independence period, the government of India became more concerned for education. The national policy of education (1968 & 1986) and its revised formulation (1992) envisaged a uniform pattern of school education (10+2+3) pattern i.e. 12 years of schooling and 3 years of graduation) across the country. The post reforms of 1990s enhanced the demand of quality human resource and competition in the quickly changing employment landscape and global ecosystem.

Database and Methodology

The study completely relies on secondary sources of data downloaded from the website of Census of India. Apart from Census, planning commission reports and educational reports published by National Institute of Educational Planning and Administration (NIEPA) and Ministry of Human Resource Development (MHRD), Government of India have also been consulted. The study has been conducted with reference to two census years of 1991 taken as base year and 2011 as latest year. The present study is based on analysis of 25 states and 7 union territories as per 1991 census year, although, there are 28 states and 7 unionterritories as per 2011 census.

For conducting study effectively and making comparisons easy, the data for newly

formed states of Uttarakhand, Jharkhand and Chhattisgarh in 2011 have been clubbed in the parent states of Uttar Pradesh, Bihar and Madhya Pradesh, respectively. Hence, Census map of 1991 has been taken as the base map for comparisons. For the purpose of analysis, the data are compiled to arrive at three broad stages of elementary, secondary and higher level of education. The primary and upper primary educated persons are integrated and taken as elementary educated. Similarly, the educated persons at high/matric and senior secondary level are integrated as secondary educated. While, highly educated include those who have completed the postsecondary education i.e. graduates, postgraduates, M.Phil. and Ph.D. degree holders.

In order to examine the distributional pattern of educational attainment in India, the following 10 determinants of educational attainment have also been analyzed. These include number of elementary schools/800 persons, secondary schools/1000 persons, and higher educational institutes/1,00,000 persons (Y_1) ; gross enrolment ratio (per cent) at elementary, secondary and higher education levels respectively (Y_2) ; level of urbanization (per cent) (Y_3) ; density of population (persons/km²) (Y_4) ; level of poverty (per cent) (Y_5) ; work participation rate (per cent) (Y₆); road density (km/100 km^2) (Y₇); railway density (km/100 km²) (Y₈); gross state domestic product (GSDP, per cent) (Y_9) and budgeted expenditure on education (per cent) (Y_{10}) . Co-efficient of correlation has also been calculated to understand the relationship between educated persons at each level with the determinants of educational development for both the reference years. The number of primary and upper primary schools in each state has been summed up to arrive at single unit, i.e. elementary schools. According to Right to Elementary Education (RTE) Act (2009), a habitation having 300 persons is ideal for building a primary school and a habitation having 500 persons is considered ideal for upper-primary school. So, technically, there should be 1 elementary school per 800 persons. Thus, in the present study, to compute the density of elementary schools per size of population, the population norm of 800 persons has been taken into consideration. The spatio-temporal variations in educational attainment have been discussed with the help of comparative choropleth maps.

Choice of variables

It is imperative to justify the selection of determinants of educational attainment. It needs to be seen in analytical framework rather than abstract logic and should have sound conceptual underpinning. The first indicator in the series is availability of educational institutes. A good educational infrastructure is prerequisite for the development of literacy and education in any nation. Higher the number of educational institutions, more is likely to be the literacy rate and educational attainment. The next indicator is gross enrolment ratio. It determines the number of students enrolled at an educational level. Higher enrolment normally leads to higher literacy and thus higher level of educational attainment. The next indicator is urbanization. Urbanization is the cause and effect of literacy and education. Urban schools are generally larger, more likely to have higher proportion of qualified teachers and have optimum student-teacher ratios as compared to schools in the rural areas of developing countries like India. Access to better schooling facilities in urban areas leads to higher level of literacy and educational attainment as compared to rural areas.

Other indicator is density of population. The states with higher densities of population may record larger stock of population in each level of education, resulting into higher educational attainments and vice-versa. The next variable is poverty. Children from well-off households are more likely to remain in school, college and university as compared to poorer ones who are prone to be withdrawn from educational institutions due to their financial constraints. It is generally assumed that the poor states have lower educational attainments as compared to the economically sound states. Road density and railway density are other potent drivers of educational attainments. The recent development of means of transportation has added a new dimension to the process of propagation of literacy and education. The rural isolation has been broken. Educational institutions in the urban areas have now become accessible to the countryside. The states with better road-railway connectivity are expected to have greater educational attainments and vice-versa.

The next variable in the series is work participation rate (WPR). Higher the level of work participation in a state, more will be the level of educational attainment and better will be the economy of the state. The next indicator is gross state domestic product (GSDP). States with higher GSDP have most successful learning systems, offering education to a good extent to its inhabitants. The last variable is budgeted expenditure on education. The total educational expenditure expressed as a percentage of GSDP gives a good indication of priority given to education sector in the society. More money spent on education is likely to increase all kind of facilities in schools and colleges which are necessary to make a healthy academic environment. Notably, these may not be adequate indicators in capturing the complex picture of educational attainment in India but surely are the best for which limited secondary data for state level analysis have been available at the time of the study.

Results and Discussion Inter-state Variations in Levels of Educational Attainment

The spatio-temporal variations in educational attainment have been discussed at three different educational levels i.e. elementary level, secondary level and higher education level as under:

Educated Persons up to Elementary Level (1991-2011)

The share of elementary educated persons has been 49.6 per cent to total literates in 1991. It declined to 41.13 per cent during next two decades (Table 1). But there has been an increase in the absolute number of elementary educated persons. Their number has increased by 78.29 per cent during the study period (Table 2). The highest growth among elementary educated persons has been observed in Dadra & Nagar Haveli (about 280 per cent), followed by Rajasthan (174.86 per cent) and Madhya Pradesh (174.22 per cent). The highest negative growth has been recorded by Kerala (-26.33 per cent) followed by Goa (-13.97 per cent). The decline in share of elementary educated persons is an obvious pointer of pursuance of higher education by more people in these states. It is a visible sign of growing educated population in the country. The rising awareness among people towards higher education for better jobs, quality of life and high standard of living also motivates people to go for higher education. The correlation matrix (Table 3) exhibits a positive correlation between educated persons and

work participation rate (0.56 in 1991 and 0.27 in 2011), poverty (0.26 in 2011) and budgeted expenditure on education (0.34 in 2011). However, negative relationship has been found between educated persons at elementary level and level of urbanization (-0.54 in 2011) and density of population (-0.51 in 2011) at national level. The negative association between educated persons and urbanization at elementary stage is largely due to slum population and more scope of unskilled jobs in the country. The study reveals that the poverty is no longer a major constraint in seeking elementary education after universalization of elementary education under Sarva Shiksha Abhiyan (SSA-2001) and Right of Children to Free and Compulsory Education Act-2009. Higher availability of educational institutes, high work participation rate and high budgeted expenditure on education all fostered the elementary educational attainment during the post liberalization period in India.

Areas with High Proportion of Elementary Educated Persons

Three states namely, Kerala, Assam, Nagaland and two union-territories (UTs) Daman & Diu and Lakshadweep have registered high proportion (more than 55 per cent) of literates with elementary education in 1991 (Table 1 and Fig. 1). The study reveals that the states and UTs with high literacy rates like Kerala (89.81 per cent), Lakshadweep (81.78 per cent) and Daman & Diu (71.20 per cent) and states with higher availability of elementary schools like Assam (1.23 unit per 800 persons) and Nagaland (1.09 unit) have registered higher proportion of elementary educated persons (Table 4). The states with high work participation rate like Nagaland (42.70 per cent) and Assam (36.10 per cent) also observed higher share of elementary

States and UTs		Per cen	t of Litera	tes at Diffe	rent Leve	s of Educa	tion	
	Elementar	y Level	Seconda	ry Level	Highe	r Level	Oth	ers*
	1991	2011	1991	2011	1991	2011	1991	2011
Andhra Pradesh	44.62	37.62	19.56	28.14	5.98	11.03	29.84	23.21
Arunachal Pradesh	47.44	43.76	14.77	23.95	5.28	6.99	32.51	25.30
Assam	56.67	45.19	17.50	20.61	3.76	5.27	22.07	28.93
Bihar	49.44	40.97	21.87	21.23	6.26	6.19	22.43	31.61
Goa	51.88	29.86	23.46	31.30	6.00	12.59	18.66	26.25
Gujarat	54.85	41.39	18.51	22.59	4.82	7.72	21.82	28.30
Haryana	45.14	39.02	22.01	30.83	5.06	11.30	27.79	18.85
Himachal Pradesh	50.59	39.47	18.11	35.52	3.67	8.86	27.63	16.15
Jammu & Kashmir	DNA	41.77	DNA	30.96	DNA	9.25	DNA	18.02
Karnataka	46.46	36.05	19.50	28.00	5.30	9.94	28.74	26.01
Kerala	60.58	35.98	17.45	31.05	3.50	8.99	18.47	23.98
Madhya Pradesh	43.05	47.57	14.72	17.92	5.88	7.28	36.35	27.23
Maharashtra	52.31	35.83	19.38	28.01	5.80	10.59	22.51	25.57
Manipur	50.85	41.07	18.11	29.06	7.94	11.82	23.10	18.05
Meghalaya	45.55	39.82	9.74	16.05	4.32	5.07	40.39	39.06
Mizoram	51.93	48.21	8.38	18.53	2.43	5.85	37.26	27.41
Nagaland	56.03	47.29	13.87	20.55	3.36	6.68	26.74	25.48
Orissa	47.58	48.61	11.44	18.53	4.30	6.67	36.68	26.19
Punjab	46.01	39.31	25.36	34.72	5.93	9.41	22.7	16.56
Rajasthan	47.91	46.61	16.30	18.61	6.15	8.00	29.64	26.78
Sikkim	44.17	41.61	16.12	20.08	3.43	7.34	36.28	30.97
Tamil Nadu	49.97	42.31	19.39	28.20	4.82	10.52	25.82	18.97
Tripura	44.84	46.03	8.98	16.90	4.52	4.91	41.66	32.16
Uttar Pradesh	46.60	44.42	20.99	22.85	6.47	8.92	25.94	23.81
West Bengal	53.42	44.57	13.54	17.92	6.25	7.84	26.79	29.67
Andaman & Nicobar Islands	48.86	46.56	18.99	26.72	4.17	8.20	27.98	18.52
Chandigarh	31.77	30.06	28.49	31.01	21.92	24.14	17.82	14.79
Dadra & Nagar Haveli	50.38	38.44	17.60	24.98	4.04	8.58	27.98	28.00
Daman and Diu	72.33	40.90	16.12	32.81	3.17	6.79	8.38	19.5
Delhi	40.44	32.67	27.7	29.71	17.50	21.65	14.36	15.97
Lakshadweep	60.58	45.89	17.45	24.64	3.50	4.38	18.47	25.09
Pondicherry	49.47	37.50	21.54	30.79	5.99	14.83	23.00	16.88
National Average	49.60	41.13	18.60	24.10	5.67	8.90	26.13	25.87

Table 1 India: Educated Persons at Different Levels of Education

Source: Compiled by Authors, DNA : Data not Available. **Others*** Technical plus non-technical diploma or certificate holders not equal to degree

States and UTs		Educational Le	vels
	Elementary	Secondary	Higher
Andhra Pradesh	74.08	196.95	280.39
Arunachal Pradesh	149.11	338.03	257.68
Assam	60.72	137.34	182.50
Bihar	122.34	160.36	165.54
Goa	-13.97	99.43	213.75
Gujarat	46.76	137.28	211.55
Haryana	92.61	212.03	397.15
Himachal Pradesh	42.19	257.36	339.33
Jammu & Kashmir	DNA	DNA	DNA
Karnataka	50.09	177.59	263.61
Kerala	-26.33	120.61	218.20
Madhya Pradesh	174.22	202.09	207.02
Maharashtra	31.47	177.49	250.47
Manipur	68.19	234.11	209.67
Meghalaya	130.09	333.69	208.89
Mizoram	70.47	306.11	341.04
Nagaland	83.68	222.33	331.98
Orissa	111.51	235.31	220.57
Punjab	60.92	157.91	198.50
Rajasthan	174.86	222.61	267.18
Sikkim	121.83	193.34	403.30
Tamil Nadu	44.68	148.52	273.06
Tripura	110.77	286.36	122.88
Uttar Pradesh	150.55	186.19	262.33
West Bengal	57.44	149.75	136.79
Andaman & Nicobar Islands	63.90	142.01	238.17
Chandigarh	79.27	106.25	108.64
Dadra & Nagar Haveli	279.91	606.93	957.00
Daman & Diu	74.39	527.51	559.56
Delhi	74.94	132.23	167.86
Lakshadweep	27.02	260.81	278.00
Pondicherry	39.24	162.46	354.61
National Average	78.29	174.94	231.00

 Table 2

 India: Growth Rate (per cent) among Educated Persons (1991-2011)

Source: Compiled by Authors, DNA : Data not Available.

							_	Determ	inants c	of Educ	ational	Attainn	nent (Y)							
		ر1	*	2	Y	3	Y	. 4	X	S	Ĺ	۲6	×	۲		´∞	Y	. 6	Y	10
	1991	2011	1991	2011	1991	2011	1991	2011	1991	2011	1991	2011	1991	2011	1991	2011	1991	2011	1991	2011
X,	0.23	0.36	0.73	-0.15	-0.05	-0.54	-0.17	-0.51	0.07	0.26	0.56	0.27	-0.26	-0.52	-0.17	-0.38	0.05	-0.09	-0.05	0.34
\mathbf{X}_2	0.02	-0.01	0.71	0.50	0.48	0.43	0.55	0.27	-0.33	-0.41	0.20	-0.30	0.53	0.28	0.67	0.17	0.17	-0.03	-0.52	-0.25
X ₃	0.43	0.29	0.84	0.78	0.70	0.66	0.88	0.81	-0.37	-0.16	0.04	-0.22	0.91	0.80	0.84	0.63	-0.02	0.06	-0.35	-0.19

Table 3	With Determinants of Educational Attainment (Y	
	India: Correlation of Educated Persons (X)	

X₃= Educated Persons up to Higher Education Level (%) Ď



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States and U1s	Literacy Ka	te (per cent)	Elementary Person	Schools/800 s (No.)	Secondary S Person	cnools/1000 s (No.)	Higner Education Perso	n Institutes/100000 ns (No.)
	1991	2011	1991	2011	1991	2011	1991	2011
Andhra Pradesh	44.08	67.02	0.66	0.78	0.11	0.29	0.76	5.74
Arunachal Pradesh	41.59	65.39	1.30	1.75	0.15	0.24	0.58	2.09
Assam	52.89	72.19	1.23	1.16	0.15	0.17	1.05	1.58
Bihar	37.49	62.92	09.0	0.64	0.05	0.08	0.70	0.66
Goa	75.51	88.70	0.78	0.92	0.32	0.32	1.88	3.49
Gujarat	61.29	78.03	0.59	0.55	0.13	0.15	0.82	3.04
Haryana	55.85	75.55	0.31	0.55	0.15	0.28	0.88	4.24
Himachal Pradesh	63.86	82.80	1.35	1.65	0.22	0.48	0.89	4.57
Jammu & Kashmir	DNA	68.74	DNA	1.55	DNA	0.25	DNA	2.53
Karnataka	56.04	75.6	0.71	0.77	0.11	0.29	1.22	5.44
Kerala	89.81	93.91	0.26	0.23	0.09	0.13	0.49	2.93
Madhya Pradesh	44.67	69.57	1.01	1.56	0.07	0.19	0.75	2.69
Maharashtra	64.87	82.34	0.59	0.56	0.14	0.20	1.22	4.13
Manipur	59.89	79.85	1.70	0.88	0.24	0.31	1.96	2.91
Meghalaya	49.1	74.43	2.19	3.32	0.18	0.34	1.41	2.39
Mizoram	82.26	91.58	1.92	2.36	0.33	0.60	1.88	2.91
Nagaland	61.65	80.11	1.09	0.86	0.15	0.30	1.32	3.08
Orissa	49.09	73.45	1.32	1.46	0.15	0.22	1.08	2.63
Punjab	58.51	76.68	0.54	0.62	0.14	0.31	1.00	3.57
Rajasthan	38.55	67.06	0.73	1.04	0.09	0.35	0.48	3.93
Sikkim	56.94	82.2	1.24	1.33	0.18	0.32	0.25	2.78
Tamil Nadu	62.66	80.33	0.50	0.41	0.09	0.09	0.55	3.28
Tripura	60.44	87.75	0.72	0.77	0.17	0.24	0.62	1.14
Uttar Pradesh	41.71	68.22	0.53	96.0	0.04	0.11	0.35	2.53
West Bengal	57.70	77.08	0.64	0.46	0.10	0.10	0.56	1.01
Andaman & Nicobar Islands	73.02	86.63	0.66	0.61	0.24	0.27	1.07	1.57
Chandigarh	77.81	86.05	0.10	0.03	0.12	0.14	2.34	2.84
Dadra & Nagar Haveli	40.71	76.24	0.94	0.70	0.09	0.10	DNA	1.16
Daman & Diu	71.20	87.1	0.51	0.36	0.19	0.15	0.98	2.05
Delhi	75.29	86.21	0.20	0.15	0.12	0.11	0.84	1.24
Lakshadweep	81.78	91.85	0.35	0.38	0.21	0.19	DNA	DNA
Pondicherry	74.74	86.55	0.44	0.25	0.13	0.25	1.49	6.97
National Average	52.21	74.04	0.80	0.92	0.14	0.23	0.91	2.85
Source: Compiled by	Authors, DN	VA : Data not	t Available.					

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				TUM	ia: Dete	rmmar	ILS OF EC	IUCAUOU	al Aua	nnenu						
States and UTs	Urban Po (per c	pulation :ent)	Perso	ns/km²	BPL Popu (per ce	ulation ent)	Work Partici (per c	pation Rate ent)	Road Len	gth (km)/100 cm²	Railway (km)/10	Length 0 km²	GSDP (po	er cent)	Budge Expendit Educar	ted ure on tion
	1661	2011	1661	2011	1991	2011	1991	2011	1991	2011	1991	2011	1991	2011	1991	2011
Andhra Pradesh	26.90	33.36	242	308	22.19	9.20	45.10	46.61	15.79	76.22	1.82	1.91	6.87	4.91	3.34	3.24
Arunachal Pradesh	12.80	22.93	10	17	39.35	34.70	46.20	42.47	6.59	13.04	0.001	DNA	0.14	0.14	5.46	4.45
Assam	11.10	14.09	286	397	40.86	32.00	36.10	38.36	38.93	51.43	3.14	4.98	1.99	1.85	3.91	5.36
Bihar	13.10	14.36	959	1516	54.96	35.30	32.20	36.50	10.83	28.72	3.05	6.33	5.71	5.15	4.65	4.15
Goa	41.00	62.17	316	394	14.92	5.10	35.30	39.58	191.62	276.19	2.13	1.86	0.34	0.55	4.59	3.74
Gujarat	34.50	42.59	211	308	24.21	16.6	40.20	40.98	20.44	39.53	2.69	2.69	5.90	7.97	3.42	2.13
Haryana	24.60	34.87	372	573	25.05	11.20	31.00	35.17	52.06	61.33	3.39	3.48	3.27	3.85	2.27	2.69
Himachal Pradesh	8.70	10.03	93	123	28.44	8.10	42.80	51.85	42.77	60.57	0.48	0.53	0.65	0.94	6.45	5.35
Jammu & Kashmir	23.80	27.37	<i>LL</i>	124	25.17	10.30	DNA	34.47	5.49	9.81	0.03	0.12	DNA	1.01	4.11	6.44
Karnataka	34.90	38.67	235	319	33.16	20.90	42.00	45.62	68.26	39.21	1.59	1.69	5.82	7.82	3.14	3.04
Kerala	26.40	47.70	749	859	25.43	7.10	31.40	34.78	52.19	72.57	2.53	2.70	3.16	4.71	4.18	3.51
Madhya Pradesh	23.20	26.49	288	425	42.52	35.70	42.80	45.57	29.45	36.31	1.90	3.26	6.11	6.13	3.27	4.06
Maharashtra	38.70	45.22	257	365	36.86	17.40	43.00	43.99	57.34	78.55	1.76	1.82	15.17	16.48	2.40	2.78
Manipur	27.50	29.20	82	122	33.78	36.90	42.20	45.09	23.93	61.93	0.004	DNA	0.19	0.17	7.88	7.16
Meghalaya	18.60	20.06	79	132	37.92	11.90	42.70	39.96	25.35	38.20	DNA	DNA	0.19	0.26	6.23	4.76
Mizoram	46.10	52.11	33	52	25.66	20.40	48.90	44.36	15.97	2.75	0.005	0.01	DNA	0.09	9.63	9.37
Nagaland	17.20	28.85	73	119	37.92	18.90	42.70	49.24	10.58	72.58	0.07	0.08	0.14	0.15	6.35	5.61
Orissa	13.40	16.68	203	269	48.56	32.60	37.50	41.79	DNA	11.66	1.28	1.55	2.76	2.95	4.08	3.41
Punjab	29.60	37.48	403	550	11.77	8.30	30.90	35.67	76.44	207.07	4.28	8.15	4.45	3.45	2.39	2.14
Rajasthan	22.80	24.87	129	201	27.41	14.70	38.90	43.60	17.04	55.34	1.70	1.69	4.50	5.65	3.63	2.85
Sikkim	9.10	25.15	57	86	41.43	8.20	41.50	50.47	31.89	27.26	DNA	DNA	0.08	0.14	9.94	5.79
Tamil Nadu	34.20	48.39	429	555	35.03	11.30	43.30	45.58	131.32	209.33	3.08	2.98	7.27	9.73	3.03	2.67
Tripura	15.30	26.16	263	350	39.01	14.00	31.10	40.00	54.81	161.46	0.42	1.46	0.26	0.25	10.3	5.66
Uttar Pradesh	19.80	22.65	680	1017	40.85	20.30	32.20	35.66	24.37	125.09	3.03	4.28	13.01	10.87	2.80	4.10
West Bengal	27.50	31.87	767	1029	35.66	19.90	32.20	38.08	20.02	23.17	4.30	4.44	8.63	DNA	4.22	3.07
Andaman & Nicobar Islands	26.70	37.70	34	46	34.47	1.00	35.24	40.08	10.47	16.23	DNA	DNA	0.04	0.05	DNA	6.81
Chandigarh	89.70	97.25	5632	9252	11.35	DNA	34.9	38.29	1245.61	2530.41	9.64	14.04	DNA	0.24	DNA	2.36
Dadra & Nagar Haveli	8.50	46.72	282	698	50.84	39.30	53.20	45.73	72.70	164.96	DNA	DNA	DNA	DNA	DNA	DNA
Daman & Diu	46.80	75.17	907	2169	15.8	9.90	37.60	49.86	DNA	242.34	DNA	DNA	DNA	DNA	DNA	DNA
Delhi	89.90	97.50	6352	11297	14.69	9.90	31.60	33.28	1461.9	2202.49	11.32	80.65	3.20	4.45	DNA	1.68
Lakshadweep	56.30	78.06	1616	2013	25.04	2.80	26.40	29.09	DNA	673.33	DNA	DNA	DNA	DNA	DNA	DNA
Pondicherry	64.00	68.33	1683	2598	37.4	9.70	33.10	35.66	97.34	139.82	5.51	4.49	0.14	DNA	DNA	5.63
National	26.10	31.16	267	382	35.97	21.90	37.50	39.80	70.79	142.68	1.89	1.96	3.45	3.57	3.80	4.17
Source: Compile	d by Aı	uthors,	DNA	Data n	ot Availa	ıble.										

 Table 5

 India: Determinants of Educational Attainment

118

PUNJAB GEOGRAPHER VOLUME 16 OCTOBER 2020



educated persons (Table 5) in 1991. In 2011, no state as well as UT fell in this category (Fig. 2). It does not mean that overall educational attainment at elementary level has declined among these states during the study period, rather it is a promising sign of higher educational attainments as people have shifted from lower academic standards to higher ones in the country.

Areas with Moderate Proportion of Elementary Educated Persons

The study reveals that more than half of India registered moderate proportion (45-55 per cent) of elementary educated persons in 1991. The states running from north-western part to eastern and north-eastern parts and coastal states like Gujarat, Maharashtra, Karnataka, Orissa and Tamil Nadu have witnessed moderate proportion of elementary educated people in 1991 (Fig. 1). The moderate to high literacy rates (60 to 75 per cent), moderate to higher availability of elementary schools (1 to 1.5) per size of population and high work participation rates (more than 40 per cent) have been some of the factors responsible for moderate share of elementary educated persons in these states. By 2011, central and north-eastern Indian states of Rajasthan, Madhya Pradesh, Orissa, Mizoram, Assam, Nagaland and Tripura and UTs like Andaman & Nicobar Islands and Lakshadweep have witnessed moderate proportion of elementary educated persons (Fig. 2).

Areas with Low Proportion of Elementary Educated Persons

The states namely Tripura, Sikkim, Andhra Pradesh, Madhya Pradesh and unionterritories Delhi and Chandigarh have registered low share (less than 45 per cent) of elementary educated persons in 1991 (Fig. 1). Very high population density resulting into low availability of elementary schools per size of population in Chandigarh (0.10 unit) and Delhi (0.20 unit) could be one of the factors responsible for low proportion of elementary educated persons (Table 4).

In 2011, almost whole of India except Rajasthan, Madhya Pradesh and Orissa (now Odisha) in central India and Assam, Nagaland, Tripura and Mizoram in northeast India registered low proportion of elementary educated persons (Fig. 2). Low proportion of elementary educated persons in large populous states of northern plains namely Punjab, Haryana, Uttar Pradesh, Bihar and West Bengal and peninsular India like Maharashtra, Karnataka, Kerala, Tamil Nadu and Andhra Pradesh is a remarkable sign of educational development. These states witnessed an improvement in educational attainment during next two decades because of the shift of educated people from elementary to secondary stages and beyond (Table 1).

Educated Persons up to Secondary Level (1991-2011)

The national average of secondary educated persons has been about 19 per cent of the total literate population of India in 1991. It increased to 24.10 per cent in 2011 (Table 1). Number of secondary educated persons increased by about 175 per cent between 1991 and 2011 (Table 2). The growth of secondary educated people has been more than the double from the elementary educated persons during the same period. The highest growth among secondary educated persons has been observed in UTs of Dadra & Nagar Haveli (606.93 per cent) and Daman & Diu (527.51 per cent) followed by states of Arunachal Pradesh (338 per cent) and Meghalaya (334 per cent). The least growth in

number of secondary educated persons has been observed in Goa (99.43 per cent) during the study period (Table 2).

Growing demand of skilled, semiskilled and educated human resource in different sectors of Indian economy, attracted the people towards attaining higher levels of education. Many literacy and education improvement programmes introduced and implemented by both central and state governments have been equally responsible for the shift of people to secondary and higher education levels. The correlation matrix (Table 3) exhibits a positive correlation between secondary educated persons and gross enrolment ratio at secondary level (0.71 in 1991 and 0.50 in 2011), level of urbanization (0.48 in 1991 and 0.43 in 2011), density of population (0.55 in 1991 and 0.27 in 2011), road density (0.53 in 1991 and 0.28 in 2011) and railway density (0.67 in 1991 and 0.17 in 2011). However, negative relationship is found between secondary educated persons and poverty (-0.33 in 1991 and -0.41 in 2011). The study thus reveals that growing urbanization, development of roads and population density functioned as seedbed for the secondary educational attainment at the national level. Poverty continued to curtail the progress of secondary education at the national level during 1990s and beyond in India. The spatiotemporal variations in secondary educated persons in India have been discussed as under:

Areas with High Proportion of Secondary Educated Persons

The broad pattern of secondary educated persons reveals that Punjab, Haryana, Uttar Pradesh, Bihar, Goa and three UTs namely Delhi, Chandigarh and Pondicherry recorded high percentage (20 per cent and above) of secondary educated persons in 1991 (Fig. 3). In 2011, the states with more density of population, highly urbanised, equipped with better transportation facilities and incurring more expenditure on education namely Punjab, Harvana, Goa, Uttar Pradesh and Bihar recorded higher proportion of secondary educated persons (Fig. 4; Table 5). Similarly, due to high literacy rate and better availability of secondary schools per 1000 persons, the states of Himachal Pradesh (0.48 unit), Goa (0.32 unit), Sikkim (0.32 unit) and Manipur (0.31 unit), have recorded high proportion of secondary level educated persons (Table 4; Fig. 4). Likewise, Delhi and Chandigarh UTs and southern states of India have been better in terms of secondary educational attainment. However, the poverty stricken states like Bihar and Uttar Pradesh and states with poor road-railway connectivity like Jammu & Kashmir and north-eastern India like Sikkim. Arunachal Pradesh, Assam, Nagaland and Manipur have also fared well in attaining higher proportion of secondary education (Fig. 4; Table 5).

Areas with Moderate Proportion of Secondary Educated Persons

The hilly states like Himachal Pradesh, Sikkim, Assam, Manipur and northwest states of Rajasthan, Gujarat and whole of south India have witnessed moderate proportion (15-20 per cent) of secondary educated persons in 1991 (Fig. 3). The moderate urbanization, moderate population density and low poverty in Gujarat, Andhra Pradesh, Himachal Pradesh and Manipur are responsible for their moderate level of attainment of secondary education (Table 5). In 2011, only seven states of country namely Rajasthan, Madhya Pradesh, Orissa, West Bengal and northeastern states of Meghalaya,





Tripura and Mizoram have been found in this category (Fig. 4).

Areas with Low Proportion of Secondary Educated Persons

The poverty stricken states namely Orissa, Madhya Pradesh, Arunachal Pradesh and Tripura; states with low total work participation rate like West Bengal and poor roadrailway connectivity like, Arunachal Pradesh, Tripura, Meghalaya, Nagaland and Mizoram have registered low proportion (less than 15 per cent) of secondary educated persons in 1991 (Fig. 3; Table 5). In 2011, no state has been found in this category as all the states have moved up to upper levels of education. Because of the growing demand of skilled, semi skilled and educated workforce in globalising Indian market, the people have started attaining higher levels of education. A series of flagship programmes such as Programme of Action (POA-1992), National Knowledge Commission (NKC-2005), National Scheme of Incentives to Girls for Secondary education (2008) and Rashtriya Madhyamik Shiksha Abhiyan (RMSA-2009) introduced and implemented by both central and state governments are also equally responsible for the epochal shift of people to higher education levels.

Educated Persons up to Higher Level (1991-2011)

The study unfolds that there has been a slight increase in proportion of highly educated persons from merely 5.67 per cent in 1991 to 8.90 per cent in 2011. It clearly indicates that Indian higher education system is passing through teething stage where even one-tenth of its total literate population is still not highly educated. However, the study has revealed the highest growth of educated people at higher education level as compared with elementary and secondary stages. Their number has increased phenomenally at 231 per cent during the study period. Their growth has been about 3 and 1.32 times higher than elementary and secondary educated people respectively. It signfies the propensity and inclination of people towards higher education after 1990s. The highest growth rate among highly educated people has been observed in two UTs namely Dadra & Nagar Haveli (957 per cent), Daman & Diu (559 per cent) followed by Sikkim (403 per cent) and Haryana (397 per cent) states. On the other hand, the least decadal growth has been observed in Chandigarh (108 per cent). The correlation matrix exhibits a positive association between educated persons at higher level and number of educational institutes per size of population (0.43 in 1991 and 0.29 in 2011), gross enrolment ratio (0.84 in 1991 and 0.78 in 2011), level of urbanization (0.70 in 1991 and 0.66 in 2011), density of population (0.88 in 1991 and 0.81 in 2011) and rail-road density at national level (Table 3). The study shows negative relationship between educated persons at higher level and level of poverty (-0.37 in 1991) at national level. The study therefore reveals that increasing number of educational institutes, higher enrolments, growing urbanization and improved network of roads and railways resulting into greater place to place connectivity furthered higher educational attainments at the national level. The poverty continued to hinder the progress of higher education at the national level during the post-liberalization period in India. The spatiotemporal variations among educated persons at higher level during the study period are discussed below:

Areas with High Proportion of Higher Educated Persons

Two union-territories of Delhi and

Chandigarh have highest share (10 per cent and above) of graduates, post-graduates, M. Phil. and Ph.D. degree holders (Fig. 5; Table 1). Better road-railway connectivity along with the availability of institutions of higher education and affordability of people to seek higher education are the reasons for high proportion of highly educated persons in these UTs (Table 5). The higher concentration of highly educated people in the national capital territory of India and Chandigarh the capital city of Punjab and Haryana states in 1991 may be attributed to high literacy rate (75.29 per cent and 77.81 per cent), high urbanization (89.90 per cent and 89.70 per cent), high population density (6352 and 5632 persons/ km²) and better road-railway connectivity along with the availability of institutions of higher education and affordability of people to seek higher education (Table 4 and 5). In 2011, the states like Harvana, Manipur, Maharashtra, Goa, Tamil Nadu and Andhra Pradesh and UTs such as Chandigarh, Delhi and Pondicherry have recorded high proportion of highly educated persons (Fig. 6). The spatial pattern of highly educated persons (2011) has been the corollary of a host of factors like high urbanization in Delhi (97.50 per cent), Chandigarh (97.25 per cent), Pondicherry (68.33 per cent), Goa (62.17 per cent) and Tamil Nadu (48.39 per cent) and high population density in Delhi (11297 persons/km²), Chandigarh (9252 persons/ km²), Pondicherry (2598 persons/km²), and very low poverty in Goa (5.1 per cent), and Andhra Pradesh (9.20 per cent) (Table 5).

Areas with Moderate Proportion of Higher Educated Persons

Major states of India lying in Indo-Gangetic plains extending from Punjab to West Bengal and the tribal population dominated states of Arunachal Pradesh and Manipur along with Madhya Pradesh, Maharashtra, Andhra Pradesh and Karnataka in south India accounted for moderate level of (5-10 per cent) proportion of highly educated persons in 1991 (Fig. 5). In 2011, majority of the states in northern half of India along with Karnataka and Kerala have recorded moderate share of highly educated persons (Fig. 6). A cursory look at the pattern reveals that high population density resulting into more literates to seek higher education in Bihar (1516 persons/km²), West Bengal (1029 persons/km²), Uttar Pradesh (1017 persons/ km²) and Kerala (859 persons/km²) has resulted into moderate share of highly educated people. In additon to this, low poverty indicating more affordability for higher education in Kerala (7.10 per cent), Himachal Pradesh (8.10 per cent), Sikkim (8.20 per cent) and Punjab (8.30 per cent), high work participation rate in Madhya Pradesh (45.57 per cent), Bihar (36.50 per cent), Uttar Pradesh (35.66 per cent) and Himachal Pradesh (51.85 per cent) have been some of the reasons behind such a distri-butional pattern of higher educated persons in these states (Fig. 6).

Areas with Low Proportion of Higher Educated Persons

The hilly state of Himachal Pradesh and some north eastern states along with Gujarat, Orissa, Kerala and Tamil Nadu and Andaman & Nicobar Islands, Dadra & Nagar Haveli, Lakshadweep and Daman & Diu UTs have recorded very low proportion (less than 5 per cent) of highly educated persons in 1991 (Fig. 5). The most intriguing feature is the low proportion of higher educated persons in the high literate states of Kerala (89.81 per cent), Himachal Pradesh (63.86 per cent), Assam (52.89 per cent) and Nagaland (61.65 per





cent) (Table 4). In 2011, only Tripura state and Lakshadweep UT continued to be at bottom in the higher educational attainments (Fig. 6). Out of the 28 states and 7 UTs, the Tripura state stood at 4th rank in terms of literacy rate in 2011 (Table 4). But, it is at the bottom in terms of higher educational attainment in India (Table 1). However, it is at the top in attainment of professional degrees and diplomas in the country, indicating that people are drifiting away from higher education with little scope for employment. Similar is the case of other highly literate states like Kerala, Himachal Pradesh, Mizoram.

Conclusions

The study finds remarkable changes in the educational attainment at all the three levels of elementary, secondary and higher education in India between 1991 and 2011. The proportion of elementary educated persons has declined due to epochal shift of elementary educated persons towards secondary and higher education levels. But, there has been increase in the absolute number of elementary educated persons during the study period. A rise in elementary schools per size of population, higher work participation rate and high budgeted expenditure on education supported and fostered the elementary education. The government's initiative to achieve the target of universalization of elementary education is a big factor in expanding the elementary education even in poverty ridden, rural and geographically inaccessible areas of the country. The study reveals phenomenal rise in the number of secondary educated persons between 1991 and 2011. The growth of secondary educated people has been more than double as compared to the elementary educated persons during the same period. The national capital

Delhi and Chandigarh UT and southern states of India have higher proportion of secondary educated persons. However, the poor states and states with preponderance of tribal population like Madhya Pradesh, Orissa and north-eastern states have shown relatively lower proportion of secondary educated persons during the study period.

The highest growth (about 231 per cent) has been observed in higher educational attainment in India during 1991-2011. The growth among highly educated people has been about 3 and 1.32 times higher than the elementary and secondary educated people respectively. It shows the growing propensity and inclination of people towards higher education after 1990s. Although the number of higher educated people has increased from about 6 per cent in 1991 to 9 per cent of total literates in 2011, even then the country is passing through an infancy stage of higher educational attainments where about 91 per cent of total literates have yet to be graduated and post-graduated. The advanced nations generally have the highest share of population in tertiary education followed by secondary and elementary education, but in case of India it is just opposite. Delhi and Chandigarh UTs emerged as academic leaders in terms of higher educational attainment during the study period. The pace of increase in proportion of highly educated people has been quite low in densely populated states of country like Bihar, West Bengal and in hilly tribal tracts of north-east India.

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