
SPATIO-TEMPORAL APPRAISAL OF LITERACY AND SCHOOL EDUCATION FACILITIES THROUGH GENDER BASED EDUCATIONAL DEVELOPMENT INDEX USING GEOSPATIAL TECHNOLOGY: A DISTRICT LEVEL STUDY OF HARYANA

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Abstract:

The study of literacy pattern, gender based literacy growth with trends are the most important indicators of socio-economic change of an area. The progress in literacy rate as shown by decennial census is very slow in Haryana.. The literacy rate of Haryana was 67.91% in 2001 while it was increased to 75.55% in 2011. Male literacy rate in Haryana increased 5.57 percentages while female literacy rate is increased 10.21 percentages during last decade. In this analysis, UNDP based Gender Based Educational Development Index (GEDI) methodology was used to measure inequality in educational achievement between male and female. The GEDI is measured district wise during 2001to 2011 for all district of Haryana State. The geospatial technology is used to analysis the Spatial distribution of schools at primary, middle, high and senior secondary level for different districts, The study indicates that maximum GEDI movement is recorded in Mewat district (0.15) while minimum movement is recorded in Gurgaon, Faridabad, Rohtak & Gurgaon districts (0.07).

Keywords: Gender Based Education Development, Spatio- Temporal, Literacy, School Education, Geospatial Technology.

Introduction:

The present day education system in India has come a long way and the age old traditions have under gone a new makeover. Government of India is doing lots of efforts in this field so that the objective of inclusive growth can be achieved with fast speed by it. A great achievement of the Indian government is a big jump in the literacy rate from 18.3% in 1950-51 to 74.04% in 2010-11. This progress is achieved by Indian government in the education sector by making sustained efforts.

The government is trying hard to improve the country's education status to enhance the standard of living of the people and also to achieve other goals like, overcoming the problem of poverty and unemployment, social equality, equal income distribution, etc. Education contributes to the individual's well being as well as the overall development of the country. Education is not only an instrument of enhancing efficiency but is also an effective tool of widening and augmenting democratic participation and upgrading the overall quality of individual and societal life (Goel, 2008). Thus, the importance of education can't be ignored.

Literacy is also one of the main components of Human Development Index (HDI) with life expectancy and per capita income. The Governments of India and Haryana have focused on women education. Sarva Shiksha Abhiyan (SSA) is being implemented in gross enforcement ratio. National Programme for education of girls at elementary level (NPEGEL) has been aimed to improve strength of girl students. Recently, Govt. has taken up the programme 'Beti Bachao Beti Padhao'. The district of Ambala, Kurukshetra, Kaithal and Sirsa are facing the problem of female illiteracy. Similarly, the Muslim population dominated Mewat district is also having low female literacy.

Education has been made too easy for the students so that more and more students can enter into the scope of education system of the state. The announcements like abolishing compulsory CBSE board exams for class 10th from the session 2010-11, introduction of grading system, the passage of Right of Children to free and Compulsory Education Bill, reservation policies etc. are a few among them. Now the question arises as to what extent such efforts will bear fruits in the field of education. In present study, education facilities like number of school including government, private, CBSE board, Aarohi & Sanskriti model also studied.

There is also change in the definition of literacy over time. At present time, census of India defined literacy as "*a person age above six year who can both read and write with understanding in any language is called literate*".

Objectives:

The study was carried out with following objectives

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1. To analyze the spatial movement of GEDI (Gender Based educational development index) for all districts of Haryana during last decades (2001-2011).
2. To compare the education system of all district of Haryana on the basis of GEDI and educational facilities.
3. To analysis the impact of government educational policies & schemes.

Study Area:

The study area, the Haryana state is lies between 27°37' north to 30°53' northern latitude and 74°28' east to 77°36' eastern longitude. The area is bounded by Punjab and Himachal Pradesh from north, Rajasthan from west and south, U.P. and Delhi from east. The location map of study area is presented in figure1.

The population of Haryana is according to 2011 census stands at about 25 million making the 17th most populated state of India. The state is spread over an area of about 44212 sq. km and it is 20th largest state in the country in terms of area. The density of population recorded as 573 persons per sq. km. in 2001 which is fifth highest in Indian states. The sex ratio recorded 877 females per thousand males, which is lowest in India and has 76.64 percent literacy rate with differential of 85.38 percent male literacy and 66.77 percent female literacy (census 2011).



Figure 1

Materials & Methods:

The following data have been used to study the GEDI & educational facilities in all districts of Haryana State collect data:-

- Census Report 2001& 2011, Government of India.
- Economic Survey of India 2001& 2011.
- United Nations Human Development Report, 2011.
- Primary Census Abstract, Census of India 1
- Statistical Abstract of Haryana, 2012-13.

The methodology of this analysis is based on UNDP-human development report (HDR) framework. The GEDI value of 1.0 is the maximum achievement with perfect gender equality. The minimum value of GEDI is '0'. The GEDI explains or measures how far a district has travelled

for minimum level of achievement and how far it has stilled to travel. District wise literacy and educational data for the year 2001 and 2011 are taken from the census publication and economics and statistical department of Haryana state.

The GEDI (Gender Based Development Index) is given below:

$$GEDI = \frac{1}{\frac{FP}{FL} + \frac{MP}{ML}}$$

Here FP is Female population above six years and FL is female literacy. Like this, MP is male population above six years and ML is male literacy. The district wise GEDI is calculated using the 2001 & 2011 census data (Table 2). The GEDI map & the spatial distribution map of govt. schools, govt. girl s schools and co-educational schools of all levels have been prepared using Arc GIS 9.3 software (Figure 2).

Results and Discussion:

District Wise Spatial variation in GEDI:

A very large spatial variation is observed in distribution of GEDI among 21 districts of Haryana. The districts like Gurgaon (0.84), Panchkula (0.83), Faridabad (0.82), and Ambala (0.82) have high GEDI because of good educational facilities and large scale urbanization, industrial and economic development. On the other hand, Mewat district has very low GEDI in the order of 0.50 because the area is backward socially & economically and dominated by Muslims who have poor culture of education. In addition to that poverty is the vital of the factor for low level of education. The Gender Based Development Index (GEDI) analysis of Haryana State for 2001 and 2011 is showing progress in all districts.

Highest movement in GEDI noticed in Mewat (0.15) and Palwal district (0.14) while lowest movement in GEDI noticed in Kurukshetra, Rohtak, Faridabad & Gurgaon districts (0.07). In last decade, Govt. of Haryana has taken up initiative to increase the new schools and particularly girl's schools in Mewat Area in which some part of Palwal district is also covered. In these two districts, the GEDI movement clearly perceptible in literacy growth of male & particularly female population during the period 2001 to 2011 as compared to other districts of state. The districts of Faridabad, Gurgoan, Rohtak and Kurukshetra etc. in close proximity to Delhi and socio and economic condition are better off. Due to these factors the literacy rate in these districts was already high. Therefore, the change in GEDI movement is low during the period 2001-2011. Jind, Kaithal & Fatehabad districts have GEDI movement is 0.12 during last decennial period and in these districts literacy growth is quite good during this period. The GEDI movement of remaining districts of state is ranges from 0.8 to 0.11 and this is due to increasing urbanization and industrialization (figure 2).

Table-1 District wise number of schools in Haryana

District	Literacy % (2001)		2001 (Male population % to total population above 6 years)	2001 (Female population % to total population above 6 years)	GEDI 2001	Literacy % (2011)		2011 (Male population % to total population above 6 years)	2011 (Female population % to total population above 6 years)	GEDI 2011	Movement in GEDI (2001 to 2011)
	Male	Female				Male	Female				
HARYANA	76.1	59.61	53.51	46.49	0.67	85.4	66.8	53.08	46.92	0.76	0.08
Kurukshetra	78.1	60.6	53.12	46.88	0.69	83.5	69.2	52.65	47.35	0.76	0.07
Rohtak	83.2	62.6	53.93	46.07	0.72	88.4	71.2	54.07	45.93	0.80	0.07
Gurgaon	88	67.5	53.78	46.22	0.77	90.3	77.6	53.88	46.12	0.84	0.07
Faridabad	85.1	65.6	54.85	45.15	0.75	89.9	75.2	53.32	46.68	0.82	0.07
Yamunanagar	78.8	63.4	53.32	46.68	0.71	85.1	72	53.07	46.93	0.78	0.08
Panipat	78.5	58	57.35	42.65	0.68	85.4	68.2	53.62	46.38	0.76	0.08
Rewari	88.4	60.8	52.20	47.80	0.73	92.9	70.5	52.22	47.78	0.81	0.08
Ambala	82.3	67.4	48.82	51.18	0.74	88.5	76.6	52.87	47.13	0.82	0.09
Karnal	76.3	58	53.26	46.74	0.66	83.7	68.3	52.76	47.24	0.76	0.09
Sonapat	83.1	60.7	54.13	45.87	0.71	89.4	70.4	53.74	46.26	0.80	0.09
Hisar	76.6	51.1	53.98	46.02	0.62	82.8	62.3	53.37	46.63	0.72	0.09
Jhajjar	83.3	59.6	54.01	45.99	0.70	89.4	71	53.41	46.59	0.80	0.09
Panchkula	80.96	65.7	54.91	45.09	0.73	88.67	77.5	53.46	46.54	0.83	0.10
Sirsa	70.1	49.9	52.89	47.11	0.59	78.6	61.2	52.62	47.38	0.69	0.10
Bhiwani	80.3	53	53.10	46.90	0.65	87.4	64.8	54.73	45.27	0.75	0.11
Mahendragarh	84.7	54.1	51.46	48.54	0.66	91.3	65.3	53.67	46.33	0.77	0.11
Kaithal	69.2	47.3	53.64	46.36	0.57	79.3	60.7	52.96	47.04	0.69	0.12
Jind	73.8	48.5	53.83	46.17	0.59	82.5	61.6	53.33	46.67	0.71	0.12
Fatehabad	68.2	46.5	52.51	47.49	0.56	78.1	59.3	52.35	47.65	0.68	0.12
Palwal	75.1	40.8	53.63	46.37	0.54	82.6	56.4	53.14	46.86	0.68	0.14
Mewat	61.2	23.9	52.56	47.44	0.35	73	37.6	52.46	47.54	0.50	0.15

Table-2 Movement in GEDI (Gender Based Development Index) at district level during 2001 to 2011

District	Middle	High	Sen. Sec.	Middle Girls	High Girls	Sen. Sec. Girls	Co-ed Middle	Co-ed High	Co-ed Sen. Sec.	BSEH Bhiwani Pvt. School	CBSE School	Total in district
Ambala	111	1	4	8	6	5	19	67	72	183	47	523
Bhiwani	140	116	130	17	23	34	1	0	2	348	34	845
Faridabad	13	3	9	6	5	10	25	32	28	472	93	696
Fatehabad	13	2	7	11	11	7	62	67	50	131	33	394
Gurgaon	80	45	55	10	4	11	1	1	1	221	99	528
Hisar	71	107	99	26	33	26	2	1	1	402	49	817
Jhajjar	44	38	97	8	12	27	0	0	1	202	42	471
Jind	74	92	75	24	19	20	1	0	2	278	32	617
Kaithal	64	44	74	10	11	13	1	0	2	221	24	464
Karnal	56	4	7	3	5	11	67	74	66	283	59	635
Kurukshetra	174	50	54	13	3	5	0	0	2	171	43	515
Mahendergarh	115	47	73	17	5	14	0	0	5	286	40	602
Mewat	137	3	1	60	4	5	65	39	27	107	5	453
Palwal	62	4	7	16	5	10	67	46	30	289	13	549
Panchkula	43	0	1	2	1	2	38	26	30	62	35	240
Panipat	33	2	6	6	10	11	26	24	58	268	37	481
Rewari	90	55	74	9	6	9	0	0	2	192	38	475
Rohtak	27	35	76	9	15	34	0	0	2	201	59	458
Sirsa	103	91	73	17	9	7	0	0	2	218	42	562
Sonipat	75	75	90	6	11	28	0	0	5	341	53	684
Yamunanagar	236	61	43	2	1	3	0	0	3	260	45	654
Haryana	1761	875	1055	280	199	292	375	377	391	5136	922	11663

Spatial distribution of education facility

The total Govt. schools in Haryana State is 5605 and out of these 1761 Govt. Middle School, 875 Govt. High School, 1055 Govt. Sen. Sec. School, 280 Govt. Girls Middle School, 199 Govt. Girls High School, 292 Govt. Girls Sen. Sec. School, 375 Govt. Co -educational Middle School, 377 Govt. Co -educational High School and 391 Govt. Co -educational Sen. Sec. School.

Board of School Education, Haryana and 922 schools is affiliated to CBSE, New Delhi. This shows that private schools are more than Govt. Schools. The maximum number of private schools is mainly located in Faridabad, Gurgaon, Hisar and Bhiwani districts. The number of govt. schools is less in Gurgaon and Faridabad, Hisar and Bhiwani. However the geographical area and population is large in Bhiwani & Hisar is more in comparison from other districts.

Conclusion:

Positive movement in Gender Based Education Development Index was observed in all districts of the state but highest movement has taken place in Mewat & Palwal districts which were earlier socially and economically backward. Faridabad, Gurgaon, Kurukshetra & Rohtak districts have observed movement in GEDI value below state average (0.08) while Yamunanagar, Panipat & Rewari districts have observed movement in GEDI value equal to state average. As this study shows there is positive correlation in decennial literacy growth and GRDI movements. Overall all, the maximum number of Govt. School is in Bhiwani district while minimum number of schools is in Faridabad district. But maximum number of Govt. Girls School is in Rohtak district while minimum number of Govt. Girls School is in Panchkula district.

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