

Web GIS Based Child Education Analysis For Sustainable Growth Of Bundelkhand Zone Of The State Of Uttar Pradesh, India

Garima Srivastava, Prof. R. K. Srivastava, Prof. R. C. Vaishya

Department of Geographical Information System, Motilal Nehru National Institute of Technology, Allahabad, India,
Department of Geographical Information System, Motilal Nehru National Institute of Technology, Allahabad, India,
Department of Geographical Information System, Motilal Nehru National Institute of Technology, Allahabad, India.
Email: versatilegarima@gmail.com

Abstract: This paper endeavours to present a picture of the current educational state of affairs in junior basic schools of Bundelkand Zone in Uttar Pradesh (India), and focuses on the gap in the educational system from 2001 to 2010 with the help of Web based Geographical Information System.

Keywords: Sustainable Development, Child Education, Bundelkhand Zone, Web Based Geographical Information System.

1 INTRODUCTION

Sustainable development is “development which meets the needs of the present without compromising the ability of future generations to meet their own needs” (Brundtland Report, 1987). Sustainability is often considered as having three overlapping, mutually dependent goals that are to live in a way that is environmentally sustainable, or continues for a very long-term, to live in a way that is economically sustainable, maintaining living standards for a long-term, and to live in a way that is socially sustainable, now and in the future. (Dillard, et al., 2009) and for this very purpose it is essential to analyze the educational system because education is the only way through which people can be made aware as to how to sustain the planet. Education means acquisition of knowledge in particular and having over-all awareness in general. Education is the backbone of a society through which people can understand their responsibilities towards the society for the developments of both individual and community by knowing Human Rights such as Child Rights, Gender Equality; Labour & Employment, Poverty, Social Justice, fulfilment of minimum standards of Security, Health & Human well being etc.. Only educated people can help the society to develop. And development of a society means development of nation which leads toward societal sustainability. Education makes people comprehend our environment in a much better manner. It is the only way through which people can get aware of the necessity, use and maintenance of the Natural Resources i.e. trees, water, energy, minerals, soil etc. for achieving environmental sustainability. Education teaches us how to utilize available Natural Resources to increase the economy for a long term. Economy, whether it is good or bad, definitely affects the society as well as environment. So it all depends on education. Only an educated man can meet his individual and social requirements and increase his economy without compromising environment. Education helps us understand the global scenario in a better manner and it makes us perceive what our new requirements are and we accordingly change and endeavour to transform our life both socially and economically. It plays a very prominent role on shaping our career as a certain amount of education has become the minimum eligibility criterion for seeking an employment in any field. In any country the children of

today are the youth of tomorrow which constitute the spinal cord of any country. Educating children today means strengthening the nation tomorrow for the sustainability of the planet which leads ultimately to the sustainable development of any nation in social as well as economic terms. Therefore child education should be treated as a matter of primary concern of any country and educated children are the most important asset of the future of any nation. The Sustainable Development of the earth today in due course depends largely on the youth of tomorrow because total Sustainable Development is a time taking process to which the educated children of today, when they grow into educated people of tomorrow, will contribute considerably to the Sustainable Development of any nation. Basic Schools are the primary centres where early education can be acquired and such centres prove temple of learning for the children who become a valuable asset of a nation. In modern society school is not just to learn history but to know about the present as well as the future scenario in every field. This helps children to think, analyse and find a better alternative. In India according to the act of child right, education is necessary for all children till 14 years which includes Junior Basic Education as well as Senior Basic Education and all the Districts of Bundelkhand Zone of Uttar Pradesh try to follow this act (This paper will confine to a consideration of Junior Basic level education).

2 Design/methodology/approach:

The study consists of four investigation phases. The first phase concerns the collection of 10- year background data with regard to junior school educational system such as:

2.1 Child population.

- Total population
- Population of Boys
- Population of girls

2.2 Year wise Junior Basic Schools details:

- No. of Junior Schools,
- No of male/female Teachers,
- No. of girls/boys Students,

These are followed by the discussion with various officials of Basic Education Department, as well as Vikas Bhavan (Development Department). The second phase deals with Map Digitization with the help of Arc GIS and ERDAS IMAGIN. The third phase deals with data organization, data analysis with the help of GIS (Geographical Information System) platform and SPSS for Decision making. The fourth phase involved query making on Local Host Server for Web representation of the problem concerned with the help of Geo Server and uDig to present current condition of Junior Basic Schools to take the sustainable as well as suitable educational steps for improving the educational system in the study area (Bundelkhand Zone).

3 Findings:

The existing educational system in the Districts of Bundelkhand Zone is highly unprofessional, dismal, lacking in technical methodology. There are neither sufficient no. of schools nor students nor teachers. In most of the schools the number of girl students of any category is very low, presenting an unacceptable scenario.

4 Data Collection:

For the present study, District level educational data for the all Junior Basic Schools has been collected for the year 2001 to 2010 from the Vikas Bhavan (Development Department), and Basic Education Department, Lucknow, Uttar Pradesh. Topographical maps of the study area have been collected from the Survey of India (SOI), Lucknow, Uttar Pradesh.

5 Practical implementation:

Arc GIS 10.0, Geo Server 2.1.4, uDig 1.3.2, Apache Tomcat 6.0, MS Access 2010, MS Excel 2010, SPSS 16.0, SQL and JSP has been used for storing, manipulating and analysing all type of data for relevant decision making.

6 Originality/ Value:

The paper accesses the problems in the existing educational system in the whole of Bundelkhand Zone of Uttar Pradesh and proposes to give GIS based solution strategies for its sustainability and growth. The proposed Web GIS based problem identification and its future status will help to find out sustainable growth oriented education system which is expected to improve the current educational condition in Bundelkhand Zone. The second phase of the study is shown in Figure 1, 2 and 3. The third phase of the study is divided into following categories:

1. Data organisation and analysis at District level which is shown in Figure 2.
2. Data organisation and analysis of whole Zone are shown in Table 1,2,3,4,5 and 6

The fourth phase of the study is shown in Figure 3.

7 Study Area:

All the Districts of Bundelkhand Zone which constitutes the southern part of Uttar Pradesh (India) have been considered for the study. Bundelkhand lies between the Indo-Gangetic Plain to the north and the Vindhya Range to the south. It is a gently sloping upland, marked by barren hilly terrain with

sparse vegetation. It is geographically the central part of India covering some part of Madhya Pradesh and some of Uttar Pradesh. In this paper only those districts of Bundelkhand have been considered which is the part of Uttar Pradesh. The population of this Zone is approximately 50 million. In spite of being rich in minerals, the Zone is underdeveloped and people are poor and backward. The Bundelkhand Zone of Uttar Pradesh lies between 23° 10' and 26° 27' N Latitude and 78° 4' and 81° 34' E Longitude. It comprises seven districts (Jhansi, Jalaun, Lalitpur, Hamirpur, Mahoba, Banda, Chitrakoot) of Uttar Pradesh with the total area of 29418 sq km.

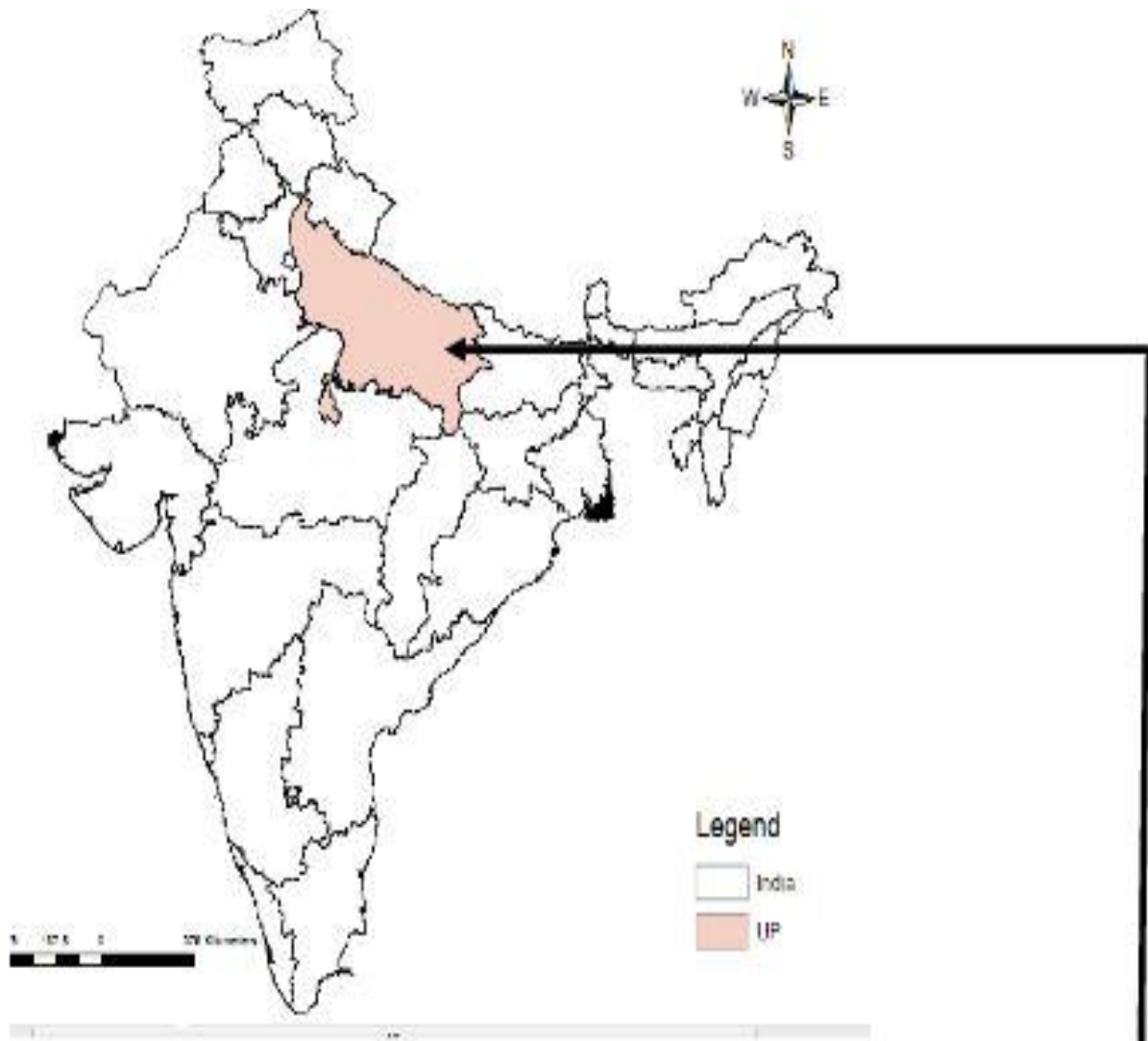


Figure 1: Location Map of the study area

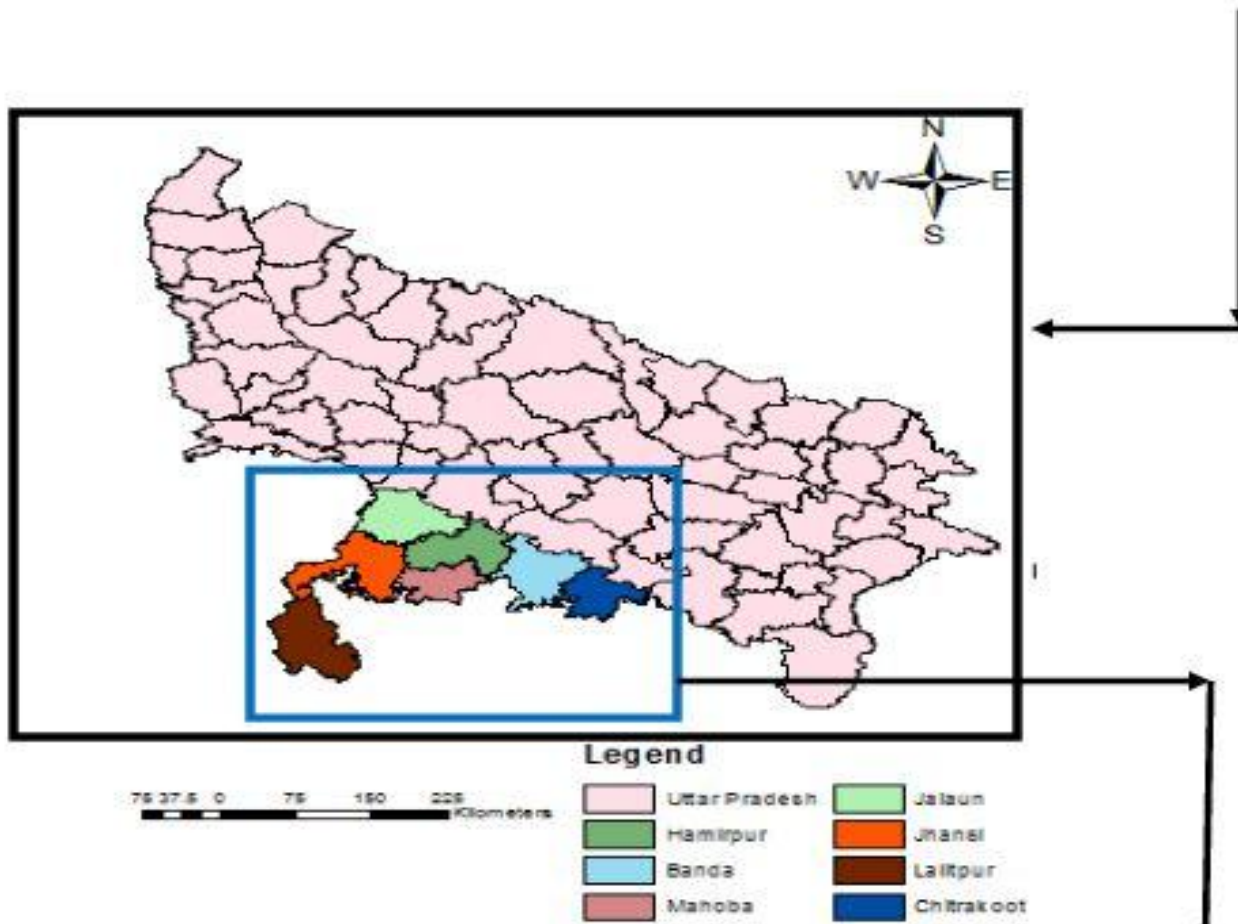


Figure 2: Location Map of the study area

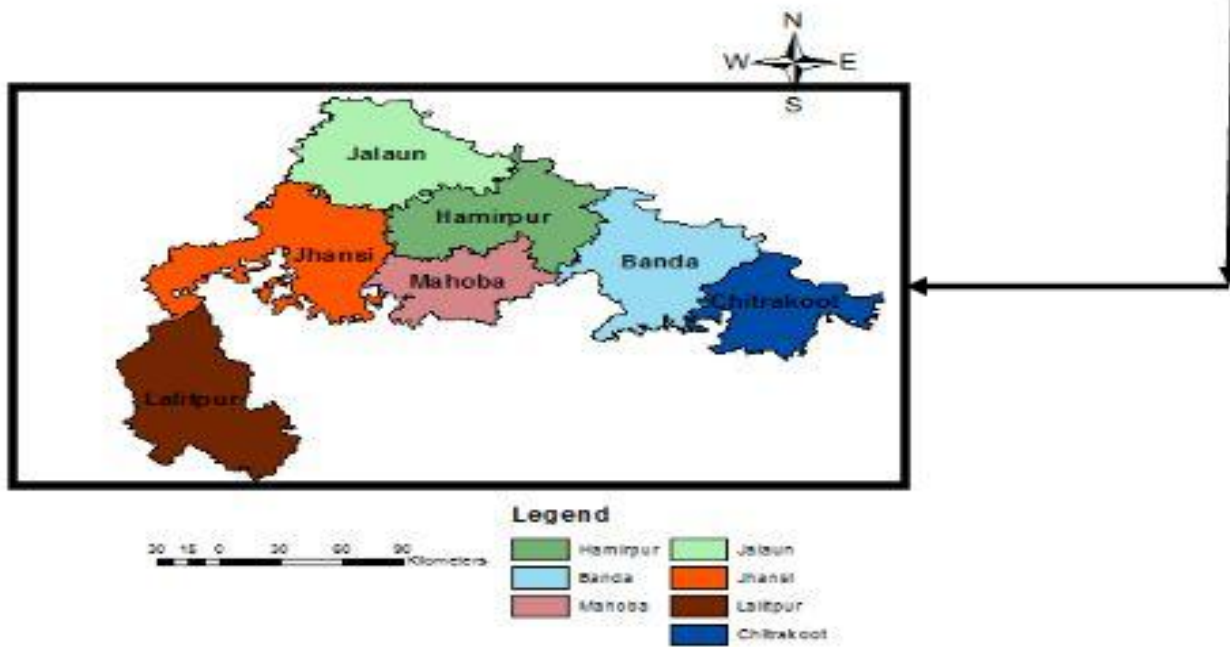


Figure 3: Location Map of the study area

Figure 1 shows the digitized boundary map of every state of India, where as Figure 2 shows the digitized State boundary map of entire Uttar Pradesh, India and at last but not least Figure 3 displays the map of Bundelkhand Zone which lies in Uttar Pradesh (India) which is the study area for the research.

8 Creation of Integrated Geospatial Database:

1. First and foremost, the SOI topographical maps are rectified by Universal Transverse Mercator (UTM) projection system with World Geodetic System (WGS) 84 datum based on second order polynomial algorithm in ArcGIS 10.0 Software.
2. Layers Creation has been done.
3. District Educational Information related to Junior Schools, Teachers, and Students are arranged and then prepared an Attribute Database in the Microsoft Office Access 10.0.

4. With the help of ArcGIS 10.0 Attribute database which were created in Microsoft Office Access 10.0 has been integrated into the GIS layer to create an Integrated Geospatial Database.

Finally all relevant data have been published on Web GIS Server for suitable and sustainable decision making.

9 Discussion:

With the help of digitized map and Column Chart the description of child education environment at Junior Basic School level of each district of Bundelkhand Zone is described in Figure2 and Figure3. The descriptive statistical characteristics of each parameter are represented in Table 1 to Table 6 for 10 years.

10 Statistical Analysis

A descriptive characteristic of the study parameters has been calculated in SPSS software and MS Excel.

10.1 Ratio Analysis of ten years:

Table 1: Student-Teacher Ratio (STR) Analysis

Year	95% CI for Mean		Avg STR in a whole Zone	95% CI for Median		Median	Std dev	Std error	Kurt	Skew	Graphical representation
	Min Avg of STR in a BK Zone	Max Avg of STR in a BK Zone		Min Avg of STR with corresponding district	Max Avg of STR with corresponding district						
2001	54.089	74.589	64.336	49.386 (Hamirpur)	73.398 (Meerut)	67.806	11.086	4.190	1.218	-1.338	
2002	56.915	78.701	67.808	52.780 (Hamirpur)	85.208 (Jaunpur)	70.695	11.778	4.451	-1.324	0.126	
2003	55.592	79.587	67.589	47.244 (Hamirpur)	87.761 (Jaunpur)	71.350	12.972	4.908	0.305	-0.062	
2004	57.102	84.662	70.882	47.787 (Hamirpur)	87.761 (Jaunpur)	70.027	14.899	5.691	-0.910	-0.338	
2005	44.349	82.469	63.408	28.921 (Jaunpur)	89.6 (Chitrakoot)	67.183	20.608	7.789	-0.025	-0.485	
2006	59.969	77.734	69.851	48.435 (Hamirpur)	88.857 (Chitrakoot)	68.501	12.848	4.356	1.129	0.676	

2007	51.877	85.160	68.518	48.963 (Hamirpur)	96.478 (Banda)	64.452	17.993	6.8	-0.801	0.671	
2008	49.465	89.524	69.495	31.667 (Jalaun)	96.972 (Banda)	66.501	21.657	8.185	0.569	-0.572	
2009	49.745	88.011	68.878	47.069 (Jalaun)	111.851 (Jhansi)	61.395	20.688	7.819	3.907	1.774	
2010	43.251	70.48	56.84	27.180 (Jalaun)	72.585 (Hamirpur)	57.352	14.694	5.558	3.156	-1.508	

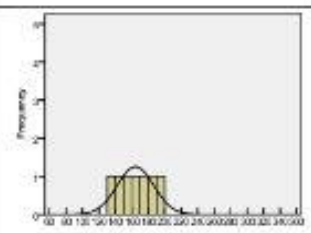
CI= Confidence interval, BK= Bundelkhand, Std= Standard, dev= Deviation, Avg=Average, Min=minimum, Max=Maximum, skew= skewness, kurt= Kurtosis

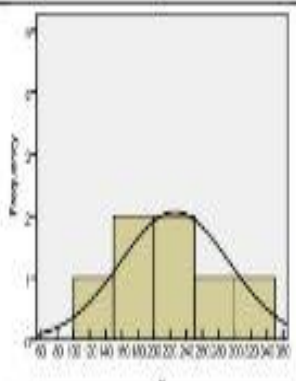
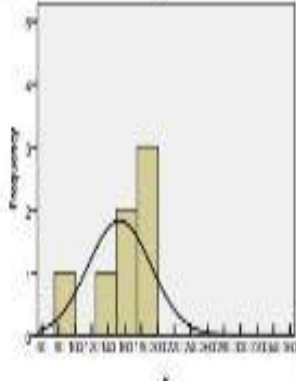
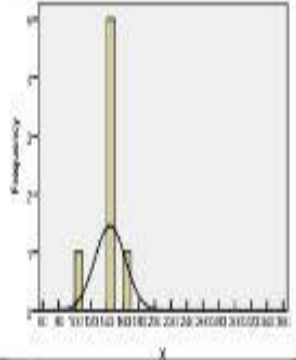
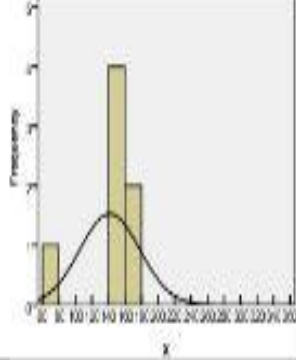
The Indian norm for Student-Teacher ratio as specified by the Ministry of education is 30 students for one teacher in primary schools, we can observe that only one district (Jalaun) happened to be well within the national norm particularly in the years 2005 (STR, 28.921) and 2010 (STR, 27.18) perhaps by fluke for in other years this STR did not persist. In other years, the Student-Teacher ratio was much higher than 30, which indicates that fewer teachers than the requisite national norm were employed to teach the student population in the schools. If we see another measure that is the STR in the entire Zone, it is discovered that STR is also very bad. It ranges from 43.251 (minimum) to 89.524 (maximum) which bespeaks that in the whole zone the minimum burden of students on a teacher are 43.251 and the maximum burden on a single teacher is 89.524 students. This warrants that certain measures must

be adopted with a view to enhancing the STR to maintain the national norm for student teacher ratio by recruiting more teachers in the primary schools in the entire Zone. Normally histogram representation is used to graphically display the distribution of data; here histogram representation shows huge dispersion in the data and because of this, it is found that skewness and kurtosis are not normalized. Nature of skewness and kurtosis can be checked from the above table. Standard deviation from the mean is also calculated to check how much data is deviated from its mean. Standard error from the mean are also calculated to find out the deviation error.

Note: In normalised condition skewness, kurtosis, standard deviation and standard error will be zero.

Table 2: Student - School Ratio (SSR) Analysis

Year	95% CI for Mean		Avg STR in a whole Zone	95% CI for Median		Median	Std dev	Std error	Kurt	Skew	
	Min Avg of STR in a BK Zone	Max Avg of STR in a BK Zone		Min Avg of STR with corresponding district	Max Avg of STR with corresponding district						
2001	148.702	184.899	164.300	192.63 (Lalitpur)	192.167 (Mahoba)	165.765	22.272	8.418	-1.992	-	0.181
2002	159.936	184.537	172.237	152.856 (Lalitpur)	189.725 (Chitrakoot)	170.688	19.300	5.0270	-1.100	-	0.279
2003	159.609	182.954	169.282	149.340 (Hamirpur)	190.268 (Chitrakoot)	172.308	15.864	5.996	-1.558	-	0.071
2004	159.404	178.328	168.866	149.263 (Hamirpur)	178.812 (Jhansi)	172.308	10.290	3.866	1.616	-	1.338
2005	157.124	181.198	169.161	151.833 (Jalaun)	185.973 (Banda)	170.78	19.015	4.919	-1.39	-	0.1
2006	150.938	183.878	167.408	133.189 (Lalitpur)	185.973 (Banda)	172.423	17.808	6.73	1.747	-	1.358

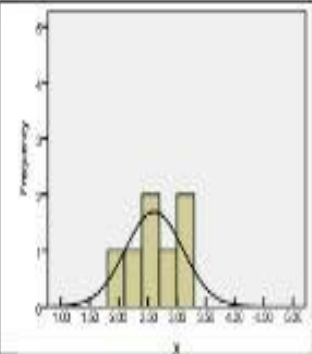
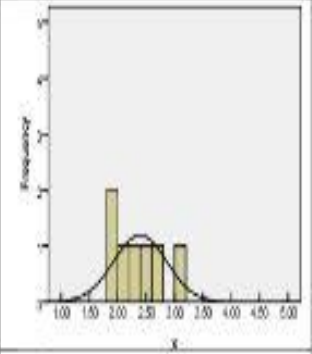
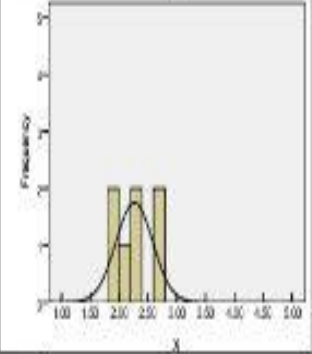
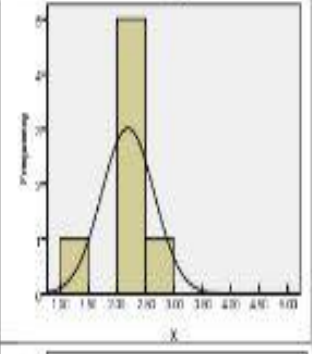
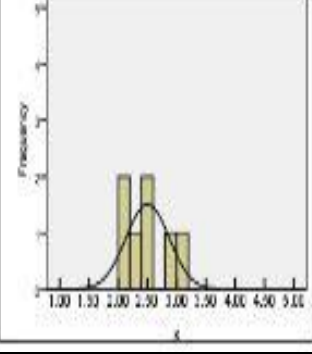
2007	169.286	288.341	225.813	142.617 (Jalaun)	337.128 (Mahoba)	229.165	67.608	25.55 3	-0.385	0.597	
2008	118.961	189.179	158.77	75.932 (Jalaun)	185.741 (Banda)	162.87	38.286	14.47	3.221	1.765	
2009	126.498	161.848	144.143	105.286 (Jalaun)	168.627 (Banda)	147.796	19.148	7.295	3.776	1.452	
2010	107.902	175.387	141.645	60.784 (Jalaun)	167.279 (Banda)	149.986	36.485	19.78 9	6.048	2.392	

During the survey it is found that as compared to population there is very low number of children enrolled in schools. It is realized that Government is laying more emphasis on opening schools here and there than encouraging children to join schools while according to the act of child education every child till the age of 14 must be educated. During

survey it is noticed that from class 2 dropout rates of students are increased class by class. The lowest SSR noticeable in Jalaun in particular is 60.784 in 2010, whereas the maximum is 337.128 in Mahoba in 2007 and the overall minimum SSR in the whole Zone is 107.902 and the maximum is 288.341.

Table 3: Teacher - School Ratio (TSR) Analysis

Year	95% CI for Mean		Avg STR in a whole Zone	95% CI for Median		Median	Std dev	Std error	Kurt.	Skew	Frequency
	Min Avg of STR in a BK Zone	Max Avg of STR in a BK Zone		Min Avg of STR with corresponding district	Max Avg of STR with corresponding district						
2001	2.194	3.015	2.559	1.862 (Lalitpur)	3.28 (Hemirpur)	2.591	0.417	0.157	2.408	0.100	
2002	2.248	2.929	2.589	2.008 (Jabun)	3.228 (Hemirpur)	2.598	0.368	0.139	1.892	0.248	
2003	2.204	2.884	2.544	1.963 (Jabun)	3.161 (Hemirpur)	2.561	0.367	0.139	1.265	0.141	
2004	2.059	2.858	2.459	1.963 (Jabun)	3.123 (Hemirpur)	2.415	0.482	0.163	-0.885	0.580	
2005	1.924	4	2.962	1.918 (Chitraloot)	5.25 (Jabun)	2.48	1.122	0.424	3.144	1.682	

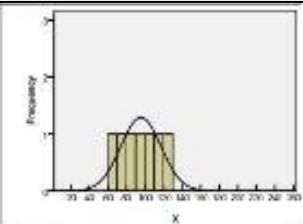
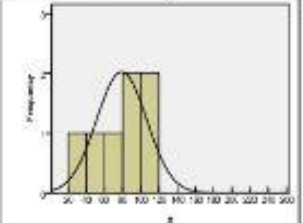
2006	2.152	3.067	2.608	194 (Chitrakoot)	3.279 (Banda)	2.48	0.494	0.186	-1.068	0.285	
2007	1.96	2.824	2.392	1915 (Banda)	3.194 (Hamirpur)	2.374	0.467	0.176	-0.221	0.72	
2008	1.97	2.561	2.266	1915 (Banda)	2.7108 (Jhansi)	2.215	0.32	0.120	-1.637	0.398	
2009	1.765	2.621	2.193	1.321 (Jhansi)	2.836 (Banda)	2.237	0.463	0.1750	2.258	-0.897	
2010	2.160	2.848	2.502	2.105 (Chitrakoot)	3.054 (Jhansi)	2.417	0.369	0.139	-1.331	0.297	

In table 1 we can observe that the ratio between teacher and students is extremely low. This happens because the ratio between teachers and school is not in sync with the number of students. The lowest teachers-school ratio is 1.321 which is noticed in Jhansi in 2009 and the overall

average ratio in a zone is 2.193 that is in 2009. So Government must seriously adopt appropriate measures in terms of enhancing the strength of teachers in a school for imparting quality education to children in Bundelkhand Zone.

Table 4: Girls' Student-Female Teacher Ratio (GSFTR) Analysis

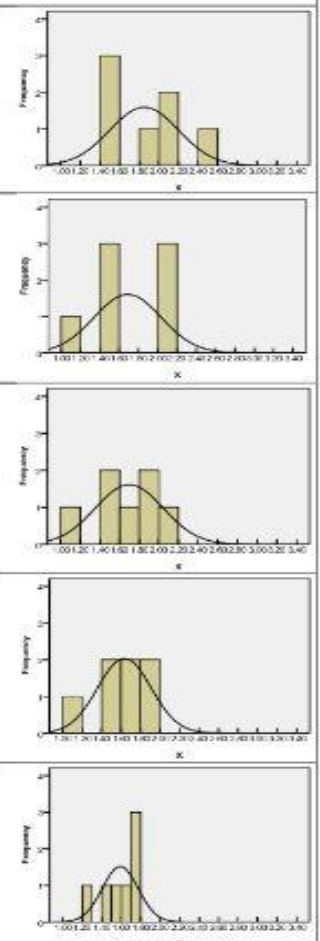
Year	95% CI for Mean		Avg STR in a whole Zone	95% CI for Median		Median	Std dev	Std error	Kurt	Skew	Frequency
	Min Avg of STR in a BK Zone	Max Avg of STR in a BK Zone		Min Avg of STR with corresponding district	Max Avg of STR with corresponding district						
2001	87.639	152.048	119.848	69.638 (Jhansi)	178.273 (Chitrakoot)	116.288	34.821	18.161	0.517	0.481	
2002	69.318	147.626	108.487	38.133 (Lalitpur)	167.362 (Chitrakoot)	116.324	42.351	16.007	0.215	-0.488	
2003	74.045	129.926	102.001	74.710 (Lalitpur)	154.381 (Chitrakoot)	94.131	30.226	11.424	-0.246	0.871	
2004	73.039	137.907	105.473	77.308 (Jalain)	173.047 (Chitrakoot)	90.665	35.069	13.255	1.575	1.405	
2005	48.48	161.583	105.087	15.935 (Jalain)	213.548 (Chitrakoot)	92.358	61.141	23.109	1.43	0.611	
2006	60.669	161.334	111.001	36.96 (Jalain)	204.227 (Chitrakoot)	105.777	54.423	20.569	0.426	0.321	
2007	60.286	173.062	116.674	47.418 (Jalain)	207.041 (Chitrakoot)	89.45	60.97	23.044	-1.212	0.66	
2008	62.679	179.707	121.193	31.208 (Jalain)	209.583 (Chitrakoot)	124.308	63.269	23.913	-0.96	0.17	

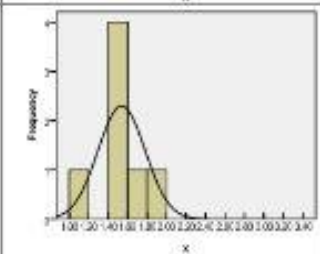
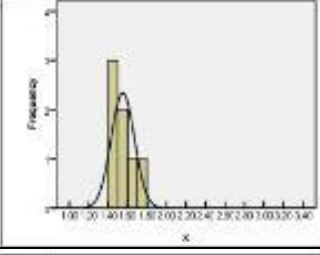
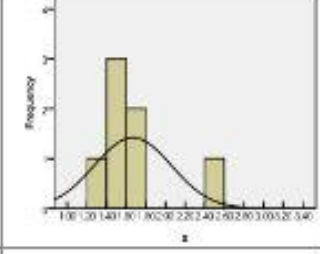
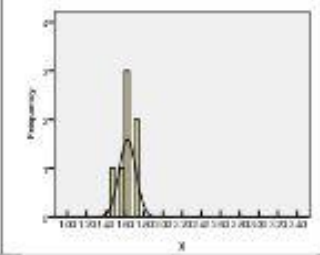
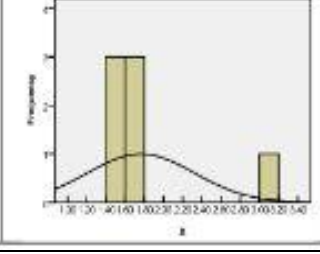
2009	75.583	115.585	95.559	66.473 (Jalgaon)	122.705 (Jhansij)	94.906	216.59	8.184	-1.598	-0.154	
2010	58.846	104.328	78.887	96.207 (Jalgaon)	110.892 (Chitrakoot)	85.405	27.562	10.417	-0.812	-0.542	

Girls are generally very little educated in India. There are several reasons why girls in a family are not allowed to join a school to be educated precisely because of the absence of female teachers in a school. Parents do not admit their girls to a school in which there is either no female teacher or there is nominally one female teacher. During the survey it has been discovered that most of the schools have only

one female teacher, while they need more female teachers for attracting larger number of female students. The above analysis denotes that during ten years a single female teacher has a maximum burden of 213.549 which is noticed in year 2005 in Chitrakoot district. And in the whole zone maximum ratio goes to 179.707 in 2008.

Table 5: Population –Student Ratio (PSR) Analysis

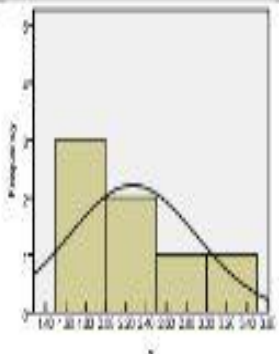
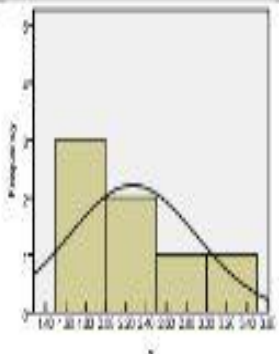
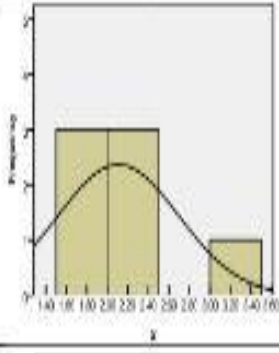
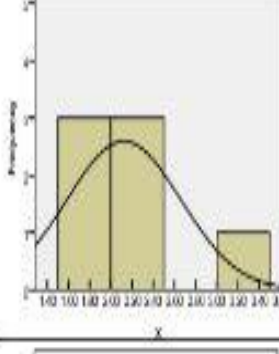
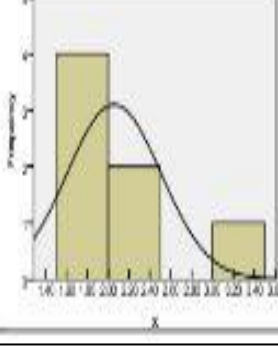
Year	95% CI for Mean		Avg STR in a whole Zone	95% CI for Median		Median	Std dev	Std error	Kurt	Skew	
	Min Avg of STR in a BK Zone	Max Avg of STR in a BK Zone		Min Avg of STR with corresponding district	Max Avg of STR with corresponding district						
2001	1.527	2.175	1.850	1.508 (Chitrakoot)	2.414 (Jalgaon)	1.858	0.350	0.182	-1.0800	0.486	
2002	1.865	2.008	1.687	1.146 (Jalgaon)	2.050 (Banda)	1.595	0.348	0.191	-1.269	-0.801	
2003	1.878	2.019	1.698	1.112 (Jalgaon)	2.042 (Banda)	1.798	0.346	0.190	-0.544	-0.789	
2004	1.881	1.887	1.694	1.112 (Jalgaon)	1.922 (Banda)	1.748	0.279	0.108	1.482	-1.244	
2005	1.42	1.76	1.59	1.269 (Jalgaon)	1.794 (Jalgaon)	1.62	0.184	0.069	0.817	-0.859	

2006	1.313	1.763	1.588	1.113 (Jaleun)	1.876 (Laitpu)	1.527	0.248	0.081	0.994	-0.492	
2007	1.44	1.661	1.55	1.412 (Chitakoot)	1.765 (Laitpu)	1.552	0.119	0.045	0.748	0.86	
2008	1.304	2.081	1.668	1.382 (Chitakoot)	2.506 (Jaleun)	1.484	0.393	0.148	4.57	2.086	
2009	1.548	1.710	1.629	1.480 (Mehote)	1.744 (Jaleun)	1.647	.088	.0830	282	-0.579	
2010	1.247	2.283	1.765	1.459 (Jhensi)	3.021 (Jaleun)	1.606	.560	211	6.585	2.528	

This ratio projects the actual literacy level of the area concerned. The analysis exhibits that in this zone child literacy level is still low. In Jalon District (2010) at every 3 children there is only 1 child who is enrolled in a school.

And the maximum average of the whole zone is 2.283 in 2010. This indicates the prevailing nonchalance to education in the zone.

Table 6: Girls' Population - Girls' Student Ratio (GPGSR) Analysis

Year	95% CI for Mean		Avg STR in a whole Zone	95% CI for Median		Median	Std dev	Std error	Kurt	Skew	
	Min Avg of STR in a BK Zone	Max Avg of STR in a BK Zone		Min Avg of STR With corresponding district	Max Avg of STR with corresponding district						
2001	1.603	2.85	2.266	1.620 (Chite koot)	3.462 (Jhe rs i)	2.21	0.691	0.238	1.508	1.183	
2002	1.562	2.658	2.107	1.569 (Chite koot)	3.317 (Jhe rs i)	2.005	0.589	0.222	3.364	1.708	
2003	1.624	2.620	2.122	1.548 (Chite koot)	3.242 (Jhe rs i)	2.004	0.598	0.208	4.028	1.747	
2004	1.638	2.472	2.055	1.590 (Chite koot)	3.002 (Jhe rs i)	1.972	0.450	0.170	4.316	1.852	

2005	1.586	2.417	2.001	1.481 (Chite koot)	2.899 (Jhars i)	1.811	0.448	0.169	1.284	1.177	
2006	1.629	1.92	1.775	1.477 (Chite koot)	2.004 (Jh un)	1.776	0.157	0.059	2.747	0.896	
2007	1.546	1.765	1.696	1.457 (Chite koot)	1.812 (Laitpur)	1.667	0.118	0.044	0.08	0.498	
2008	1.487	2.086	1.797	1.481 (Chite koot)	2.979 (Jh un)	1.667	0.929	0.122	2.279	1.488	
2009	1.512	1.981	1.747	1.567 (Laitpur)	2.905 (Chite koot)	1.661	2.59	0.857	5.829	2.369	
2010	1.418	2.311	1.864	1.599 (Jhars i)	2.800 (Jh un)	1.626	4.83	.182	1.668	1.629	

In Uttar Pradesh very few girls are educated considering their population. So it is extremely essential to measure the ratio between the female students and their overall population. In 2010 the maximum GPGSR reached 2.800 in Jalaun District which is not so encouraging if we compare this district with 2006 analysis which indicated the ratio being 2.004. In the entire Zone the maximum average ratio was found in 2.85 in 2001 which has now reached 2.311 in 2010.

Note: 1. from all the above analysis it is find out that the histogram representation shows huge dispersion in the data

and because of this, it is found that skewness and kurtosis are not normalized. Nature of skewness and kurtosis can be checked from the above table. Standard deviation from the mean is also calculated to check how much data is deviated from it mean. And standard error from the mean are also calculated to find out the deviation error.

2. In normalised condition skewness, kurtosis, standard deviation and standard error will be zero. For detail study, all analytical data have been further analysed on ArcGIS and then published on a web with the help of GeoServer for graphical user interface.

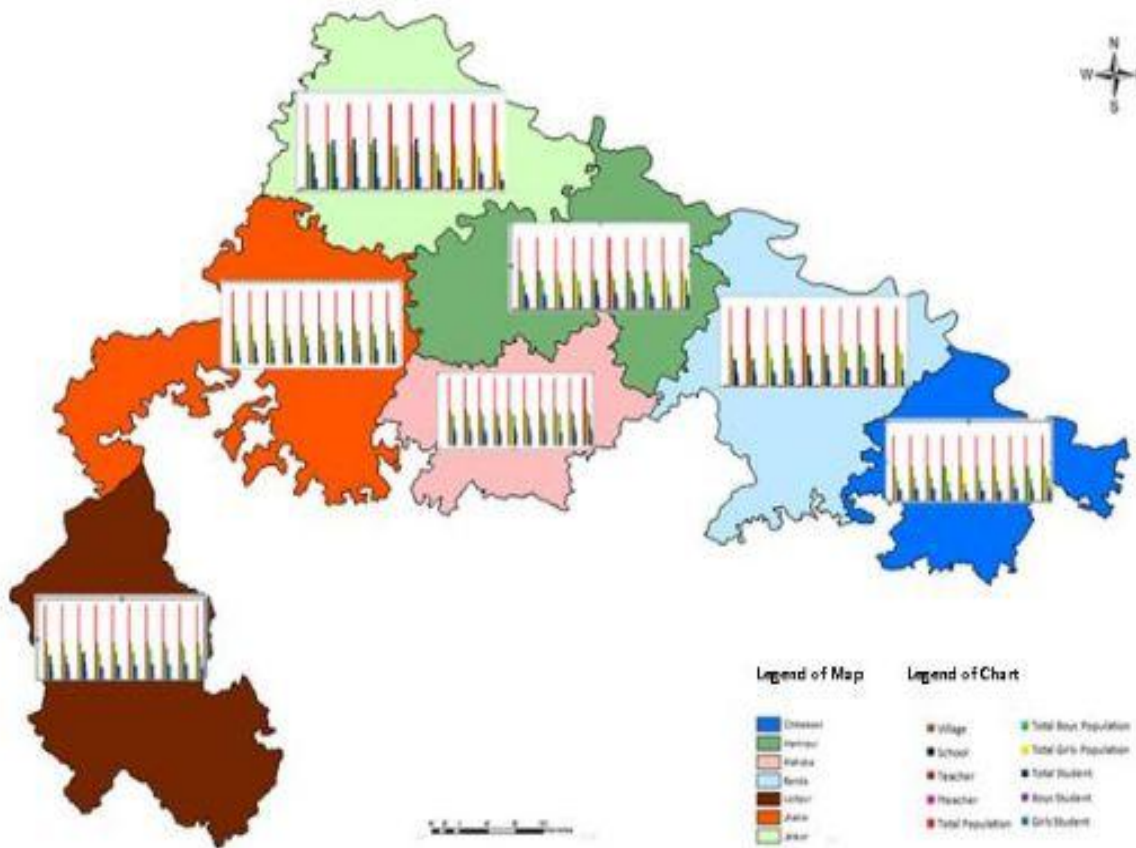


Figure 2: District-wise child education environment at Junior Basic School of Bundelkhand Zone

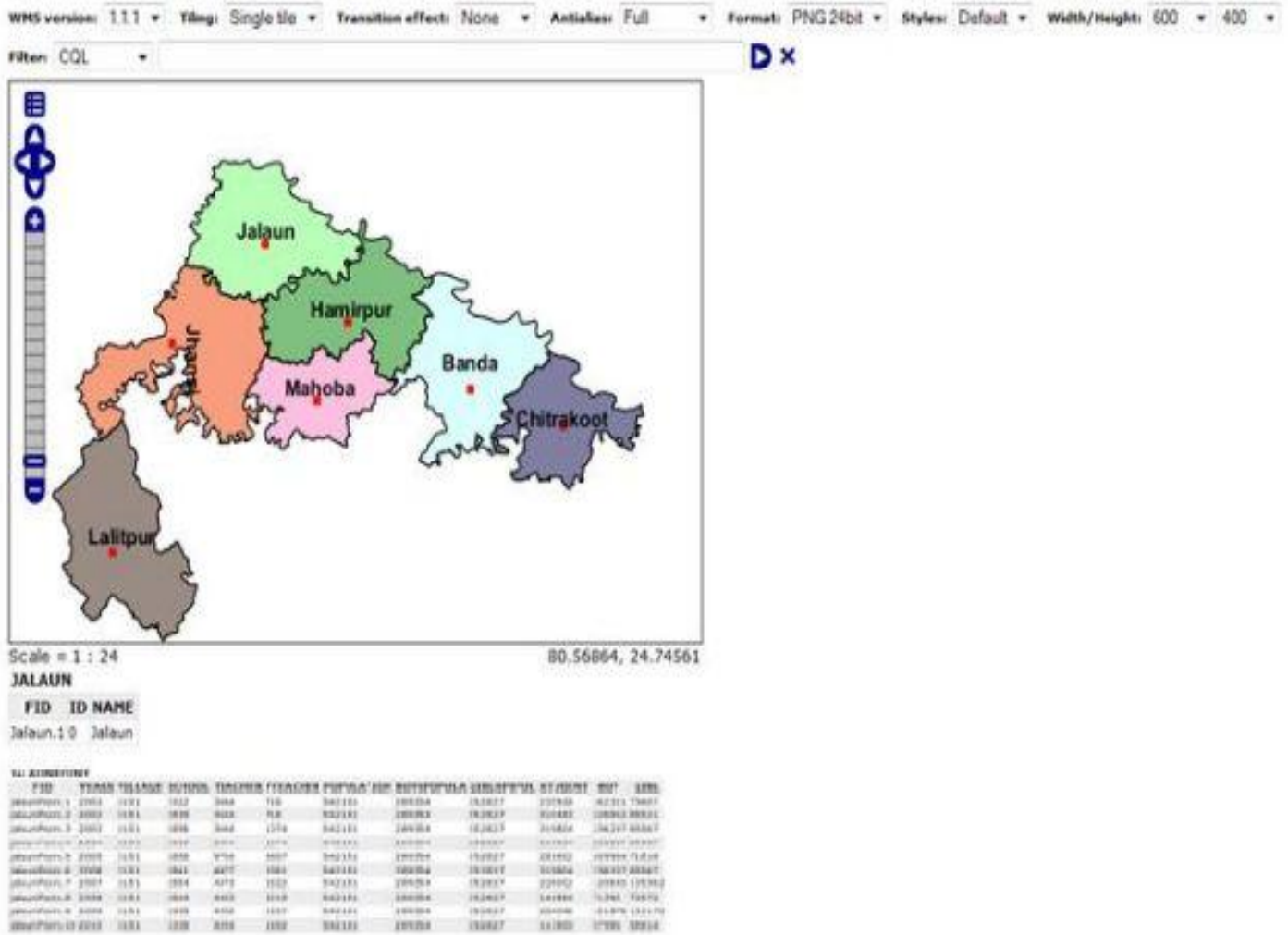


Figure 3: District -wise Child education environment at Junior Basic School of Bundelkhand Zone in Geoserver

11 CONCLUSION

Bundelkhand Zone of Uttar Pradesh is educationally very backward as its literacy rate is 48.41% and woman literacy rate is 34.98%. More than half of the population of this zone is illiterate. And as it is obvious without literacy, growth oriented development of any area cannot be feasible. So it is very imperative to take every possible measure to enhance the literacy rate. Government should attach more importance to all possible endeavours focusing on child education as children of today are the youth of tomorrow which constitute the spinal cord of any country. Educating children today means strengthening the nation tomorrow which leads ultimately to the sustainable development of any nation in social as well as economic terms. The entire entity ratio calculated during the research displays a deplorably bad condition of this zone. Government rules are not properly adhered to in this Zone as in this zone Student teacher ratio is very miserable as there is much heavier burden on the teacher than the required 30 students per teacher which shows inefficiency and negligence of the government in implementing the right to education (RTE) act in a proper manner. In a view of the foregoing analysis

of female teachers vs girls students, it has been noticed that the presence of one or two female teacher in a school attracted very few girls students for enrolment and such schools in this zone failed to achieve the target of RTE act. Parents do not admit their girls to a school in which there is either no female teacher or there is nominally one female teacher. During the survey it has been discovered that most of the schools have only one female teacher, while they need more female teachers for attracting larger number of female students. Therefore to improve the girls participation in the zone recruitment of more female teachers is very vital. With a view to improving the dismal picture of child education at Junior Basic level as prevalent in entire Bundelkhand Zone, Government will have to take into account certain measures which will surely remove the imbalance in various types of ratio discussed above. For this very purpose GIS will prove to be a powerful tool as it shows the results graphically with the help of a map. People can see the growth of their respective area with the help of just a single click on the map.

REFERENCES

- [1]. Brundtland, G. (ed). Our Common Future: The World Commission on Environment and Development. Oxford: Oxford University Press, 1987.
- [2]. Desai S, Kulkarni V (2008), Changing Educational Inequalities in India in the Context of Affirmative Action. Demography.vol 45, issue 2, pg 245–270.
- [3]. Hasanzadeh Kamyar (2010), GIS, Cadastre and Sustainable Development, International Journal of Geomatics and Geosciences. Vol 1, pg 3.
- [4]. Latu Savae (2009), Sustainable Development: The Role of GIS And Visualisation, The Electronic Journal on Information Systems in Developing Countries.
- [5]. Nair Biji, Joglekar Abhaya R. (2012), Journal of Humanities and Social Science, vol 1, issue 6, pg 01-02
- [6]. Quoted by Heinberg Richard (2010), "What Is Sustainability?", ThePost Carbon Reader: Managing the 21st Century's Sustainability Crises, Richard Heinberg and Daniel Lerch, eds., Healdsburg, CA: Watershed Media
- [7]. Sahlin (2007), Advancing Sustainable Development in Sweden, Institutionalising Sustainable Development, OECD Sustainable Development Studies
- [8]. Sharma S, Dhaiya P, (2012), Comparative Study of Attitude towards Teaching of Science and Arts of B.Ed. Students., Bhartiya International Journal of Education & Research, vol.1, issue 2, pg 85-110.
- [9]. Census of India 2001, Series 1, India, Provisional Population Totals, Paper 1 of 2001. Delhi: Controller of Publications, Registrar General & Census Commissioner, India 2001
- [10]. http://www.parmarthindia.org/status/location_condition.html
- [11]. <http://en.wikipedia.org/wiki/Bundelkhand>