

Spatio - Temporal Variation in Gender Related Educational Development Index: South Bihar

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Abstract: *Illiteracy continues to be a social problem in Bihar and South Bihar plain. It hinders the efforts made for the development of any region, and plays a negative role in the human development. Literacy removes the inequality from the society. Bihar is a state of higher gender disparity in terms of educational achievement. Bihar is the third most populous state and ranked lowest among all the Indian states. The literacy rate of Bihar has increased from 47 percent in 2001 to 61.80 percent in 2011. According to 2011 census report male literacy rate in Bihar was 71.20 percent and female literacy rate was 51.50 percent, which shows a wider gap in terms of gender wise educational achievement. Present paper deals with the variation in male and female literacy in 2001 and 2011 in South Bihar plain. Apart from this main aim of this paper is to find out the spatio - temporal variation in Gender Related Educational Development Index (GEDI) and their changes from 2001 to 2011 in South Bihar. The gender gap in the level of education can be easily understood by means of GEDI. United Nation Development programme, Human Development reports, stated that Gender Development Index measures the difference in male and female achievement in terms of health, education and command over economic resources. On the basis of GEDI value of two successive decade 2001 and 2011, as well as changes in GEDI value during this period, we can say that there is a wider gap among all the districts, except few of them. But the improvement in GEDI value in 2011, indicates that the gender wise educational achievement seems to be spreading across all the districts in South Bihar, but at very slow pace. The changes in GEDI values during this period are not appreciable and lag far behind the optimum gender - wise educational achievement.*

Keywords: Bihar, South Bihar, Literacy Rate, GEDI Value, Gender Gap, Male Literacy Rate, Female Literacy Rate. Gender Related Educational Development Index

1. Introduction

India ranks second among the world's most populous countries. With the total population of 1210854977 (2011 Census) and literacy rate of 74.04 percent will grow enormous in terms of population. According to the 2011 census report total population of Bihar is 104099452, of which there are 54278157 males and 49821295 females. The population growth rate was 25.42 percent in 2011 as compared to 28.43 percent in 2001. The total population of Bihar comprises 8.60 percent of India in 2011 and 8.07 percent in 2001. If we go through the district of South Bihar we find that total female population of South Bihar was 18404451 in 2011. Out of the total female population of South Bihar 8511864 females are literate, whereas out of total 20147474 male population, 12671411 are literate. According to the economic survey of Bihar (2019 - 20), Bihar registered an average growth rate of 10 percent, which is higher than the average growth of Bihar in the last three years. The per capita GSDP (Gross state domestic product) of Bihar was 47541 at current prices and 33629 at constant price (Bihar Economy Register higher growth than India economy in the last three years, Amarnath Tiwari, The Hindu, Patna, Feb.24, 2020). The survey also declared that the fiscal deficit of the state was 2.68% GSDP, and revenue surplus 1.34% of GSDP, during 2018 - 19. In spite of this fact Bihar is considered as an agricultural state and majority of the population is still illiterate and ranked lowest in terms of literacy rate among all the Indian state, with literacy rate of 61.80 percent as compared to national average literacy rate of 74.04 percent. The quality of population can be represented by means of literacy rate and is an important indicator of socio - economic development. There is a crisis in Bihar, primary education system. The classrooms in Bihar is most crowded but have fewest teachers, yet spends the least money per student, which results into low literacy rate.

Literacy rate among people affects the birth rate and indicates the level of economic development, standard of living, technological development as well as status of women in the society, which ultimately affects the human development index. In contemporary times, illiteracy has been considered as a major hindrance towards development of any region. Higher literacy affects the quality of life and leads to well - developed mind as well as better understanding of things. Apart from this literacy produces a skilled workforce, which affects economy in a positive way. Therefore, the areas showing higher level of education are more prosperous and developed, which leads to regional disparity in any region. High gender disparity in terms of literacy rate is a major concern of today's world and large gap exists between literacy rate of female and males in Bihar as well as South Bihar Plain. According to census report 2011, male literacy rate in Bihar is 71.20 percent whereas female literacy rate is 51.50 percent, which leads to a gap of 19.7 percentage points. The problem of low literacy rate especially among women is a matter of great concern, not only in Bihar but India as a whole which leads to the disparities in socio - economic status of the women. Gender disparities in terms of education may be attributed to the boy preferences and prejudice against girl child. Although a number of works have been done on gender disparities in India, but a little work has been done on gender disparity in terms of male and female educational achievement. So far as the work on gender related educational development index (GEDI) is concerned, Joshi has done two important works in 2001 and 2003, which provides conceptual and methodological insights into gender disparity in spatial and temporal perspective. Employing a cartographic and statistical technique, she developed a cartographic expression called ISOGEDI (line joining places of equal gender related educational development index or GEDI) for the distribution of GEDI values on the map. Similarly

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Kumari in 2007 worked on Gender related development index of Bihar (1991 - 2001) and found that the average literacy rate in male and female literacy rate is very high. Apart from this, Das and Mookherjee in 2015, concluded that the literacy rate in Kolkata Municipal Corporation is high, and therefore, gender difference in education is very low and the GEDI value was nearer to be perfect. Sabina Bano in 2017, worked on the spatio - temporal variation of male - female disparity in literacy in Awadh region and concluded that the level of literacy is very low and there is a vast gender gap in the literacy rate at district level.

Present paper deals with the variation in male and female literacy rate (2001 - 2011) in South Bihar plain, as well as it evaluates the male - female differentiation in literacy rate with the help of gender related educational development index (GEDI). United Nation Development programme on human development Reports stated that Gender Development index measures the difference in male and female achievement in three basic dimensions of human development, health, education and command over economic resources. The GEDI is the ratio of female HDI to male HDI. The education dimension is measured using two indicators; female and male expected years of schooling for children and female and male mean years of schooling for adults ages 25 and older. The gender gap in human development achievements can be easily understood by means of GDI, because it provides insight into the disparities in gender wise achievement and can be used to design and monitor the policies to reduce the disparities.

2. Database and Methodology

The present research paper depicts the spatio - temporal variation in male - female disparities in literacy in 2001 and 2011. Therefore, the present study has been primarily accomplished through secondary sources of data, especially from the census report published by the government of India. Data have been collected from District Census Handbook of different districts of South Bihar, Office of the Registrar General and Census Commissioner. The district has been considered as the smallest unit of the study. In the present paper the methodology is mainly based on United Nations Development Programme, Human development Reports on Gender Development Index (GDI) framework. Therefore, gender related education development index has been calculated on the basis of harmonic mean of female and male educational achievements. If the GEDI value comes to 1.0, it means there is maximum achievement with perfect gender equality, whereas the lowest value is 0 (Joshi, 2003). But none of the district can achieve such a perfect gender equality of GEDI value 1.0. There is a wider gap between achievement of male and females in terms of education. Therefore, the value of GEDI increase as the disparity between male and female achievement decreases. The GEDI has been calculated by using following formula:

$$GEDI = 1 / (FP/FL + MP/ML)$$

Where, GEDI = Gender Related Educational Development Index

FP = Female Population, MP = Male Population,

FL = Female Literates, ML = Male Literates

Apart from this, percentage change in GEDI Value between 2001 and 2011 has been calculated to assess the improvement in GEDI over this decade as well as suitable cartographic techniques, like bar graph and choropleth method have been applied to compare the variation in GEDI Value during this decade.

3. Objective of the Study

- To analyse the differential in male and female literacy, 2001 and 2011
- To analyse the Gender related Education Development Index (GEDI), 2001 and 2011
- To assess the percentage change in Gender Related Educational Development Index (GEDI) at district level from 2001 to 2011

3.1 Study Area

South Bihar is the southern part of Bihar state and is bounded by river Ganga and North Bihar plain on the North, the Bengal Basin to the east, Ayodhya (Oudh) plains to the west and Chhotanagpur plateau to the south. South Bihar plain is narrower than North Bihar plain and located in the eastern part of India. South Bihar plain is located between 24°46'48" North to 25°30'21" North latitude and 83°36'20" East to 86°59'20" east longitude. It extends over 46179 sq. km. and bordered by Kaimur districts in the west and Bhagalpur in the east or Northeast. South Bihar plain gradually tapers towards east and widens towards west. The elevation of South Bihar plain decreases from 500 feet in the south to only 100 feet in the north, towards river Ganga with an average elevation of 173 feet. Ganga located on the northern border is the main river in this region, which enters into South Bihar from Bhojpur and later on joined by three rivers viz., Ghaghra, Gandak and Son. South Bihar has a continental type of climates with three distinct seasons. The economy of South Bihar plain is dominated by agriculture especially fruits and vegetables. According to 2011 census report total population of Bihar was 104099452, whereas, total population of South Bihar was 38551925 persons. South Bihar includes seventeen districts of Bihar, located south of River Ganga.

3.2 Variation in GEDI Value

Bihar is the third most populous state of India after Uttar Pradesh and Maharashtra. As far as the literacy rate of Bihar is concerned, it is 61.80 percent and ranks lowest among all the state in India (2011). The literacy rate of Bihar has increased from 47 percent in 2001 to 61.8 percent in 2011, which registered an increase of 14.8 percentage point. Whereas the literacy rate in India as a whole increased from 64.84 percent in 2001 to 74.04 percent in 2011, registered an increase of 9.2 percentage point, which is lower than the increase in Bihar. Apart from this male literacy rate in Bihar was 59.68 percent which increased to 71.20 percent, registered an increase of 11.52 percentage point. Similarly female literacy rate increased from 33.12 percent in 2001 to 51.50 percent, which registered an increase of 18.38 percentage point, much higher than the increase in male literacy rate during 2001 - 2011. Increase in female literacy

rate in Bihar recorded a massive jump among all Indian state. There has been a number of plans

Gender Differential of South Bihar in Literacy (2001)

		Female Population	Female Literate	FP/FL	Male population	Male Literate	MP/ML	GEDI	GEDI % age change 2001 - 2011
1	Bhagalpur	1, 131, 514	343, 004	3.30	1, 291, 658	622, 679	2.07	0.19	31.58
2	Banka	765, 480	173, 329	4.42	843, 293	373, 997	2.25	0.15	53.33
3	Munger	530, 067	204, 702	2.59	607, 730	349, 630	1.74	0.23	26.09
4	Lakhisarai	384, 553	102, 568	3.75	417, 672	200, 968	2.08	0.17	47.06
5	Sheikhpura	251, 510	67, 118	3.75	273, 992	134, 917	2.03	0.17	47.06
6	Nalanda	1, 131, 929	350, 397	3.23	1, 238, 599	665, 076	1.86	0.20	25.00
7	Patna	2, 198, 650	917, 829	2.40	2, 519, 942	1, 535, 672	1.64	0.25	16.00
8	Bhojpur	1, 063, 533	358, 825	2.96	1, 179, 611	714, 185	1.65	0.22	27.27
9	Buxar	664, 042	212, 753	3.12	738, 354	429, 414	1.72	0.21	33.33
10	Kaimur	604, 959	186, 658	3.24	670, 620	375, 196	1.79	0.20	35.00
11	Rohtas	1, 173, 755	425, 674	2.76	1, 290, 488	779, 613	1.66	0.23	30.43
12	Aurangabad	972, 110	326, 244	2.98	1, 040, 945	594, 522	1.75	0.21	33.33
13	Gaya	1, 681, 265	492, 433	3.41	1, 792, 163	913, 020	1.96	0.19	31.58
14	Nawada	879, 736	225, 835	3.90	929, 960	453, 300	2.05	0.17	41.18
15	Jamui	669, 658	140, 538	4.76	729, 138	335, 723	2.17	0.14	64.29
16	Jehanabad	445, 295	142, 836	3.12	481, 194	268, 674	1.79	0.20	35.00
17	Arwal	284, 074	88, 868	3.20	303, 752	173, 737	1.75	0.20	30.00
	Bihar	39, 754, 714	10, 465, 201	3.80	43, 243, 795	20, 644, 376	2.09	0.17	41.18
	South Bihar	1, 48, 32, 130	47, 59, 611	3.12	1, 63, 49, 111	89, 20, 323	1.83	0.20	35.00

Source: Census Report and GEDI Value Calculated by author

Gender Differential of South Bihar in Literacy (2011)

		Female Population	Female Literate	FP/FL	Male population	Male Literate	MP/ML	GEDI
1	Bhagalpur	1, 422, 103	635, 397	2.24	1, 615, 663	937, 669	1.72	0.25
2	Banka	967, 623	374, 360	2.58	1, 067, 140	590, 961	1.81	0.23
3	Munger	638, 724	328, 076	1.95	729, 041	473, 741	1.54	0.29
4	Lakhisarai	474, 567	202, 088	2.35	526, 345	305, 182	1.72	0.25
5	Sheikhpura	306, 599	132, 245	2.32	329, 743	196, 431	1.68	0.25
6	Nalanda	1, 380, 593	600, 375	2.30	1, 497, 060	919, 558	1.63	0.25
7	Patna	2, 759, 953	1, 431, 632	1.93	3, 078, 512	2, 028, 047	1.52	0.29
8	Bhojpur	1, 298, 027	625, 665	2.07	1, 430, 380	973, 486	1.47	0.28
9	Buxar	818, 375	396, 263	2.07	887, 977	593, 544	1.50	0.28
10	Kaimur	779, 378	370, 353	2.10	847, 006	549, 923	1.54	0.27
11	Rohtas	1, 416, 372	738, 049	1.92	1, 543, 546	1, 061, 783	1.45	0.30
12	Aurangabad	1, 221, 389	597, 269	2.04	1, 318, 684	868, 733	1.52	0.28
13	Gaya	2, 124, 852	928, 810	2.29	2, 266, 566	1, 368, 803	1.66	0.25
14	Nawada	1, 074, 478	431, 538	2.49	1, 144, 668	659, 474	1.74	0.24
15	Jamui	844, 341	324, 203	2.60	916, 064	534, 385	1.71	0.23
16	Jehanabad	539, 731	244, 469	2.21	585, 582	374, 412	1.56	0.27
17	Arwal	337, 346	151, 072	2.23	363, 497	235, 279	1.54	0.26
	Bihar	49, 821, 295	20, 896, 530	2.38	54, 278, 157	31, 608, 023	1.72	0.24
	South Bihar	1, 84, 04, 451	85, 11, 864	2.16	2, 01, 47, 474	1, 26, 71, 411	1.59	0.27

Source: Census Report and GEDI Value Calculated by author

to promote literacy, since independence. The government of Bihar has initiated many schemes in order to improve the literacy rate, like, Rashtriya Madhyamika Shiksha Abhiyan, Rajya Medha Chhatrvirti, Mukhyamantri Balika Protsahan Yojana, Madhyahan Bhojan Yojana, Mukhyamantri Cycle Yojana and Mukhyamantri Balika Poshak Yojana. These initiatives taken by the government of Bihar might have helped in improving the overall literacy rate and especially female literacy rate. In spite of these programmes initiated by the government of Bihar, literacy rate is at the lowest among all Indian state even female literacy rate is very poor as compared to other states. Lower female literacy rate in Bihar may be attributed to a variety of factors like gender based inequality, socio - economic discrimination, engagement of girl child in domestic works, girl child

prejudice, male child preferences, and low enrolment of girls in schools, low retention rate and high dropout rate among girl child in schools. Therefore we can say that the literacy rate in Bihar is not satisfactory and the situation is even worse when it comes to women literacy rate.

Education is a very important factor in the economic development of any region, especially Bihar or South Bihar. Education includes the process of teaching, learning and training of human resources inschools and colleges which results into skill development and ultimately improves the quality of human resources. Education is the basic right to human development which leads to individual's growth and nation's development, but is hampered due to the low status of women education. There is a significant gap in literacy

rates between male and female in Bihar. It is evident that female literacy rate is increasing at steady rate, in spite of this there is a wider gap between male and female literacy rate.

As far as Gender Related Education and Development Index (GEDI) is concerned, it has been formulated on the lines of Human Development Index (HDI) under United Nations Development Programme (UNDP). Gender related Educational Development Index measures the disparities between women and men in terms of educational development, which depicts the multifarious discrimination against women. It needs to be recognized that in a poor state like Bihar, poverty accentuates the problems faced by the women.

The districts of Bihar and south Bihar show a wider variation in educational status of women and men. As far as GEDI in South Bihar is concerned it reveals a wider disparities in GEDI values among all the seventeen districts. If we go through the districts of South Bihar we find that, normally eastern districts like Bhagalpur and Banka have lower GEDI values, whereas, north western districts, like Buxar and Bhojpur have higher GEDI values.

In 2001, the average GEDI value of the state of Bihar was 0.17. Out of seventeen districts in South Bihar, twelve districts recorded GEDI value higher than the state average, whereas three districts, named as Lakhisarai, Sheikhpura and Nawada recorded GEDI value similar to the state (0.17). Apart from this there is no district in South Bihar which has recorded GEDI value higher than 0.3, even the capital city Patna (0.25). The highest GEDI value of 0.25 was recorded in Patna, which is followed by Munger and Rohtas, both having GEDI value of 0.23. The lowest value was observed in Jamui (0.14), located in the south eastern part of South Bihar, whereas the second lowest Banka (0.15) is located in the eastern part of the region. Whereas, Lakhisarai, Sheikhpura and Nawada with GEDI value 0.17 are located in the southern in eastern part. These values are very close to the minimum value 0, which indicates a very high level of disparity in male and female educational achievement. In 2001, out of seventeen districts six districts recorded GEDI value higher than the GEDI value of South Bihar (0.20), whereas four districts, named as Nalanda, Kaimur, Jehanabad and Arwal, recorded GEDI value equal to the South Bihar (0.20). Seven districts recorded GEDI value lower than 0.2. Lower GEDI value may be attributed to the poverty. Illiteracy is intrinsically tied into the cycle of poverty. Therefore, impoverished families cannot afford to send their children, especially girl child to school. Parents always give preference to son, when they have to choose between sending son or daughter to school. No doubt one of the important cause of low GEDI value is the poverty, which may be due to over population, apathy towards family planning, poor land and water management for agriculture, poor governance, corruption, poor health facilities and lack of industrialization.

On the basis of the GEDI value both in 2001 and 2011, we can divided all the seventeen districts of South Bihar into Low (Below 0.16), Moderate (0.17 – 0.20), High (0.21 to 0.25), Very High (Above 0.25). According to this

categorization, there are only two districts named as Banka (0.15) and Jamui (0.14) in South Bihar, which can be categorized under low GEDI value below 0.16. These two districts with low GEDI values are located in south eastern part of South Bihar plain. The GEDI value of these two districts are very close to the minimum value of 0, which clearly indicates that there is a high level of disparities in the educational achievement of males and females. In 2001, Banka recorded a female literacy rate of 28.67 percent, whereas the male literacy rate was 55.29 percent, which registered a gender gap of 26.62 percentage point. Similarly Jamui with the lowest GEDI value (0.14) recorded 26.32 percent female literacy rate and 57.06 percent male literacy rate, registered a gap of 30.74 percentage point. Apart from this, both the districts comprises more than 90 percent rural population which certainly reflects low level of educational facilities, especially for girl child due several socio - economic factors. Districts with moderate GEDI value between 0.16 - 0.20 are widely spread over the south Bihar plain, which includes, Bhagalpur, Lakhisarai, Sheikhpura, Nalanda, Kaimur, Gaya, Nawada, Jehanabad and Arwal. A little bit improved GEDI value of these nine districts, also reflects the wider disparities in gender wise educational achievement. Again the poor GEDI value of these districts may be attributed to the fact that a larger portion of the people living in these districts are engaged in primary economic activities like, agriculture, and is the main source of livelihood. Apart from this low source of income and lack of infrastructures for primary education, sanitation facilities in schools, and distance of schools from the house have resulted into the wider disparities in the educational achievement of male and female in these districts. Furthermore, the larger number of districts under moderate level of GEDI value (0.16 to 0.20) also suggests that in most of the districts, majority of the population live in rural areas. If we go through Bhagalpur, one of the important district of south Bihar, we find that the female literacy rate in 2001 was 38.13 percent, whereas male literacy rate was 59.22 percent, registered a gender gap of 21.09 percentage point. The economy of Bhagalpur depends mainly on agriculture and small businesses. Apart from this Bhagalpur is also associated with silk industry for over hundred years. The Silk Institute and Agriculture University are also located in the city. In spite of these facts, there is a wider disparities in the male female educational achievement in Bhagalpur district. Gaya is another important district of not only south Bihar, but whole of Bihar and world over, because it is a religious town both for Hindus and Buddhist. Buddhist from all over the Buddhist world come to Bodh Gaya, where Gautam Buddha got enlightenment. Apart from this Gaya is also significant from the point of view that Hindus from all over the world come here for the salvation to the souls of their ancestors, a ritual, called as Pindadanam. In 2001, the GEDI value of Gaya is 0.19, which clearly reflects the educational achievement of Gaya districts, in spite of its significance in terms of its importance in religion and education. If we go through the average literacy rate of Gaya in 2001, we find that it was 50.45 percent, whereas female and male literacy rate was 36.66 percent and 63.27 percent respectively, which registered a gender gap of 26.61 percentage point. These 9 district of moderate GEDI value between 0.16 - 0.20, spread over whole South Bihar from Bhagalpur in the extreme east to Kaimur in the extreme

west. Higher value of GEDI between 0.21 - 0.25 has been observed in six districts of South Bihar, which includes Munger (0.23), Patna (0.25), Bhojpur (0.22), Buxar (0.21), Rohtas (0.23), and Aurangabad (0.21). It is interesting to note here that Patna (0.25), the capital of Bihar, recorded the

highest GEDI value among all the seventeen districts of south Bihar. The history and culture of Patna known as Patliputra go back to 600 century



B. C. Patna has been a major hub of agriculture and trade. There are several sugar mills in and around Patna. Patna is also an important luxury and brand center of eastern India. The economy of Patna depends upon fast moving consumer goods industry, service sectors, along with Green revolution in agriculture. As per 2015, per capita GDP of Patna was Rs.106000 and its GDP growth rate was 7.29 percent. According to 2001 census report average literacy rate of Patna was 62.92 percent, whereas, male and female literacy rate was 73.34 percent and 50.83 percent respectively, registered a gender gap of 22.51 percentage point. It is also important to mention here that as compared to other districts of South Bihar nearly 60 percent population of Patna lives in rural areas. Therefore, we can say that higher GEDI value of Patna may be attributed to the above mentioned facts and especially urbanization, better educational facilities and easier accessibility to other resources and government initiatives. Out of the seventeen districts in South Bihar, none of them can be categorized under very high GEDI value above 0.25.

In 2011 the average GEDI value of the Bihar state is 0.24, registered an increase of 41.18 percent from the previous census year 2001. Similarly South Bihar recorded a GEDI value of 0.27 in 2011 and registered a percentage increase of 35 percent from the previous census year 2001. Out of seventeen districts in south Bihar, fourteen districts recorded GEDI value higher than the average GEDI value of South Bihar, whereas two districts, named as Kaimur and Jehanabad recorded the same GEDI value of the South Bihar

(0.27). In 2011, the highest GEDI value has been observed in Rohtas district (0.30), which is followed by Munger and Patna with the same GEDI value of 0.29, whereas, Buxar, Bhojpur and Aurangabad with GEDI value 0.28 recorded the third highest rank in terms of GEDI value. The higher GEDI value in 2011, as compared to 2001, clearly indicates that there has been a perceptible improvement in the educational achievement of women and men in South Bihar during this decade. Rohtas with higher GEDI value 0.30 has 85.55 percent rural population. In spite of this higher percentage of rural people, average literacy rate in rural area is 72.50 percent and 78.35 percent in urban areas. The male literacy rate in rural area of Rohtas is 82.57 percent whereas the female literacy rate is 61.53 percent, which shows a gender gap of 21.04 percentage point. Similarly the average literacy rate in urban Rohtas is 78.35 percent, whereas, male and female literacy rate is 84.65 percent and 71.32 percent respectively, which registered a gender gap of only 13.33 percent. Patna and Munger, which ranked second after Rohtas in terms of GEDI value are very different from each other. In Patna rural population is 56.93 percent, whereas in Munger rural population constitutes 72.21 percent. But in terms of literacy rate both the districts are very much similar to each other. The average literacy rate of Patna is 70.68 percent, whereas, it is 70.46 percent in Munger. Similarly male and female literacy rate in Patna is 78.48 percent and 61.96 percent respectively, whereas male and female literacy rate in Munger is 77.74 percent and 62.08 percent respectively.



According to the categorization, adopted earlier for all the seventeen districts into Low (Below 0.16), Moderate (0.16 – 0.20), High (0.21 – 0.25) and Very High (Above 0.25) GEDI value, we do not find any of the district under low and moderate categories. It clearly reflects that there has been an improvement in the GEDI value during decade 2001 to 2011. But the improvement is still disappointing, because it is still far away from the GEDI value 1, which reflects a maximum educational achievement with perfect gender equality. Out of seventeen district in South Bihar, eight districts named as, Bhagalpur (0.25), Banka (0.23), Lakhisarai (0.25), Sheikhpura (0.25), Nalanda (0.25), Gaya (0.25), Nawada (0.24) and Jamui (0.23), can be categorized under high GEDI value (0.21 to 0.25). All these eight districts are located in the eastern half of South Bihar plain, which is very nearer to West Bengal. Rest of the nine districts, named as Munger (0.29), Patna (0.29), Bhojpur (0.28), Buxar (0.28), Kaimur (0.27), Rohtas (0.30), Aurangabad (0.28), Jehanabad (0.27) and Arwal (0.26), can be categorized under very high GEDI value above 0.25. If we go through the spatial distribution of all the seventeen districts of South Bihar according to GEDI value, we find that, there is a clear cut demarcation between the districts of high and very high GEDI value. Districts with high GEDI value (0.21 to 0.25) are located in the eastern half and districts with very high GEDI value are located in the western half of South Bihar plain. Patna, the capital of Bihar is also located in the very high value GEDI region. According to 2011 census report total population of Patna was 5838465, out of which 3078512 were males and 2759953 females. The average literacy rate of Patna in 2011,

is 70.68 percent, whereas male and female literacy rate are 78.48 percent and 61.96 percent, respectively, which registered a gender gap of 16.52 percentage point. Out of the total population of 58.38 lakhs in 2011 census, 56.93 percent lives in rural areas, of which males and females are 1746025 and 1577850 respectively. In rural areas of Patna, average literacy rate was 62.38 percent, whereas male and female literacy rate are 72.57 percent and 51.04 percent. Therefore, we can say that the gender related educational achievement in Patna is somewhat better, but far away from the ideal condition of GEDI value 1.0. Rohtas, with the highest GEDI value (0.30) has average literacy rate of 73.37 percent, whereas male and female literacy rate are 82.88 percent and 62.97 percent respectively, which shows better gender wise educational achievement as compared to Patna. In spite of the higher percentage of rural population (85.55 percent) in Rohtas, average rural literacy rate in 2011 was 72.50 percent, whereas male and female literacy rate was 82.57 percent and 61.53 percent respectively. In terms of rural gender wise educational achievement, Rohtas is at better off position as compared to the capital of Bihar, Patna.

Distribution of districts according to GEDI values in 2011, clearly indicates that, due to urbanization and better and improved educational opportunities, no districts were categorized under low and moderate GEDI values, whereas in 2001, none of the district was categorized under very high GEDI value. This improvement in educational opportunities may be due to several initiatives taken up by the government of Bihar for the betterment of education.

Levels of Disparity and Comparison (Based on GEDI Value 2001 - 2011)

Category	Range of GEDI Values	No. of Districts 2001	No. of Districts 2011	Levels of Disparity	Name of the Districts	
					2001	2011
Low	Below 0.16	2	0	Very high	Banka, Jamui	NIL
Moderate	0.16 – 0.20	9	0	High	Bhagalpur, Lakhisarai, Sheikhpura, Nalanda, Kaimur, Gaya, Nawada, Jehanabad, Arwal	NIL
High	0.21 – 0.25	6	8	Moderate	Munger, Patna, Bhojpur, Buxar, Rohtas, Aurangabad	Bhagalpur, Banka, Lakhisarai, Sheikhpura, Nalanda, Gaya, Nawada, Jamui
Very high	Above 0.25	0	9	Low	NIL	Munger, Patna, Bhojpur, Buxar, Kaimur, Rohtas, Aurangabad, Jehanabad, Arwal

Source: Author

Changes in Gender wise Educational Achievement.

The overall change in GEDI value during 2001 - 2011 in Bihar was 41.18 percent, which is not up to the mark. Similarly the percentage change from 2001 to 2011 in GEDI value of south Bihar is 35 percent, which lesser that the change in GEDI value of Bihar, and is also not appreciable. It shows that the state of Bihar as a whole and South Bihar lag behind the optimum gender wise educational achievement. Being the state with the lowest literacy rate of 61.80 percent, among all the Indian state, it will not be an exaggeration to say that Bihar's education system has been completely collapsed, and therefore, it require an overhaul. According to a report published in the times of India (How to turn Bihar around: It must fix its broken education system

and harness the energies of its young people, Sanjay Kumar, Oct.25, 2018). Bihar has 37.3% fewer teachers than it needs in elementary school, falling short by 278602 teachers based on the RTE criteria. Only 55% of teachers at secondary level and 40% at higher secondary level are professionally qualified. Apart from this one of the important reason to fail the government education system in Bihar is the rise of private tuitions, coaching institution and private schools. Therefore to achieve the proper education system in Bihar, government needs to finalize a short and long term strategy to turn around the system and harness the energy of the young population.

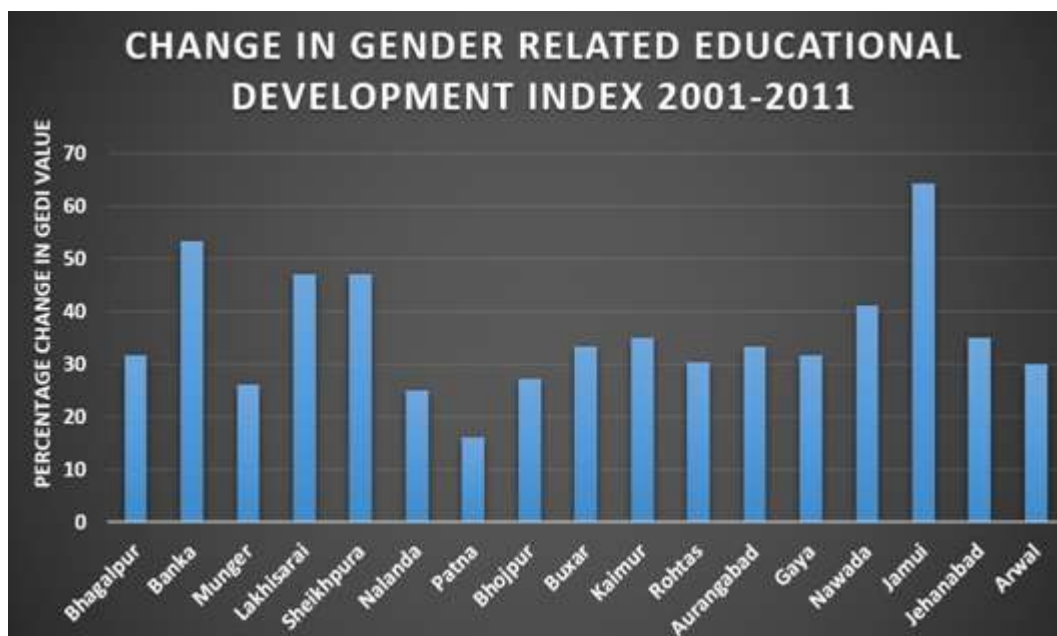


Table reveals that the highest percentage change in GEDI value has been observed in Jamui (64.29%), which has increased from 0.14 in 2001 to 0.23. Second highest change in GEDI value has been recorded by Banka (53.33 percent), where, the GEDI value increased from 0.15 to 0.23. Apart from these two districts, Lakhisarai and Sheikhpura, both recorded the third highest change in GEDI value (47.06 percent). The GEDI value in both these districts increased from 0.17 in 2001 to 0.25 in 2011. The minimum change in GEDI value has been observed in Patna (16.00 percent), where, GEDI value increased from 0.25 in 2001 to 0.29 in 2011. There are only four districts, named as, Banka (53.33%), Lakhisarai (47.06%), Sheikhpura (47.06%) and

Jamui (64.29%), which recorded changes in GEDI value higher than the state average change (41.18%), whereas, Nawada recorded the change in GEDI value similar to the state average change (41.18%). Out of seventeen districts in South Bihar, five districts named as Banka (53.33%), Lakhisarai (47.06%), Sheikhpura (47.06%), Nawada (41.18%) and Jamui (64.29%), recorded the change in GEDI value higher than the average change of South Bihar (35.00%), whereas there are two districts named as Kaimur (35.00%) and Jehanabad (35.00%) recorded the change in GEDI values similar to the average change of South Bihar (35.00%).



If we divide all the seventeen districts of South Bihar, according to the percentage change in GEDI value over the decade 2001 - 2011, into Low (Below 20.01), Moderate (20.01 to 30), High (30.01 to 40), Very High (Above 40), we find that only one district, named as Patna (16.00 percent) can be categorized under low level of percentage change in GEDI value below 20.01 percent, whereas, four districts, named as Munger (26.09%), Nalanda (25.00%), Bhojpur (27.27%) and Arwal (30.00%), can be categorized under moderate level of percentage change in GEDI value between 20.01 to 30 percent. Maximum number of districts in South Bihar lie in the high range of percentage change in GEDI value between 30.01 to 40 percent. Districts with high percentage change in GEDI value are, Bhagalpur (31.58%), Buxar (33.33%), Kaimur (35.00%), Rohtas (30.48%), Aurangabad (33.33%), Gaya (31.58%) and Jehanabad (35.00%). Higher number of districts in high percentage change in GEDI value clearly reflects that these districts are stepping forward towards reducing disparities in gender wise educational achievement. Very high change in GEDI value above 40 percent has been observed in Banka (53.33%), Lakhisarai (47.06%), Sheikhpura (47.06%), Nawada (41.18%) and Jamui (64.29%) are moving faster towards reducing disparities in gender wise educational achievement in South Bihar. Out of these five districts four have got changes less than 50 percent except Jamui which has got percentage changes in GEDI value of 64.29 percent which clearly reveals that there is a long way to end the disparities between male and female educational achievement. It has also been observed that districts with lower GEDI value in 2001 improved their GEDI value up to larger extent in 2011, and the districts are, Bhagalpur, Banka, Lakhisarai, Sheikhpura, Nawada and Jamui.

4. Conclusion

Bihar, the third most populous country after Uttar Pradesh and Maharashtra, ranks lowest in terms of literacy rate (61.80 percent). According to 2011 census report the male and female literacy rate in Bihar is 71.20 percent and 51.50 percent respectively, registered a gender gap of 19.7 percentage points. The problem of low literacy rate, especially among women in Bihar and south Bihar is a matter of grave concern, which leads to disparities in socio-economic status of women. Gender discrimination in terms of education may be attributed, especially to girl child

prejudice and son preferences as well as poverty ridden society in South Bihar.

To assess the gender related educational achievement, GEDI value has been calculated. The GEDI value of the state of Bihar was 0.17 in 2001, which increased to 0.24 in 2011, registered a percentage change of 41.18 percent. Similarly the GEDI value of South Bihar in 2001 was 0.20, which increased to 0.27 in 2011, and recorded a change of 35 percent. As far as the GEDI value in South Bihar is concerned, it reveals a wider disparity in GEDI values among all the seventeen districts in 2001 as well as 2011. The GEDI value of eastern districts like Bhagalpur, Banka, Sheikhpura, Lakhisarai, and Jamui are lower as compared to the western districts, like, Bhojpur and Buxar. In 2001, twelve districts recorded GEDI value higher than the state average GEDI value (0.17). None of the district recorded the GEDI Value higher than 0.3, even in the census year 2011. In 2001, the highest GEDI value was recorded by Patna and lowest by Jamui. In 2011, fourteen districts recorded GEDI value higher than the state average 0.24, whereas, six districts recorded GEDI value higher than South Bihar. In 2011, Rohtas (0.30) recorded the highest GEDI value, whereas the lowest GEDI value was recorded by Banka and Jamui (0.23). Over all there has been an improvement in the GEDI value during 2001 - 2011. The higher GEDI value in 2011, as compared to 2001, clearly indicates that there has been a perceptible improvement in the gender wise educational achievement in South Bihar. The overall changes in GEDI value during 2001 - 2011 in South Bihar cannot be said as appreciable and lag behind the optimum gender wise educational achievement. There is a vast gap among all the districts except few of them. But the improvement of GEDI value in 2011, indicates that the gender wise educational achievement seems to be spreading across all the districts. Being a state of lowest literacy rate in India, it will not be exaggerated if we say that the education system in Bihar and South Bihar has been completely collapsed and required to be overhauled by means of increasing the teacher - student ratio, classrooms, sanitation facilities etc. Therefore, to achieve the proper gender wise educational achievement, government needs to finalize a short and long term strategy to turn around the system and harness the energy of the young population.

References

- [1] Bano, S., 2017, Spatio Temporal Variation of Male - Female Disparity in Literacy: A Geographical Analysis of Awadh Region, U. P, INDIA, *IOSR Journal of Humanities and Social Sciences*, 22 (8), pp.26 - 31.
- [2] Pooja Pal, Suman Singh, 2020, A Spatio - Temporal Analysis of Gender Related Educational Development Index of Uttar Pradesh, *NGJI, An International Peer Reviewed Journal*, Vol.66, No.1, pp.32 - 40
- [3] Das, T., and Mookherjee S., 2015, Gender Related Educational Development Index (GEDI) of Kolkata Municipal Corporation (KMC) India, *International Research Journal of Social Sciences*, 4 (3), pp.41 - 47.
- [4] Dijkstra, A. G., 2002, Revisiting UNDP's GDI and GEM: Towards an alternative, *Social Indicators Research*, 57 (3), pp.301 - 338.
- [5] Dreze, Gazdar, 1996, Uttar Pradesh: Burden of Inertia; in, Dreze, Gazdar (ed.) *Indian development: Selected Regional Perspective*, Oxford University Press, New Delhi, pp.33 - 128.
- [6] Guha, J., 1991, Socio - Economic Determinants of Female Literacy Rates, *Journal of Educational Planning and Administration*, 5 (2), pp.195 - 199.
- [7] Hazra, J., 1997, Women and literacy, *Geographical Review of India*, 59 (1), pp.62 - 74.
- [8] Joshi, H., 2002, Gender Related Educational Development Index of Rajasthan: A spatial temporal Appraisal, *Geographical Review of India*, 66 (3), pp.251 - 259.
- [9] Joshi, H., 2011, Gender Related Educational Development Index at Village Level: Methodology and Measurement: A Case Study of Khamnor Pachayat Samiti of Rajasthan District, Rajasthan, *Geographical Review of India*, 73 (3), pp.283 - 285.
- [10] Kumari, N., 2007, Gender Related Educational Development Index (GEDI) of Bihar (1991 - 2001), *Geographical review of India*, 69 (1), pp.39 - 45.
- [11] Raju, S., 1993, Regional Disparities in Female Literacy in Urban India: Problems and Prospects in S. C. Nuna (ed.) *Regional Disparities in Education Development*, South Asian Publishers, New Delhi, pp.243 - 65.
- [12] Rustagi, P., 2004, Significance of genderrelated development indicators: An analysis of Indian states, *Indian Journal of Gender Studies*, 1111 (3), pp.291 - 343.