

Gender Inequality in Education and the Reasons of its Variation Across Assam, India

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Abstract

Gender inequality in education is the inequality in education between males and females. Several studies upon gender inequality in education showed that it acts as an obstacle to development. The study aimed to find out the extent of gender inequality in education across Assam, the extent of gender inequality in education across Assam in different age groups, and the reasons of variation of gender inequality in Assam. To examine the extent of gender inequality in education across Assam, gender parity index (GPI) with respect to literacy rate (LR) in the period from 1971 to 2011 and education for all development index (EDI) for the years 2012-2013 and 2013-2014 were calculated. Calculated GPI of LR showed that in all the districts of Assam and Assam as a whole, gender inequality in education where females lag behind males existed in the period. EDI values for the districts for which it were calculated were not found to be satisfactory for both the years. However, on comparing the EDI values of the state as a whole for the years 2012 - 2013 and 2013 - 2014, it was found that the EDI values increased, showing an improvement in terms of access, quality, and gender gap. To find out the gender inequality in education in different age groups, gender gap (GG) of illiteracy rate (ILR) for the year 2011 was calculated for the districts of Assam. It is found that, in all the age groups, that is, 7-14, 15-19, 20-24, 25-29, 30-34, 35-59, 60, above (60+), and age not stated (ANS), female ILR surpassed male ILR in majority of the districts and in the state. Moreover, in the state as a whole and in majority of the districts, the gender inequality in ILR increased with the higher age groups, that is, from 7-14 up to 60+. To find out the reasons of variation in gender inequality in education in Assam, cross section data for 2011 upon GPI of LR, percentage of scheduled caste (SC) and scheduled tribe (ST), percentage of poverty, per capita gross district domestic product (PCGDDP), population size, percentage of rural population, percentages of Hindus, Muslims, Christians, Sikhs, Jains and Other persuasions population were used in regression analysis. It was found that the impact of poverty on GPI of LR was significantly negative. It was also found that the impact of Muslims, Sikhs, Jains, and others (excluding Hindus, Christians, Sikhs, Jains, Buddhists, and religion not stated) on GPI of LR was significantly positive, while the impact of Christians on GPI of LR was significantly negative.

Keywords: gender, inequality, education, districts, poverty

JEL Classification : C1, I2, Y1

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Gender inequality in education refers to the inequality in education between females and males. In a Report to Committee on the Elimination of Discrimination against Women (CEDAW), it was mentioned that the pervasive denial of the human right to education experienced by women and girls across the globe is revealed by the fact that two-thirds of the world's non-literate adults were women, which is a striking example of gender discrimination and, therefore, true gender equality in education and beyond remains far from being achieved (Global Campaign for Education, 2012). According to the UNESCO Institute for Statistics (UIS),

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as in June 2014, 758 million adults (aged 15 years and older) in the world were illiterates, out of which 279 million were men and 479 were women, that made up for 63% of the global illiterate adult population (UNESCO Institute for Statistics, 2016). Further, UIS in its information paper about adult and youth literacy in June 2013 (UNESCO Institute for Statistics, 2013) showed that the number of illiterate adults in India were 266,367(000) which accounted for the highest population of illiterate adults. It also mentioned that in 2015, the percentage of women illiterates were 66.6%, while the figures were 65.1%, 64.7%, and 61.5% in 2006, 2001, and 1991, respectively.

An important fact that has been revealed from the 2011 Census report of India is the large gap between male literacy rate and female literacy rate, where male literacy rate was 82.14% and female literacy rate was only 65.46%. The same report also showed the existence of gender inequality in literacy rate in Assam, where male literacy rate was 78.81% and female literacy rate was 67.27%. Across India, both male and female literacy rates have increased, but female literacy rate has remained lower than the male literacy rate. Perfect gender equality with respect to literacy rate has not been achieved by the Indian states. However, a considerable decline in the inequality in all the states has been observed. Gender parity index with respect to literacy rate according to the 2011 Census of India showed that Assam has the 12th highest gender inequality in literacy rate (out of 20 ranks).

Though the human right to education and non discrimination has been affirmed by a number of international treaties, yet many regions, including India, continue to face gender inequality in education. Several studies have shown that gender inequality in education adversely affects development of an economy. Hence, this paper attempts to :

- (i) Find out the extent of gender inequality in education across Assam.
- (ii) Find out the extent of gender inequality in education across Assam in different age groups.
- (iii) Find out the reasons of variation of gender inequality in education in Assam.

Review of Literature

Several relevant literatures on gender inequality in education have been reviewed. Some of them are presented below :

Balatchandirane (2007) in his study looked at the denial of access to education that girls and women faced and how this affected on the modernization processes of a number of Asian countries. He studied the gender discrimination in education in each country and correlated its trend with the economic development. To study the discrimination, he built Becker's coefficient of discrimination using time series data for literacy rate, gross enrolment ratio, dropout rates, and mean years of schooling. In his study, he analyzed the economic and non-economic benefits of education. He examined the relation between discrimination and various social indicators like female life expectancy, infant mortality rate, and maternal mortality rate. He also analyzed the relation between educational attainment of women and their labour force participation. He found that every country that positively attempted to reduce gender discrimination in education was enormously benefited by such attempts, economically and otherwise. The author also observed without exception that no country in the world was able to show substantial progress in modernization, economic and otherwise, without substantially reducing the gender discrimination in education or eliminating it.

Pervez, Chani, Jan, and Choudhury (2011) analyzed the impacts of gender inequality on economic growth of Pakistan. They used the data for the period from 1972 - 2009. They regressed growth rate of real gross domestic product per capita on labour force growth, investment, trade openness, and a composite index of gender inequality. They found that labour force growth, investment, and trade openness had a statistically significant and positive impact ; whereas, gender inequality had a significant and negative effect on economic growth.

Tansel and Güngör (2012) examined the gender effects of education on economic growth or in steady state level of output. By using province level data, they found that female education positively and significantly affected the steady state level of labour productivity, while the effect of male education was in general either positive or insignificant.

Sharma and Nagaich (2014) investigated the relationship between women's literacy rate, sex ratio, and women work participation. They found that with an increase in women's literacy rate, there was no significant impact on improvement in the sex ratio and women's work participation in Punjab.

Bordoloi (2015) concluded that there was an urgent need to make education accessible to all the citizens of the country which was mainly because of the gender inequalities in all stages of education. Licumba, Dzator, and Zhang (2015) examined the impact of gender equality in education on economic growth on a panel data of five Southern African countries between 1970 and 2010. They used the instrumental variable technique to examine the impact of gender equality in education as measured by a ratio of girls to boys in primary enrolment and economic growth as measured by real gross domestic product per capita at 2005 constant prices. The study found that there was a positive, robust, and significant effect of gender equality in education on economic growth in the region.

Basumatary and Das (2015) investigated how and to what extent gender bias in education affected total fertility rate, infant mortality rate, birth rate, death rate, overall sex ratio, life expectancy at birth, net state domestic product, per capita net state domestic product, and development of education in Assam. They used literacy rate gap as a proxy for gender bias in education and found that gender bias in education had a significantly positive impact on total fertility rate, infant mortality rate, birth rate, death rate, and negative impact on sex ratio, life expectancy, net state domestic product, per capita net state domestic product, and development of education.

Uniqueness of the Study and the Research Gap Addressed by the Study

Some studies on gender inequality in education and economic development at the global level and continental level, and many studies upon the same at the national level were found. A few studies about the same were also found for India as well as separately for its states and union territories. Moreover, many studies showing the importance of female education and studies showing the importance of female education and male education separately were found at the global level, continental level, national level, and regional level. Although a few studies on gender inequality in education and the reasons of its variation were found, no study upon gender inequality in education and the reasons of its variation were found for Assam. Therefore, the study is a humble attempt to fill this research gap. Moreover, since several researchers found a negative impact of gender inequality in education on economic development and since gender inequality in education generally does not remain same in different regions of an economy, it is important to study the gender inequality in education and the reasons of its variation across a region.

Data and Method of Analysis

To find the extent of gender inequality in education in Assam, gender parity index (GPI) of literacy rate (LR) for the period from 1971 to 2011 and education for all development index (EDI) for the years 2012-2013 and 2013-2014 for the districts of Assam were calculated. To find out the gender inequality in education in different age groups, gender gap (GG) of illiteracy rate (ILR) in the age groups, that is, 7-14, 15-19, 20-24, 25-29, 30-34, 35-59, 60+, and age not stated (ANS) across Assam were calculated for the year 2011. To find out the reasons of variation of gender inequality in education in Assam, regression analysis was done based on the cross section data upon GPI of LR, percentage of scheduled caste (SC) and scheduled tribe (ST), percentage of poverty, per capita gross

district domestic product (PCGDDP), population size, percentage of rural population, percentages of Hindus, Muslims, Christians, Sikhs, Jains, and other persuasions population for 2011. Firstly, impacts of SC and ST, percentage of poverty, PCGDDP, population size, and percentage of rural population on GPI of LR are examined and, secondly, impacts of GPI of LR on percentages of Hindus, Muslims, Christians, Sikhs, Jains, and other persuasions population on GPI of LR are examined. Both the cases have been examined by running an (ordinary least square) OLS regression of the form :

$$Y_i = \beta_1 + \beta_2 X_{2i} + \beta_3 X_{3i} + \dots + \beta_n X_{ni} + U_i$$

where, $X_2, X_3, \dots, X_n$ are the independent variables and Y is the GPI in literacy rate. U is the random disturbance term having usual classical linear regression properties.

GPI is a socioeconomic index usually designed to measure the differences in an outcome that males and females achieve. It is calculated as the quotient of female achievement by male achievement of an outcome. A GPI equal to 1 indicates parity between females and males. A value less than 1 indicates disparity in favour of males, and a value greater than 1 indicates disparity in favour of females. Literacy rate is the total number of literates in the age group of 7 years and above expressed as a percentage of the total corresponding population.

To examine the gender inequality in education, EDI was developed by UNESCO to gather information on access, quality, and the gender gap in education. EDI is the arithmetic mean of the four proxy indicators namely, universal primary education : NER (net enrolment ratio) ; adult literacy: literacy rate of the group aged 15 years and over ; gender : GEI (gender specific education for all index) ; and progression: survival rate till grade 5. GEI is the arithmetic mean of the gender parity indices (GPIs) for the primary and secondary gross enrolment ratios and the adult literacy rate. EDI weighs each of its four components equally. It falls between 0 and 1, with 1 representing full education for all (EFA) achievement.

GG is a disproportionate difference or disparity between the sexes. It is calculated as the male achievement over female achievement of an outcome. A GG equal to zero indicates parity between females and males. A positive value indicates disparity, where male performance is higher than female performance, and a negative value indicates male performance to be lower than that of females.

Illiteracy rate is the total number of illiterates in the age group of 7 years and above expressed as a percentage of the total corresponding population. For the analysis, secondary data were collected.

Analysis and Results

The Table 1 (see Appendix 1) shows the gender inequality in LR in the districts of Assam and Assam as a whole in the period from 1971 - 2011. In the Table 1, gender inequality in LR has been shown by GPI of LR. From the Table 1, it can be seen that male literacy rate surpassed female literacy rate in all the districts of Assam and Assam as a whole throughout the period.

However, gender disparity in LR in all the districts of Assam and Assam as a whole declined except in Hailakhandi district. The Table 1 also shows that in 2011, out of the 27 districts of Assam, gender disparity in LR was the highest in Baksa followed by Udalguri and Tinsukia.

Moreover, gender disparity in LR was the lowest in Kamrup Metro district in the years 2012-13 and 2013-14. It has been observed that the EDI value increased, showing an improvement in terms of access, quality, and gender gap. As shown in the Table 1, Darrang district had the lowest EDI value, while Hailakhandi had the highest EDI value in 2012-13. In 2013-14 also, Darrang had the lowest EDI while Hailakhandi had the highest EDI value.

Table 2 (see Appendix 2 and Appendix 3) shows the EDI values for the state as a whole and for the majority of its districts for the years 2012-2013 to 2013-2014. As shown in the Table 2, the EDI values in both the years for the

Table 1. Gender Parity Index of Literacy Rate in the Districts of Assam and Assam During 1971 - 2011

Sl. No.	District	Year			
		1971	1991	2001	2011
1	Baksa	NA	NA	NA	0.795
2	Barpeta	NA	NA	0.73	0.838
3	Bongaigaon	NA	NA	0.75	0.861
4	Cachar	0.49	NA	0.78	0.869
5	Chirang	NA	NA	NA	0.807
6	Darrang	0.47	NA	0.73	0.855
7	Dhemaji	NA	NA	0.72	0.817
8	Dhubri	NA	NA	0.72	0.845
9	Dibrugarh	0.57	NA	0.78	0.833
10	DimaHasao	NA	NA	0.77	0.856
11	Goalpara	0.43	NA	0.78	0.883
12	Golaghat	NA	NA	0.79	0.851
13	Hailakhandi	NA	NA	1.05	0.837
14	Jorhat	NA	NA	0.82	0.872
15	Kamrup Metro	NA	NA	NA	0.923
16	Kamrup Rural	0.48	NA	0.82	0.854
17	KarbiAngalong	0.38	NA	0.70	0.814
18	Karimganj	NA	NA	0.77	0.857
19	Kokrajhar	NA	NA	0.70	0.811
20	Lakhimpur	0.45	NA	0.77	0.846
21	Morigaon	NA	NA	0.80	0.891
22	Nagaon	0.54	NA	0.80	0.890
23	Nalbari	NA	NA	0.75	0.860
24	Sivsagar	0.63	NA	0.82	0.870
25	Sonitpur	NA	NA	0.74	0.825
26	Tinsukia	NA	NA	0.72	0.800
27	Udalguri	NA	NA	NA	0.800
	All Assam	0.52	0.70	0.77	0.851

Sources: Government of Assam (1980) ; Government of Assam (2006) ; Government of Assam (2012) ; Office of the Registrar General and Census Commissioner, Ministry of Home Affairs, Government of India (2011).

Note: NA represents not available.

districts as well as for the state as a whole are unsatisfactory. The calculated EDI values for the state as a whole for 2012 - 13 and 2013 - 14 are 0.583 and 0.622, respectively.

A comparison of the EDI values of the state as a whole for gender disparity in ILR in the districts of Assam and in Assam as a whole in the age groups of 7-14, 15-19, 20-24, 25-29, 30-34, 35-59, 60+, and ANS has been shown in Table 3 (see Appendix 4). In the Table 3, gender disparity in ILR has been shown by GG of ILR. As shown in the Table 3, female ILR was higher than male ILR in Assam in all the age groups including ANS group.

Table 2. Education for All Development Index for the Districts of Assam and Assam in 2012 - 13 and 2013 - 2014

Sl. No.	District	2012-13	2013-14
1	Baksa	NA	NA
2	Barpeta	0.548	0.602
3	Bongaigaon	0.532	0.567
4	Cachar	0.640	0.668
5	Chirang	NA	NA
6	Darrang	0.487	0.520
7	Dhemaji	0.647	0.682
8	Dhubri	0.538	0.585
9	Dibrugarh	0.599	0.648
10	DimaHasao	0.563	0.597
11	Goalpara	0.564	0.611
12	Golaghat	0.635	0.682
13	Hailakandi	0.666	0.740
14	Jorhat	0.652	0.683
15	Kamrup Metro	NA	NA
16	Kamrup-Rural	0.573	0.588
17	KarbiAnglong	0.555	0.579
18	Karimganj	0.650	0.685
19	Kokrajhar	0.575	0.599
20	Lakhimpur	0.634	0.704
21	Morigaon	0.568	0.593
22	Nagaon	0.600	0.623
23	Nalbari	0.572	0.595
24	Sibsagarh	0.652	0.694
25	Sonitpur	0.556	0.579
26	Tinsukia	0.521	0.567
27	Udalguri	NA	NA
28	State	0.583	0.622

Sources: Office of the Registrar General and Census Commissioner, Ministry of Home Affairs, Government of India (2011) ; Government of Assam (2012 - 2014d) ; Government of Assam (2012 - 2014a) ; Government of Assam (2012 - 2014b) ; Government of Assam (2012 - 2014c).

Note: NA represents not available.

Similar to the state as a whole, in majority of the districts, female ILR remained greater than male ILR in all the age groups except for the seven districts, that is, Dhubri, Goalpara, Barpeta, Morigaon, Nagaon, Bongaigaon, and Darrang. In Dhubri district, except for the age group of 7-14, and in Goalpara, Barpeta, Morigaon, Nagaon, Bongaigaon, and Darrang except for the age groups 7-14 and 15-19, in all the other age groups, female ILR surpassed male ILR. In the ANS group, in all the districts and in the state, female ILR remained higher than male ILR. Moreover, if all ages above 6 years are considered, female ILR remained higher than male ILR in all the districts and in the state as a whole.

Table 3. Gender Gap of Illiteracy Rate in the Districts of Assam and Assam in 2011

Name of Area	Age Group								
	7-14	15-19	20-24	25-29	30-34	35-59	60+	ANS	>6
1	2	3	4	5	6	7	8	9	10
Assam (State)	-0.47	-2.48	-8.57	-10.39	-12.55	-19.60	-32.38	-13.34	-11.58
Kokrajhar	-0.97	-3.84	-10.95	-15.35	-16.79	-22.34	-31.78	-14.55	-13.62
Dhubri	2.95	-0.05	-7.89	-10.40	-12.85	-18.93	-30.71	-11.07	-9.76
Goalpara	2.63	1.69	-4.38	-6.34	-9.98	-16.95	-32.34	-16.22	-8.33
Barpeta	1.08	0.72	-8.73	-9.07	-11.49	-19.91	-34.57	-10.85	-11.23
Morigaon	2.72	2.79	-3.97	-5.26	-8.58	-17.43	-30.91	-9.38	-7.86
Nagaon	1.15	1.21	-4.84	-7.09	-9.52	-16.42	-29.79	-6.27	-8.44
Sonitpur	-1.91	-5.66	-12.18	-14.82	-16.54	-20.08	-27.34	-17.53	-9.82
Lakhimpur	-1.64	-3.55	-7.93	-9.99	-12.41	-22.60	-37.66	-12.82	-12.85
Dhemaji	-1.61	-3.75	-9.86	-12.61	-16.76	-27.99	-37.59	-4.70	-14.63
Tinsukia	-3.80	-8.66	-15.12	-16.00	-17.94	-22.78	-30.23	-16.07	-15.46
Dibrugarh	-2.94	-7.38	-12.36	-13.64	-14.46	-19.60	-30.88	-16.21	-13.83
Sivasagar	-2.58	-5.14	-8.83	-10.37	-11.59	-14.89	-30.79	-8.25	-11.13
Jorhat	-2.29	-4.85	-8.72	-9.21	-10.35	-15.39	-30.15	-14.49	-11.18
Golaghat	-2.31	-5.49	-10.61	-11.49	-13.11	-19.14	-31.10	-16.54	-12.47
KarbiAnglong	-2.22	-5.10	-11.82	-16.03	-19.62	-25.78	-30.46	-16.76	-14.14
DimaHasao	-0.63	-3.57	-8.61	-11.79	-15.20	-25.37	-23.86	-16.36	-11.96
Cachar	-1.93	-3.51	-7.02	-9.45	-11.40	-17.88	-30.17	-10.58	-11.09
Karimganj	-1.43	-2.96	-7.48	-10.38	-13.90	-20.94	-32.38	-17.77	-12.03
Hailakandi	-1.82	-4.06	-10.58	-14.25	-14.94	-22.53	-32.97	-11.00	-13.14
Bongaigaon	0.93	0.77	-5.65	-7.09	-10.05	-19.15	-34.97	-20.99	-10.43
Chirang	-0.68	-3.69	-11.03	-13.60	-16.71	-23.43	-33.50	-13.66	-13.59
Kamrup	-0.25	-0.81	-6.85	-7.75	-9.60	-20.06	-39.53	-17.05	-11.84
Kamrup Metro	-1.17	-2.51	-3.99	-4.92	-6.11	-10.42	-21.47	-10.63	-7.06
Nalbari	-1.00	-0.71	-6.57	-7.44	-8.77	-18.90	-38.59	-12.59	-11.79
Baksa	-1.40	-3.97	-9.63	-13.11	-16.36	-27.46	-38.40	-10.95	-15.75
Darrang	2.81	1.70	-7.89	-8.72	-9.49	-19.42	-33.66	-17.99	-9.83
Udalguri	-1.35	-3.97	-11.06	-14.66	-16.84	-24.83	-32.38	-18.48	-14.53

Source: Office of the Registrar General and Census Commissioner, Ministry of Home Affairs, Government of India (2011).

As shown in the Table 3, the gender disparity in ILR increased with the higher age groups, that is, from the age group of 7-14 up to the age group of 60+ for the state as a whole and for majority (18 out of 27) of the districts.

Gender disparity or inequality in education in different districts of Assam was seen to be different. To find the reasons behind the variation in gender disparity in education across Assam, the impacts of percentage of poverty, PCGDDP, percentage of rural population, percentage of SC and ST population, and population size on GPI of LR have been examined. The impacts of the independent variables on the dependent variable have been shown in the Table 4 (see Appendix 5).

It can be seen from the Table 4 that impact of percentage of poverty on GPI of LR is significantly negative. If the

Table 4. Reasons of Variation in Gender Disparity in Education Across Assam

Sl. No.	Independent Variables	Coefficient	Standard Error	t- value	Significance
1	Percentage of SC and ST Population	-0.020	0.011	-1.729	0.098
2	Percentage of Poverty	-0.118	0.046	-2.573	0.018
3	PCGDDP	-0.028	0.032	-0.876	0.391
4	Population Size (above 6 years)	-0.019	0.020	-0.992	0.333
5	Percentage of Rural Population (above 6 years)	0.005	0.012	0.393	0.698

R Square = 0.438, Adjusted R Square = 0.304, and F = 3.271

Sources: Office of the Registrar General and Census Commissioner, Ministry of Home Affairs, Government of India (2011) ; Bhandari and Chakraborty (2014) ; Government of India (n.d.).

Table 5. Impact of Religions on GPI of LR in Assam

Sl. No.	Independent Variables	Coefficient	Standard Error	t- value	Significance
1	2	3	4	5	6
1	Percentage of Hindus	0.007	0.021	0.344	0.734
2	Percentage of Muslims	0.027	0.009	3.086	0.006
3	Percentage of Christians	-0.012	0.004	-2.999	0.007
4	Percentage of Sikhs	0.027	0.007	4.186	0.000
5	Percentage of Jains	0.021	0.008	2.528	0.021
6	Percentage of Other Persuasions Population	0.010	0.004	2.427	0.025

R Square = 0.726, Adjusted R Square = 0.643, F = 8.813

Source: Office of the Registrar General and Census Commissioner, Ministry of Home Affairs, Government of India (2011).

percentage of poverty increased by 1%, then GPI of LR decreased by 0.118. The coefficient of the explanatory variable (independent variable) comes out to be statistically significant at the 5%. Impacts of percentage of SC and ST population, PCGDDP, and population size on GPI of LR are insignificantly negative in all, and the impact of percentage of rural population is insignificantly positive.

Assam is a multi-religious state. Religion may also be a factor of variation in gender inequality in education across Assam. To find out the impact of different religions on GPI of LR, the impacts of different religions, that is, Hindus, Muslims, Christians, Sikhs, Jains, and other population groups on GPI of LR have been examined.

The impacts of the independent variables on the dependent variable have been shown in Table 5 (see Appendix 5). Percentage of Buddhists has been excluded from the analysis due to the multicollinearity problem. From the Table 5, it can be seen that except the percentage of Hindus, the impacts of percentages of Muslims, Christians, Sikhs, Jains, and other persuasions population on GPI of literacy rate is significant in all. As shown in the Table 5, the impact of percentage of Christians is negative. This means that if the percentage of Christians increased by 1%, then the GPI of LR fell by 0.012. The coefficient of the independent variable comes out to be significant at the 5%. On the other hand, the impacts of percentages of Muslims, Sikhs, Jains, and other persuasions population are significantly positive. If percentages of Muslims, Sikhs, Jains, and other persuasions population increased by 1%, then the GPI of LR increased by 0.027, 0.027, 0.021, and 0.010, respectively. The coefficients of the independent variables come out to be significant at the 5%, 1%, 5%, and 5% levels, respectively.

Discussion and Conclusion

Gender inequality in education where women are unfavorable has been found during the period from 1971 - 2011 across Assam. Though literacy rate for both males and females has increased, female literacy rate remained behind male literacy rate across Assam. Moreover, the calculated EDI values for Assam as a whole and for the districts is not found satisfactory for both the years. Female illiteracy rate has been found to be higher than male ILR in Assam including ANS group. Similar to the state as a whole, in majority of the districts, female ILR remained higher than male ILR in all the age groups including the ANS group. The gender disparity in ILR increased with the higher age groups, that is, from 7-14 up to 60+ for the state as a whole and for majority of its districts. Gender inequality in education with respect to literacy rate in the districts of Assam has been seen to be different. Poverty is found to have a significant negative impact on GPI of LR. Amongst various religions, Muslims, Sikhs, Jains, and other persuasions population has been seen to have a significant positive impact on GPI in LR, while Christians has been seen to have a negative impact on GPI of LR.

In spite of the various government steps taken up to encourage female education in India, yet females lag behind males in education in Assam. In order to eliminate the gender inequality in education in Assam, the following can be considered in the policy making :

- (i) Re-plan to implement the introduced scheme for encouraging women's education, namely, Sakshar Bharat Mission for female literacy.
- (ii) Opportunities for informal learning need to be made more available.
- (iii) New poverty alleviation measures need to be taken up. The government also needs to look into proper implementation of the schemes or programmes to raise income of the people.
- (iv) Moreover, there should be motivation among the illiterate people, especially women, for acquiring education. The success of the other policies for eliminating gender inequality in education depends largely upon it.

Research and Policy Implications

Since very limited studies on gender inequality in education and the reasons of its variation were found, so the study would fill the research gap. It is expected that the study will add up in the literature and will be of help to the researchers doing similar or relevant studies. In spite of being affirmed by a number of international treaties, gender inequality in education exists in many parts of the world. The Incheon Declaration identified education as a main driver of development (The World Education Forum, 2015). Several researchers have shown the negative impact of gender disparity in education on economic development. Thus, elimination of gender disparity in education is important. Since the study finds the extent of gender inequality in education and the gender inequality in education in the different age groups across Assam and the reasons of variation of gender inequality in education in Assam, it would help the policy makers in framing suitable policies for the upliftment of the economy.

Limitations of the Study and Scope for Further Research

The study discussed only the gender inequality in LR and ILR. The study could have been broadened by incorporating the gender disparity in gross enrolment ratio, net enrolment ratio, and dropout rate in the lower primary, upper primary, secondary and higher secondary levels, and gross enrolment ratio in the higher education level. Moreover, in examining gender inequality in LR, gender inequality in LR for the year 1991 could not be

collected by us and regarding ILR, gender inequality in ILR only for the year 2011 has been examined.

EDI for the districts of Assam as well as for many of its districts were calculated for the years 2012-13 and 2013-14. Although EDI values were calculated for the said years, yet same data of LR or GPI of LR was used due to the unavailability of data on an annual basis. It could not be calculated for the years before 2012-13 and even for 2014-15 due to the data unavailability upon survival rate for the districts of Assam for the years under consideration. In the study, a better index than EDI, to examine the gender inequality in education could not be used.

In the analysis of the reasons of variation in gender inequality in education in Assam, time-series analysis could not be done due to the unavailability of the required data of independent variables to match with the data of the dependent variable. However, cross section analysis was done. In Assam, 27 districts' data were used in the analysis of the reasons of variation in gender disparity in education. Impact of the government expenditure on education upon the variation in gender disparity in education could not be analyzed due to the unavailability of data of the government budgeted expenditure on education or government actual expenditure on education of the districts. Moreover, in the analysis of reasons of variation in gender inequality in education in India as well as in Assam, GPI of LR was used as a proxy for gender inequality in education. All these limitations can be taken up as scope for further research for future studies by the researchers.

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APPENDICES

Appendix 1. Male LR and Female LR in the Districts of Assam and Assam During 1971 to 2011

Sl. No.	District	1971		1991		2001		2011	
		M-LR	F-LR	M-LR	F-LR	M-LR	F-LR	M-LR	F-LR
1	Baksa	NA	NA	NA	NA	NA	NA	78.6	62.3
2	Barpeta	NA	NA	NA	NA	64.8	47.1	70.7	59
3	Bongaigaon	NA	NA	NA	NA	67.7	50.4	75.5	65.2
4	Cachar	40.4	19.9	NA	NA	75.7	59.4	85.9	74.6
5	Chirang	NA	NA	NA	NA	NA	NA	71.4	57.9
6	Darrang	30.3	14.3	NA	NA	63.9	46.4	68.4	60.4
7	Dhemaji	NA	NA	NA	NA	74.4	53.5	75.7	62.1
8	Dhubri	NA	NA	NA	NA	55.9	40	64.2	54.3
9	Dibrugarh	38.1	21.6	NA	NA	77.3	60	82.6	69.5
10	DimaHasao	NA	NA	NA	NA	75.7	58.4	85.3	72.2
11	Goalpara	30.3	13	NA	NA	64.9	50.9	72.7	64.5
12	Golaghat	NA	NA	NA	NA	77.1	61	84.2	72.2
13	Hailakhandi	NA	NA	NA	NA	48.2	50.5	81.6	69.5
14	Jorhat	NA	NA	NA	NA	83.6	68.5	88.4	78.2
15	Kamrup Metro	NA	NA	NA	NA	NA	NA	91.3	85.8
16	Kamrup R.	38.2	18.2	NA	NA	81.2	66.3	77.6	67.7
17	Karbi A.	26.9	10.3	NA	NA	67.2	47.3	82.1	64.6
18	Karimganj	NA	NA	NA	NA	74.7	57.3	85.7	73.5
19	Kokrajhar	NA	NA	NA	NA	60.3	42.4	73.4	59.5
20	Lakhimpur	39	17.5	NA	NA	77.1	59.6	84.7	71.9
21	Morigaon	NA	NA	NA	NA	64.2	51.5	73.7	65
22	Nagaon	37	20	NA	NA	68.3	54.7	78.2	69.2
23	Nalbari	NA	NA	NA	NA	76.6	57.3	85.6	73.9
24	Sivsagar	44.3	27.9	NA	NA	81.5	66.8	86.8	75.7
25	Sonitpur	NA	NA	NA	NA	67.5	49.7	77	62.5
26	Tinsukia	NA	NA	NA	NA	70.2	50.8	77.9	63.5
27	Udalguri	NA	NA	NA	NA	NA	NA	73.8	59.2
	All Assam	NA	NA	61.9	43	71.3	54.6	78.8	67.3

Sources : Government of Assam (1980) ; Government of Assam (2006) ; Government of Assam (2012) ;
Office of the Registrar General and Census Commissioner, Ministry of Home Affairs, Government of India (2011).

Notes: 1.Data for 1991 could not be calculated for the districts by us due to the unavailability of the data.

2. NA represents not available.

Appendix 2. EDI for the Districts of Assam and Assam in 2012- 2013

District	LP NER	UP NER	Adult LR	Reten- tion (Upto Grade VIII)	Male LP	Fema- le LP	GPI LP GER: Col. (7/6)	Male UP GER	Fema- le UP GER	GPI UP GER: (10/9)	Male Secon- dary GER	Fema- le Secon- dary GER	GPI Seco- ndary GER: (13/12)	Adult MLR	Adult FLR	Adult GPI LR: Col. (16/15) 14+17 4+5+18	GEI: Col. (8+11+ 14+17) 4+5+18 /4	EDI: Col. 19/100 (2+3+ 5)	Col.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Baksa	98	75.9	64.96	NA	104.1	105.1	1.01	109.5	108.5	0.99	70.12	79.81	1.138	74.50	55.20	0.741	0.970	NA	NA
Barpeta	98.2	70.5	59.42	44.9	101.2	100.4	0.992	98.5	101.7	1.032	51.68	62.64	1.212	66.72	51.76	0.776	1.003	54.80	0.55
Bongaigaon	98.6	65.5	65.72	35	109.1	108.7	0.996	93.8	95.5	1.019	53.12	60.51	1.139	72.39	58.83	0.813	0.992	53.16	0.53
Cachar	100	70.4	76.98	71.8	104.8	104.4	0.997	101	101	1.001	46.66	56.11	1.203	83.56	70.12	0.839	1.010	64.04	0.64
Chirang	100	71.1	58.50	NA	110.4	111.1	1.006	90.8	91.2	1.005	72.15	72.3	1.002	67.01	49.76	0.743	0.939	NA	NA
Darrang	97.4	60.9	59.32	24.7	104.2	104.5	1.002	93.6	95.2	1.017	52.28	65.79	1.258	66.00	52.29	0.792	1.017	48.67	0.49
Dhemaji	100	100	68.65	53.9	101.5	101.8	1.003	98.8	98.7	0.999	82.32	94.99	1.154	77.63	59.23	0.763	0.980	64.71	0.65
Dhubri	100	74.3	53.55	40.1	105.5	105	0.996	99.4	100.7	1.014	44.84	53.66	1.197	60.30	46.48	0.771	0.994	53.79	0.54
Dibrugarh	94.4	65.3	73.51	65.5	104.5	104.8	1.003	94.8	94.1	0.992	50.45	56.05	1.111	81.48	65.24	0.801	0.977	59.94	0.60
DimaHasao	89.3	70.4	74.73	46.3	124.6	121.5	0.975	85.9	86.6	1.008	77.65	81.83	1.054	82.01	66.81	0.815	0.963	56.34	0.56
Goalpara	100	69.8	63.25	47.7	103.8	103.5	0.998	94	97	1.032	43.72	57.86	1.323	68.91	57.40	0.833	1.046	56.36	0.56
Golaghat	100	76.3	74.35	65.8	104.3	104.3	1	97.5	97.4	0.999	64.49	70.53	1.094	81.68	66.76	0.817	0.978	63.49	0.63
Hailakandi	100	80.9	71.01	80	100.5	100.4	0.999	107.4	109.2	1.017	43.06	59.17	1.374	79.12	62.40	0.789	1.045	66.59	0.67
Jorhat	94.2	77.7	80.19	73	102.2	102.4	1.002	105.6	105.6	1	67.08	78.21	1.166	86.58	73.56	0.850	1.004	65.22	0.65
Kamrup Metro	62.5	47.3	88.11	NA	98.1	98.2	1.001	105.2	104.9	0.997	23.68	31.35	1.324	92.03	83.92	0.912	1.058	NA	NA
Kamrup Rural	98.3	76.9	73.00	37.5	98.3	98.3	0.999	108.7	108.8	1.001	61.95	68.96	1.113	80.14	65.44	0.817	0.982	57.34	0.57
KarbiAnglong	100	67.1	65.18	44.5	108	108.3	1.003	88.6	89.1	1.005	65.91	70.76	1.074	73.81	56.07	0.760	0.960	55.55	0.56
Karimganj	100	76.4	75.31	72.3	103.3	103.4	1	100.3	100.9	1.007	36.17	46.38	1.282	82.74	67.58	0.817	1.026	65.01	0.65
Kokrajhar	100	77	60.42	49.3	105.5	106.6	1.01	89.9	90.5	1.006	69.53	75.32	1.083	68.81	51.69	0.751	0.963	57.54	0.58
Lakhimpur	100	88.1	73.72	54.2	101.7	101.5	0.998	100.7	101.3	1.006	68.29	80.24	1.175	81.54	65.67	0.805	0.996	63.40	0.63
Marigaon	100	66.7	63.48	53	97	98.2	1.013	91.4	96.6	1.056	44.68	56.64	1.268	68.96	57.84	0.839	1.044	56.84	0.57
Nagaon	99.1	66.1	68.28	65.5	99.2	99.1	0.999	96.5	100.2	1.038	39.2	56.17	1.433	73.84	62.48	0.846	1.079	60.01	0.60
Nalbari	100	77.8	76.65	30.4	103.2	102.2	0.991	95.9	98.7	1.029	68.53	85.37	1.246	83.59	69.29	0.829	1.024	57.17	0.57
Sibsagar	100	76.3	78.41	70.4	102.4	101.8	0.994	98.4	98.7	1.003	62.23	70.33	1.13	84.77	71.74	0.846	0.993	65.22	0.65
Sonitpur	90.7	60.3	63.49	62.7	105.5	105.2	0.997	93.9	94.9	1.011	49.99	60.99	1.22	71.23	55.34	0.777	1.001	55.64	0.56
Tinsukia	83.9	54.1	66.28	55.4	105.2	104.4	0.992	90.6	91.6	1.012	51.99	60.88	1.171	75.24	56.86	0.756	0.983	52.13	0.52
Udalguri	99.8	56.6	61.04	NA	99.1	99.4	1.003	99.6	100.8	1.012	43.99	57.72	1.312	69.88	51.96	0.744	1.018	NA	NA
Assam	96.5	71.1	68.95	54.1	103.1	103	0.999	97.7	99	1.013	52.26	62.65	1.199	76.07	61.51	0.809	1.005	58.33	0.58

Sources: Office of the Registrar General and Census Commissioner, Ministry of Home Affairs, Government of India (2011) ; Government of Assam (2012 -2014a.) ; Government of Assam (2012 -2014b.) ; Government of Assam (2012 -2014c.) ; Government of Assam (2012 -2014d.)

Note: NA represents not available.

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Sources: Office of the Registrar General and Census Commissioner, Ministry of Home Affairs, Government of India (2011) ; Government of Assam (2012 -2014a.) ; Government of Assam (2012 -2014b.) ; Government of Assam (2012 -2014c.) ; Government of Assam (2012 -2014d.)

Note: NA represents not available.

Note: NA represents not available.

Age Groups																													
All Ages > 6						7-14			15-19			20-24			25-29			30-34			35-39			60+			ANS		
Area Name		Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Assam	22.15	33.73	15.50	15.97	13.51	15.98	16.25	24.82	20.31	30.70	22.47	35.02	29.01	48.61	36.80	69.18	31.77	45.11											
Kokrajhar	28.11	41.73	17.14	18.10	14.72	18.56	18.86	29.81	24.66	40.02	30.69	47.49	40.79	63.12	48.82	80.60	28.54	43.09											
Dhubri	36.90	46.67	28.39	25.44	26.22	26.27	31.39	39.28	37.03	47.42	39.61	52.45	47.40	66.33	51.33	82.04	43.81	54.88											
Goalpara	28.54	36.87	20.10	17.47	18.63	16.94	24.46	28.83	29.34	35.68	30.76	40.75	37.78	54.73	41.10	73.44	37.44	53.66											
Barpeta	30.71	41.94	22.35	21.27	19.25	18.53	24.40	33.13	31.53	40.59	33.31	44.80	39.73	59.64	46.47	81.04	42.83	53.67											
Morigaon	28.10	35.96	18.70	15.98	18.90	16.12	22.28	26.25	28.33	33.59	30.50	39.08	36.34	53.77	46.99	77.90	27.89	37.27											
Nagaon	23.49	31.93	14.56	13.41	15.02	13.81	18.45	23.30	23.19	30.29	25.23	34.75	31.23	47.65	39.16	68.94	39.74	46.00											
Somitpur	44.85	54.67	17.04	18.95	16.02	21.68	18.72	30.90	23.25	38.08	26.86	43.40	35.21	55.29	43.60	70.94	30.01	47.54											
Lakhipur	16.48	29.33	9.30	10.94	8.28	11.83	11.69	19.62	14.80	24.79	16.54	28.96	22.83	45.44	32.76	70.42	33.33	46.15											
Dhemaji	20.16	34.79	12.53	14.14	9.81	13.55	14.01	23.87	17.03	29.64	18.78	35.54	28.73	56.72	43.11	80.70	45.30	50.00											
Tinsukia	22.81	38.27	15.07	18.88	13.98	22.64	17.31	32.43	21.26	37.26	22.77	40.72	29.93	52.71	38.01	68.24	33.33	49.41											
Dibrugarh	17.18	31.01	11.27	14.22	10.11	17.49	12.08	24.44	14.86	28.51	16.57	31.02	22.82	42.42	29.03	59.90	26.65	42.86											
Sivasagar	14.16	25.29	9.31	11.89	8.10	13.24	9.15	17.99	11.15	21.52	12.59	24.18	19.07	33.96	23.83	54.62	35.23	43.48											
Jorhat	12.37	23.55	7.44	9.72	6.85	11.70	8.10	16.81	10.44	19.65	11.88	22.24	16.24	31.63	21.61	51.77	24.81	39.30											
Golaghat	16.44	28.91	8.69	11.00	8.80	14.29	11.57	22.18	14.87	26.36	16.48	29.59	22.96	42.09	29.09	60.19	32.41	48.95											
Karbi Anglong	23.86	38.00	15.97	18.19	11.63																								

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Appendix 5. Reasons of Variation in Gender Disparity in Education in Assam

District	Total Population 6 years and above, 2011	GPI LR, 2011	GDP, 2009-10	Poverty, 2011-12	(SC+ ST) above 6 years, 2011	Hindus above 6 years, 2011	Muslims above 6 years, 2011	Christians above 6 years, 2011	Sikhs above 6 years, 2011	Buddhists above 6 years, 2011	Jains above 6 years, 2011	Other persuasions Population above 6 years, 2011
1	2	3	4	5	6	7	8	9	10	11	12	13
Baksa	827203	0.79	2,060.20	39.40	355406	688754	111686	23195	139	1037	191	301
Barpeta	1405793	0.83	3,175.96	34.90	107735	443472	960226	857	102	42	357	11
Bongaigaon	622412	0.86	2,627.39	34.20	88353	320431	294628	5032	355	219	792	8
Cachar	1479843	0.87	4,620.81	26.20	240880	902854	541216	31523	249	282	1521	84
Chirang	408947	0.81	1,040.84	43.20	184454	277380	86687	42871	75	344	102	401
Darrang	772092	0.88	2,427.47	39.60	42686	293652	475283	1444	413	43	639	18
Dhemaji	581886	0.82	1,401.33	35.80	310097	555972	11207	7293	270	786	149	5321
Dhubri	1580996	0.85	2,729.46	48.10	67253	344338	1230210	3423	217	88	1682	41
Dibrugarh	1163125	0.84	6,514.42	25.10	143384	1050773	57154	46018	2081	4208	947	38
DimaHasao	181688	0.85	1,108.39	34.10	131221	122401	3615	53321	194	556	56	989
Goalpara	836526	0.89	2,227.34	35.70	239224	307179	462071	65129	755	167	433	89
Golaghat	932095	0.86	3,372.75	26.80	150822	803245	77422	43916	1019	3481	473	1211
Hailakandi	548018	0.85	1,709.11	32.00	60761	216288	323086	6988	75	390	208	567
Jorhat	967662	0.89	4,737.05	23.30	197975	893133	48876	18379	1399	2248	650	530
Kamrup (Metro)	1317481	0.94	6,877.36	15.19	157518	962998	131745	16509	3340	1478	8348	127
Kamrup Rural	1128552	0.87	5,604.65	30.70	254916	788926	496377	27986	301	166	1189	46
KarbiAnglong	804632	0.79	2,975.53	38.50	485340	647728	16461	130183	333	5339	326	3030
Karimganj	1016726	0.86	3,278.82	32.60	135581	454757	550188	10004	102	376	466	
Kokrajhar	750218	0.81	2,957.87	41.50	268506	458590	201753	85964	88	1486	365	
Lakhimpur	885398	0.85	2,535.25	31.50	278887	687489	154574	38830	376	951	223	
Morigaon	793604	0.88	2,141.58	36.10	218596	393662	398055	708	107	59	226	
Nagaon	2363828	0.89	5,035.64	30.80	332489	1082687	1251357	22695	2765	909	1053	
Nalbari	676306	0.86	2,258.00	25.50	74234	444480	229626	370	55	19	916	
Sivasagar	1011670	0.87	6,749.67	21.40	79784	884584	85207	28386	841	3581	254	
Sonitpur	1646248	0.81	4,309.46	32.00	292336	1237382	280582	117561	1230	4528	920	
Tinsukia	1146103	0.82	6,109.28	25.00	103318	1020175	41940	65197	1824	14408	757	
Udalguri	718394	0.80	2,151.04	36.30	269044	534782	84550	95949	190	1463	108	
Assam	26567446	0.85	NA	NA	5270800	16818112	8605782	989731	18895	48654	23351	

Sources: Office of the Registrar General and Census Commissioner, Ministry of Home Affairs, Government of India (2011) ; Bhandari & Chakraborty (2014) ; Government of India (n.d.)

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