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Gender Ineqality in Education as Determinant Of Regional Disparity: A District Level Analysis of the State of West Bengal, India

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Abstract
Development of a region is the outcome of enduring interaction between physical and socio-economic parameters. Physical parameters provide the structure over which socio-economic parameters act as a sculpturing agent. Physical parameters are preset by nature and therefore cannot be radically changed according to the desire of the resource user. However, the competency of the anthropogenic factors can be enhanced which ultimately creates variability in the standard of development. Thus, similar bio-physical set up are characterized by diverse level of regional development. The present work is a macro level study and focused its attention on district wise variation of regional development of the state of West Bengal, India. The author tries to analyze the interrelationship between the standard of education and the holistic human development through the lens of gender. The study reveals that Male Female Differential Index (MFDI) in terms of overall literacy acts one of the influential determinants in creating regional variability of Human Development Index (HDI) of different districts of West Bengal. The correlation coefficient between MFDI and HDI is -0.54. Present paper is entirely based on secondary information and the approach is quantitative.
Key words*: Physical parameters, Socio-economic parameters, Gender, MFFI, HDI*

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I. Introduction:

Knowledge, one of the three dimensions of human development, is the most gender sensitive element. Education in terms of literacy is considered as yardstick to measure the extent of knowledge. Literacy can be viewed as a panacea which can heal not only the socio-cultural twinge but the political and economic twinge of a nation as well. Education enhances the span of knowledge both vertically and horizontally and consequently spreads out the vision or eyesight of the individuals. Comparing to an uneducated one, an educated individual can definitely select the right option and thus becomes a prudent decision maker. Therefore, as an affiliate of a society education is a fundamental right to all individuals irrespective of religion, language, caste, creed and gender. According to Lumsford, Moglen and Slevin, literacy is a right not a privilege: A right that has been denied an extraordinary number of our citizens" (Keefe & Copeland, 2011). However, biasness towards male gender is a universal scenario in the literacy map of the developing and underdeveloped nations. According to Census of India (2011) total literacy rate of the country is 74.04% with 82.14% of male literacy and 65.46% of female literacy, representing a 12.68% of gender gap in literacy. The states and union territories of India also represent varied percentage of gender gap ranging between 4% and 20%. This paper focuses its attention to the district wise variation of gender gap in literacy and overall regional development of West Bengal, the eastern state of India. West Bengal represents 76.26% of overall literacy rate with male literacy of 81.69% and female literacy of 70.54%, representing 11.15% of gender gap.

Spatio-temporal variation of gender disparity in literacy as a focal point of study is not a new concept. A plethora of research papers by over emphasizing the nature and causes of gender disparity in literacy have already been published at both national and international level. Shiv Prakash Katiyar (2016) analysed the state and union territory wise gender disparity of India and also indicated future projections of levels of female illiteracy. Arun Kumar Ghosh (2003) has rightly pointed out that unbiased education and health system can be a booster in overall social improvement of a nation. In a religion specific study, Islam and Siddiqui (2019) have shown gender disparity in literacy of Muslim communities in different districts of West Bengal. Rosemary Subba (2021) has provided a district wise account of gender disparity in literacy of West Bengal. He

discriminated the rural and urban areas in reference of Male Female Differential Index (MFDI) in the perspective of literacy. Saha and Halder (2017) examined the negative impact of low female literacy on family planning and population stabilization efforts. They specifically examined the spatial variability of female literacy in non-urban areas of different districts of West Bengal. They have used modified Sopher's Index to explore the gender disparity in literacy. Sau et.al. (2018) have also incorporated modified Sopher's Index to calculate block-wise gender disparity in the levels of literacy of Purba Medinipur districts of West Bengal. They made a comparative analysis between the statistics of 2001 and 2011.

From the viewpoints of aims and objectives, all the studies mentioned above are pivoted around the central theme of exploring the gender wise disparity in literacy. Methodologically, to find out the extent of disparity the above studies also stick to more or less the same methods i.e. either modified Sopher's Index or Male Female Differential Index. The vertical (community, religion and cast wise variability) and horizontal or spatial (from block to state level) variability create differences from one study to another. In this work the author has attempted to cross the boundary by incorporating HDI within the same frame work. An endeavour has been initiated to detect the impact of low female literacy on the overall human development in different districts of West Bengal. Human Development Index (HDI) and Gender Inequality Index (GII) are two of the 29th global indices which the Govt. of India has identified to observe the country's performance in global ranking. At this very juncture district wise computation of these indices necessitates utmost attention to present a region specific picture of the existing scenario. The precise picture will enable the policy makers to take corrective policies, programmes and schemes. The hypothesis of this paper is that high gender wise disparity in respect of literacy will correspond to low level of overall human development and vice versa.

II. Objectives

- To identify the status of district wise gender gap in literacy in West Bengal
- To identify the spatial variation of Male Female Differential Index (MFDI) in respect of overall literacy
- To find out the district wise status of development in reference of Human Development Index (HDI)
- To examine the correlation between Male Female Differential Index and overall Human Development Index and consequent regional variability of different districts of West Bengal

III. Study area:

The macro level study gathers together its attention on one of the states of India i.e. West Bengal which is located in the eastern side of the country and is coordinated between 21^{o}25$^{/}$ N and 27^{o}13$^{/}$ N latitude and from 85^{o}50$^{/}$ E and 89^{o}50$^{/}$ E longitude. The state is bordered by the country of Bhutan and the state of Sikkim to the north, by the country of Bangladesh and the state of Assam to the east and by the country of Nepal and states of Jharkhand, Bihar and Odisha to the west. The coast line of Bay of Bengal forms the southern boundary of West Bengal. In terms of areal coverage it represents the 14th largest state (88,752 sq.km.) of India. The state occupies 7.55% of country's total population with a population density of 1028 persons per sq.km. (2011 Census). Out of 36 states and Union Territory, West Bengal occupies 20th rank in respect of overall literacy (76.26%). 70.54% female literates are found against 81.69% of male literates (2011 Census).

IV. Database and Methodology:

The study aims to explore the interrelationship between gender disparity in education and the overall human development. For identification of the nature and extent of relationship the whole study has been arranged into three consecutive and sequential phases. At first the taken hypothesis has been reinforced by gathering information from existing literature. A detailed literature survey has been done to identify the research gaps. Methodologically the present work is quantitative and totally based on secondary data. Data has been collected from Statistical Abstract (West Bengal), 2015 and State Domestic Product and District Domestic Product of West Bengal, 2013-14 and various other articles published at national and international journals.

In the second phase, computation and analysis of data has been done by using following statistical techniques:

i)Male Female Differential Index (MFDI) = (MLR-FLR)/TLR

Where MLR = Male Literacy Rate, FLR = Female Literacy Rate and TLR = Total Literacy Rate

ii)Calculating Human Development Index

Step 1: Computing the dimension indices:

District level HDI has been computed by preserving the same dimensions as proposed by United Nation. However, the indicators of dimensions have been slightly modified as per the availability of data. Maximum and minimum values (goalposts) are fixed in order to convert the indicators expressed in different units into indices between 0 and 1. These goalposts act as a "natural zeros" and "aspirational targets", respectively from which component indicators are standardized (GHD,pp 33) by using following formula:

Dimension Index (DI) = (Actual value – Minimum value)/ (Maximum value – Minimum value).

For the current study the goalposts for different dimension indicators are set with the following values:

Table 1: Goalpost values for different dimension indicators

Dimension	Indicators	Minimum Value	Maximum value
Long & Healthy Life	Health Centre Density/10 sq.km.	0.90	23.00
	No. of beds/1000 pop.	0.40	6.50
	Survival Rate (>70 pop.)	2.00	5.00
Knowledge	Total Literacy Rate (%)	0	100
	Gross Enrolment Ratio	0	100
A Decent Standard of Living	Per capita Gross District Domestic Product (Rs.)	19000	63500

The goalposts values of different dimension indicators are set by scrutinizing the district level performance of different indicators. For instance, the lowest value (Rs. 19139.69) of per capita Gross District Domestic Product (GDDP) for the year 2011 has been observed in the district of Uttar Dinajpur and the highest value (Rs. 63144.26) was found in the district of Kolkata. Accordingly, the minimum and maximum goalpost values for the per capita GDDP have been set with Rs. 19000 and Rs. 63500 respectively. To achieve a respectable level of human development it does not require unlimited income. Accordingly, logarithm of income is used (HDR, 2007/2008). In illustration of Total Literacy Rate (TLR) and Combined Gross Enrolment Ratio (CGER) zero (0) has been taken as minimum and 100 has been taken as maximum value. The logic behind this is that irrespective of physical and socio-economic specificity percentage of education indicators of any region may roam between 0% and 100%. Table 2 summarizes the formula for computing different indicators and their dimension indices.

Table 2: Summery of formula

Indicators	**Formula for computing indicators**	**Formula for computing dimension index**
Health Centre Density/10sq.km.	No. of Health Centre/ Total Area) x 10	DI = (Actual value – Minimum value)/ (Maximum value – Minimum value) **Health Index** = (Health centre index + No. of beds index + survival index)/3
No. of beds/1000 population	(No. of beds/ Total Population) x 1000	
Survival Rate (>70 population)	(No. of population of > 70 age group /Total population) x 100	
Total Literacy Rate (%)	(Total no. of Literate Population / Total Population) x 100	DI = (Actual value – Minimum value)/ (Maximum value – Minimum value) **Education Index** = 2/3 (Total Literacy Index) + 1/3 (Combined Gross Enrolment Index)
Gross Enrolment Ratio (GER)	(Total No. of Students in Primary/ Middle/ High School / Total No. of Population of that age group) x 100	
Combined Gross Enrolment Ratio (CGER)	(GER for Primary school +GER for Middle School + GER for High School) / 100	
Per capita Gross District Domestic Product (GDDP)	(Gross District Domestic Product / Total Population)	DI= (log Actual Value – log Minimum Value)/ (log Maximum Value – log Minimum Value)

Step 2: Computation of HDI by aggregating the above three dimension indices:
HDI = (Health Index + Education Index + GDP Index) /3
iii) Karl Pearson's Product Moment Correlation Coefficient has been done to identify the degree of relationship between Male Female Differential Index in education and over all Human Development Index in the study area.

V. Result and Analysis:

5.1. Analysis of Male Female Differential Index:

In terms of overall literacy rate (76.26%) West Bengal possesses 20th rank among the 36 states and union territories of India (2011 Census). Despite the fact that about 12 districts out of 19 districts of West Bengal have more than 80 % of male literacy rate, however, the poor performance of their female counterpart is responsible for overall low literacy rate. According to 2011 Census gender gap in literacy is highest in the district of Purulia (27.34%) and is lowest in the district of Kolkata (4.28%). District level MFDI represents a wide range of variability in the study area. Based on mean and standard deviation grouping techniques the districts of the study area has been categorized into high, medium and low MFDI regions ranges between 0.0496 (Kolakata) and 0.4240 (Purulia) (Table 3).

Table 3: Gender wise variation of Literacy rate (2011)

Districts	Total Literacy Rate (%)	Male Literacy Rate (%)	Female Literacy Rate (%)	Gender Gap (%)	MFDI
Bankura	70.26	80.05	60.05	20.00	0.2847
Burdwan	76.21	82.42	69.63	12.79	0.1678

Birbhum	70.68	76.92	64.14	12.78	0.1808
Dakshin Dinajpur	72.82	78.37	67.01	11.36	0.1560
Darjeeling	79.56	85.61	73.33	12.28	0.1543
Howrah	83.31	86.95	79.43	7.52	0.0903
Hoogly	81.80	87.03	76.36	10.67	0.1304
Jalpaiguri	73.25	79.95	66.23	13.72	0.1873
Coochbihar	74.78	80.71	68.49	12.22	0.1634
Kolkata	86.31	88.34	84.06	4.28	0.0496
Maldah	61.73	66.24	56.96	9.28	0.1503
Murshidabad	66.59	69.95	63.09	6.86	0.1030
Nadia	74.97	78.75	70.98	7.77	0.1036
N. 24 Paraganas	84.06	87.61	80.34	7.27	0.0865
Paschim Medinipur	78.00	85.26	70.50	17.76	0.1892
Purba Medinipur	87.02	93.32	81.37	11.95	0.1373
Purulia	64.48	77.86	50.52	27.34	0.4240
S. 24 Paraganas	77.51	83.35	71.40	11.95	0.1542
Uttar Dinajpur	59.07	65.52	52.17	10.35	0.2260
Mean of MFDI: 0.1652, Standard Deviation of MFDI: 0.0800					

Source: Raw data has been obtained from Statistical Abstract, West Bengal (2015) and compiled by the author

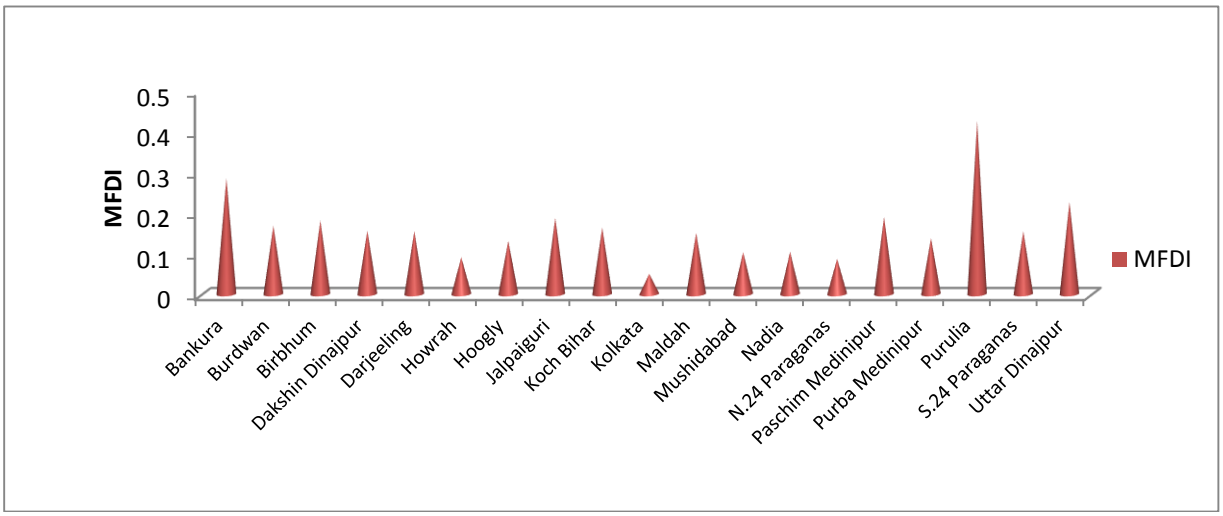

Fig. 1: District wise distribution of MFDI

Table 4: District wise variation of MFDI

MFDI Range	Name of the Districts	Category /No. of Districts
<0.1652	Dakshin Dinajpur, Darjeeling, Howrah, Hoogly, Coochbihar, Kolkata, Maldah, Murshidabad, Nadia, N.24 Paraganas, Purba Medinipur, S. 24 Paraganas	Low (12)
0.1652 – 0.2452	Burdwan, Birbhum, Jalpaiguri, Paschim Medinipur, Uttar Dinajpur	Moderate (5)
>0.2452	Bankura, Puruliya	High (2)

Spatial pattern of distribution of MFDI represents that more than half percentage of the districts (63%) fall under the category of low MFDI. Only 11% of the districts (Puruliya & Bankura) sharing the southwestern portion of the state represent high MFDI. The remaining 26% of the districts sporadically distributed in the northern, middle and southern portions of the state represent moderate MFDI. From the distributional pattern it is evident that there exists an east-west disparity in the execution of male-female literacy in West Bengal. The existing socio-cultural and economic backwardness of the western districts are accountable for creating a male dominated biased society. About 87% of the total population of Puruliya district resides in non-urban areas. Moreover, the mainstay of rural economy agriculture is constrained by undulating land (60% upland) with paucity of adequate irrigation facility. Contrary to this, Kolkata being the capital city of West Bengal represents the prime business, commercial and financial hub of Eastern India.

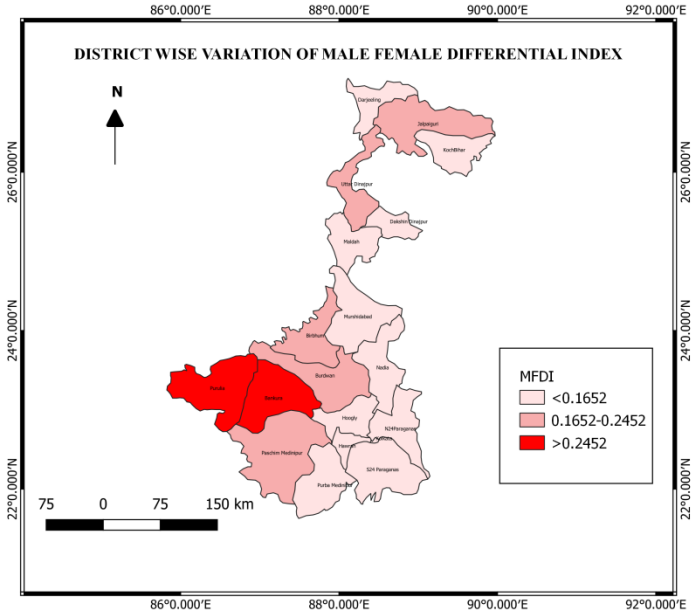

Fig.2 District wise distribution of MFDI

5.2 Analysis of Human Development Index:

5.2.1: Health Index

According to the United Nation's Human Development Report the indicator for determining the dimension of long and healthy life is life expectancy at birth. However, due to unavailability of district level data of this parameter, three realistic indicators have been taken to assess the dimension of long and healthy life of different districts of West Bengal (Table 5).

i) Health centre density/10 sq.km. area: Health centre density includes both Govt. and private organizations. Except Kolkata all other districts are lagging far behind in respect of health centre density.

ii) No. of beds/1000 population: In this indicator Kolkata possesses highest rank with abnormally high index value of 0.94 in comparison to other districts of the state. Uttar Dinajpur with abnormally low index value of 0.001 occupies the lowest rank. The other districts lie within the index value between 0.03 and 0.35.

iii) Survival rate of above 70 population: As high survival rate of aged population always bears a positive correlation with advanced medical facilities, therefore, survival rate above 70 population has been taken as one of the determining factors of health index. Uttar Dinajpur district possesses lowest rank (0.07) followed by Maldah (0.07) and Bibhum districts (0.09).

Health index is the simple arithmetic average of the above three indicators (Table 5). Combined health index among the different districts of West Bengal ranges between 0.02 (Uttar Dinajpur) and 0.29 (N.24 Paraganas). However, Kolkata with exceptionally high index value of 0.97 remain as an outlier (Fig. 3).

Table 5: Indicators of Health Index

Districts	Index of H.C.* density/10km^2	Index of No. of beds/1000 population	Index of S.R.**(>70 Population)	Health Index
Bankura	0.0060	0.1122	0.4955	0.2045
Burdwan	0.0321	0.1577	0.3355	0.1751
Birbhum	0.0204	0.0738	0.0987	0.0643
Dakshin Dinajpur	0.0176	0.0603	0.2629	0.1136
Darjeeling	0.0162	0.3537	0.3115	0.2271
Howrah	0.1641	0.1179	0.5322	0.2714
Hoogly	0.0902	0.1122	0.6648	0.2891
Jalpaiguri	0.0065	0.0692	0.1717	0.0825
Coochbihar	0.0230	0.0678	0.2903	0.1271
Kolkata	0.9719	0.9438	0.9804	0.9653
Maldah	0.0305	0.0223	0.0739	0.0422
Murshidabad	0.0441	0.0307	0.1917	0.0888
Nadia	0.0316	0.1449	0.6488	0.2751
N. 24 Paraganas	0.0796	0.0758	0.7152	0.2902

Paschim Medinipur	0.0126	0.0766	0.4557	0.1816
Purba Medinipur	0.0503	0.0560	0.5280	0.2114
Purulia	0.0009	0.0802	0.3124	0.1312
S. 24 Paraganas	0.0204	0.0359	0.3840	0.1468
Uttar Dinajpur	0.0155	0.0012	0.0456	0.0208
Mean of Health Index: 0.2057, Standard Deviation of Health Index: 0.2022				
*H.C. = Health Centre, ** S.R.= Survival Rate				

Source: Raw data derived from Statistical Abstract, West Bengal (2015) and compiled by the author

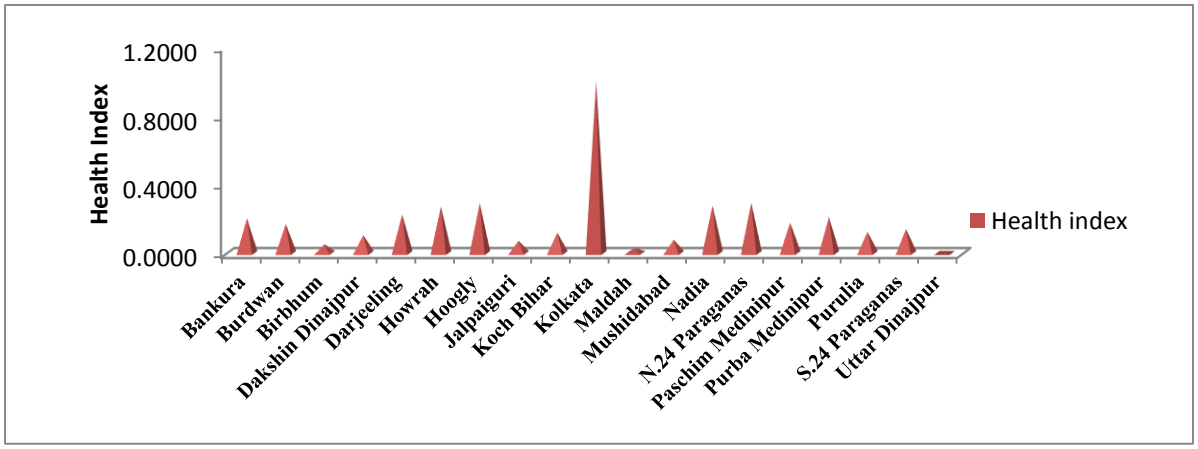

Fig 3. District wise distribution of Health Index

In respect of health index different districts of West Bengal have been divided into three categories. Mean and standard deviation grouping techniques is used to categorize the districts. 12 out of 19 districts of West Bengal (63%) fall under the category of low health index (<0.21). About 32% of the districts fall under the category of moderate health index (0.2057– 0.4079) (Table 6).

Table 6: District wise variation of Health Index

Health Index Range	Name of the Districts	Category /No. of Districts
<0.2057	Bankura, Burdwan, Birbhum, Dakshin Dinajpur, Jalpaiguri, Coochbihar. Maldah, Murshidabad, Paschim Medinipur, Puruliya, S.24 Paraganas, Uttar Dinajpur	Low (12)
0.2057 – 0.4079	Darjeeling, Howrah, Hoogly, Nadia, N.24 Paraganas, Purba Medinipur	Moderate (6)
>0.4079	Kolkata	High (1)

5.2.2 Education Index:

Education index is the quantitative expression of the dimension of knowledge. It is the combined manifestation of the two important aspects of knowledge i.e. Combined Gross Enrolment Ratio (CGER) and Total Literacy Rate (TLR). The current study has ensured the proportion share of these two aspects as concomitant with United Nation Development Report i.e. 1/3 of CGER and 2/3 of TLR. District wise variation of overall literacy rate represents a grim picture with nearly 84% districts lie below the states average of 76% literacy rate (2011 Census). As compared to health index and GDDP index, the education index represents more or less balanced pattern of distribution throughout the 19 districts of West Bengal (Table 7 & Fig. 4).

Table 7: Indicators of Education Index (2011)

Districts	CGER*	CGEI**	1/3CGEI	TLR*** (%)	TLI****	2/3 TLI	Education Index
Bankura	67.48	0.6748	0.2249	70.26	0.7026	0.4684	0.6933
Burdwan	59.13	0.5913	0.1971	76.21	0.7621	0.5081	0.7052
Birbhum	60.26	0.6026	0.2009	70.68	0.7068	0.4712	0.6721
Dakshin Dinajpur	63.02	0.6302	0.2101	72.82	0.7282	0.4855	0.6955
Darjeeling	60.19	0.6019	0.2006	79.56	0.7956	0.5304	0.7310
Howrah	57.05	0.5705	0.1902	83.31	0.8331	0.5554	0.7456
Hoogly	64.63	0.6463	0.2154	81.80	0.8180	0.5453	0.7608
Jalpaiguri	61.84	0.6184	0.2061	73.25	0.7325	0.4883	0.6945
Coochbihar	71.86	0.7186	0.2395	74.78	0.7478	0.4985	0.7381
Kolkata	54.79	0.5479	0.1826	86.31	0.8631	0.5754	0.7580
Maldah	55.38	0.5538	0.1846	61.73	0.6173	0.4115	0.5961
Murshidabad	56.41	0.5641	0.1881	66.59	0.6659	0.4439	0.6320
Nadia	68.44	0.6844	0.2281	74.97	0.7497	0.4998	0.7279
N. 24 Paraganas	54.69	0.5469	0.1823	84.06	0.8406	0.5604	0.7427

Paschim Medinipur	60.78	0.6078	0.2026	78.00	0.7800	0.5200	0.7226
Purba Medinipur	58.64	0.5864	0.1955	87.02	0.8702	0.5801	0.7756
Purulia	63.80	0.6380	0.2127	64.48	0.6448	0.4299	0.6425
S. 24 Paraganas	56.27	0.5627	0.1876	77.51	0.7751	0.5167	0.7043
Uttar Dinajpur	51.54	0.5154	0.1718	59.07	0.5907	0.3938	0.5656
*CGER- Combined Gross Enrolment Ratio, **CGEI – Combined Gross Enrolment Index, ***TLR- Total Literacy Rate, ****TLI- Total Literacy Index							
Mean of Education Index: 0.7002, Standard Deviation of Education Index: 0.5668							

Source: Raw data obtained from Statistical Abstract, West Bengal (2015) and compiled by the author

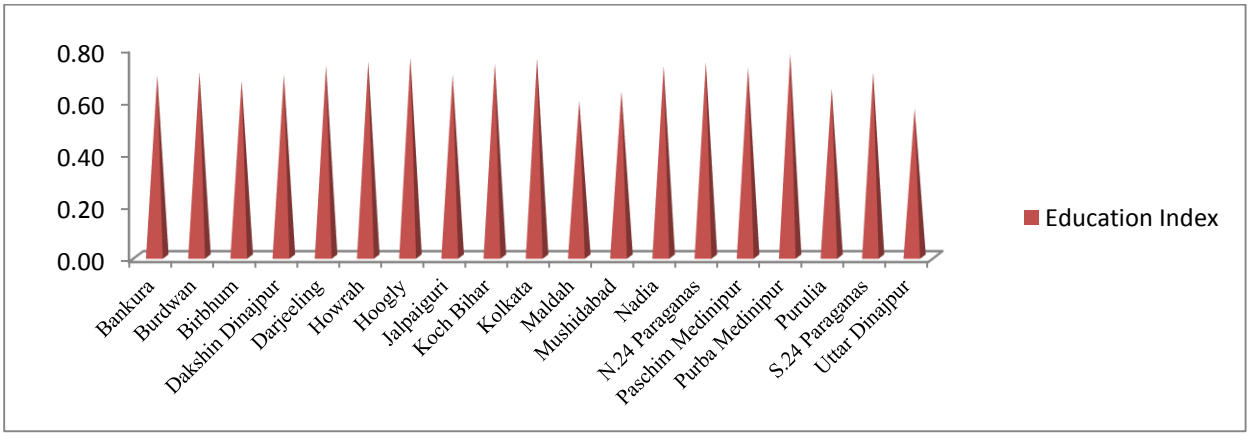

Fig 4. District wise variation of Education Index

Based on mean and standard deviation grouping techniques the districts of West Bengal has been categorized into low, moderate and high education index zone (Table 8). Only 16% of the districts namely Kolkata, Hoogly and Purba Medinipur correspond under the group of high education index zone with more than 0.7570 Education Index score.

Table 8: District wise variation of Education Index (2011)

Education Index Range	Name of the Districts	Category /No. of Districts
<0.7002	Bankura, Birbhum, Dakshin Dinajpur, Jalpaiguri, Maldah, Murshidabad, Purulia, Uttar Dinajpur	Low (8)
0.7002 – 0.7570	Burdwan, Darjeeling, Howrah, Coochbihar, Nadia, N.24 Paraganas, Paschim Medinipur, S.24 Paraganas	Moderate (8)
>0.7570	Hoogly, Kolkata, Purba Medinipur	High (3)

5.2.3 GDP Index:

Other factors being constant per capita Gross Domestic Product (GDP) is an expression of the standard of living of a region. An extensive range of variability in per capita Gross District Domestic Product (GDDP) has been observed with Rs. 19139.69 (Uttar Dinajpur) as lowest value to Rs. 63144.26 (Kolkata) as highest value (Table 9, Fig. 5).

Based on mean and standard deviation grouping techniques the districts of West Bengal has been categorized into low, moderate and high GDDP index zone (Table 10). More than half of the districts (63%) fall under the group of low GDDP index zone. The southern districts of West Bengal (Howrah, Hoogly, N.24 Paraganas, Kolkata, Purba Medinipur and Burdwan) fall under the category of moderate to high GDDP Index zone. The only exception is found in the northern district of Darjeeling. The tourism industry and tea industry facilitate the district to enter into the category of high GDDP index zone with score 0.7398 (Table 9).

Table 9: Indicators of GDDP Index (2011)

Districts	Per capita GDDP* (Rs.)	Log value of GDDP* Index
Bankura	26127.14	0.2639
Burdwan	43522.24	0.6869
Birbhum	23306.51	0.1692
Dakshin Dinajpur	25514.12	0.2442
Darjeeling	46393.83	0.7398
Howrah	40068.56	0.6183
Hoogly	37602.29	0.5657
Jalpaiguri	29998.95	0.3784
Coochbihar	23954.08	0.1919
Kolkata	63144.26	0.9953
Maldah	24591.65	0.2137

Murshidabad	24599.18	0.2140
Nadia	28935.35	0.3485
N. 24 Paraganas	38951.52	0.5949
Paschim Medinipur	26423.70	0.2733
Purba Medinipur	47360.17	0.7569
Purulia	22815.52	0.1516
S. 24 Paraganas	29974.62	0.3778
Uttar Dinajpur	19139.69	0.0059
*__GDDP__ - Gross District Domestic Product		
Mean of GDDP Index: 0.4100, Standard Deviation of GDDP Index: 0.2621		

Source: Raw data obtained from State Domestic Product and District Domestic Product of West Bengal (2013-14) and compiled by the author

Table 10: District wise variation of GDDP Index

GDDP Index Range	Name of the Districts	Category /No. of Districts
<0.4100	Bankura, Birbhum, Dakshin Dinajpur, Jalpaiguri, Coochbihar, Maldah, Murshidabad, Nadia, Paschim Medinipur, Purulia, S.24 Paraganas, Uttar Dinajpur	Low (12)
0.4100 – 0.6721	Howrah, Hoogly, N.24 Paraganas	Moderate (3)
>0.6721	Burdwan, Darjeeling, Kolkata, Purba Medinipur	High (4)

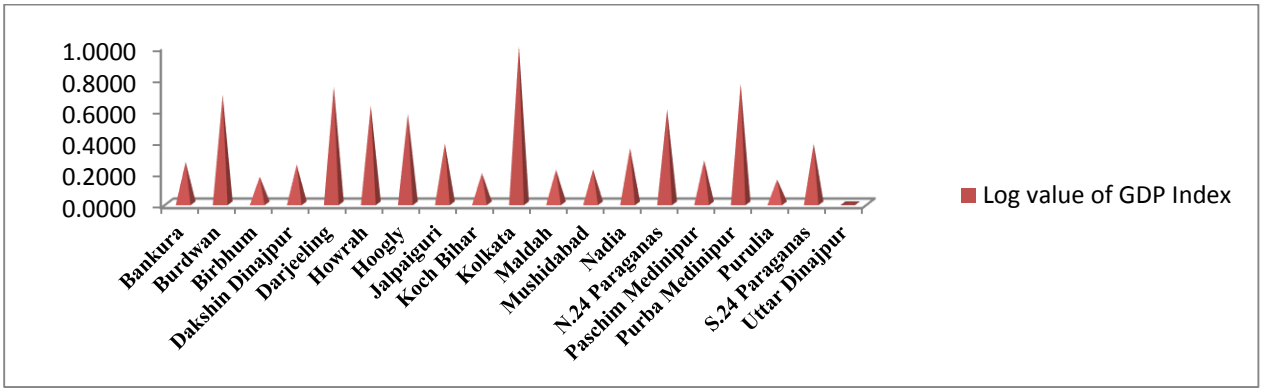

Fig. 5 District wise variation of GDDP Index

5.2.4 Human Development Index (HDI):

District wise variation of human development index manifests a comparative depiction of social and economic wellbeing of different districts of West Bengal (Table 11, Fig. 6). The 2014 Human Development Report (HDR) introduced fixed cut-off points (0.550, 0.700 and 0.800) for regional categorization according to HDI. If this cut-off marks is to be followed, the districts of West Bengal would be disproportionately arranged into two extreme categories i.e 18 out of 19 districts (95%) fall under the low category (<0.550) as against only one district (Kolkata) lie in the very high category with HDI index value 0.9062. However, by considering the regional specificities, instead of taking the global cut-off points, the author tries to imply the mean and standard deviation grouping techniques to organize the districts into three HDI zones i.e low (11 districts), moderate (7 districts) and high (1 district) (Table 12).

Table 11: Indicators of Human Development Index (2011)

Districts	Health Index	Education Index	GDDP Index	HDI
Bankura	0.2045	0.6933	0.2639	0.3873
Burdwan	0.1751	0.7052	0.6869	0.5224
Birbhum	0.0643	0.6721	0.1692	0.3019
Dakshin Dinajpur	0.1136	0.6955	0.2442	0.3511
Darjeeling	0.2271	0.7310	0.7398	0.5660
Howrah	0.2714	0.7456	0.6183	0.5451
Hoogly	0.2891	0.7608	0.5657	0.5385
Jalpaiguri	0.0825	0.6945	0.3784	0.3851
Coochbihar	0.1271	0.7381	0.1919	0.3523
Kolkata	0.9653	0.7580	0.9953	0.9062
Maldah	0.0422	0.5961	0.2137	0.2840
Murshidabad	0.0888	0.6320	0.2140	0.3116
Nadia	0.2751	0.7279	0.3485	0.4505
N. 24 Paraganas	0.2902	0.7427	0.5949	0.5426
Paschim Medinipur	0.1816	0.7226	0.2733	0.3925
Purba Medinipur	0.2114	0.7756	0.7569	0.5813

Purulia	0.1312	0.6425	0.1516	0.3084
S. 24 Paraganas	0.1468	0.7043	0.3778	0.4096
Uttar Dinajpur	0.0208	0.5656	0.0059	0.1974
Mean of HDI: 0.4386, Standard Deviation of HDI: 0.1585				

Source: Compiled by the author

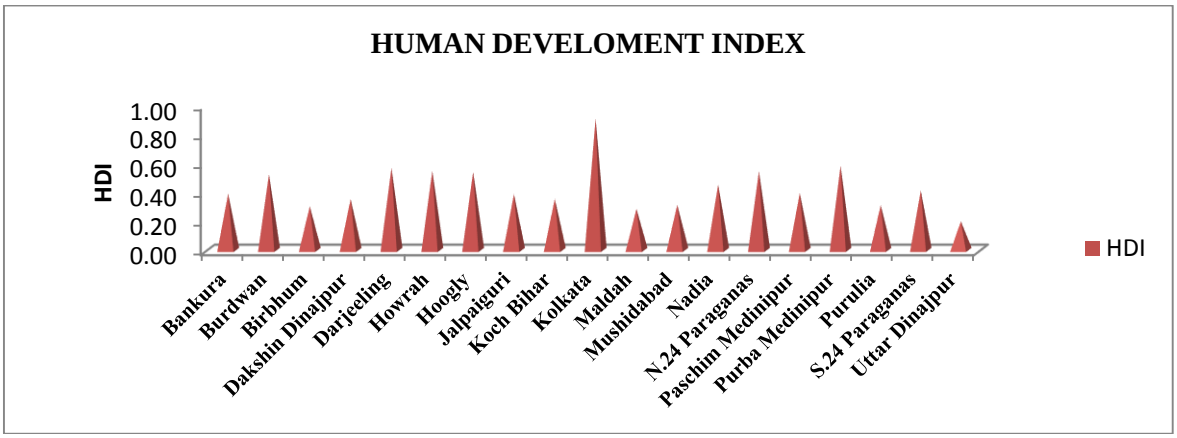

Fig. 6: District wise variation of HDI

Table 12:

HDI Index Range	Name of the Districts	Category /No. of Districts
<0.4386	Bankura, Birbhum, Dakshin Dinajpur, Jalpaiguri, Coochbihar, Maldah, Murshidabad, Paschim Medinipur, Purulia, S.24 Paraganas, Uttar Dinajpur	Low (11)
0.4386 – 0.5971	Burdwan, Darjeeling, Howrah, Hoogly, Nadia, N.24 Paraganas, Purba Medinipur	Moderate (7)
>0.5971	Kolkata	High (1)

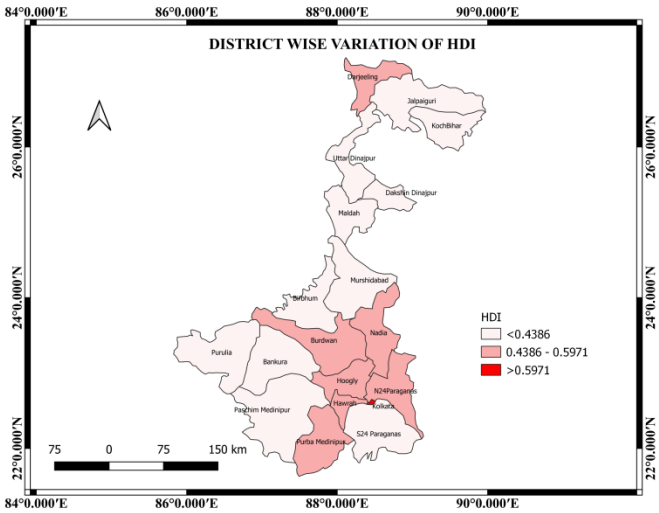

Fig 7: District wise distribution of HDI

5.3 Correlation between MFDI and HDI:

Pearson's Product Moment Correlation Coefficient between MFDI in education and overall HDI represents a moderately negative relationship (-0.54) between the two parameters (Fig. 8). Nearly 15 out of 19 districts bear a conflicting relationship i.e. lower gender disparity in education corresponds to higher human development index and vice versa (Table 13, Fig. 9). For instance in Kolkata lower level of gender discrimination in education resulted in lowest value of MFDI (0.05). The influence of higher educational attainment irrespective of gender is reflected in greater level of overall human development with an index value of 0.91. On the other side of the coin lies the district of Purulia. The greater gender discrimination in education (MFDI value 0.42) reduces overall human development with an index value of 0.31. The other districts namely

Howrah, Hoggly, Purba Medinipur, Paschim Medinipur, Maldah, Darjeeling, Dakshin Dinajpur, Cooch Bihar, Birbhum, Jalpaiguri, N. 24 Paraganas, Uttar Dinajpur and Bankure remain at par as with Kolkata and Purulia (Table 13). However, the districts of Murshidbad, Nadia, S. 24 Paragans and Burdwan represents a negatively oriented linear relationship between MFDI and HDI. In Murshidabad district educational achievement in both the sex is nearer to equivalent which, in turn, results in low value of MFDI (0.10). However, overall human development index of the district is also very low (0.31). Similarly, in case of Burdwan district both the parameters go hand in hand with moderate level of MFDI (0.17) and moderate HDI (0.52) value.

Table 13: MFDI & HDI

Districts	MFDI	HDI
Bankura	0.2847	0.3873
Burdwan	0.1678	0.5224
Birbhum	0.1808	0.3019
Dakshin Dinajpur	0.1560	0.3511
Darjeeling	0.1543	0.5660
Howrah	0.0903	0.5451
Hoogly	0.1304	0.5385
Jalpaiguri	0.1873	0.3851
Coochbihar	0.1634	0.3523
Kolkata	0.0496	0.9062
Maldah	0.1503	0.2840
Murshidabad	0.1030	0.3116
Nadia	0.1036	0.4505
N. 24 Paraganas	0.0865	0.5426
Paschim Medinipur	0.1892	0.3925
Purba Medinipur	0.1373	0.5813
Purulia	0.4240	0.3084
S. 24 Paraganas	0.1542	0.4096
Uttar Dinajpur	0.2260	0.1974

Source: Compiled by the author

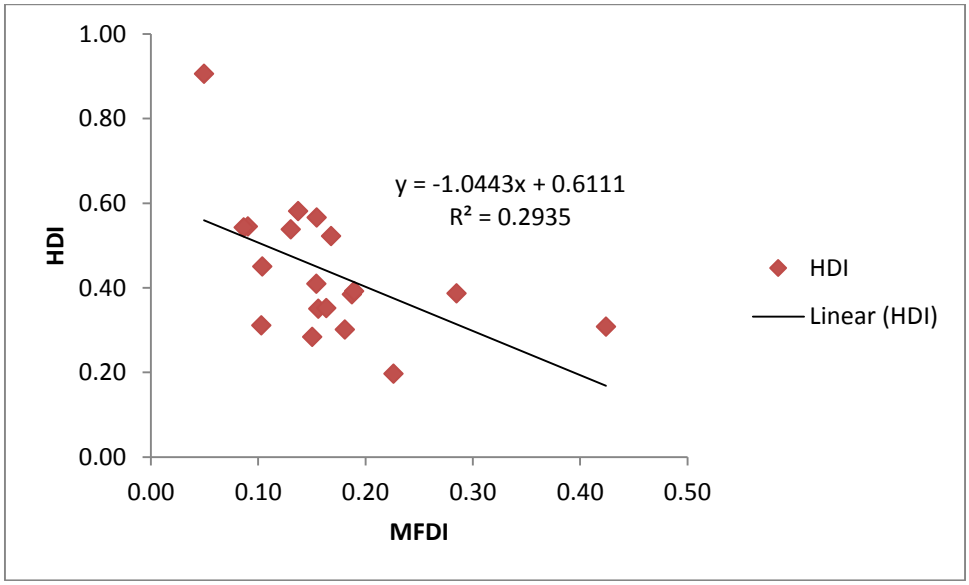

Fig 8. Regression analysis between MFDI and HDI

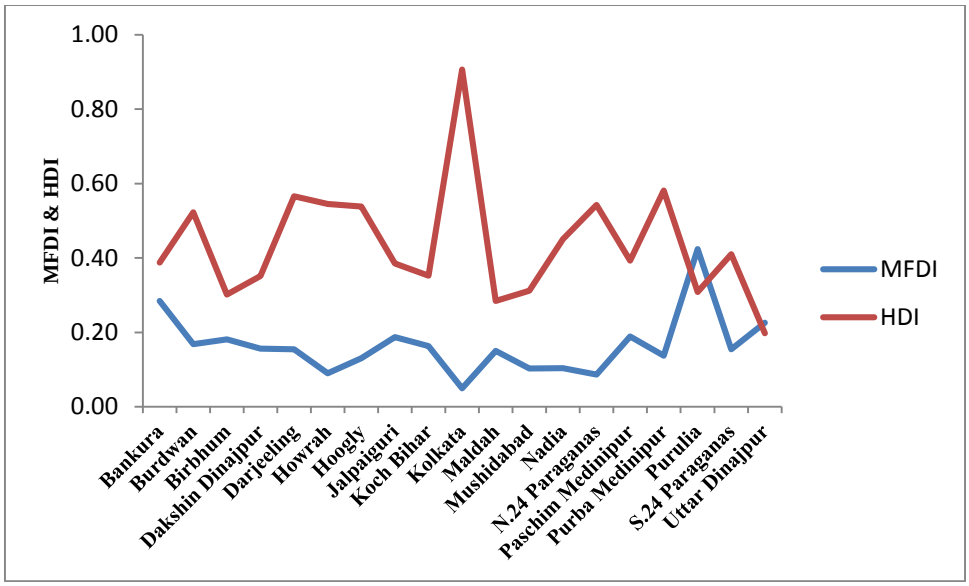

Fig 9. Inverse relationship between MFDI & HDI

VI. Concluding Remarks:

The present work reveals the fact that gender inequality in literacy is one of the significant determining factors of overall human development of a region, the fact that endorse the taken hypothesis. For a balanced development of human resource education should be equally distributed among both the sex. Higher gender gap in literacy reduces the prudency in decision making process. Illiteracy or partial education makes the female gender to perpetuate in the distress condition. In the long run the female genders begin to realize that it's their fundamental right to be in distress. The impression of this realization is manifested through gender discrimination in every aspect of life. Thus, the overall human development is restrained. The spatial analysis clearly shows that district having low MFDI correspond with high HDI. However, in case of Murshidabad district it is observed that though the district fall in the category of low MFDI (0.10) but overall HDI of the district is also very low (0.31). Thus, it can be said that gender equality in education is not the sole determinant of overall human development. Overall human development is a multi-dimensional approach influenced by diverse factors. Education, being placed at the core of these factors, set the appropriate path of their movement. Therefore, for overall regional development instead of sectional education of male gender overall education irrespective of gender is essential.

References:

[1]. Dey, J. (2015). Gender Disparity in Literacy: A Macro Level Spatio-Temporal Account of India, Journal of Humanities and Social Science (ISOR-JHSS), Volume 20, Issue 10, Ver. VI, pp 52-59.
[2]. file:///C:/Users/HP/Downloads/De_J_2015.pdf
[3]. Gendering Human Development (GHD). Ministry of Statistics and Programme Implementation. Government of India.
[4]. Ghosh, A.K. (2003). Female Literacy and Social Development. Council for Social Development, Volume 33, Issue 4, page(s): 65-72. Retrieved February 25, https://journals.sagepub.com/doi/10.1177/004908570303300405?icid=int.sj-abstract.similar-articles.1
[5]. Islam, M.S., & Siddiqui, L. (2019). A geographical analysis of gender inequality in literacy among Muslims of West Bengal, India (2001-2011), Geojournal 85, 1325-1354 (2020). Retrieved February 25, https://doi.org/10.1007/s10708-019-10025-1
[6]. Katiyar, S.P. (2016). Gender Disparity in Literacy in India, Council for Social Development, Volume 46, Issue 1, page(s): 46-69.
[7]. Keefe, E. B., & Copeland, S. R, (2011). What is literacy? The Power of a Definition, Research and Practice for Persons with Severe Disabilities, Vol. 36, 92-99.
[8]. https://journals.sagepub.com/doi/10.2511/027494811800824507
[9]. Roy, D (2013). Status of Human Development in the District of Birbhum at Block Level, Sociology and Anthropology 1(2), pp 104-110. Retrieved February 13, http://www.hrpub.org
[10]. Saha, P.K. & Halder, K. (2017). Community based spatial variance of Rural Female Literacy status of West Bengal, IOSR Journal of Humanities and Social Science, Volume 22, Issue 12, Ver. 9, pp 01-09. Retrieved February 13, www.iosrjournals.org
[11]. Sao, S., Hazra, N. & Mondal, M. (2018). Gender Disparities in the Levels of Literacy Rate: A Block Level Analysis of Purba Medinipur District, West Bengal, India. International Journal of Recent Scientific Research, Volume 9, Issue 4, pp 26181-26185. Retrieved February 10, http://dx.doi.org/10.24327/ijrsr.2018.0904.2008
[12]. State Domestic Product and District Domestic Product (2013-2014). Bureau of Applied Economics and Statistics. Government of West Bengal.
[13]. Statistical Abstract, West Bengal, (2015). Bureau of Applied Economics and Statistics. Government of West Bengal.
[14]. Subba, R. (2021). A Geographical Analysis of Gender Disparity in Literacy in the Districts of West Bengal, International Journal of Creative Research Thoughts (IJCRT), Volume 9, Issue 1. Retrieved February 25, www.ijcrt.org