___

ASSESSING RURAL-URBAN DISPARITY IN CHILD SEX RATIO OF MUSLIMS IN WEST BENGAL, INDIA USING RUDI METHOD: A SPECIAL ATTENTION TO FEMALE CHILD DEFICIT

Md Safikul Islam[1] , Lubna Siddiqui[2], Md Nawaj Sarif[1] , Neha Parveen[1], Shahanshah Khan[1], Nazreen Khanam[1] and Navneet Kaur[1]
[1]Research Scholar, Department of Geography, Jamia Millia Islamia, New Delhi.
[2]Associate Professor, Department of Geography, Jamia Millia Islamia, New Delhi.

___
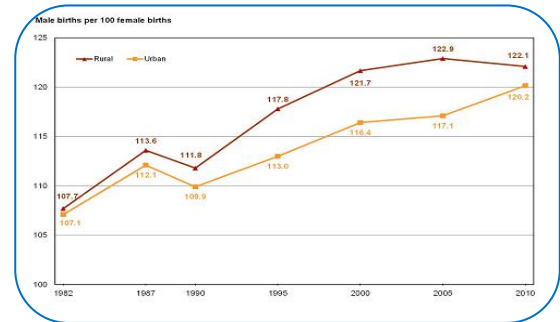
ABSTRACT :

This manuscript has been designed to assess the rural-urban differential in child sex ratio (CSR) of Muslims in particular and total population in general. The main objectives of the present study are to trace out the decadal change in extent and degree of rural-urban CSR difference of Muslims and total population and to investigate the determinant factors affecting such difference. The present study is dealt with the data collected from census of India (2001 and 2011), Indiastat, and DLHS – 4 report, 2012 – 2013. RUDI model and linear regression analysis have been used to represent the proposed objectives. The result reveals that the disparity in Muslim CSR has reduced highly in southern Bengal as compared to northern Bengal while the overall rural-urban CSR difference has fallen down during 2001-2011. Female child deficit in sex ratio and the concerned differential are the matters of global concern especially in underdeveloped and developing countries.

KEYWORDS : Female Child Deficit, Muslims, Spatial Disparity, Human Development, Sustainability.

1. INTRODUCTION

According to United Nations Secretariat (1998), it is well established that more males than females are born among all human populations under normal conditions and it ranges between 103 to 106 males per 100 females at birth (Unisa, 2009). It is believed that the natural "sex ratio at birth" should preferably be around 105 males for every 100 females at birth on average. The ratio beyond the 105-threshold indicates domination of son preference leading to reduction in the number of born girl child due to sex-selective abortion and infanticide (WHO-SEARO, n.d.). Therefore, likewise the sex composition of the total population, the sex composition by age groups is vital for studying the demographic trends of young population, its future patterns and particularly, the status of the girl child (Census of India, 2011). With taking into account, this manuscript tries to assess regional disparity in child sex ratio (CSR) of population of West Bengal which is one of the highlighting states in terms of female child deficit.

Both deficit of female children and significant rural-urban differential in CSR are the threats not only to India but also to the underdeveloped and developing countries throughout the world. CSR differential is highly observed at the grass root level of these countries where illiteracy and poverty play the crucial role in developing such difference. Basically, rural and urban areas are the two sides of a coin wherein rural area characterises social backwardness with high sex ratio and urban area reflects a

___

picture of high quality of living with low sex ratio due to child preference. West Bengal is the suitable study area for the concerned issues which is derived due to the socio-economic backwardness irrespective of religion, cast and culture. With due perpetuation to the religious stratum of West Bengal, it is reported that Muslims are the most backward community despite of being the highest minority in this state. Therefore, it can be stated by putting all these aspects on the tray of concern that this manuscript can enrich the field of demographic and gender research with regional development approach and may become an empirical update validated by scientific techniques for the global thinkers including researcher, policy makers and planners.

By addressing the regional imbalance in sex composition of children, this paper tries to measure the extent of rural-urban disparity of child sex ratio among Indian Muslims. It also intentionally throws light on the deficiency of Muslim female child in sex composition. The present study aims to achieve some significant objectives like (i) tracing out the extent of rural-urban CSR difference of total and Muslim population in West Bengal with the time span of 2001 and 2011, (ii) detecting the degree of rural-urban CSR difference of Muslims along with total population of West Bengal by using RUDI method, (iii) portraying the regional difference of decadal change in rural-urban differential of CSR of Muslims and its comparison with such differential of total population and (iv) finding out the determinant factors affecting the rural-urban CSR difference.
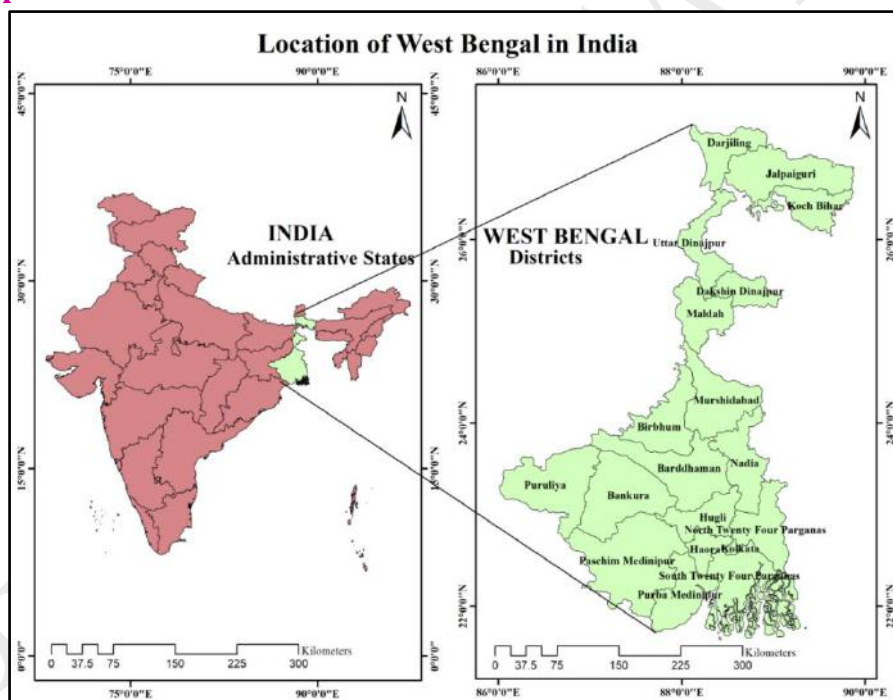
2. STUDY AREA

Figure 1: West Bengal as Study Area

West Bengal, located in the Indian subcontinent, is one of the easternmost states which is stretched over the area between the latitude from 21°20' N to 27°32' N and the longitude from 85°50' E to 89°52' E extending from Himalaya in its northern border to the Bay of Bengal (figure 1). It contains an area of 88,752 sq. km which stands at 2.7% of the total area of the country. The climate of West Bengal is attributed with tropical, moist and hot monsoon type except to the cold region of Himalaya where the altitude becomes the influencing factor (Chapter 4 The Study Area, Shodhganga). According to the census 2011, this state has a population of 9.13 crore individuals where the majority is accounted by Hindu with 70.54 per cent and the major minority group is Muslim consisting of 27.01 per cent of the total population of the state. Between 2001 and 2011, the rate of population growth was 13.84 per cent

_____
Journal for all Subjects : www.lbp.world

2

which was 17.77 per cent in the earlier decade (1991-2001). The state has obtained an excellent level of education as the literacy rate was documented as 76.26 per cent which is greater than the national average of 74.04 per cent. The sex rate has also promptly improved from 934 (2001) to 950 (2011) which is greater than the national average of 943 (census 2011). About 70 per cent of total population of the state is mainly rural who are directly dependent on agriculture consisting of cultivation, animal husbandry, forestry, horticulture and fisheries (West Bengal Action Plan on Climate Change 2010).

3. DATABASE AND METHODOLOGY

This manuscript is entirely based on secondary sources of data which have been collected from Office of the Registrar General and Census Commissioner. The major shortcoming has been faced for collecting data of 2011 but eventually, the required data has been gathered through digital library portal provided by census of India. Another portal named Indiastat has also played an equivalent role in providing data related to this study. The co-author was able to gather religious data of 2001 from office of census of India which has really helped this study to be completed. Child sex ratio (CSR) of both total and Muslim population has been calculated by the authors from collected religious data. The remaining data for the present study have been managed from report of DLHS (District Level and Household and Facility Survey) 2012-2013.

The calculated CSR of rural and urban areas have been analysed by different dimensions. First of all, a simple difference between rural and urban CSR has been calculated in both census years 2001 and 2011 (table 1). In order to represent the degree of rural-urban differential of CSR statistically, the method has been adopted from the research paper entitled 'Regional analysis of urban-rural differentials in literacy in Uttar Pradesh, India' which is explicitly appropriate for the present study. In fact, the method was taken from another paper named 'Regional Aspects of Urban-Rural Differentials in Literacy in India: 1971' of Krishan and Shayam (1978) who also tried to represent the same differential index in literacy. But in order to use the method for CSR, it has been modified by the authors of the present study as per the existing variables. After modification, it has been termed as rural-urban differential index (RUDI).

$$RUDI = \frac{R_{CSR} - U_{CSR}}{T_{CSR}} \qquad (1)$$

Where,
RUDI = rural-urban differential index, U = urban population; R = rural population, CSR = Child Sex Ratio and T = total population.

In both aforesaid research papers, this formula was applied for calculating urban-rural differential index in literacy where rural literacy rate is lower than urban literacy rate while it is reported that rural sex ratio is higher than urban sex ratio in India. Therefore, urban sex ratio has been subtracted from rural sex ratio and it is thus termed as rural-urban differential index (RUDI). In terms of child sex ratio, this method can be explained in two ways. First, greater the value of RUDI inculcates greater extent of difference between rural and urban areas. Second, positive and negative values show the dominance of rural and urban child sex ratio respectively. According to these principles, the indices would be

West Bengal = $\frac{959-947}{956} = 0.013$ (extent of RUDI)

Koch Bihar = $\frac{949-937}{948} = 0.013$ (dominance of rural CSR in RUDI)

Uttar Dinajpur = $\frac{953-955}{953} = -0.002$ (dominance of urban CSR in RUDI)

_____
Journal for all Subjects : www.lbp.world

3

_____

In the above equations, West Bengal represents the extent of RUDI while Koch Bihar and Uttar Dinajpur represent positive and negative RUDI. In Koch Bihar, rural child sex ratio is greater than urban child sex ratio but in contrary to this, urban child sex ratio is greater than rural child sex ratio in Uttar Dinajpur. After calculating RUDI of each district for total and Muslim population, the difference and decadal change has also been calculated (table 2). On the basis of these statistics, a clear demonstration has been established by scatterplot diagrams of multiple variables.

For the purpose of testing the relationship of rural and urban child sex ratio with the determinant factors, linear regression analysis has been used with taking data from census of India, 2011 and DLHS, 2012-13.

Linear Regression Analysis

$$Y = a + bX \qquad (2)$$

Where,
Y is the dependent variable, X is the independent variable,
a is the y-intercept, and b is the slope of the line

In this equation, four dependent variables namely Muslim rural CSR, Muslim urban CSR, total rural CSR and total urban CSR and 41 independent variables have been taken. The independent variables are broadly categorized in seven groups which are named as demographic indicators; birth and abortion; antenatal care; place of child delivery and cost; availability of facility and health personnel; sterilization and contraception; and socio-economic conditions.

4. RESULTS AND DISCUSSIONS
4.1. Decadal Change of Rural-Urban CSR Difference of Total and Muslim Population

Likewise sex ratio, there has been noticed both positive and negative decadal change in rural-urban gap of child ex ratio of total and Muslim Poulation (figure 2). It is again very important to mention that positive and negative change mean increase and decrease in the rural-urban difference of child sex ratio respectively. In case of total population, the positive decadal change has been found in Darjiling, Jalpaiguri, Koch Bihar, Maldah, Birbhum, Bardhhaman, Nadia, Bankura and Medinipur. In all these districts except Medinipur, two directional damages have occurred like the rural-urban gap has increased in one hand and the sex ratio has also dropped down in both urban and rural areas on the other hand. Another district named Maldah had the rural-urban difference of 22 in 2001 by registering rural and urban sex ratio of 965 and 943 respectively which have dropped down to 960 and 882 standing at 78 points of such difference in 2011. It is noteworthy that, there was the decline of only 5 rural females (965 – 960) but a huge decline of 61 urban females (943 – 882) has been detected between 2001 and 2011. It means that child sex ratio is more likely to decline in urban areas than rural areas of this state. The same kind of situation has also been found in the districts like Darjiling, Jalpaiguri, Koch Bihar, Birbhum, Barddhaman and Nadia. Contrary to this, child sex ratio has been found progressive also in urban areas of Uttar Dinajpur, Murshidabad, North Twenty Four Parganas, Puruliya, Medinipur, Haora and South Twenty Four Parganas. Hence, urban child sex ratio has increased more in southern districts than northern districts of West Bengal. Meanwhile, the districts with negative change in rural-urban gap have registered as Uttar Dinajpur and Dakshin Dinajpur in northern districts and Murshidabad, North Twenty Four Parganas, Hugli, Puruliya, Haora and South Twenty Four Parganas in southern districts. Again, the side of southern districts is heavier than northern districts but this time in positive sense. It means that the rural-urban difference of child sex ratio has reduced which is, in fact, a good sign to eliminate spatial difference.

In terms of Muslim population, the positive change has occurred in three districts out of six in northern districts such as Darjiling, Koch Bihar and Uttar Dinajpur. On the other hand, only three districts namely Murshidabad, Puruliya and Medinipur out of 11 in southern districts have been found

_____

with positive change. In the other words, it can be said that the difference of Muslim child sex ratio has declined in more number of southern districts like Birbhum, Barddhaman, Nadia, North Twenty Four Parganas, Hugli, Bankura, Haora and South Twenty Four Parganas. Murshidabad, being a Muslim majority district, could not be part of negative change unfortunately but a very slight change of 1 point has taken place considering negligible change or no change. Similarly, the sex ratios of both rural and urban areas have not dropped with high numbers i.e. from 976 and 974 in 2001 to 970 and 973 in 2011 respectively. It has been observed in case of total population that the decadal changing numbers of rural and urban areas was very negligible as compared to other districts. Moreover, Maldah is also a Muslim majority district but it has been counted under negative change. Unfortunately, rural and urban sex ratio of Dakshin Dinajpur have slipped down abruptly from 967 and 1176 in 2001 to 951 and 871 in 2011 respectively with the huge change of difference of 189 points (209 -20) wherein a rampant fall has been recorded in urban child sex ratio than rural. The districts with negative change have posed with the name of Jalpaiguri, Dakshin Dinajpur and Maldah in northern part of the state but they have also been encountered by the declining trend of child sex ratio. Exceptionally, Muslims of Maldah has experienced an increase of child sex ratio in urban areas from 904 in 2001 to 946 in 2011 but a sharp decline has been found in favour of total population. By concluding this section, it can be said that child sex ratio of total and Muslim population has declined more in urban areas than rural areas suggesting an increase in the practice of sex selective birth with increasing urbanization.
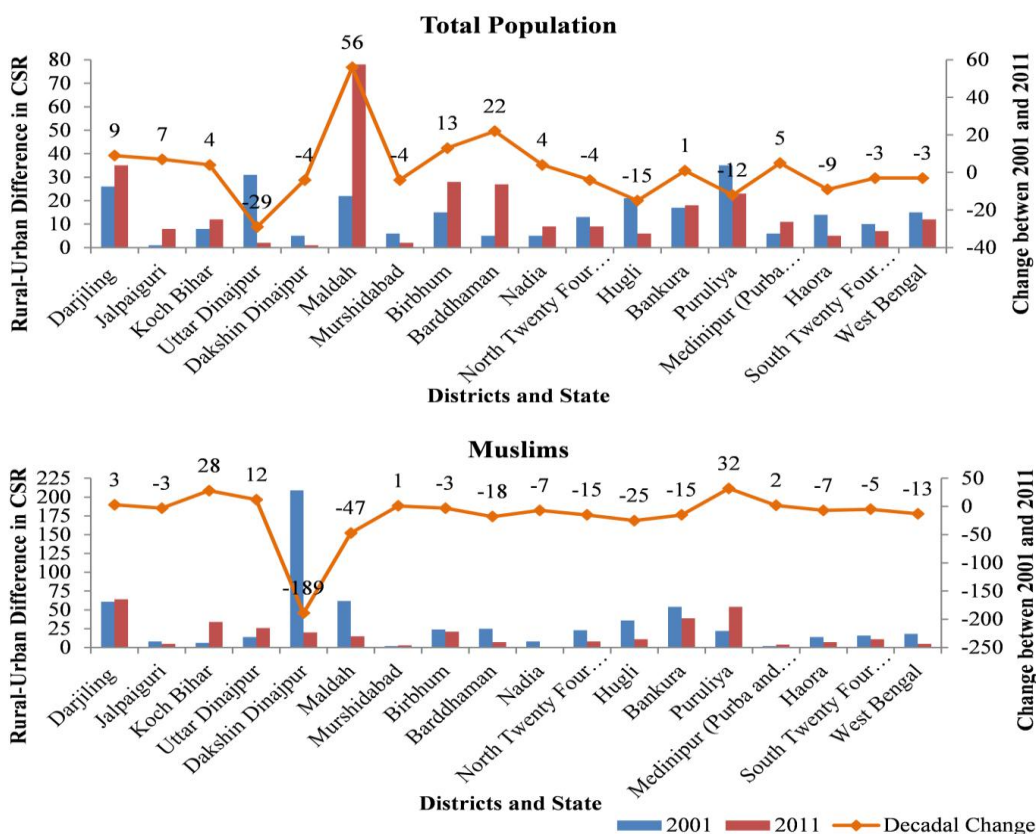
Figure 2: Decadal Change in Rural-Urban CSR Difference in West Bengal (2001-2011)

4.1.2. Decadal Change of CSR in Absolute Numbers (2001-2011)

This is another way to discuss the decadal change of child sex ratio by subtracting sex ratio of present census year (2011) from sex ratio of former census year (2001) of total, rural and urban population separately regarding Muslim and total population of West Bengal. By taking into

_____
Journal for all Subjects : www.lbp.world

5

_____

consideration of this aspect, it has been found here also that both positive and negative change (increase and decrease in child sex ratio respectively) have taken place in rural as well as in urban areas. In terms of total population of this state, there was more number of districts under negative change in rural areas (13 districts) than urban areas (9 districts) but the extent of urban change is higher than rural change. For example, the districts like Darjiling, Jalpaiguri, Maldah, Birbhum and Nadia where the negative change of rural areas is lower than urban areas. It means that child sex ratio has decreased at large number in urban areas while rural areas have experienced comparatively lower negative change during the last decade. It is noteworthy that the highest negative change in urban areas has been recorded by Maldah (-61) which was also the highest representative with – 34 (including 947 in 2001 and 913 in 2011) in terms of overall sex ratio (census of India). So, there is a strong positive relationship between sex ratio and child sex ratio. In one hand, the negative change urban areas was higher than the rural areas but on the other hand, half number of districts have represented positive change in terms of urban child sex ratio. Out of half (9 districts), eight districts are from the southern part of this state namely Murshidabad, North Twenty Four Parganas, Hugli, Puruliya, Medinipur, Haora, Kolkata and South Twenty Four Parganas. Only one district i.e. Uttar Dinajpur belongs to northern districts. Therefore, declining of urban child sex ratio is more vulnerable in northern districts than southern districts. The similar condition has also been found with rural child sex ratio.

Coincidently, the numbers of districts with negative change of rural and urban areas are same i.e. 13 and 9 respectively in case of Muslim population like total population but the spatial pattern is totally different. Rural child sex ratio in all the northern districts has experienced negative change and it starts from Darjiling stretching to Birbhum with remarkable negative numbers of child females which contains eight districts in this patch of huge area. It has again held its feet in another small patch comprising of Nadia, North Twenty Four Parganas and Hugli by characterising negative change. All the districts with positive change like Barddhaman, Bankura and Haora are situated in the southern part of the state. So, the state is divided into parts wherein northern districts represent negative change and southern districts represent the positive change. Contrary to this, urban Muslim child sex ratio decadal change including positive and negative have been found very unevenly distributed over the districts of West Bengal (table 1). It is very interesting to note that Malda has achieved a positive change of 42 female children which has been discussed earlier as well, such change is very prolific in looking but there is still a negative change number in terms of total Muslim population (-5). It is noteworthy that a dramatic huge negative change of -305 females has taken place in Dakshin Dinajpur around which no districts could reach due to the sharp decline of child sex ratio from 1176 in 2001 to 871 in 2011. It is thus because, child sex ratio was climbed up after the division of West Dinajpur into parts i.e. Uttar Dinajpur and Dakshin Dinajpur in 1992 wherein Dakshin Dinajpur is very small district with only 1565 urban Muslims in 2001 which has raised to 2112 persons in 2011. The population has increased by almost 35 per cent in last decade with the down falling of child sex ratio by 305 child females (table 1). It directly indicates that male and female children have not been preferred proportionally demonstrating the practice of higher number of male selective birth in urban areas of this district than any other districts of West Bengal. Therefore, Muslim child sex ratio is very vulnerable in urban areas of Dakshin Dinajpur. Other remarkable districts with high urban negative change were Darjiling, Uttar Dinajpur and Barddhaman. Moreover, Child sex ratio of West Bengal concerning with total and Muslim population has categorically represented negative change during the last decade (table 1). Irrespective of religion, child sex ratio of West Bengal has really declined between 2001 and 2011 which is one way or other a threat to the society where it is believed that females are the half of total living population.

_____

Table 1: Rural-Urban Difference of Total and Muslim CSR (0-6 years) in West Bengal

Districts	2001								2011							
	Total				Muslim				Total				Muslim			
	Total	Rural	Urban	Difference	Total	Rural	Urban	Difference	Total	Rural	Urban	Difference	Total	Rural	Urban	Difference
Darjiling	962	968	942	26	987	1000	939	61	953	965	930	35	942	961	897	64
Jalpaiguri	969	969	970	1	973	974	966	8	955	957	949	8	956	957	952	5
Koch Bihar	964	963	971	8	969	969	975	6	948	949	937	12	951	950	984	34
Uttar Dinajpur	965	967	936	31	972	972	958	14	953	953	955	2	953	954	928	26
Dakshin Dinajpur	966	966	961	5	967	967	1176	209	957	957	958	1	950	951	871	20
Maldah	964	965	943	22	965	966	904	62	950	960	882	78	960	961	946	15
Murshidabad	972	972	966	6	976	976	974	2	968	968	970	2	971	970	973	3
Birbhum	964	965	950	15	968	969	945	24	959	962	934	28	954	956	935	21
Barddhaman	956	958	953	5	961	955	980	25	951	962	935	27	963	965	958	7
Nadia	972	972	967	5	979	979	971	8	960	962	953	9	966	966	967	1
North Twenty Four Parganas	958	963	950	13	968	972	949	23	956	960	951	9	963	965	957	8
Hugli	951	957	936	21	955	963	927	36	952	954	948	6	957	954	965	11
Bankura	953	952	969	17	952	950	1004	54	949	947	965	18	961	959	998	39
Puruliya	964	967	932	35	966	975	897	22	953	956	933	23	960	975	921	54
Medinipur (Purba and Paschim)	951	951	957	6	965	965	967	2	955	954	965	11	955	955	959	4
Haora	956	962	948	14	958	952	966	14	962	965	960	5	966	961	968	7
Kolkata	927	0	927	#	918	0	918	#	933	0	933	#	935	0	935	#
South Twenty Four Parganas	964	965	955	10	971	973	957	16	963	964	957	7	963	965	954	11
West Bengal	**960**	**963**	**948**	**15**	**968**	**970**	**952**	**18**	**956**	**959**	**947**	**12**	**961**	**962**	**957**	**5**

(i)#rural population is absent (ii) Purba and Paschim Medinipur are calculated together due to undivided Medinipur in 2001.

Source: (i) Calculated by authors from the table of census of India for relevant years

4.2. Rural-Urban Differential Index (RUDI)

After the discussion regarding the extent of rural-urban difference in CSR, the study demands a detailed analysis on the degree of such difference of total and Muslim population. In order to deliver the degree of difference between rural and urban areas regarding CSR, rural-urban differential index (RUDI) method has been brought in picture which is applied to calculate the differential index of total and Muslim population for each districts of West Bengal (table 2). Meanwhile, the resulted index values of total and Muslim population have been compared subsequently with due time span of 2001 and 2011 and finally the agenda of this section ends with decadal change of RUDI of total and Muslim population.

_____

Table 2: Rural-Urban Child Sex Ratio Differential Index (DI) of Total and Muslim Population of West Bengal

| District	2001		2011		Decadal Change (2001-2011)	
	Total	*Muslim*	*Total*	*Muslim*	*Total*	*Muslim*
Darjiling	0.027	0.062	0.037	0.068	+0.010	+0.006
Jalpaiguri	-0.001	0.008	0.008	0.005	+0.009	-0.003
Koch Bihar	-0.008	-0.006	0.013	-0.036	+0.021	-0.030
Uttar Dinajpur	0.032	0.014	-0.002	0.027	-0.034	+0.013
Dakshin Dinajpur	0.005	-0.216	-0.001	0.084	-0.006	+0.300
Maldah	0.023	0.064	0.082	0.016	+0.059	-0.048
Murshidabad	0.006	0.002	-0.002	-0.003	-0.008	-0.005
Birbhum	0.016	0.025	0.029	0.022	+0.013	-0.003
Barddhaman	0.005	-0.026	0.028	0.007	+0.023	+0.033
Nadia	0.005	0.008	0.009	-0.001	+0.004	-0.009
North Twenty Four Parganas	0.014	0.024	0.009	0.008	-0.005	-0.016
Hugli	0.022	0.038	0.006	-0.011	-0.016	-0.049
Bankura	-0.018	-0.057	-0.019	-0.041	-0.001	+0.016
Puruliya	0.036	0.081	0.024	0.056	-0.012	-0.025
Medinipur (Purba and Paschim)	-0.006	-0.002	-0.012	-0.004	-0.006	-0.002
Haora	0.015	-0.015	0.005	-0.007	-0.010	+0.008
Kolkata	#	#	#	#	#	#
South Twenty Four Parganas	0.010	0.016	+0.007	0.011	-0.003	-0.005
West Bengal	**0.016**	**0.019**	**0.013**	**0.005**	**-0.003**	**-0.014**

Note: # = rural sex ratio is absent in Kolkata, {1. (+) and (-) are used for indicating that DI has increased and decreased for each group i.e. total and Muslim population respectively in decadal change columns.
Source: calculated by authors on the basis of table 1

4.2.1. RUDI of CSR of Total and Muslim Population

The RUDI values of total and Muslim population of West Bengal explicitly reveals a down falling trend in rural-urban difference of CSR (figure 3). According to this figure, the trend line of 2001 moves upward but the trend line of 2011 has slipped downward. It means that CSR difference between rural and urban areas has fallen down during 2001 and 2011. It is noteworthy that most of the districts out of total number of districts have been found in positive quartile (+, +) which inculcates the dominance of rural CSR over urban CSR in both census years. Moreover, such difference is increased substantially in Malda district for total population (+0.023 to +0.082) and Muslim population (+0.064 to +0.066) which place this district at the extreme right of the scatterplot. The differential index of Muslims in Malda (+0.066) is really quite high but it has been surpassed by Dakshin Dinajpur with +0.084 which is in fact the highest among all the districts in 2011 and in 2001 as well that of -0.216 nevertheless with the dominance of urban CSR. Therefore, the decadal change of RUDI in all the districts may present actual detailed analysis in identifying the changing pattern of rural-urban CSR difference of Muslims (figure 4).
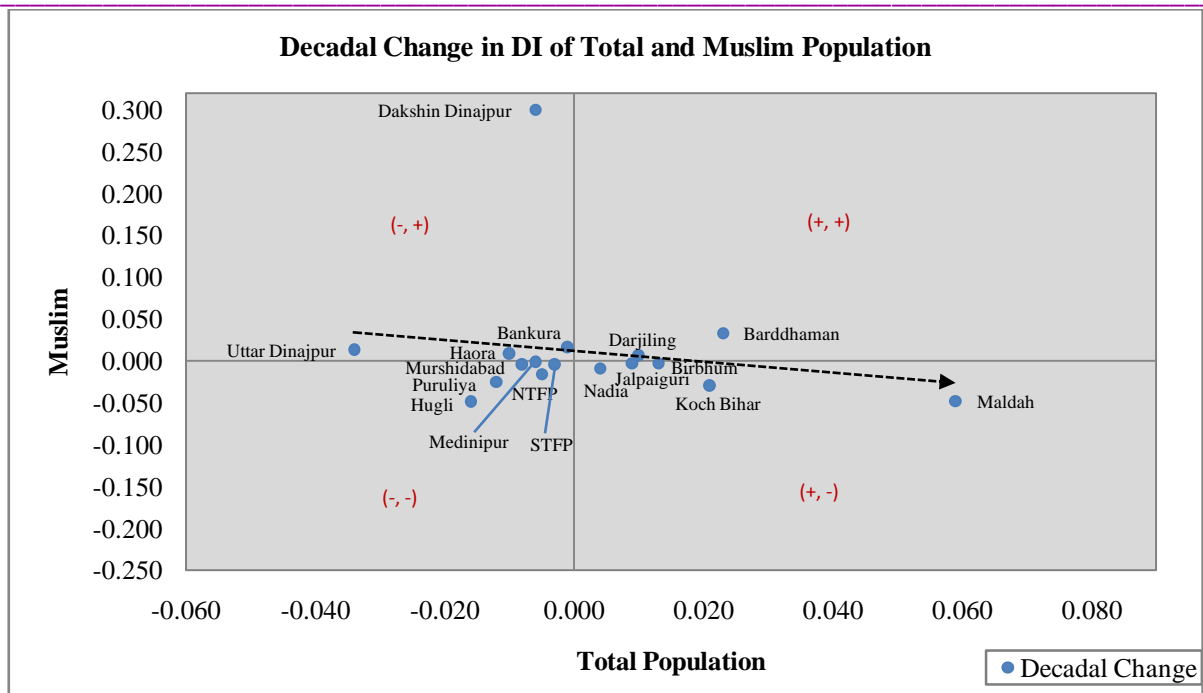
_____

_____
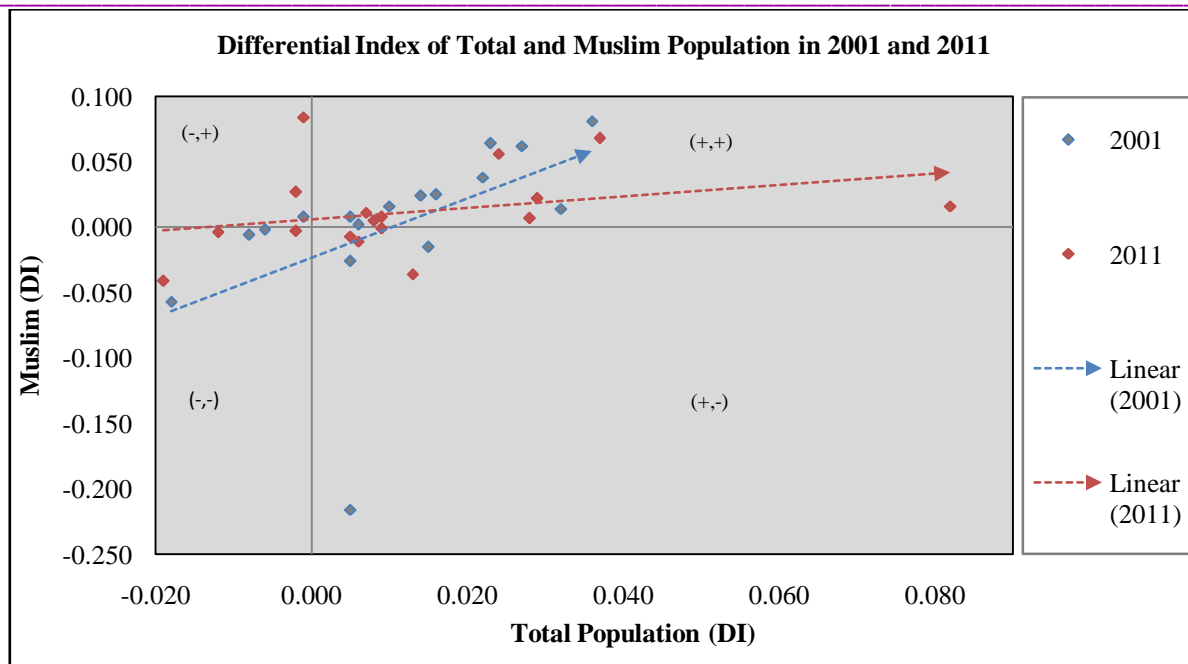
Figure 3: Differential Index of Total and Muslim Population in 2001 and 2011

4.2.2. Decadal Change in RUDI of Total and Muslim Population

     All the districts of West Bengal have taken their places in four quartiles as per the change in RUDI of CSR during 2001 and 2011 (figure 4). Only two districts namely Darjiling and Barddhaman have occupied the positive quartile thereby means still the dominance of rural CSR over urban CSR in terms of both total and Muslim population. Contrary to this, both total and Muslim population have experienced negative decadal change in Murshidabad, Puruliya, Hugli, Medinipur (Purba and Paschim), North Twenty Four Parganas and South Twenty Four Parganas. All these districts are located in the southern part of West Bengal where RUDI of CSR has declined substantially with improving socio-economic condition including literacy and work participation. It has been noticed that Medinipur is the only district which has been dominated throughout both the decades by urban CSR over rural CSR. Division of Medinipur in 2002 has played a crucial role in such kind of dominance of urban CSR. RUDI of Muslim has faced positive growth in Dakshin Dinajpur, Uttar Dinajpur, Haora and Bankura where total population is attributed by negative growth. In contrast, RUDI of total population has settled its feet with positive growth rate in Jalpaiguri, Koch Bihar, Malda, Birbhum and Nadia where Muslims enjoyed negative growth during the last decade. As per the figure 4, the bottom districts like Puruliya, Hugli, Koch Bihar and Malda have managed to reduce the rural-urban difference in CSR while it has increased highly in Dakshin Dinajpur from -0.216 in 2001 to +0.084 in 2011. Eventually, out of three Muslim majority districts Murshidabad and Malda have been found in reduction of CSR and this declining trend may place both rural and urban child sex ratio in one single equilibrium line in future decades.

_____

_____

Note: NTFP = North Twenty Four Parganas, STFP = South Twenty Four Parganas
Figure 4: Decadal Change in RUDI of Total and Muslim Population

4.3. Determining Factors for Rural-Urban CSR Differential and Improvement in Child Health in West Bengal

Linear regression analysis has represented a detailed account regarding the relationship between CSR and its distinctive determinant factors shaping the investigation to find out the best influential factors (table 3). It has been noticed that decadal growth rate of West Bengal has played a positive role for an increase of Muslim CSR in both rural ($r = 0.142$) and urban ($r = 0.011$) areas but very week negative relationship has been observed between urban CSR ($r = -0.038$) of total population and decadal growth rate. So, it can be said that greater the child sex ratio, greater the growth rate in overall population. This is noteworthy that fertility of ever married women and percentage of urban population provoke child sex ratio in rural areas while these reduce the CSR in urban areas because spontaneous abortion is really low and induced abortion is high in urban areas than rural areas for not only Muslim women but also for women of total population. The rate of live birth is another important factor which controls Muslim CSR in different degree characterizing inverse relationship between rural ($r = -0.055$) and urban ($r = 0.135$) areas . So, low live birth of rural Muslim child may reduce the rural-urban disparity in CSR. The modes of abortion .i.e. spontaneous and induced are closely associated with the place of delivery because it is really important to make sure that the abortion or delivery is being exercised in safe hand or safe place. In West Bengal, Muslim CSR of rural areas is more likely to improve than urban areas with the improvement of institutional delivery, assistance of skilled personnel and decline in delivery costs (see place of child delivery and cost in table 3). Moreover, SBA delivery is more active in urban areas ($r = 0.189$) than rural areas ($r = -0.060$) resulting less surveillance of skilled personnel at the time of birth. Therefore, any kind of complications or malfunctioning may harm newborn child or lead to death.

_____

Table 3: Outcomes of Linear Regression Analysis between CSR and Determinant Variables, West Bengal

Determinant Variables	Muslim CSR		Total CSR	
	Rural (*r*)	Urban (*r*)	Rural (*r*)	Urban (*r*)
Demographic Indicators				
Decadal Growth Rate (2001-11)	0.142	0.011	0.163	-0.038
Number of Male child aged 0-6 years	0.471**	0.468**	0.384***	0.244
Number of Female child aged 0-6 years	0.476**	0.470**	0.394***	0.250
Fertility rate of ever married women	0.230	-0.199	0.124	-0.039
Percentage of Urban Population	0.242	-0.053	0.462	-0.057
Birth and Abortion				
Live birth	-0.055	0.135	-0.046	-0.420**
Still birth	-0.085	-0.028	0.064	0.624*
Induced abortion	0.144	0.091	0.016	0.321***
Spontaneous abortion	0.006	-0.262	0.049	0.167
Antenatal Care				
Any ANC Check up	-0.175	0.139	-0.177	0.017
Government Health Facility	-0.150	-0.049	-0.205	0.470**
Government ICDS/Mobile Unit	0.408**	-0.078	0.068	0.115
Private health facility	-0.464	0.112	-0.350***	-0.077
Others	-0.268	0.324***	-0.309	0.471**
Place of Child Delivery and Cost				
percentage of women who had institutional delivery	-0.034	0.149	-0.086	-0.089
percentage of women who had delivery at home	-0.037	-0.191	0.073	0.060
Home delivery assisted by skilled personnel	-0.043	-0.009	0.119	0.191
Percentage of SBA Delivery	-0.060	0.189	-0.061	-0.038
Delivery cost (in Rs)	-0.240	0.251	-0.060	-0.031
Availability of Facility and Health Personnel				
Primary and middle school	-0.121	0.110	-0.034	0.130
Sub-Health Centre	0.040	0.204	0.117	0.0470
PHCs	-0.056	0.366***	0.013	0.322***
Any government health facility	0.047	0.220	0.131	0.057
Anganwadi Centre	0.028	0.118	0.099	0.150
VHNSC	0.002	0.352***	-0.049	-0.069
Sterilization and Contraception				
Current use of family planning methods (percent)	-0.219	0.252	-0.308	0.181
Any Modern method	-0.210	0.178	-0.327***	0.101
Male Sterilization	-0.233	0.038	-0.175	0.068
Female Sterilization	-0.071	0.161	-0.371***	0.184
IUD	0.387***	-0.276	0.354***	-0.011
Pill	-0.114	0.002	0.192	-0.069
Condom	-0.120	-0.019	-0.151	-0.247
Rhythm method	0.097	0.123	0.303	0.037
Withdrawal method	-0.037	-0.037	-0.110	0.133
Other	0.322***	-0.402**	0.323	-0.530**
Socio-Economic Conditions				

With electricity	-0.18	-0.054	0.274	-0.149
Improved source of drinking water	-0.241	0.335***	-0.095	0.414**
Improved access to Sanitation	-0.360***	0.081	0.046	-0.033
Using liquefied Petroleum Gas	-0.280	-0.136	0.022	-0.272
Living in pucca house	0.172	0.181	0.117	0.010
Having BPL card	-0.192	-0.050	-0.279	0.068
N	**18**	**19**	**18**	**19**

* p< 0.01, ** p < 0.05, *** p < 0.1

Note: Kolkata is excluded from rural CSR because rural population is absent in Kolkata, N = number of districts, ANC = Ante-natal Care, ICDS= Integrated Child Development Services, SBA = Skilled Birth Attendant, PHC = Primary Health Centre, VHNSC = Village Health Nutrition and Sanitation Committee, BPL = Below Poverty Line, IUD = Intra-uterine Device

Source: (i) Census of India, 2011 (ii) DLHS (District Level Household and Facility Survey), 2012-13

Antenatal care is another equally important factor for affecting child sex ratio wherein it plays its role after the birth of child. It includes three types of care like government health facility, private health facility and others. Government health facilities can be divided further into two types like government health facilities and ICDS or mobile unit whereas ICDS is the scheme of Indian government which provides preschool education, food, primary health care to children of under 6 years age and their mother and is really an effective factor for improving Muslim CSR in rural areas of West Bengal (table 3). Rural children's are more likely to have these basic facilities than urban children. Therefore, rural CSR is found in positive correlation with ICDS (r = 0.408) in West Bengal and has been found statistically significant. Nevertheless, it is very unusual that government health facility is negatively correlated with Muslim child sex ratio of both rural (r = -0.150) and urban (r = -0.049) areas while it is positively co-related with only urban CSR (r = 0.470) of total population. May be, it is because government facilities are operated muliti-dimentionally with different degree of effectiveness. Moreover, ANC check-up is usually exercised more in urban areas than rural areas of West Bengal. Rural women are not aware about different antenatal care and check-up which are provided by the government for free of cost at different concerned places. The facilities are basically available at primary and middle school, sub-health centres; primary health centres (PHCs); Anganwadi centres; and VHNSC. These centres generally provide basic health care facilities and related information to take care of child and mother. More number of such kinds of health centres especially PHCs (r = 0.366) and VHNSCs (r = 0.352) can improve CSR of Muslims residing in urban areas of West Bengal (table 3). These health centres also provide information regarding sterilization and contraception to control the number of children in a family. Sterilization for both Muslim male and female are characterized by positive relationship with CSR in urban areas (r = 0.038 and 0.0161 respectively) but a completely opposite scenario has been found in rural areas (r = -0.233 and -0.071 respectively) because Muslims are afraid to commit such practice due to Islamic prohibition. Not only Muslim but also total rural male (r = -0.175) and female (r = -0.371) population and are not likely to commit sterilization. On the other hand, both female (r = 0.184) and male (r = 0.068) of urban areas are very much aware about sterilization and they perform it very effectively to control the number of children. In rural areas of West Bengal, females have been found to use IUD (Intra-uterine Device), pill and rhythm method to stop pregnancy. Males are also helpful to their wife to control the pregnancy in the form of withdrawal method. Health of child and mother is directly related with socio-economic conditions of the household. During the pregnancy and after the birth, child should be taken care with hygienic nourishment and proper nutrition. In West Bengal, improvement in sources of safe drinking water and sanitation accessibility considering the basic needs have acted inversely in improving total child sex ratio in rural and urban areas respectively. Unhygienic sources of drinking water and sanitation are the primary medium of transferring deadly diseases by which children are affected very easily. Som and Mishra (2014) had found out some crucial factors responsible for low CSR in West Bengal. These factors comprises of increasing pressure of male child preference and neglect of girl child; female child death rate at the age group of 0-4 years and 5-9

_____
Journal for all Subjects : www.lbp.world

12

_____

years is higher than male child death rate; and age sex selective abortion causing skewed sex ratio at birth through rampant misuse of technology.

5. CONCLUDING REMARKS AND RECOMMENDATIONS

The key findings reveals that child sex ratio of total population is more likely to decline in urban areas than rural areas of West Bengal while urban child sex ratio has increased more in southern districts than northern districts of this state. It has been also found that there is no relationship between Muslim concentration and their CSR difference between rural and urban areas. The RUDI method has also revealed a mesmerising picture where it has been noticed that CSR difference between rural and urban has been fallen down during 2001-2011 in West Bengal as a whole. However a pleasant negative growth has taken place during the last decade, the differential gap has extended further in Darjiling and Barddhaman in favour of both total and Muslim population. Some of important steps like Poorna Sakti, Kendra, State Plane for action for Children, Anganwari, Kanyashree etc.was launched by cooperation of state and central government for special care of improving child sex ratio especially female child, and women empowerment.For all the aforesaid steps implemented by government, West Bengal has become the second fastest infant mortality declining state in the country and child sex ratio has jumped to 956 which is higher than the national average of 919. The population growth rate has also decreased from 1.77 per cent in 1991-2001 to 1.39 per cent 2001-2011. It is evident that in patriarchal society, at least one boy child is very important while in many other societies, this has in turn affected reproductive behaviour which inculcates that the number born children is directly associated to ensuring at least one surviving male heir (Gietel-Basten et al., 2015; Repetto, 1972). Patriarchal society including Muslim community, thus, results deficit of female child in CSR although it is believed that sterilization among Muslims are prohibited according to Islamic rules.All the above factors have jointly come in picture to reduce CSR and enhance the rural-urban differential. In spite of all the mentioned schemes, West Bengal government should take one step ahead with the help of strict implementation of PC-PNDT (Pre-Conception and Pre-Natal Diagnostic Technology Act 1994) to regulate import of sex detection machines and to eliminate sex selective abortion which may become one of the ingredients of policy making in response to reduce rural-urban CSR differential not only in West Bengal but also in global arena.

REFERENCES

Census of India(2011), Gender Composition, Office of the Register General & Census Commissioner, Ministry of Home Affairs, Government of India.
http://censusindia.gov.in/Census_And_You/gender_composition.aspx

Chapter 4 Shodhganga.The Study area.
http://shodhganga.inflibnet.ac.in/bitstream/10603/52629/12/12_chapter%204.pdf

Gietel-Basten, S. &Verropoulou, G. M. X., Ping, Y. (2015),Indifferent Gender Preferences among Childless Beijing Citizens. https://journal.fi/fypr/article/view/51490/18255

Krishan G, &Shayam,M. (1978), Regional Aspects of Urban-Rural Differentials in Literacy in India: 1971, *Journal of Developing Areas,* 13(1): 11-22.

Repetto, R. (1972), Son Preference and Fertility Behavior in Developing Countries,*Studies in Family Planning1* 3 (4): 70–76.

Som, K. S.&Mishra R. P. (2014), Gender Imbalance: Trends, Pattern and its Impact on West Bengal,*International Journal of Scientific and Research Publications*, Volume 4, Issue 7, July 2014 1 ISSN 2250-3153.

Unisa, S. (2009), An Investigation into Masculinization of Sex Ratio in India, Paper presented at XXVI IUSSP International Population Conference. http://iussp2009.princeton.edu/papers/91884

West Bengal Action Plan on Climate Change (2010), Government of West Bengal Government of India.
http://www.moef.nic.in/downloads/public-information/West-Bengal-SAPCC.pdf.

_____

_____

WHO-SEARO (World Health Organization Regional Office for South-East Asia) (n.d.), Health situation and trend assessment.http://www.searo.who.int/entity/health_situation_trends/data/chi/sex-ratio/en/.

Md Safikul Islam
Research Scholar, Department of Geography, Jamia Millia Islamia, New Delhi

_____