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Spatio-Temporal Fertility Pattern in West Bengal (1981-2011)

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Abstract:
According to demographic transaction theory India comes into second stage which is characterized by high fertility and decline mortality rate due to improvement in health facilities and thus the rate of growth of population is increased. Fertility refers to the actual reproduction performance in a population based on the number of live birth that occurs in a population. It indicates the actual number of children born alive. The present study aims to analyze the spatio-temporal fertility pattern in West Bengal for four decades. The study was based on secondary data collected from Census of India, occurring in the population under consideration, being recorded regularly, were compared for the four decadal census years. Total fertility Rate (TFR) have been used as measures of fertility. The study reveals that overall there is decrease in total fertility rate in the state level i.e. and almost similar trend is maintained in its distribution by district.

1. Introduction

Fertility refers to actual reproductive performance of an individual, a couple, a group or a population. The fertility data were collected by asking all reproductive women at the age of 15-49 years to provide complete birth history of all children they had given birth to, those who were currently living with them those who were living away, and those who had died. Fertility is one of the three principal components of population dynamics, the other beings' mortality and migration (United Nations, 1973). Total fertility rate is considered to be a good measure of reproductive performance is defined as " the total number of children that would be born to a group of women, if the group passed through its reproductive span of life with these rates in each year" (Communication action research center, ISI, Calcutta, p.34). The process of demographic transition explains the change in fertility and mortality as societies develop (Coale 1984). Human fertility is as much a socio-economic process as a biological one (Robinson and Kanter 1988, McNicoll 1980). Fertility is the most important variable affecting population growth rate in most contemporary population. The variation in fertility. many times indicate, which in turn is strongly influenced by economic, social and demographic factors (Regassa 2007). The need to study fertility cannot be overemphasized because its impact on both population growth rate and other social, economic and cultural parameters (Saxena, S. (1975).

The identification and explanation of spatial variation in fertility has been considered an important component of the sub-disciplines of population geography and spatial demography (Boyle 2003, Coward 1986 and Woods 1986). The analysis of spatial variations in fertility contributes to the understanding and predicting of general determinants of fertility (Coward 1986). The interaction of various factors including place specific factors, has led to spatio-temporal change in fertility that have not been expected based on theoretical and national pattern of fertility (Chesnais 1996). Kiser and Whelpton (1949) have so well established the value of studying fertility patterns in terms of the socioeconomic status of the couples concerned that this variable has become an essentials ingredient in later fertility studies. P. M Kulkarni and M. Alagarajan (2005) observed that among Muslims fertility was higher than other religious in India and contraceptive prevalence lower than Hindus and Christians.

The aim of the paper is to analyze the trends and pattern of fertility rate in West Bengal during the decadal years 1981 to 2011. To discuss district wise distribution of fertility rate, in detail during 2011 and Fertility variation between two decades from 2001-2011.

1.1. Study Area

The state of West Bengal has been selected as a study area and district is chosen units of study. West Bengal is the 4th largest populous state and second largest population density state in India, covers about 88,750 km^2.The total population of the state is 91347736 and density of population was 1029 in 2011 Census. According to 2011 census literacy rate in West Bengal 77.08 and sex ratio 947. The Total fertility rate in West Bengal 2.0 per w in 2011, which is lower than India 2.7 per women.

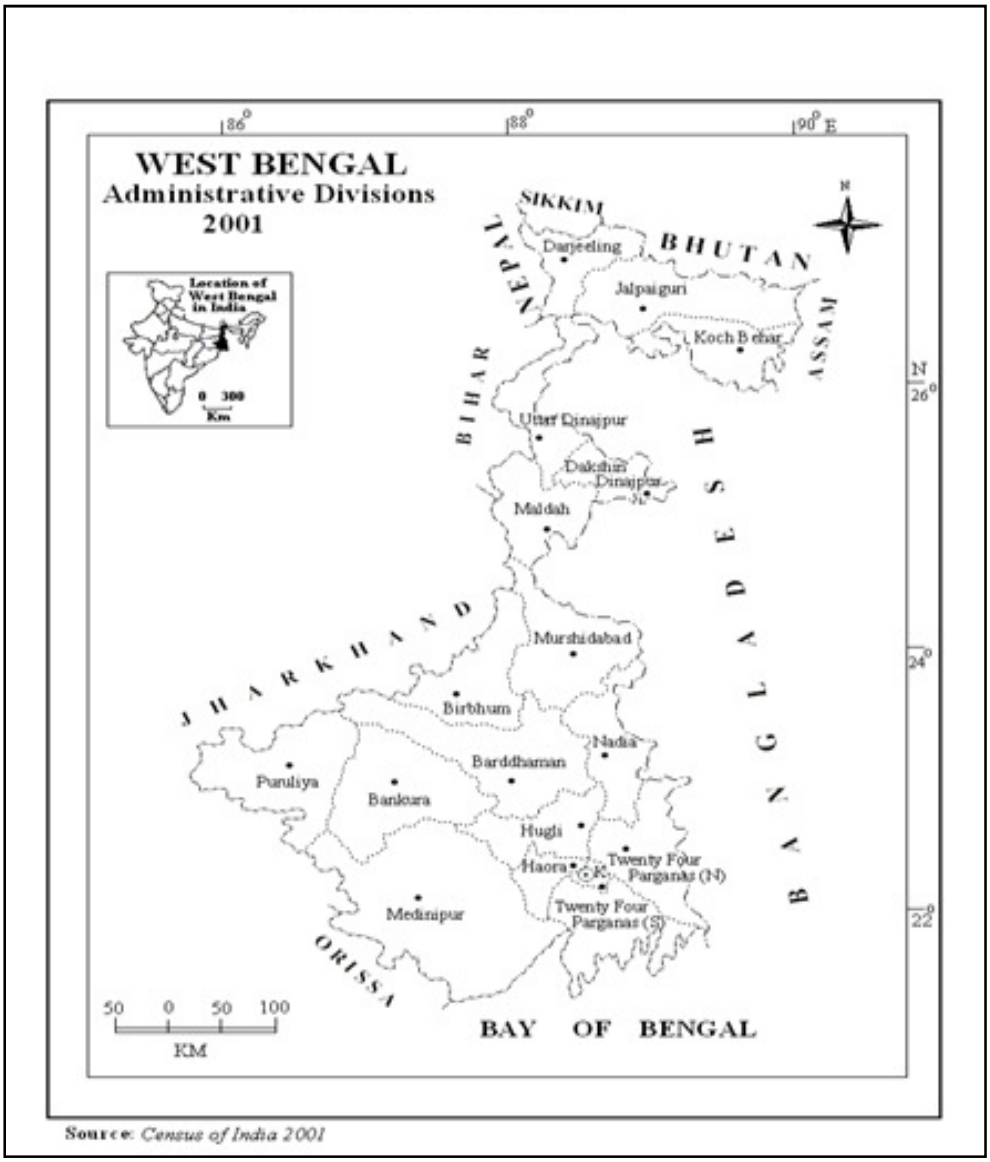

Figure 1: Study Area

1.2. Data Base and Methodology

The present study is mainly based on secondary data, collected from district census handbook, Census of India, various journals and statistical abstract of West Bengal for the year 1981 and 2011.The collected data are analyzed by calculated by suitable statistical techniques and maps and diagram are drawn and explanation are made. For the study of district level variation in fertility rate are categories into three categories high, medium and low. Some techniques are used to calculated data interval of total fertility rate.

The number of children who would be born per woman (or per 1,000 women) if she/they were to pass through the childbearing years bearing children according to a current schedule of age-specific fertility rate.

$TFR = \sum ASFR_a$(for single year age groups)

or

$TFR = 5 \sum ASFR_a$(for 5-year age groups)

Where: $\mathbf{ASFR_a}$ = age-specific fertility rate for women in age group *a* (expressed as a rate per woman).

1.3. Trends and Patterns of Fertility

The spatio-temporal analysis is discussed with the help of Table 1 and Fig 1,which express fertility scenario during the decadal year of 1981,1991,2001 and 2011 respectively. The total fertility rate (TFR) in West Bengal is continuously decreasing it was 4.2 per women in 1981 drooped to half 2.6 in 2001 and 2.0 in 2011. The total fertility rate has declined from high level of 4.2 per women in 1981 to 2.0 per women in 2011, which considered as one of the steepest decline in a with substantial improvement in socio-economic and health status that is generally expected for the decline to occur.West Bengal, well known for its advanced social indicators, has the fertility below the replacement level (2.0 children per women).But the range and rate of decline is discussion by district lie the state.

District	1981	1991	2001	2011
Darjeeling	4.20	3.50	2.10	1.60
Jalpaiguri	4.70	3.90	2.80	2.10
Koch Bihar	5.10	4.10	3.00	2.30
Uttar Dinajpur			4.30	3.20
Dakshain Dinajpur			2.10	2.10
Maldah	5.70	5.00	4.00	2.90
Murshidabad	5.50	4.90	3.50	2.70
Birbhum	4.40	3.80	2.30	2.30
Barddhaman	4.20	3.60	2.30	1.80
Nadia	5.10	3.70	2.40	1.70
North 24 Parganas	4.40	3.30	2.10	1.60
Hugli	4.20	2.90	2.00	1.60
Bankura	4.10	3.50	2.60	2.10
Puruliya	4.10	4.10	3.10	2.70
Haora	4.60	3.60	2.10	1.80
Kolkata	2.70	2.10	1.40	1.20
South 24 Parganas	4.40	4.90	3.00	3.00
Paschim Medinipur	4.90	3.70	2.60	2.00
PurbaMedinipur			2.60	2.00
West Bengal	4.20	3.20	2.60	2.00

Table 1: District wise Total Fertility Rate in West Bengal (1981-211)
Sources Census of India 1981, 1991, 2001 and 2011 (P)

District	Decadal Variation 2001-2011
Darjeeling	0.50
Jalpaiguri	0.70
Koch Bihar	0.70
Uttar Dinajpur	1.10
Dakshain Dinajpur	0.00
Maldah	1.10
Murshidabad	0.80
Birbhum	0.00
Barddhaman	0.50
Nadia	0.70
North 24 Parganas	0.50
Hugli	0.40
Bankura	0.50
Puruliya	0.40
Haora	0.30
Kolkata	0.20
South 24 Parganas	0.00
Paschim Medinipur	0.60
Purba Medinipur	0.60
West Bengal	0.60

Table 2: District wise Decadal Variation Total Fertility Rate in West Bengal (1981-211)

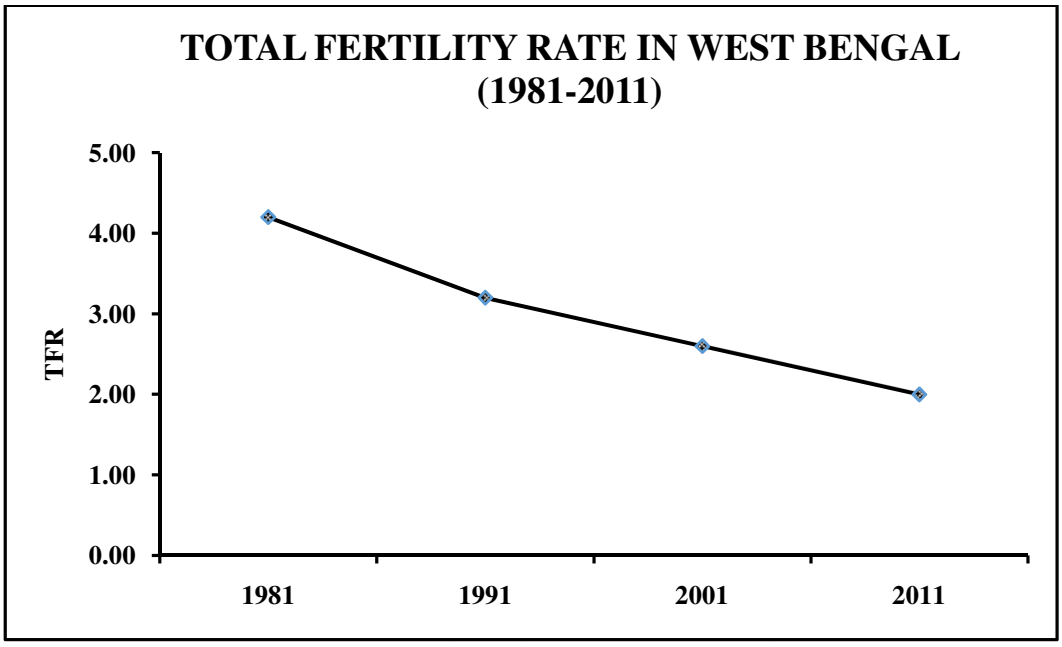

Figure 2: Total Fertility Rate in West Bengal

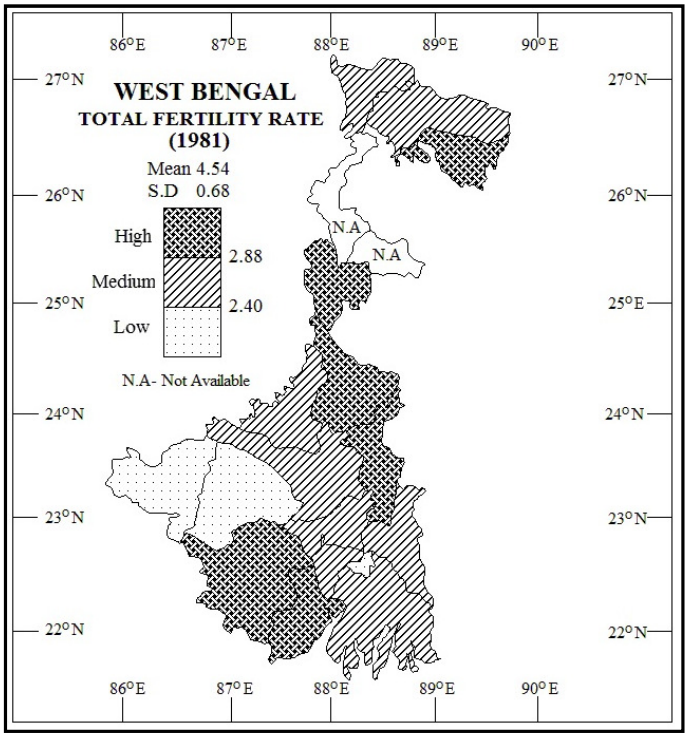

Figure 3

1.3.1. Fertility Pattern in 1981

The district wise distribution of TFR in 1981 is represented by Figure 3. The average total fertility rate in West Bengal was 4.2 in 1981, it varied from 5.7 per women in Maldah to 2.7 per women in Kolkata. There are five district have observed high total fertility rate (above 2.88 per women)these are Maldah (5.70), Murshidabad (5.50), Koch Bihar (5.10), Nadia(5.10), Paschim Medinipur (4.90) and Purba Medinipur (4.90) respectively, located in the north eastern and southern district of the state. Medium size of TFR (2.88-2.40) is observed in northern, central and eastern part of the state i.e. Jalpaiguri (4.70), Haora (4.60), Birbhum (4.40) North 24 Parganas (4.40), South 24 Parganas (4.40), Darjiling (4.20), Barddhaman (4.20) and Hugli (4.20).

The three district come into low fertility rate (below 2.40) category, these are Bankura (4.10) Puruliya (4.10) and Kolkata (2.70), which are observed central and western parts of the state.

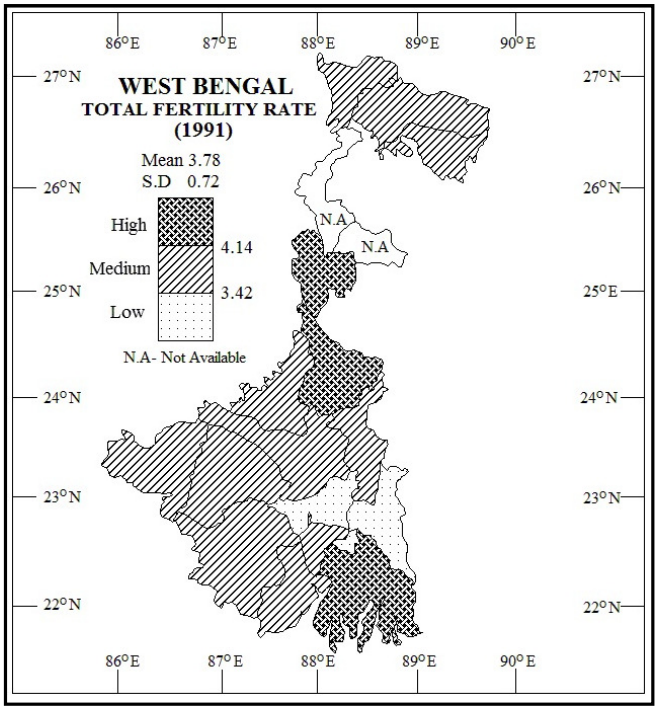

Figure 4

1.3.2. Fertility Pattern in 1991

The total fertility rate in1991 of West Bengal was improved compared to previous census year, i.e. it was 4.2 per women in 1981 and it was 3.20 in 1991. On the other hand fertility rate is also improving in all the district of West Bengal. The district wise distribution of TFR during 1991is shown by Figure 4. The aggregate TFR in West Bengal was3.20 per women, and maximum 5.00 in Maldha and minimum 2.10 in Kolkata. The high total fertility rate (above 4.14) was observed in three districts, i.e. Maldah (5.00), Murshidabad (4.90) and South 24Parganas (4.90)is situated central and south eastern parts of the state and low fertility rate (below 3.42) have found in three districts namely i.e. North 24 Parganas (3.30), Hugli (2.90) and Kolkata (2.10), which is to be found central and eastern parts of the state. The remaining 11 districts has confined medium fertility rate(4.14-3.42), these are Koch Bihar (4.10), Puruliya (4.10), Jalpaiguri (3.90), Birbhum (3.80), Nadia (3.70), Paschim Medinipur (3.70), Purba Medinipur (3.70), Barddhaman (3.60), Haora (3.60), Darjiling (3.50) and Bankura (3.50).

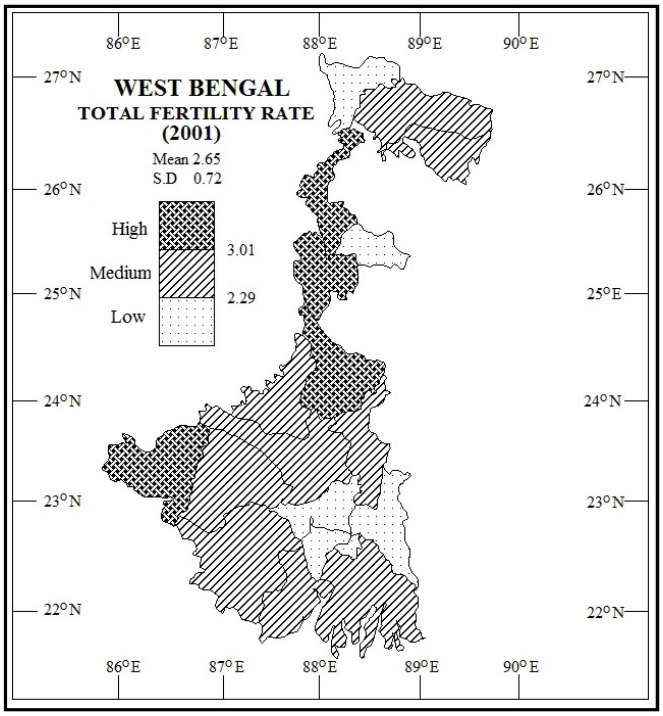

Figure 5

1.3.3. Fertility Pattern in 2001

The total fertility rate in West Bengal was 2.60 in 2001 it varied from 4.30 per women in Uttar Dinajpur to 1.4 per women in Kolkata. The district wise distribution of total fertility rate is quite uneven. So the district level TFR is categories into three categories i.e. high (above 3.01), medium (3.01-2.29) and low (below 2.29) is shown by Figure 5.The high TFR is observed in four district these are Uttar Dinajpur (4.30), Maldah (4.00) Murshidabad (3.50) and Puruliya (3.10) located western and central parts of the state. North central and southern parts of the state is experienced medium(3.01-2.29) category of fertility rate. This district isKoch Bihar (3.00), South 24Parganas (3.00), Jalpaiguri (2.80), Bankura (2.60), Paschim Medinipur (2.60), Purba Medinipur (2.60), Nadia (2.40), Birbhum (2.30) and Barddhaman (2.30). The low TFR (below 2.29) was observed in six district i.e. Darjiling (2.10), Dakshain Dinajpur (2.10), North 24 Parganas (2.10), Haora (2.10), Hugli (2.00) and Kolkata (1.40). This districts are located northern and eastern parts of the state.

1.3.4. Pattern Fertility in 2011

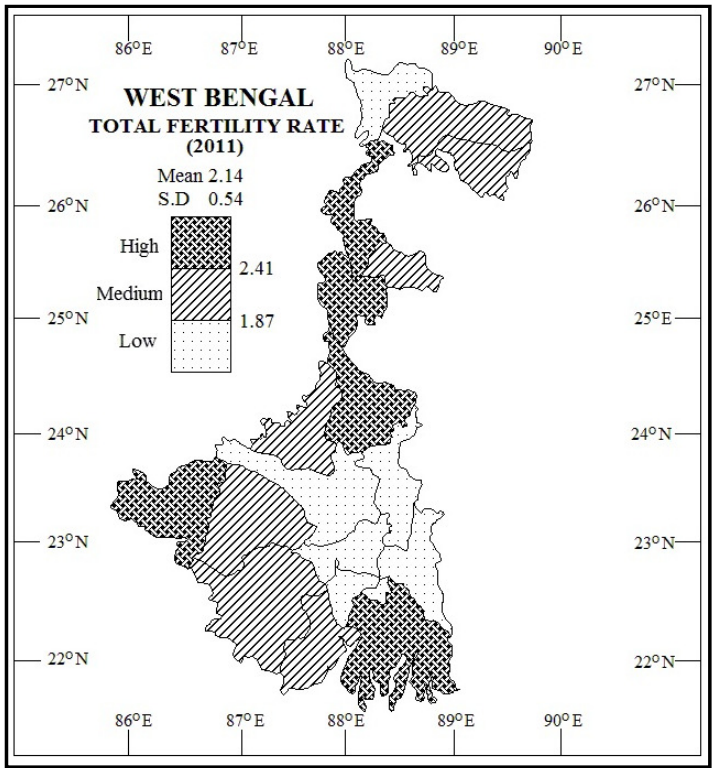

Figure 6

The total fertility rate in West Bengal during 2011 was 2.00 per women. Which is lower than previous decade and West Bengal also achieved replacement (2.1 per women) level of fertility.

The total fertility rate varied between district maximum fertility is observed 3.20 per women in Uttar Dinajpur and minimum 1.20 in Kolkata. For detail study about districts wise distribution of total fertility rate has been categories into three slabs i.e. high (above 2.41 per women) medium (2.41-1.87) and low (below 1.87) respectively. The distribution of total fertility as depicted in Figure 6, highlights that a prominent and notable zone of high level of total fertility rate (above 2.41 per women) is located in south western and eastern part comprising the districts of Uttar Dinajpur (3.20), South 24 Parganas (3.00), Maldah (2.90), Murshidabad (2.70) and Puruliya (2.70). This may be due to low literacy rate, high Muslim population, backward economic condition and socio cultural backwardness. The seven district of West Bengal fall under the medium level of total fertility rate (2.41-1.87) stretching north to south western part of the state. The district is Koch Bihar (2.30), Birbhum (2.30), Jalpaiguri (2.10), Dakshain Dinajpur (2.10), Bankura (2.10), Paschim Medinipur (2.00) and Purba Medinipur (2.00) respectively. Low level (below 1.87 per women) of total fertility rate has been observed in seven districts of the state. They are Barddhaman (1.80), Haora (1.80), Nadia (1.70), Darjiling (1.60), North 24 Parganas (1.60), Hugli (1.60) and Kolkata (1.20) located central and eastern parts of the state. All of these districts have higher level of literacy rate, urbanized district and socio economically developed.

1.3.5. District wise Decadal Variation Total Fertility Rate in West Bengal (1981-211)

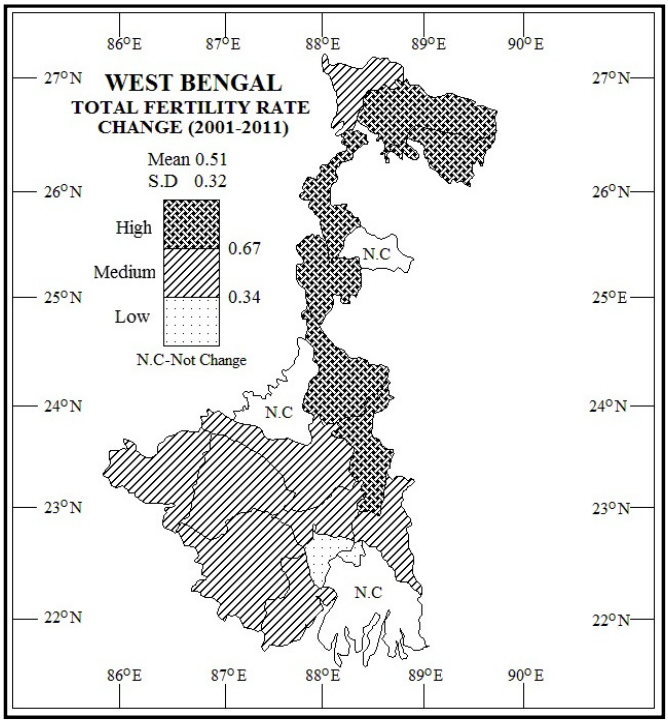

Figure 7

The decadal variation of total fertility rate during 2001-2011 has been presented in Table 2. In the state level during 2001-2011 TFR variation was 0.60 per women. The highest decadal variation was observed 1.10 per women in Maldha and lowest 0.20 in Kolkata during 2001-2011 years.

The district wise decadal variation is not equally distributed in all the district of West Bengal has been shown in Figure 7. High TFR variation has been reported in six districts are Maldah (1.10), Uttar Dinajpur (1.10), Murshidabad (0.80), Koch Bihar (0.70), Nadia (0.70) and Jalpaiguri (0.70), this district was observed in northern parts of the state. This district TFR slowly decline due to development in women education and awareness about family planning. It is observed that eight district of West Bengal have registered medium (0.67-0.34) level of TFR variation during 2001-2011. This district is Paschim Medinipur (0.60), Purba Medinipur (0.60), Darjiling (0.50), North 24 Parganas (0.50), Bankura (0.50), Barddhaman (0.50), Hugli (0.40) and Puruliya (0.40) respectively. Low TFR variation is observed in two districts, i.e. Haora (0.30) and Kolkata (0.20), located central parts of the state. This district has already developed in total fertility rate during previous decade so much variation is not observed in 2001-2011 years. It is also observed that Dakshain Dinajpur, Birbhum and South 24 Parganas district have no decadal variation during 2001-2011.

2. Conclusion

The above analysis shows that fertility levels have decrease of West Bengal in the past four decades from 1981 to 2011. The total fertility rate decline 4.20 per women in 1981 to 2.00 per women in 2011 in the state. The total fertility rate is decline in state level it also significant decline in all district of West Bengal during 1981 to 2011. It also observed that fertility of West Bengal is achieved below replacement level 2.0 per women in 2011. The level of fertility rate is sharply decline due to increasing levels of education, accessibility to better health care, and other aspects of modernization can be seen to be associated with fertility decline. There is so many variation has been observed in district level due to socio-economic and cultural factors significant impact on fertility. The districts level high TFR is observed Uttar Dinajpur, Maldha and Murshidbabad was constantly high total fertility rate on the other hand Kolkata and Hugli was regularly observed low fertility rate during four decade TFR in West Bengal. It seems to be found that most of the Muslim dominated district have register high fertility than other district. However, in a bid to reduce fertility rate, studies relating to its social inter-related factors have a major importance to national planners. For reducing fertility rate need to provide contraceptive, improve of medical facilities, fertility reduction oriented government policy, awareness of the people and increasing women education. Therefore, all the policy making agencies working in the field of fertility should formulate their programs oriented towards checking fertility in the areas where large concentration of minorities and backward communities are living. Thus the process of fertility decline can clearly have reinforced through variety of channels.

3. References

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