



(RESEARCH ARTICLE)



## The scenario of decadal variations in population growth in Purba Medinipur district of West Bengal: A comparative analysis

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World Journal of Advanced Research and Reviews, 2024, 23(02), 633–642

Publication history: Received on 25 June 2024; revised on 06 August 2024; accepted on 08 August 2024

Article DOI: <https://doi.org/10.30574/wjarr.2024.23.2.2361>

### Abstract

This study examines the decadal variations in population growth rate in Purba Medinipur district of West Bengal, India, between 1901 and 2011. Using a geographical analysis approach, we investigate the spatial patterns and demographic dynamics underlying population growth in the district. Our results show a declining population growth rate, from 26.3% in 1981-1991 to 15.36% in 2001-2011, with significant spatial variations across blocks and villages. Urbanization, literacy, and employment opportunities are identified as key factors contributing to the decline in population growth rate. In this paper the present study reveals the blockwise growth of population in Purba Medinipur district during 1901-2011. It has studied on the basis census of India report. The secondary data have been collected and computed by research. During 110 years (1901-2011) the highest decadal growth rate of total Population in the district is recorded in 1951 –1961 (28.34%) and lowest in 1911 – 21 decade (- 5.48%). Present paper analysed the spatial and temporal pattern of growth rate of population in Purba Medinipur district during the period of 1901-2011. The main objective in this paper is to understand the population growth rate of Purba Medinipur district, west Bengal.

**Keywords:** Population Growth Rate; Decadal Variations; Comparative Analysis; Purba Medinipur.

### 1. Introduction

According to the provisional results of 2011 national census, West Bengal is the fourth most populous state in India with a population of 91,347,736 (7.55% of India's population). Majority of the population comprises Bengalis. The Marwaris, Bihari and Oriya minority are scattered throughout the state; communities of Sherpa's and ethnic Tibetans can be found in Darjeeling Himalayan hill region. Darjeeling district has a large number of Gurkha people of Nepalese origin. West Bengal is home to indigenous tribal Adivasis such as Santals, Kol, Koch-Rajbongshi and Toto tribe. There are a small number of ethnic minorities primarily in the state capital, including Chinese, Tamils, Gujaratis, Anglo-Indians, Armenians, Punjabis, and Parsis. India's sole Chinatown is in eastern Kolkata. The official language is Bengali and English. Nepali is the official language in three subdivisions of Darjeeling district. As of 2001, in descending order of number of speakers, the languages of the state are: Bengali, Hindi, Santali, Urdu, Nepali, and Oriya. Languages such as Rajbongshi and Ho are used in some parts of the state. As of 2001, Hinduism is the religion at 72.5% of the total population, while Muslims comprise 25.2% of the total population, being the second-largest community as also the largest minority group; Sikhism, Christianity and other religions make up the remainder. The state contributes 7.8% of India's population. The state's 2001–2011 decennial growth rate was 13.93%, lower than 1991–2001 growth rate of 17.8%, and also lower than the national rate of 17.64%. The gender ratio is 947 females per 1000 males. As of 2011, West Bengal has a population density of 1,029 inhabitants per square kilometer (2,670 /sq mi) making it the second-most densely populated state in India, after Bihar. The literacy rate is 77.08%, higher than the national rate of 74.04%. Data of 1995–1999 showed the life expectancy in the state was 63.4 years, higher than the national value of 61.7 years.

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About 72% of people live in rural areas. The proportion of people living below the poverty line in 1999–2000 was 31.9%. Scheduled Castes and Tribes form 28.6% and 5.8% of the population respectively in rural areas, and 19.9% and 1.5% respectively in urban areas. This is the fourth-lowest crime rate among the 28 states and 7 union territories of India. West Bengal was the first Indian state to constitute a Human Rights Commission of its own.

The demographic history of Purba Medinipur is a history of continuous growth from the eighteenth century, in which the growth of trade, commerce, industry, transport and employment potential have always played a significant role for the attraction of in-migrants especially in the eastern part of the district. The population growth rate of Purba Medinipur district has declining population growth rate, from 26.3% in 1981-1991 to 15.36% in 2001-2011, with significant spatial variations across blocks and villages. Population growth rates vary significantly across different blocks and villages, with higher growth rates in urban areas and lower growth rates in rural areas. Fertility rates have declined, while mortality rates have remained stable, contributing to the decline in population growth rate.

Urbanization, literacy, and employment opportunities have increased, leading to a decline in population growth rate. Coastal areas have higher population growth rates due to migration and urbanization, while interior areas have lower growth rates due to out-migration. Family welfare programs and population control measures have been effective in reducing population growth rates. Some blocks have higher population growth rates due to influx of migrants, while others have lower growth rates due to out-migration. Urban areas have higher population growth rates, while rural areas have lower growth rates, indicating urbanization and migration patterns. In respect of this point of view the present study of population growth in purba Medinipur district has been undertaken.

### 1.1. Location of the study area

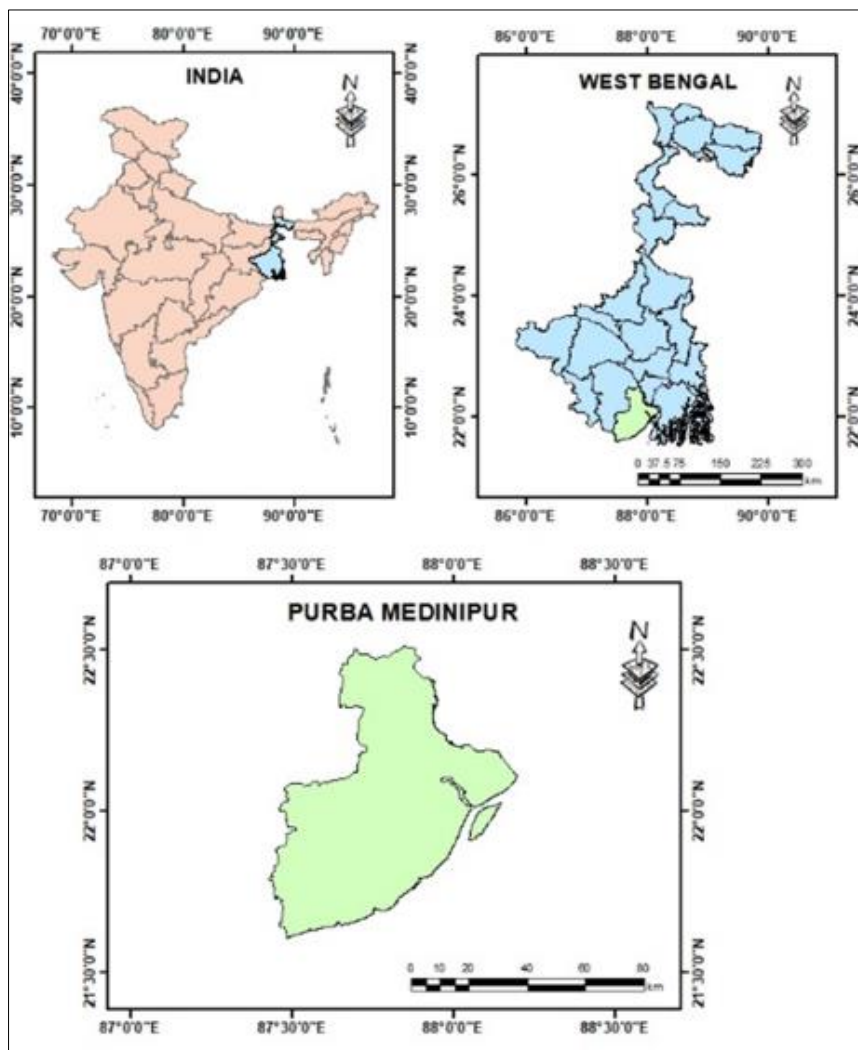


Figure 1 Location map

Purba Medinipur district is located in the Indian state of West Bengal . The district is the southernmost district of the Medinipur division, which is one of the five administrative divisions of West Bengal. The neighboring districts and bodies of water include to the north and west: Paschim Medinipur, Southwest border: the state of Odisha, South: the Bay of Bengal, East: the Hooghly river and Purba Medinipur district, Northeast: Howrah district

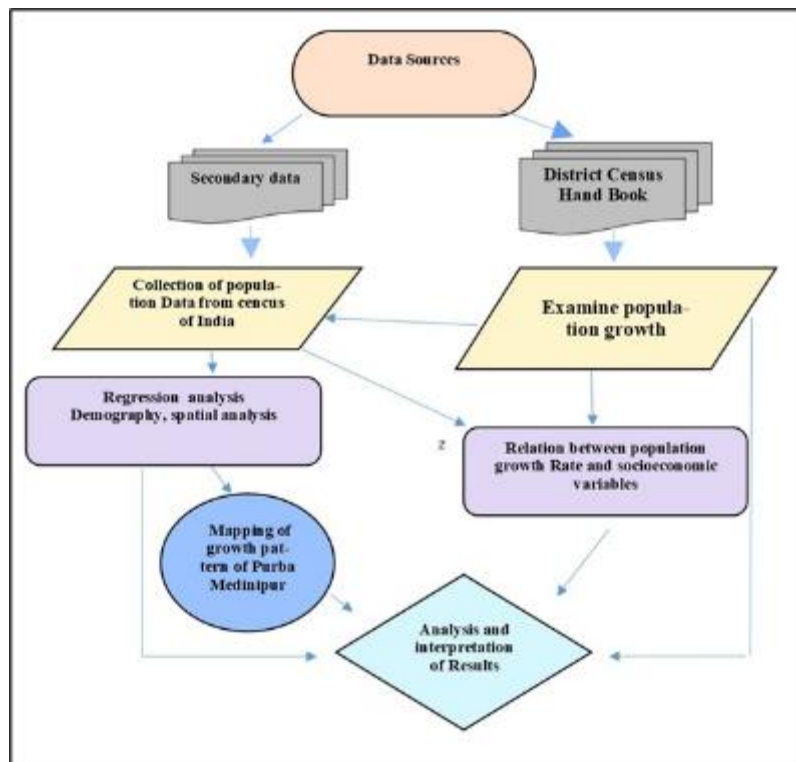
Purba Medinipur district, most populated district in West Bengal is located in the southernmost part of the deltaic plains of Bengal. The district is situated between 21.9373° N, 87.7763° E. East Midnapore (or Purba Medinipur) is one of the 23 administrative districts of West Bengal with its headquarters located at Tamluk. The district was carved out of the erstwhile Medinipur district on January 1, 2002. The largest district in West Bengal resembles an irregular triangle in shape. It has artificial land frontier as well as natural water boundaries. The study area is constituted by 4 Sub-Division, 5 Municipality and 25 no of Blocks under Purba Medinipur District.

**Objectives**

- To analyze the decadal population growth rate of Purba Medinipur district between 1901 and 2011.
- To identify spatial patterns of population growth rate across different blocks and villages of Purba Medinipur.
- To provide a geographical perspective on population growth and its dynamics in Purba Medinipur.
- To study the decadal changes of urban, rural and Sex Ratio in the district.

**2. Data base and methodology**

In this paper the present study reveals the blockwise growth of population in Purba Medinipur district during 1901-2011. The present study is based entirely on the secondary sources of data which have been obtained from District Census Hand Book of Medinipur: 1951, 1961, 1971 ,1981, 1991 and 2001, and; District Census Hand Book of Purba Medinipur 2011: Primary Census Abstract and many other relevant published reports and documents Some cartographic techniques have been used to show the patterns and changes of population growth and few maps have been prepared with the help of Arc info GIS software and Microsoft Excel for data processing and visualization. In order to assess the population growth, the following formula was used - Decadal growth rate calculation using the formula:  $((\text{Population in later year} - \text{Population in earlier year}) / \text{Population in earlier year}) * 100$



**Figure 2** Flow chart of methodology

### 3. Results and discussion

#### 3.1. Pre-Transition Equilibrium stage (period of 1901-1951)

In the period of (1901-1951) birth rate and death rate were high. So, this period may call as Pretransition Equilibrium stage. In this phase average population growth rate was 3.982 percent. In 1921, Purba Medinipur district recorded negative population growth rate -5.48 per cent .As a result of which this year (1921) may call as “Demographic divide” of Purba Medinipur district. The high mortality during this period was due to impact of First World War and low availability of medical facilities.

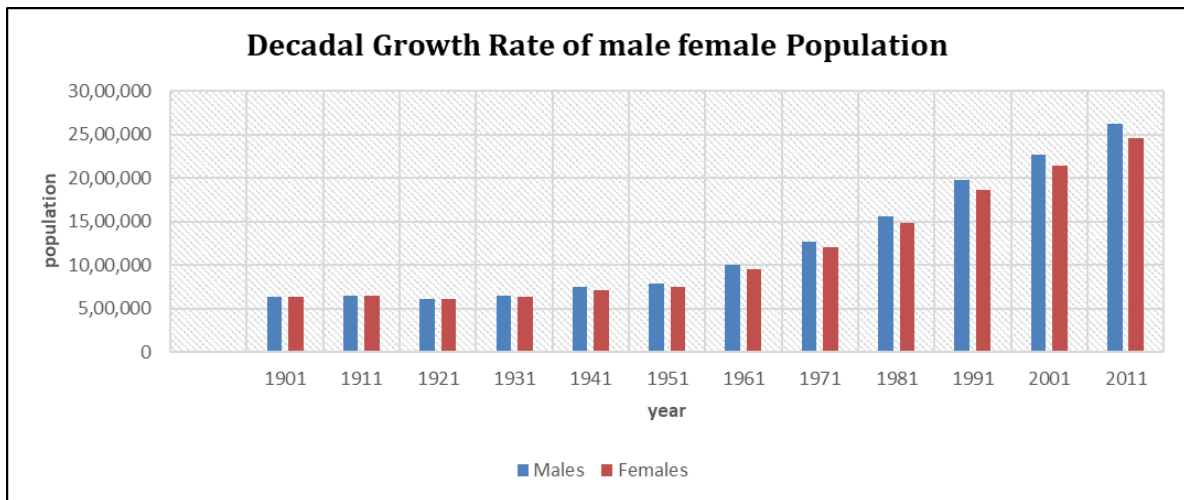
#### 3.2. Early Transition stage (1951-1991)

The characteristic of early transition stage is high birth rate and low death rate. These results increase in population. If we see the time period 1951-1991, the population growth rate was highly increased, like that between 1951 -1961 population growth rate was 28.34 per cent and between 1981 to 1991 population growth rate was 26.30 per cent. In this phase, the overall population increased 25.96 per cent and urban population was 9.9 per cent as well as rural population was 90.1 per cent. The reason for increase in population was gradual decline of mortality rate. The mortality rate declines due to more availability of medical facilities, increase in literacy and an improvement of agricultural activities throughout the district.

**Table 1** Purba Medinipur District: Decadal Growth Rate of Population

State/Union Territory/District	Census Year	Persons	Variation since the preceding census		Males	Females
			Absolute	Percentage		
Purba Medinipur	1901	12,68,984	---	---	6,32,525	6,36,459
	1911	12,83,583	+14,599	+1.15	6,41,843	6,41,740
	1921	12,13,270	-70,313	-5.48	6,09,511	6,03,759
	1931	12,73,524	+60,254	+4.97	6,44,714	6,28,810
	1941	14,51,672	+1,78,148	+13.99	7,42,374	7,09,298
	1951	15,28,279	+76,607	+5.28	7,84,414	7,43,865
	1961	19,61,409	+4,33,130	+28.34	10,05,105	9,56,304
	1971	24,73,862	+5,12,453	+26.13	12,72,634	12,01,228
	1981	30,44,897	+5,71,035	+23.08	15,63,473	14,81,424
	1991	38,45,633	+8,00,736	+26.30	19,83,085	18,62,548
	2001	44,17,377	+5,71,744	+14.87	22,68,322	21,49,055
	2011	50,95,875	+6,78,498	+15.36	26,29,834	24,66,041

Source: census data book/ computed by author



**Figure 3** Decadal Growth Rate of male female Population

### 3.3. Late Transition stage (1991-2011)

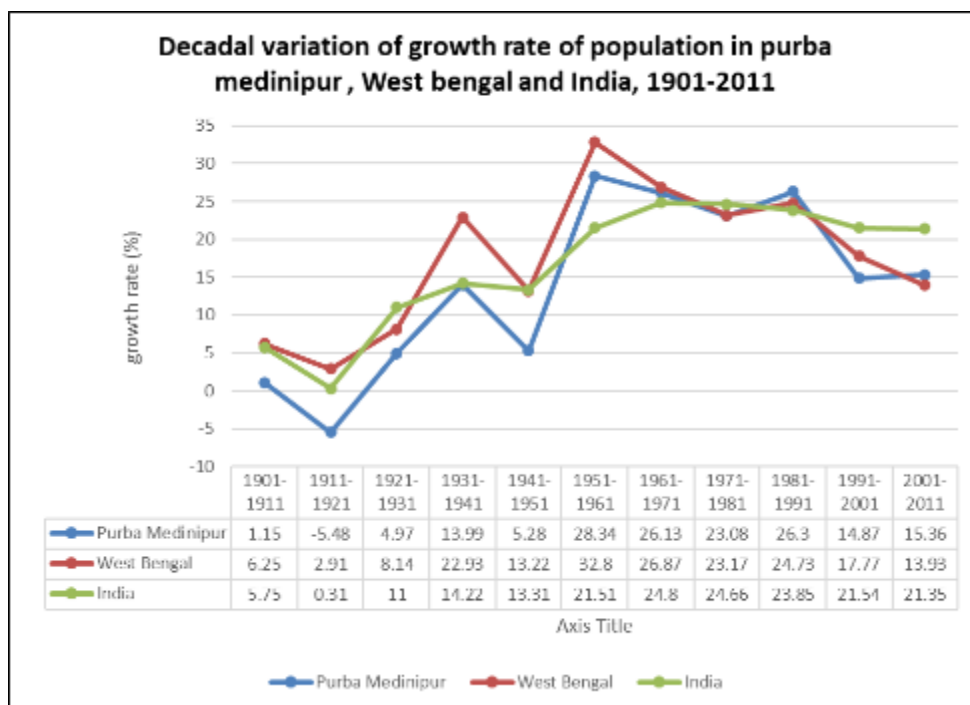
Birth rate and death rate is low, it is the characteristics of this stage. The population growth rate decreased than early transition stage. In the period of 1991-2001 the growth rate of population was 14.87 per cent and in between 2001-2011 growth rates were 15.36 per cent. On the other hand, average population growth rate was 15.11 per cent; here rural population was 88.4 per cent and urban population was 11.6 per cent. From this, it can be concluded that the growth rate of population through these decades declined, so this period may call as Late Transition stage. The reason behind decline of growth rate of population is socio-economic development of the people of Purba Medinipur district

## 4. Spatial Pattern of Population Growth

Spatial Pattern of Population is the most significant to understand the dynamics of population. Purba Medinipur district had 15.36 per cent of growth rate of population during 2001-2011. But, spatial pattern of growth rate varies enormously within the district. The block wise entire district has been classified into three sub-regions. One is High population growth region another is medium population growth region and last one is low population growth region. This classification of sub-region of population growth is based on decadal growth of 2001 to 2011 census.

### 4.1. Comparison of population growth among Purba Medinipur, West Bengal and India 1901- 2011:

In the comparative analysis of the decadal growth of population among the Purba Medinipur, West Bengal and India, it has been found that the district Purba Medinipur has been showing the higher population growth rate than West Bengal and India 1991s. The partition of India-Bangladesh in 1947 had resulted political disturbances and forced thousands of people of from erstwhile East Pakistan now Bangladesh to give up their homeland and to cross the border to India. After this Great Demographic Divide, increase in the growth rate was due to more economic, social and nutritional than epidemiological.



**Figure 4** Comparison of population growth among Purba Medinipur, West Bengal and India

During the 1941-51 decade, the district's population growth rate marginally declined than West Bengal and India. Political disturbances and resulted socio economic unrest was one of the vital reasons for such declining growth in this decade. In the decade of 1991-2001 and 2001-2011, India has performed a slightly better rate in population growth than West Bengal and the Purba Medinipur district average. India recorded 21.35 percent population growth rate where Purba Medinipur and West Bengal recorded 15.36 percent and 13.93 percent respectively during 2001-2011.

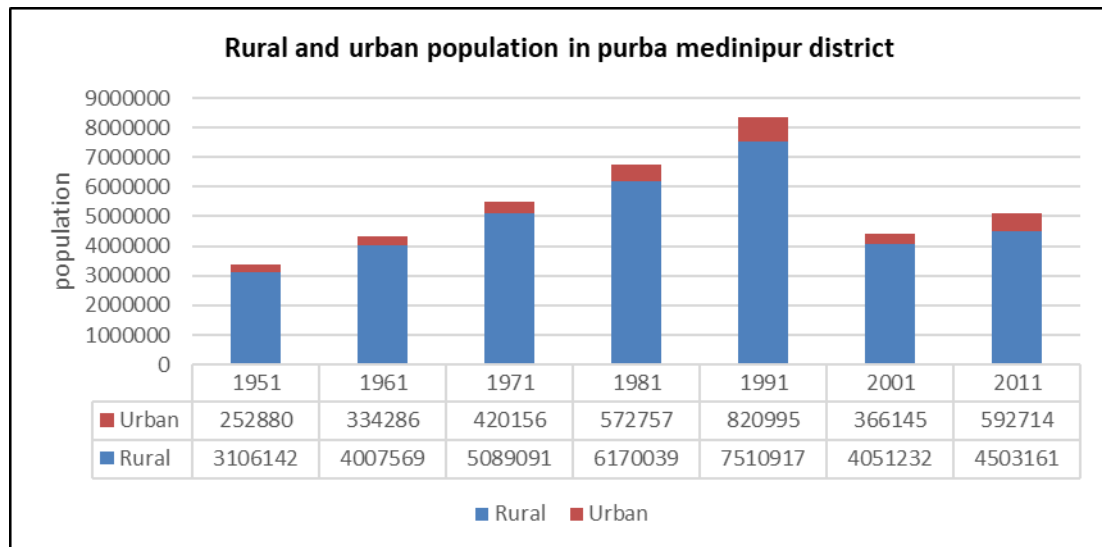
**4.2. Distribution of Population in Rural and Urban Areas:**

The total population of Purba Medinipur district as per 2011 Census is 50, 95,875 of which 45,03,161 reside in rural areas and 5, 92,714 are from urban areas. The population distribution of Purba Medinipur district for the last six decade has been shown.

**Table 2** Rural and urban population in Purba Medinipur district with percentage to total in bracket (1951-2011)

Sector/ Census Year	1951	1961	1971	1981	1991	2001	2011
Total	3359022	4341855	5509247	6742796	8331912	4417377	5095875
Rural	3106142 (92.5)	4007569 (92.3)	5089091 (92.4)	6170039 (91.5)	7510917 (90.1)	4051232 (91.7)	4503161 (88.4)
Urban	252880 (7.5)	334286 (7.7)	420156 (7.6)	572757 (8.5)	820995 (9.9)	366145 (8.3)	592714 (11.6)

It can be observed from the above Table that the total population of the district has increased continuously from 1951 to 1991. It is seen from the Table that in 2001 Census total population of the district has been decreased and it has increased in 2011 Census. Actually, the erstwhile Medinipur district was divided into Purba Medinipur district and Paschim Medinipur district after 2001 Census and population of 2001 Census has been re-casted on the basis of jurisdiction of 2011 Census and up to 1991 Census the corresponding figure is for undivided Medinipur district. However, the percentage of rural population has gradually decreased from 92.5 in 1951 to 88.4 in 2011 except in 1971 and 2001 Censuses where it was higher than previous Census. The percentage of urban population has been increased from 7.5 in 1951 to 11.6 in 2011 Census with an exception in 1971 and 2001 Censuses.



**Figure 5** Rural and urban population in purba medinipur district

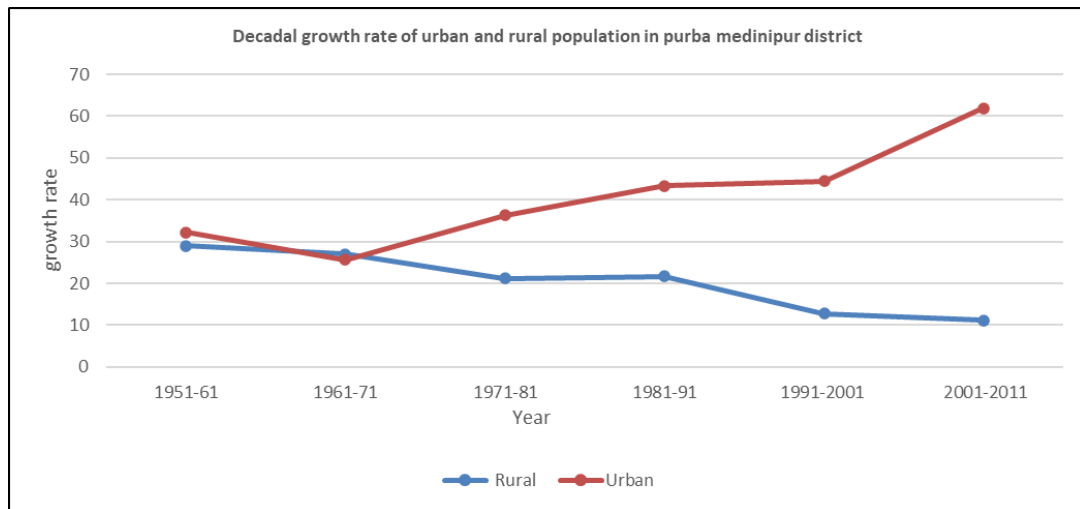
#### 4.3. Decadal growth rate of rural and urban population

The decadal growth rate is one of the important indicators of population dynamics of a district as well as a country. In the following Table 3 the decadal growth rate of Purba Medinipur district can be observed.

**Table 3** Decadal growth rate of rural and urban population in purba medinipur district (1951-2011)

Decadal year	1951-61	1961-71	1971-81	1981-91	1991-2001	2001-2011
Total	29.3	26.9	22.4	23.6	14.9	15.4
Rural	29	27	21.2	21.7	12.8	11.2
Urban	32.2	25.7	36.3	43.3	44.5	61.9

It is observed from the above Table-3 that the total decadal growth rate of population of Purba Medinipur district decreased during first three consecutive decades of 1951-61, 1961-71 and 1971-81 from 29.3 per cent to 22.4 percent. During 1981-91 it increased to 23.6 per cent. The decadal growth rate of 1991-2001 was 14.9 per cent due to recasting population of 2001 Census of Purba Medinipur. The corresponding figure for 2001-2011 is 15.4 per cent. The rural decadal growth rate has followed decreasing trend up to 2001- 2011 with an exception during 1981-91 where it was marginally higher than previous. On the other side, the urban decadal growth rate has followed increasing trend up to 2001- 2011 except 1961-71.



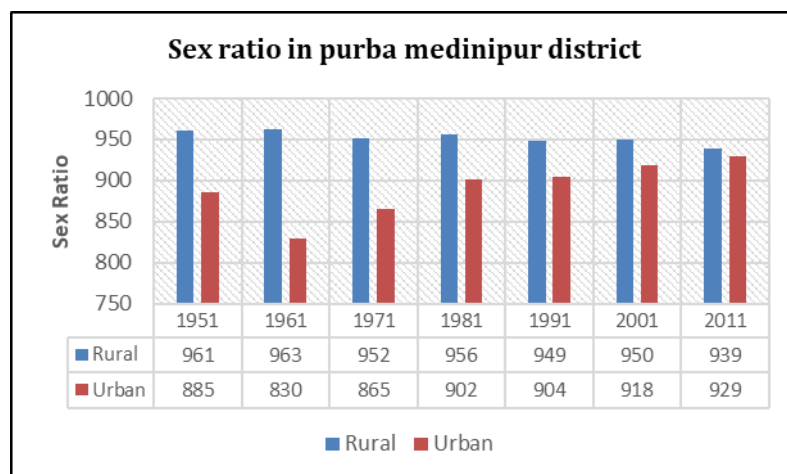
**Figure 6** Decadal growth rate of urban and rural population in Purba Medinipur district

#### 4.4. Sex ratio in Purba Medinipur district

Sex ratio is an important demographic indicator for ascertaining the gender balance of the population and it is compiled for every Census year. The following Table 5 shows the sex ratio of Purba Medinipur district:

**Table 4** Sex ratio in Purba Medinipur district (1951-2011)

Census Year	Sex Ratio		
	Total	Rural	Urban
1951	955	961	885
1961	952	963	830
1971	945	952	865
1981	951	956	902
1991	944	949	904
2001	947	950	918
2011	938	939	929



**Figure 7** Sex ratio in Purba Medinipur district



It is observed from the above Table-4 that the sex ratio of district Purba Medinipur in 2011 Census is 938 of which rural is 939 and urban is lower than that of total and rural with 929. Total sex ratio of the district depicts a decreasing trend from 1951 Census (955) to 1971 Census (945). It increases to 951 in 1981 Census and then follows decreasing trend upto the last Census, reaches to 938 with an exception of 2001 Census. The rural sex ratio also follows the same trend as that of total, it follows an ups and down trend from 1951 to 2011 Census. More or less the rural sex ratio decreases from 961 in 1951 to 939 in 2011 census. Except 1961 Census, the urban sex ratio follows an increasing trend i.e. from 830 in 1961 Census to 929 in 2011 Census.

#### 4.4.1. Results

- The decadal growth rate of population of the district has been between the state and the nation.
- The present decadal growth rate of the district is 15.36 per cent which is higher than West Bengal (13.93 per cent) and lower than India (21.35 per cent) during 2001-2011.
- Urban population growth rate (61.9 per cent) is extremely high than rural growth rate (11.2 per cent) during 2001-2011.

#### 4.4.2. Suggestions

- Proper employment opportunities should be arranged for better rural employment so that rural- urban migration can be reduced and population pressure in urban areas can be reduced so that a proper balance between rural and urban areas can be establishment.
- Frequent family planning programmes should be organized to encourage about the benefit of small family size.
- Population growth rate should be reduced below the national level in order to maintain a balance between population and resource.

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## 5. Conclusion

This geographical analysis of decadal variations in population growth rate in Purba Medinipur district of West Bengal reveals a complex scenario. The district has experienced a declining population growth rate, with significant spatial variations across blocks and villages. Urbanization, literacy, and employment opportunities have emerged as key factors contributing to this decline. Targeted interventions to address population growth and urbanization challenges. Sustainable development strategies to ensure balanced regional growth. Geographically informed policymaking to address spatial disparities. Continued monitoring and analysis of population growth dynamics. The findings have important implications for policymakers, planners, and researchers concerned with population growth, urbanization, and sustainable development in Purba Medinipur and similar regions. The study's conclusions contribute to a deeper understanding of population growth dynamics in the region, informing evidence-based decision-making for a sustainable future. The study on decadal variations in population growth rate in Purba Medinipur district of West Bengal reveals: Declining population growth rate (26.30% to 15.36%) from 1991 to 2011. Spatial variations in growth rates across blocks and villages Urbanization, literacy, and employment opportunities as key factors. Need for targeted interventions and sustainable development strategies. Importance of geographically informed policymaking. Continued monitoring and analysis of population growth dynamics.

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## Compliance with ethical standards

### *Acknowledgement*

The authors would like to acknowledge the following individuals and organizations for their contributions to this study: The Census of India for providing the population data for the years 2001, 2011, and 2021. The District Census Handbook and the District Statistical Office for providing block-level data. The Panchayat and Rural Development Department for providing village-level data.

### *Disclosure of conflict of interest*

There are no conflicts of interest regarding the publication of this paper.



### *Statement of informed consent*

Informed consent was obtained from all individual participants included in the study.

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## Author's Short Biography

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