

Urban Growth and It's Impact: A Case Study on Krishnanagar city, Nadia, West Bengal

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Abstract: Urban growth is the development and population growth of cities and towns. This development might take the shape of urban boundary extension, population density increases, or rural or underdeveloped regions becoming urbanized. Urban growth is caused by a combination of factors including economic activities, population growth, industrialization, and the position of the municipality. Demographic pressures and rural-urban migration are also major drivers of urban expansion, particularly in developing countries. The expansion of urban areas leads to the occupation and destruction of soil, deforestation, and loss of natural ecosystems. Overall, a combination of economic, demographic, and social factors drive urban expansion, with implications for land use planning and sustainable management of urban areas. This research paper gives an overview of the urban growth trends and its impact on Krishnanagar city.

Keywords: Urban Growth, Urbanization, Urban Growth Trends, Urban Expansion

I. INTRODUCTION

Urbanization is a process that increases the urban population in a community or city and develops an urban area. In the past, individuals have preferred to relocate from rural areas to urban areas in pursuit of improved lifestyles, improved working conditions, and improved communication.

India has the second most people of any country in the world, after China. West Bengal is the fourth most

urbanised state in India. It has a long past that goes back to the British era. As of the 2011 census, there are 1029 people living in the state per square kilometre, and the population growth rate is 13.84%, which is less than the 17.84% rate seen in the previous decade.

The city of Krishnanagar served as the administrative centre of the Nadia district and was established in 1864. Out of the 24 wards in the city, the most populated is 24 (with 117,390 people), while the least populous is 20 (with 3,499 people).

15,3062 people are living in the city, with a density of 9590 persons per square kilometer, according to the 2011 census. Due to continuous increseaing of population in the Krishnanagar city

II. STUDY AREA:

Near the southern banks of the Jalangi River in central Bengal, eastern India is the city of Krishnanagar, which may be found in coordinates 23°23'N to 23°26'N and 88°28'E to 88°31'E.

Krishnanagar city is very close to the border (India-Bangladesh. }The city of Krishnanagar is 100 kilometers apart from the megacity of Kolkata. Due to its relatively modest size (15.96 sq. kilometers), Krishnanagar city is home to a densely populated urban zone.

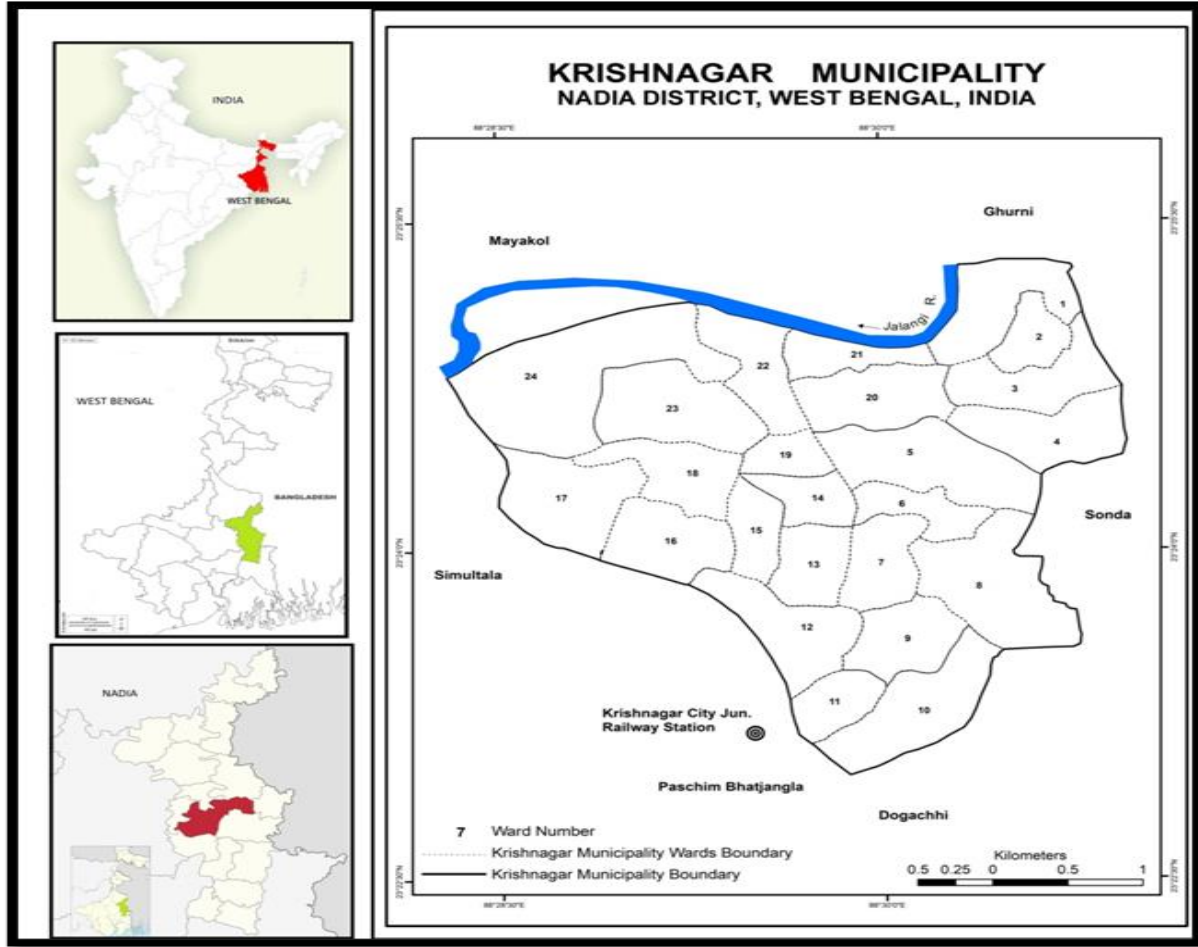


Fig. 1.1 Study Area

III. OBJECTIVES:

1. To find out the urban growth trends of the city.
2. To examine the impact of urban growth in the city.

IV. METHODOLOGY:

The present study is based on Two types of data, which have been used as follows:

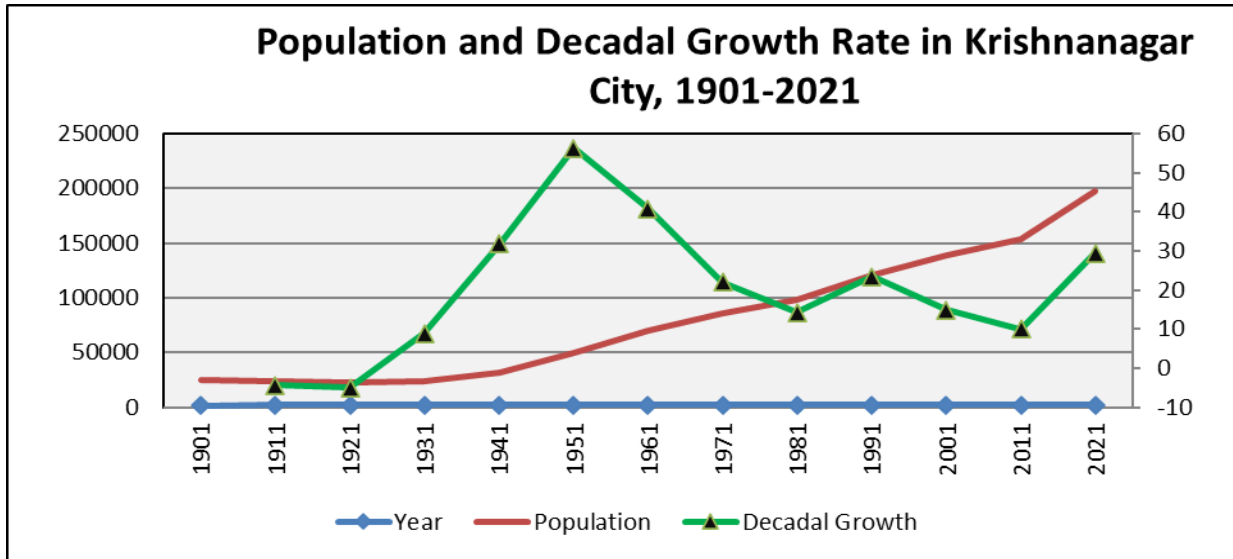
- Secondary data : Census of India, Krishnagar Municipal Corporation and Bureau of Applied Economics and Statistics, Govt. of West Bengal, Journals, Books, Magazine and etc.
- Satellite data : Landsat5 1991, 2001, 2011, 2021(Landsat8)

Various statistical analyses and diagrams have been created utilizing primary and secondary data sets, and

themed maps have been created using tools such as ArcGIS, Photoshop, and Microsoft Excel. After that, we'll methodically provide the whole thing by analyzing, interpreting, and discussing it.

VI. ANALYSIS AND INTERPRETATION:

According to the 1901 census, the population of Krishnanagar city is just 24,547, with 12,253 men and 12,294 females. However, in 2021, the population saw an eightfold growth, reaching a total of 198,000 individuals. According to Figure 1.2, the population has seen a significant rise since gaining independence in 1951. In the 2011 census, the population was recorded as 153,062, and as of 2021, it has increased to 198,000. From 2011 to 2021, the city saw its highest population growth rate.

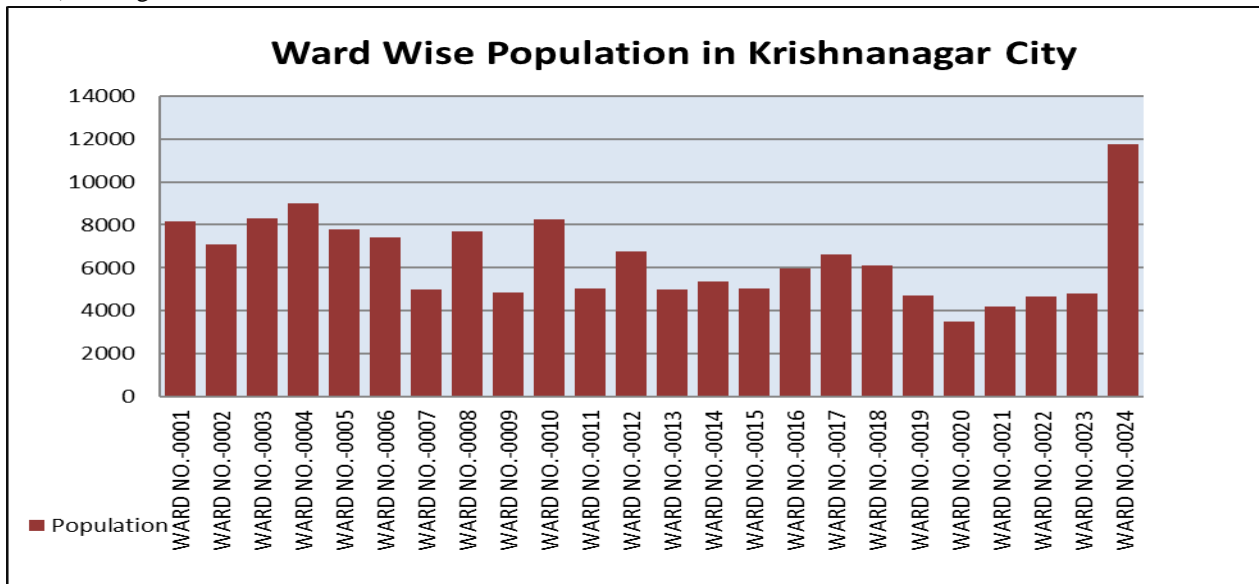


(2021 Data Source: <https://www.census2011.co.in/data/town/801682-krishnanagar-west-bengal.html>)

Fig. 1.2: Population and Decadal Growth Rate in Krishnanagar (1901-2021)

Figure 4.1 displays the population and decadal growth rate of Krishnanagar city from 1901 to 2021. The decadal growth rate of the population was -4.37 percent from 1901 to 1911, the beginning of the century. The growth rate remained constant until 1941. Between 1941 and 1951, the population's decadal growth rate multiplied by 56.30 percent, a significant rise from the 31.84 percent growth in 1931–1941. From 1951 to 1961 and 1961 to 1971, the growth rate was constant once again. After a sharp increase of 23.40 percent in 1981–1991 (the first full decade after 1951), the growth rate declined in the next three

decades: 1971–1981, 1991–2001, and 2001– 2011. From 2001 to 2011, the growth rate was 10.03 percent. However, the predicted decadal growth rate climbed again, this time to 29.36%, from 2011 to 2021. From 1941 to 1951, Krishnanagar's population grew at a rate that was far higher than the national and regional averages. The majority of the blame for this goes to the flood of migrants from neighboring states and Bangladesh. Movement from rural regions to Krishnanagar was the main driver of population increase from 2011 to 2021.



Source: Census Report 2011

Fig. 1.3: Ward wise Population in Krishnanagar city

The city is divided into 24 wards, with the most populated ward number being 24 (11739) and the least-populated ward number being 20 (3499) and the average population of each ward has 6378 in the Krishnanagar city.

Impact of Urban Growth:

Urbanization has beneficial and bad effects on the environment, society, and economy. However, it may provide benefits and opportunities. Main implications of urban growth include:

Economic Benefit: Urban expansion creates economic activity, jobs, and development. Businesses, industries, innovation, investments, and entrepreneurship thrive in cities.

Population expansion in Krishnanagar boosts economic potential. Therefore, the transportation system and market increased. New supply, supermarket, builder's, and electronic showrooms are opening. Consequently, more jobs are available. On the main road and major byways, bus, car, and toto services are increased. This service is used by low-income households. This service raises drivers' per-capita income. Small-scale companies like grill factories and wooden furniture stores are growing. Clay dolls, handlooms, and tourism have grown in Krishnanagar. High Street, DL Roy Road, RN Tagore Road, Krishnanagar city station Road, and some Anatheswar Road have the most businesses.

Infrastructure Development: Growing cities invest in transportation, utilities, and public services. This may boost urban efficiency and resident quality of life.

First, the city builds health, education, clubs, libraries, and other amenities including Maatrima Hospital and Kanyashree University. Second, the city improves roads, water, sanitation, sewage, power, street lighting, and firefighting. Third, the city builds economic infrastructure to offer citizens with banking, credit, and insurance.

Cultural Variety: Cities are melting pots of various civilizations. Cultural diversity may provide a thriving social milieu with many cultural events, cuisines, and creative manifestations.

This city is proud of its many renowned alumni, including education reformer Ramtanu Lahiri. Suresh Chandra Sarkar, founder-editor of *Desh*, *Ananda Bazar Patrika*, and *Hindusthan Standard*, comes from here. Jagadananda Roy is a famous scientific writer. Deshabandhu's close friend Hemanta Kr. Sarkar was born in this town. This site is also associated with Indian National Congress organizer and lawyer Lalmohan Ghosh. Another notable individual from this region was Maharaja Khounish Chandra Roy, who promoted education, art, and culture. Famous poet, dramatist, and lyricist Dwijendra Lal Roy was born here.

Krishnanagar glamourizes Jagaddhatri Puja. The king Maharaja Krishna Chandra started Jagaddhatri Puja at Krishnanagar in the 18th century. Sri Krishna Chandra created it in 1762, making it the festival's climax. Hindus, Muslims, and Christians coexist in the city.

Social inequality: Insufficient space leads to overcrowding. Due to urban overpopulation, large population densities in compact locations will inherently overcrowd. Social inequality exists in Krishnanagar municipality due to overpopulation and urbanization.

Land Use Changes:

Conversion of Agricultural Land: As cities expand, agricultural lands are often converted into residential, commercial, and industrial areas. This reduces the amount of land available for farming and can impact food production.

The area of agricultural territory has decreased from 936.9 hectares in 1991 to 501.66 hectares in 2021. Consequently, the area under agricultural land use experienced a cumulative loss of 435.24 hectares during this period. From the benchmark year, there was a 46.46% decrease in Krishnanagar city.

Deforestation: Urban sprawl can lead to deforestation as forests are cleared to make way for new developments. This loss of forested areas can have significant environmental repercussions.

The total plantation area was 1053.9 hectares in 1991, it has decreased to 860.13 hectares by 2021. Consequently, there was a 193.77 hectare decline in the total area covered by vegetation over this time.

Table-1: Land Transformation in Krishnanagar City (1991-2021)

Land Use	Agriculture (1991)	Barren	Built-up	Vegetation	Water	2021
Agriculture	936.9	53.23		131.76	18.35	501.66
Barren	176.42	321.84		147.96		371.79
Built	231.1	98.51	382.23	260.52		972.36
Vegetation	223.78	122.69		1053.9		860.13
Water	7.28				164.61	153.54
Total Land						2859.48

Source: Based on Landsat Satellite imagery (1991 and 2021)

Environmental Degradation:

Rapid urban expansion may cause deforestation, pollution, and green space loss. Infrastructure and industrial growth may pollute air and water, harming the surrounding ecosystem. Air pollution in Krishnanagar is rising due to car traffic and tree cutting. Some city areas smell like garbage. Slums and illegal settlements in Krishnanagar have inadequate sanitation. This area drains poorly. Unsanitary conditions cause diarrhea and malaria. Urban trash disposal is unsafe, making rubbish management a major challenge.

Loss of Biodiversity: The conversion of natural habitats into urban areas can lead to the loss of biodiversity. Many species may lose their habitats and face increased risks of extinction.

Water Resources: Urban growth can impact local water resources through over-extraction, pollution, and changes in water runoff patterns. The increased demand for water in urban areas can strain local water supplies.

Air Quality: Urban areas often have higher levels of air pollution due to increased vehicular traffic, industrial activities, and energy consumption. This can lead to health problems and environmental degradation.

Housing issues: Rapid urban growth can lead to housing shortages, increased property prices, and the development of informal settlements or slums. It also necessitates significant investment in infrastructure such as roads, sewage systems, and public transportation.

Urban expansion in Krishnanagar increases housing demand, raising property prices and posing affordable housing issues. Land costs are greater in the city center and commercial sectors such High Street, Patra

Market, Talpukur Road, etc. But land costs are cheaper in city outskirts like Monglamath Para, Ghurni Godown, Kalinagar, Sukul Para, etc. It may cause socioeconomic inequality and homelessness.

The value of land in urban areas tends to increase, which can lead to speculation and land hoarding. This often results in conflicts over land ownership and usage.

Traffic congestion: Krishnanagar's rising urban population and cars might increase traffic and commuting times. This pollutes the air and reduces transportation efficiency. Due to significant car expansion and a large number of Totos, Sadar Hospital More, Post Office More, Station Road, AV School More, and Naderpara More have the highest traffic.

Urban Planning and Sustainability:

Implementing smart growth strategies can help manage urban growth sustainably. This includes promoting higher-density development, preserving green spaces, and enhancing public transportation. Incorporating green infrastructure, such as parks, green roofs, and urban forests, can mitigate some of the negative impacts of urban growth. These initiatives can enhance urban biodiversity, improve air quality, and manage stormwater runoff.

CONCLUSION

Urban growth has profound and multifaceted impacts on land, encompassing environmental, socio-economic, and planning dimensions. Addressing these impacts requires a comprehensive approach that balances development needs with environmental conservation and social equity. Sustainable urban planning practices are essential to ensure that cities

can grow in a manner that is environmentally responsible and socially inclusive.

To prevent unplanned growth and its impact in Krishnagar city, strict rules must be set in place and implemented. The municipality should introduce a strategy for the city or local authority

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