An Analysis of Population Growth, Projection and its Characteristics of Jaunpur City

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Abstract

Planning and physical development of any town depends upon socio-economic structure. It is necessary to assess the present and future needs of the town and qualitative and, therefore, quantitative study of population is needed. The urban expansion caused by rapid urbanization has posed great challenges for planning and policy making, especially in developing countries like India (Ramchandran, 2012). Jaunpur City (25^0 43' 12" N - 25^0 46' 32" N & 82^0 39'37" E - $82^0$43' 17" E) is located in the fertile alluvial land both side of southern and northern bank of river *Gomati* (a tributary of river *Ganga*) in the eastern Uttar Pradesh. (Area-24.38 sq. Km, population 1,80,362 persons(census2011). Jaunpur city has been experiencing rapid growth in population since independence owing to its agriculturally rich surroundings, due to its central location. It has influenced the increasing population pressure on the urban space due to which well connected transport network and an urban service centre. The problem observed in form of rapid and uncontrolled development in the city. *This requires an analysis of population growth, Projection, and its Characteristics of Jaunpur City, may be utilized efficiently for a sustainability of the future city.* The methodology involved in the study is census data (1901 -2011), Varanasi Division Planning Sector, City and Rural Planning Department, Uttar Pradesh (2021) and using application of modern tools and techniques, specially using ArcGIS (10.5 version) for map making.

Keywords: Population pressure, urban space, population growth, projection and sustainability

Introduction

In 1953, when Glenn T. Trewartha's offered a tentative scheme of content and organization of materials in population geography, he confined it to (a) geography of population in the past; (b) population numbers including distribution, density, migration, growth, etc; and (c) qualities of

population and their regional pattern of distribution including physical as well as socio-economic-qualities. Man is the pivotal from which all other elements are observed. The growth of population whether positive or negative is controlled by the relative balance of fertility, mortality and migration which are generally influenced by six groups of factors: biological, environmental, economic, social, political and technological (Sauvy, 1969). Any change in the size of population over a period of time, an area have a great impact on the socio–economic as well as on the environment that of the statistical figure denoting the number of human souls of certain time (Chip, 1995).

Planning and physical development of any town depends upon socio-economic structure. It is necessary to assess the present and future needs of the town and qualitative and, therefore, quantitative study of population is needed. The urban expansion caused by rapid urbanization has posed great challenges for planning and policy making, especially in developing countries like India (Ramchandran, 2012). The population growth, distribution and density are examined in the spatio-temporal context of Maunath Bhanjan city in detail (Bharati and Sharma 2015). Urban development is the process of emergence of the world dominated by cities as well as urban culture and values. It is important to draw clear distinction between the two main processes of urban development- *urban growth and urbanization* (Clark, 1982). Urban growth, as a pattern, although helps us to understand the spatial distribution but as a static phenomenon. In fact, areas that can be identified as a sprawl for a specific time are typically part of dynamic urban scene (Ewing, 1997).

The population growth is considered as the change in the size of population of a region over a given period of time (Barclay 1958, Bogue 1969). The growth of population whether positive or negative reflects the history of man's response to the environmental possibilities presenting the region (Sharma 1978). Mishra (2008) has stressed in his paper, 'Urban History of India-focus on Harappan Civilization', the need of research in urban history which examines the urbanization processes, rise and fall of cities through time. He is not of the view, that no city exists in geotropic vacuum nor is it without history. Thus, the urban history and urban geography are two sides of the same coin and the research in urban history is prominently required in India, since the western bias of Indian urban history has been very biased. Bharati, & Yadav (2023) has stressed in his paper, 'An Analysis of Growth and Spatial Distribution of Population in Azamgarh City' and also Patel & Bharati (2023) has stressed in his paper 'Population Growth and its Characteristics of Banda City: A Geographical Study'the need of research in urban history which examines the population growth and distribution of the city.

These are vital variable of the population; determine the socio-economic conditions and development stages of the societies and also demarcate and decide the process and level of resources utilisation. The imbalanced structuring and composition of population create several problems in sustainable social setup and hider ongoing development processes in the time and space (Gupta & Bharati, 2024). The comparative growth of population of Jaunpur city of class I cities in eastern Uttar Pradesh is high after Maunath Bhanjan City. In census year 1921, the population of town like Jaunpur (32,569 persons), Ghazipur (24,708 persons), Azamgarh (14,788 persons), Ballia (18,215 persons), Deoria (5,579 persons), MaunathBhanjan (17,998 persons), Mughalsarai (2,430 persons), Gonda (17,159 persons) and Basti (17,691 persons) was low and only Faizabad (56,620 persons) is high, but in census year 2011, the population of Jaunpur city (1,80,362 persons)became very high as compared to Ghazipur (1,21,020 persons), Azamgarh (1,10,983 persons), Ballia (1,04,424 persons), Deoria 1,29,479 persons), Mughalsarai (1,09,650 persons), Faizabad (1,65,228 persons), Gonda (1,14,046 persons), Basti (1,14,657 persons) and Maunath Bhanjan city (2,78,745 persons) is only high due to medium scale industries, better infrastructure (road network, health care and electricity) and as district headquarter (1988) in eastern Uttar Pradesh. While growth (1,80,362 persons) and percentage (12.69) increase in population of Jaunpur city is very moderate as comparatively adjacent cities, because of the city is significant for historical and old town in the recent past. Therefore, it is selected to study for the present analysis. The objective of the study is to analyse the population growth, Projection and its characteristics. The following objective has been taken into consideration:

(a) to analyse the population growth and Projection of the study area.
(b) to analyse population characteristics of study area, and
(c) to illustrate the impact of growing population on urban area of the study area.

Materials and methods:
Study Area

Jaunpur City (25^0 43' 12" N - 25^0 46' 32" N & 82^0 39'37" E - $82^0$43' 17" E) is located in the fertile alluvial land both side of southern and northern bank of river *Gomati* (a tributary of river *Ganga*) in the eastern Uttar Pradesh (Area-24.38 sq. Km, population 1,80,362 persons (census 2011). It lies on the main on Gorakhpur - Mau – Shahganj - Allahabad and Varanasi – Jafarabad Lucknow northern railways and on the crossing point of NH-56 (National Highway, Varanasi to Lucknow) and Shahganj – Mirzapur road as well as main Gorakhpur-Mau-Varanasi-Mumbai railway route. Jaunpur City is connected with Lucknow 225 km, Varanasi 58 km, Prayagraj 98 km and Gorakhpur 178 km by road. The area population of this city is 1,80,362

person (Census, 2011). The district consists of a series of parallel ridges, whose summits are depressed into beds or hollows, along which the rivers flow; while between the ridges are low-lying rice lands, interspersed with numerous natural reservoirs. The soil is fertile, and very highly cultivated, bearing good crops of rice, sugarcane, and wheat and orchards of mango and guava. Maize, gram, corn, mustard are other major crops (Fig. 1.1).

LOCATION OF STUDY AREA
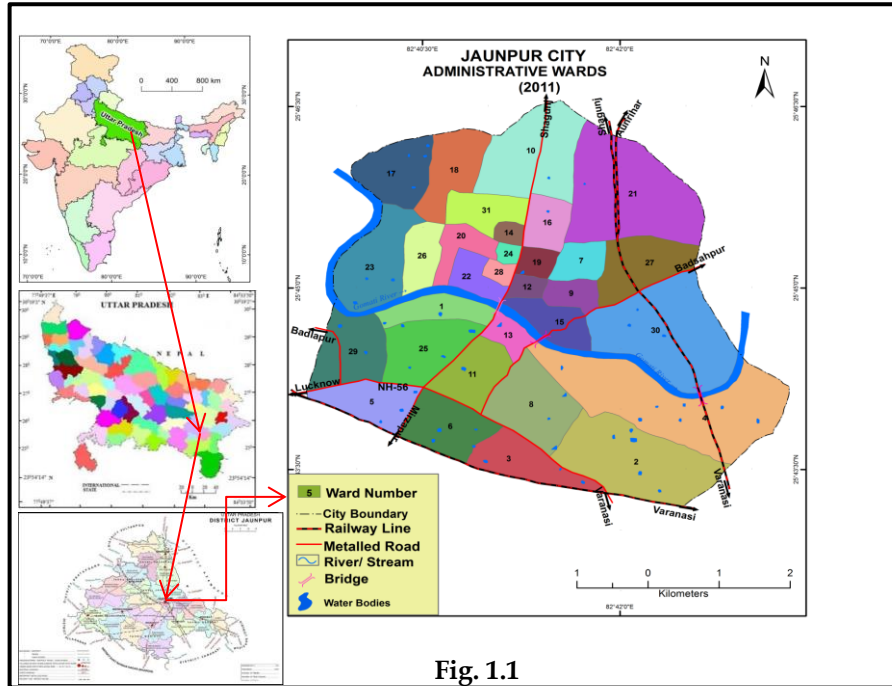
Fig. 1.1

Source: Map prepared by Toposheet No. 63 K/9 and 63 K/10 on Arc GIS 10.5 Software and based on data available from Jaunapur City Municipal Board.

Data Base and Methodology

Man's knowledge grows by studying what is already known and revising past knowledge in light of new findings (Ahuja, 2006). It is the pursuit of truth with the help of study, observation, comparison and experiment. In short, the search for knowledge through objective and systematic method of finding solution to a problem is research. The researcher has used both quantitative and qualitative methodologies in the present research work. The work based on secondary data sources, specially collected through the vast literature available in Jaunpur City. The secondary data were collected through published/ unpublished records at Municipal Corporation of Jaunpur; Census of India, Lucknow, U.P. (1901 - 2011); Primary census abstract (2011); online available data on website, Survey of India, Dehradun and Varanasi Division Planning Sector, City and Rural Planning Department, Uttar Pradesh (2021). It

was geo-referenced with the help of the toposheet no. 63 K/9 and 63 K/10. The thematic maps (populations) were prepared on Arc GIS 10.5 software. The map was digitized on Arc GIS 10.5 software and exported to calculate the areas of the respective land which were polygon features and their final layout on M S Power Point 2007, typing the manuscript in M S Word 2007, which was done by the researcher himself.

Population Growth

The growth of population is the most powerful single factor contributing to the changes in land use (Pandey, 1996). Population growth reflects the development processes related to urbanization, industrialization and modernization of an urban centre (Singh, 2002). Jaunpur city has been experiencing rapid growth in population since independence owing to its agriculturally rich surroundings, due to its central location. Jaunpur city has a population of 1,80,362 persons (Census, 2011) spreading over an area of 24.38 sq. Km (2437.64 ha) (Calculated by Author through ArcGis 10.5).

The growth of population refers to the change in the number of inhabitants of a country/territory during specific period of time, say during the last 10 years. Such a change can be expressed in two ways: in terms of absolute numbers and in terms of percentage change per year. The past trend of population growth is the indicator of future development. The first available reliable census was taken in 1901; therefore, the trend of population growth in the city has been studied since then.

Trends of Population Movement Since 1901

The analysis of the population growth and the trend of growth rate are required for evaluating the existing as well as future population resource. The growth of population has a direct effect on per capita utilization of available resources, although Jaunpur city has been an important town since past. The decennial enumeration system could be adopted only in 1901. The population growth of the city may be analysed conveniently with the help of census data available from 1901 onwards (Table 3.1 & Fig. 3.1). The city was flourishing since the British period in the later decades of 19th century. First recorded population data of Jaunpur city is 42,771 persons in 1901. But according to the census 1911, the population of Jaunpur city is 30,473 persons. The 1911 figure shows a decline -28.75%) over the previous census which might possibly be due to the epidemic spread on a large scale. The factors causing decreasing trend were poor harvests, frequent droughts and famines, wars (China war in 1900), and epidemics. Famines and epidemics gave rise to mass exodus and mass death. The

severe famines of year 1899 - 'Chhapanya Akal (famine of Samvat 1956)', and of 1905-06 - 'Basathya Akal (famine of Samvat 1962)' and frequent incidences of epidemics caused negative growth in population during this decade.

It seems that the huge fall in population during this decade 1901-1911 was mainly due to frequent epidemics of plague, influenza, cholera, and small pox rather than drought, because in the next decade (1911-1921) when the country, the state, and the district witnessed fall in population as a whole; Jaunpur city registered low but positive growth rate (+6.88%) because the famine-stricken people immigrated to the city for want of work. The First World War (1914-1919) checked the population growth to increase more. Since 1921, the population began to increase and it continued steadily till 1931. Once again, in 1941, there was a Population growth rate decreased slightly (+16.77%) to over the previous census which was due to the epidemic spread in the state as well as nation. Since 1961, the population began to increase (+40.94%) and after this which is 1971 (+30.53%) to 2011 (+12.69%) continued population growth rate slightly decreases. The 1991 census of population which was 1,36,062 persons (+29.41%) and in 2011 population of Jaunpur is 1,80,362 and growth rate is (+12.69%).

The Jaunpur city is a famous city of Purvanchal, which is situated in the fertile alluvial land of both southern (Right) and Northern (Left) bank of river *Gomati* in Eastern Uttar Pradesh. The average growth rate of the city is 1.73 percent (1901-2011) per annum, whereas average decadal growth rate is 17.36 percent (1901-2011). The average decadal growth rate during 1901 to 1951 is very low (5.92.77%), whereas during 1951 to 1981 decadal growth rate is high (33.9%) and during 1981 to 2011, it is moderate (19.91%). The population growth of Jaunpur city has been analysed into two Phase:
  (A) Phase of Pre-independence (1901-1951) and
  (B) Phase of Post-independence (1951-2011)
  Further, it has been divided into three distinct periods as follows:

Period of Slow Growth (1901-1951)

During this period (1901-1951), the population growth was fluctuating. The population of Jaunpur town was 42,771 persons in 1901. In 1911, population became 30,473 persons which showed a decline of -28.75 percent due to spread of epidemics like plague caused high death rate which was prevalent in the country and known as 'Indian Demographic Division'. Further, population increased to 32,569 persons (a growth rate of +6.88%) in 1921 followed by 37,675 persons (+15.68%) in 1931. Again in 1941, population increases to 44,833 persons, which noticed an also increase (+19.00%) during this decade.

In the census year 1951, the population again increased to 52,351 persons (16.77%) which were observed a moderately very slow growth in pre-independence phase. Therefore, during 1901 - 1951 (in five decade) an average decadal growth rate was 5.92 percent, whereas the decade 1931 and 1951 also observed coinciding the likely to be same growth rate of i.e. 15.68 percent (1931) and 16.77 percent (951) respectively. Therefore, this is the phase/ period of very slow growth of population. The reasons for slow growth from 1901–1951 are the famines and spread epidemics like plague (1911), influenza (1918), cholera (1918) and drought and famines. (1941) which took a good toll of human life (death) resulting in a general decline of population. Though a small portion of rural population moved towards the town because of the famines experienced in 1918 and, its impact was not over-weighing to that of epidemic disease.

Table 1.1: Population and Decadal Growth Rate (1901 - 2011)

| Years	Population (Persons)	Decadal Variation (Persons)	Decadal Variation (%)
1901	42,771		
1911	30,473	-12,298	-28.75
1921	32,569	+2,096	+6.88
1931	37,675	+5,106	+15.68
1941	44,833	+7,158	+19.00
1951	52,351	+7,518	+16.77
1961	61,851	+9,500	+40.94
1971	80,737	+18,886	+30.53
1981	1,05,140	+24,403	+30.23
1991	1,36,062	+30,922	+29.41
2001	1,60,055	+23,993	+17.63
2011	1,80,362	+20,307	+12.69

Source: Town Directory (1901-2011), Directorate of Census Operations, Uttar Pradesh, Lucknow.

The population of the city, in 1911 declined (-28.75%) over the previous census years and it was recovering from the shock of epidemics. It is significant to take that decade (1921-1931) has a moderate growth showing a percentage increase of population, i.e., +6.88 percent in 1921 and +15.68 percent respectively (Table 1.1& Fig. 1.2).

Period of High Growth (1951-1981)

The year 1951, is known as second 'demographic division', after that population growth of Jaunpur shows a remarkable rise. In between 1951

to 1981, the average growth rate (33.9%) of town was medium in these decades. In decade 1951, population of the city was 52,351 persons which further increased in decade 1961 to 61,851 persons (40.94%). In 1971, population increased to 80,737 persons while growth rate (30.53%) which decreased in the previous decade. While 1981, population rose to 1,05,140 persons (30.23%) and Jaunpur became city as per census of India. The administrative and judicial offices were established and development of fundamentals needs of city increased. Hence, working population shifted towards administrative offices and attraction of the rural-urban migration to the city. Therefore, the population of the city in three decades (the average decadal population growth rate 33.9%) was twice with high growth, whereas in this phase population growth was continuously increased, due to which establishment of small scale handloom industries development of health services to decrease death rate and development of fundamentals needs of town. During 1951 to 1981, the trend of population growth shows a remarkable rise high, due to which condition was a normal and free from epidemics or famines, which led to the natural processes of increase from this phase onward.
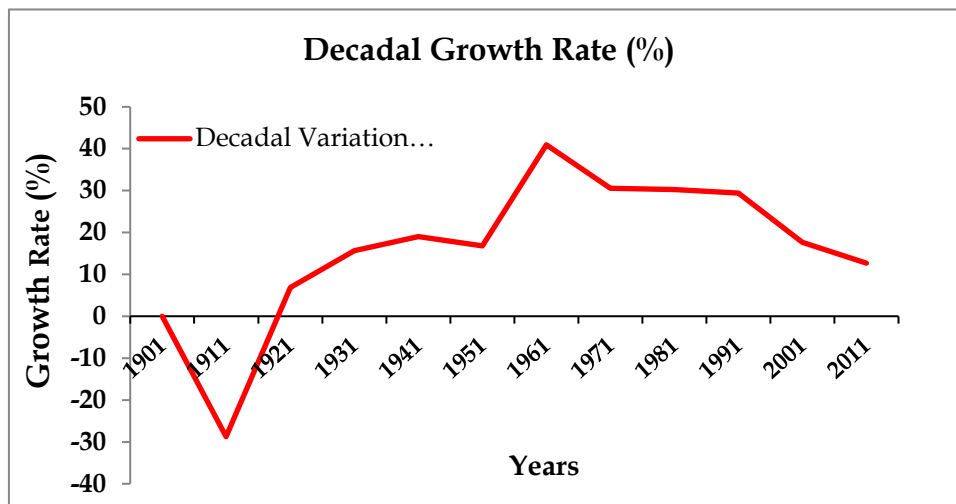
Fig. 1.2

Source: Based on Data Available from Town Directory (1901-2011), Directorate of Census Operations, Uttar Pradesh, Lucknow.

Period of Moderate Growth (1981-2011)

After 1981, the population growth has increased with a moderate rate (19.91%) in last three decades (1991, 2001 & 2011) compared to previous phase. During this phase average population growth rate is (19.91%) with moderate growth. In 1991, population of the city was 1,36,062 persons and growth rate (29.41%) which was moderate due to increase in area. The

population of the city in 2001 was 1,60,055 persons with slow growth rate (17.63%) but slightly decreased growth rate from previous decade (1991). The population (1,80,362 persons) of the city grew by 12.69 percent in the last decade (2001-2011) (Table 3.1 & Fig 3.1). It was because the people from the rural areas had started developing their choice of getting settled in the city. It was more a matter of status symbol to have a house in the city. It had nothing to do with the socio-economic development the city, but increased infrastructural facilities like road network, railways, electricity, health care, water supply, educational, sewage, communication as well as commercial facilities (Table 1.1& Fig. 1.2).

Population Projection

The population projection for Jaunpur city has been calculated by the arithmetic method implying the formula of compound interest. The average decadal growth rate of the city in last five decades is 24.1 percent. Taking year 2011 as base year, the population has been estimated for next three decades, i.e., 2021, 2031 and 2041 A.D. The migration trend has moderate impact on this estimation; the data on migration is not available for Jaunpur city. Formula used is $A = (1+ r/100)^n$. Where, A is projected population, P is present population, r is annual growth rate, and n is number of years. In 2011 the population of Jaunpur city was 1,80,362 persons as against 1,60,055 persons in 2001. So the rate of population growth during the decade (2001-2011) will be:

$$A = P\left(1 + \frac{r}{100}\right)^n$$

$$180362 = 160055\left(1 + \frac{r}{100}\right)^{10}$$

$$\left(1 + \frac{r}{100}\right)^{10} = \frac{180362}{160055}$$

Taking log in both sides

$$10\log\left(1 + \frac{r}{100}\right) = \log 180362 - \log 160055$$

$$10\log\left(1 + \frac{r}{100}\right) = 5.25614504247 - 5.20426924573$$

$$10\log\left(1 + \frac{r}{100}\right) = 0.05187579674$$

$$\log\left(1 + \frac{r}{100}\right) = \frac{0.05187579674}{10}$$

$$\log\left(1 + \frac{r}{100}\right) = 0.005187579674$$

$$1 + \frac{r}{100} = \text{Antilog } 0.005187579674$$

$$1 + \frac{r}{100} = 1.01202$$

$$\frac{r}{100} = 1.01202 - 1 = 0.01202$$

r = 0˙01202 × 100
r = 1.202%
Rate of Growth = 1.202%

Population Projection for 2021-

$$A = 180362 \left(1 + \frac{r}{100}\right)^{10}$$

$\log A = \log 180362 + 10 \log \left(1 + \frac{r}{100}\right)$

log A = 5.25614504247 + 10 (0.005187579674)

log A = 5.25614504247 + 0˙05187579674

log A = 5˙30802083921

A = Antilog 5˙30802083921

= 365371 persons i.e. **2,03,245 Persons**

By 2021 the Population of the city will be 2,03,245 Persons

Population Projection for 2031-

$$A = 278745 \left(1 + \frac{r}{100}\right)^{20}$$

$\log A = \log 180362 + 20 \log \left(1 + \frac{r}{100}\right)$

log A = 5.25614504247 + 20 (0.005187579674)

log A = 5.25614504247 + 0˙10375159348

log A = 5˙35989663595

A = Antilog 5˙35989663595

= 229032 persons i.e. **2,29,032 Persons**

By 2031 the Population of the city will be 2,29,032 Persons

Population Projection for 2041-

$$A = 180362 \left(1 + \frac{r}{100}\right)^{30}$$

$\log A = \log 180362 + 30 \log \left(1 + \frac{r}{100}\right)$

log A = 5.25614504247 + 30 (0.005187579674)

log A = 5.25614504247 + 0˙15562739022

log A = 5˙41177243269

A = Antilog 5˙41177243269

= 258090 persons i.e. **2,58,090 Persons**

**By 2041 the Population of the city will be 2,58,090 Persons**

Taking this rate continued till 2011 A.D., the population has been calculated for the years 2021, 2031, and 2041, i.e., **2,03,245** persons, **2,29,032** persons and **2,58,090** persons respectively (Table 1.2 & Fig. 1.3).

Table 1.2: Population and Decadal Growth Rate (1901 - 2011)

Years	Population (Persons)	Decadal Variation (Persons)	Decadal Variation (%)
1901	42,771		

1911	30,473	-12,298	-28.75
1921	32,569	+2,096	+6.88
1931	37,675	+5,106	+15.68
1941	44,833	+7,158	+19.00
1951	52,351	+7,518	+16.77
1961	61,851	+9,500	+40.94
1971	80,737	+18,886	+30.53
1981	1,05,140	+24,403	+30.23
1991	1,36,062	+30,922	+29.41
2001	1,60,055	+23,993	+17.63
2011	1,80,362	+20,307	+12.69
2021	**2,03,245***	-	-
2031	**2,29,032***	-	-
2041	**2,58,090***	-	-

Source: Town Directory (1901-2011), Directorate of Census Operations, Uttar Pradesh, Lucknow and calculated by Author (2023), (*Projected Population).
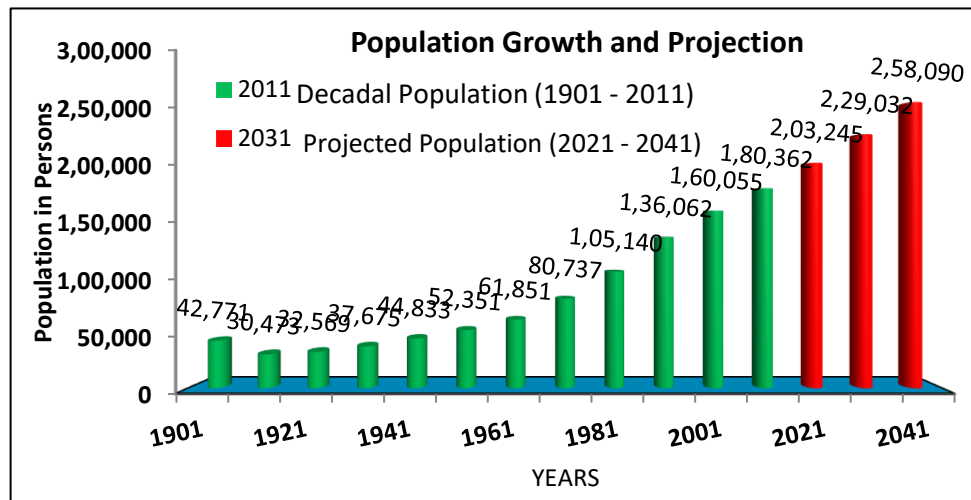
Source: Town Directory (1901-2011), Directorate of Census Operations, Uttar Pradesh, Lucknow and calculated by Author (2023), (Projected Population)

1 Characteristics of Spatial Distribution of Population

The study of population distribution is mainly based on aggregate of investigation about the people and they space occupy in region as a whole in its smallest aerial units. The distribution of population is locational, i.e., - spatial pattern in which population finds its location such as linear, dispersed, nucleated, agglomerated etc., (Tiwary, 2011).

3.1 Distribution of Population

The spatial distribution of population normally owes to the factors like physical phenomenon, economy, culture, physical and social disasters, socio-political decisions, etc., (Sharma, 2012)**.** In Jaunpur city two major clusters of settlements have developed with the times: (i) first Northern side of Gomati river (Old settlement area) i.e. the core area (central part of the city) which has developed around along Shagunj road, (ii) second Sothern side of Gomati river (New settlement area) along Lucknow – Varanasi (NH-58) and Mirzapur road. The core of the city has been basically the main commercial area along Shahgunj road which is Northern side of Gomati river (Old settlement area) consisting of 12 ward (15, 12, 19, 16, 28, 24, 14, 31, 22, 20, 10 and 26), which have more than 5,000 persons (2011) in each ward except ward 28 and 22. The highest population in ward number 10, i.e., 8,420 persons and lowest is Begamgunj i.e. 2587 persons. The Northern side of Gomati river (Old settlement area) *ward name* like *Pyare Ali, Dalgar Tola, Mundi Nasib Khan, Urdu Bazar, Makhdum Shah Adahan, Mirmust, Khwajagi Tola, Rauja Arjun, Tartala, Abhirgarh Tola, Ishapur and Mufti Muhalla*etc., which have highly dense areas of populations. It was all unplanned growth settlement of the old town.

It is packed with the variety of commercial activities and also forms the core and old commercial areas. The population distribution in the city is not even. The lowest population is in south-west of the city like in ward 2, 4 and 30 due to area of this ward is high and outer periphery of the city. The peripheral zone of the city has relatively low population. Along NH-58 road establishment of new settlement which is characterized by the medium dense population zone of the city. The population grew more in the northern side of Gomati River (Old settlement area) than that in Sothern side of Gomati River (New settlement area) along Lucknow – Varanasi (NH-58) and Pryagraj road. Since the peripheral zone has not developed as the perspective area of economic development so for. The second cluster is developed around Sothern side of Gomati River (New settlement area) along Lucknow – Varanasi (NH-58) and Pryagraj road. In this cluster, nine wards (1, 13, 11, 8, 3, 5, 6, 25 and 29) fall, which have more than 4,500 of population (2011) and the highest in ward number 6, i.e., 6,814 persons and lowest in ward number 13 i.e. 2,957 persons. Along Lucknow – Varanasi NH-58) and Pryagraj road, the peripheral zone of this cluster is around *akhas, Olandgunj, Umarpur, Husainabad,Ram Nagar, Nayigunj, Wajidpur South (Lowest), Jahangirabad and Katghara* due to which almost government offices establishment in this cluster. Only one ward i.e. wards number 10 which have more than 8,000 persons and the highest out of 31 wards (2011). The peripheral, part are areas of the city and Along Lucknow – Varanasi (NH-58) and Pryagraj road, which has scatter pattern and lies in the rural-urban fringe with agricultural land. In 2001, the population was 1,60,055 persons which increased to 1,80,362 persons in 2011. The most of

the population increased in Northern side of Gomati river (Old settlement area) and Along Lucknow – Varanasi (NH-58) and Pryagraj road (New settlement area) of these two clusters as well as peripheral areas of the city (Table 1.3 & Fig. 1.4).

1.2 Population Density

Vazquez (2022) stated that urban mobility is crucial in transport planning, especially in evaluating the location of transport stations and connecting the population density in urban areas, as population growth and mobility are crucial for public transport development and route networking (Popova, 2021). The number of transportation facilities needed depends on the population, and the convenience of the transportation facilities provided will encourage mobility for the people to travel and access the location. Hence, population density is one of the factors used to measure urban mobility (Penazzi, 2019). In terms of urban planning, mobility is crucial, especially in light of climate change. Population density will impact the environment and contribute to climate change (Abubakar, 2020).

Density is the concentration of population and activity in an urban area. The density of population affects the socio-economic conditions, urban environment as well as the facilities like health, education, employment, recreation etc., (Mishra, 2012). In the last forty years, the population load on the limited area of Jaunpur city is continuously increasing which are 32, 42, 54, 63 and 74 persons per hectare in 1971, 1981, 1991, 2001 and 2011 respectively. The spatial pattern of density is very high in old area of the city like Northern side of Gomati River. The ward consisting in this area is 12, 14, 16, 19, 20, 24, 26, 28 and 31 i.e. *Dalgar Tola, Khwajagi Tola, Urdu Bazar, Mundi Nasib Khan, Abirgarh Tola, Mirmust, Mufti Muhalla, Makhdum Shah Adahan* and *Rauja Arjan* because core area of the city.

The consisting of five ward represent medium type density in the city which is middle area of the city. The ward is 7, 9, 13, 15 and 22 i.e. *Machharhatta, Rashmandal, Olandgunj, Pyar Ali* and *Tartala*. In outer periphery of the city found density is lower which ward is 1, 3, 5, 6, 8, 10, 11, 18, 23, 25, 27 and 29 i.e. *Nakhas, Ram Nagar, Nayigunj, Wajidpur South, Husainabad, Ishapur, Umarpur, Harakhpur, Pandariba, Jahangirabad, Ahiyapur*and*Katghara*. The very low population density mostly in along Varanasi road which is wards consisting are 2, 4, 30, 17 and 21 i.e. *Matapur, Miyanpur, Chachakpur, Begamgunj*and*Abirgarh Tola*due to which large in area. Population density are high in 9 wards more than 151 persons/ha and medium type density in between 101 – 150 persons/ha in 5 wards. Population density in between 51 – 100 persons/ha in 12 wards and very low population density is below 50 persons/ha in 5 wards. It clearly

refers to the continuously increases area of the city due to pressure of population an urban expansion (Table 1.3 & Fig. 1.5).
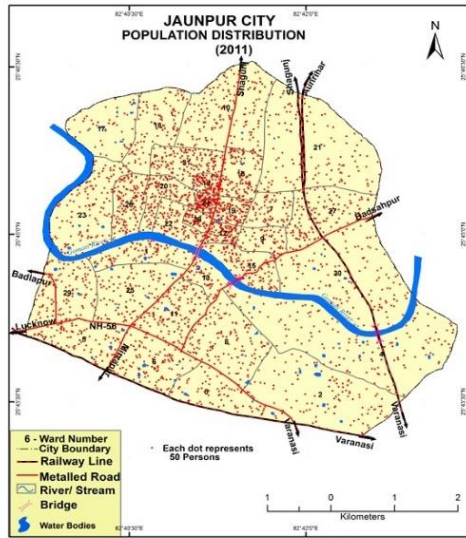

Fig. 1.4 Source: Based on data available from Primary Census Abstract 2011 and Municipal Corporation of Jaunapur City.
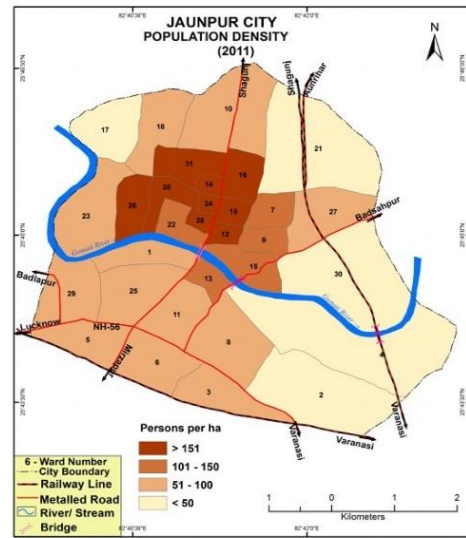

Fig. 1.5 Source: Based on data available from Primary Census Abstract 2011, and calculated by Author (2023).
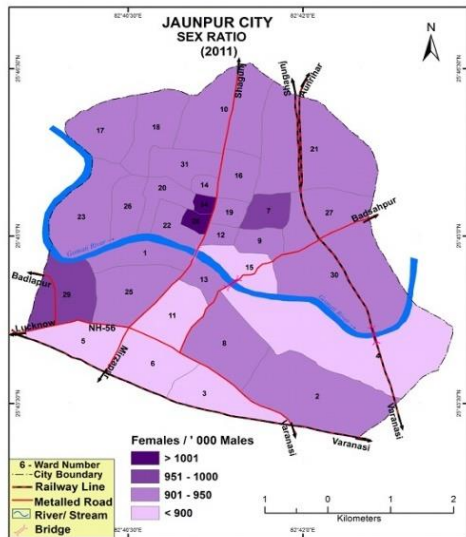

Fig.1.6 Source: Based on data available from Primary Census Abstract 2011 and calculated by Author (2023).
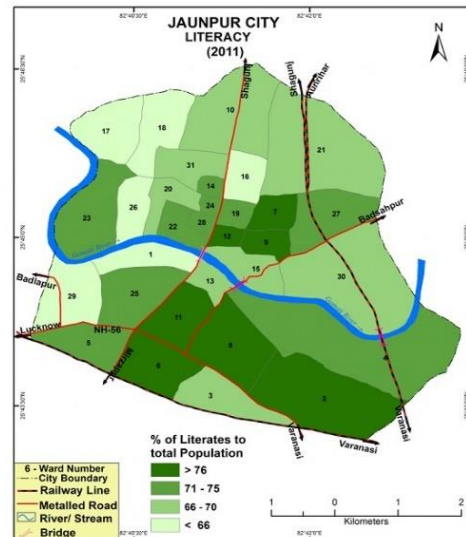

Fig.1.7 Source: Based on data available from Primary Census Abstract 2011 and calculated by Author (2023).

Table No. 1.3: Ward Name, Population, Area, Density, Sex Ratio, Literacy Rate and Working Population

Ward No.	Ward Name	Population	Area (In ha)	Population Density (In ha^2)	Sex Ratio	Literacy Rate	Working Population (in %)
1	Nakhas	4904	48.8427	100	919	65	29
2	Matapur	5744	187.893	31	922	76	25
3	Ram Nagar	4034	73.8814	55	897	70	28
4	Miyanpur	7770	267.345	29	896	71	26
5	Nayigunj	5385	68.4937	79	895	74	30
6	Wajidpur South	6814	82.0734	83	896	79	27
7	Machharhatta	3661	35.2596	104	960	81	26
8	Husainabad	6884	109.110	63	908	80	31
9	Rashmandal	3248	29.0881	112	939	76	26
10	Ishapur	8420	147.458	57	916	69	24
11	Umarpur	6656	69.5983	96	880	76	25
12	Dalgar Tola	5524	15.2921	361	933	77	32
13	Olandgunj	2957	25.4449	116	918	66	28
14	Khwajagi Tola	5445	11.8643	459	904	72	27
15	Pyar Ali	6472	50.6551	128	896	68	27
16	Urdu Bazar	6467	42.6748	152	917	63	38
17	Begamgunj	2587	78.8915	33	936	60	24
18	Harakhpur	5085	76.8708	66	904	65	32
19	Mundi Nasib Khan	6070	20.2294	300	920	71	30
20	Abirgarh Tola	6947	35.9967	193	917	68	24
21	Bhandari	6764	223.117	30	913	68	26
22	Tartala	4778	33.2573	144	936	72	28
23	Pandariba	6889	107.081	65	935	73	26
24	Mirmust	6126	8.93770	685	1011	72	25
25	Jahangirabad	5223	91.1267	57	912	73	25
26	Mufti Muhalla	7696	44.7964	172	947	64	25
27	Ahiyapur	7042	88.1738	80	910	73	26
28	Makhdum Shah Adahan	3621	11.8603	305	1005	74	26
29	Katghara	6182	87.3074	71	990	65	25
30	Chachakpur	7032	214.721	33	942	70	42
31	Rauja Arjan	7935	50.3033	158	947	70	23
Total		**180362**	**2437.64**	**74**	**925**	**71**	**28**

Source: Primary Census Abstract 2011, Directorate of Census Operations, Lucknow, Uttar Pradesh, Jaunpur Municipality and calculated by Author (2024).

1.3   Population Characteristics

1.3.1   Age-Sex Composition

There are three basic determinants of age composition of population. They are natality, mortality and mobility. Clarke (1972) rightly points out that these determinants of age structure are inter dependent and any change in one of these may influence the other two and it is through these variables that the socio-economic conditions influence the age-structure. It is the fertility rate that determines the proportion of population in the different age categories. Thus, the areas having high birth rate display large proportions in young age-groups. Since the longevity of life is also short in such areas, the proportion of population in old age-group is also not very high. Mortality also affects the age composition of population.

However, their impact upon age structure depends largely upon the variations in mortality rates at different ages. In general if the survival rate of only the childhood improves, the proportion of children will tend to rise and that of the older people will tend to fall. And if the survival rate improvement takes place only among the older people, the proportion of the older people will improve but that of children will tend to fall. Similarly, if the mortality is low both among younger and older age-groups it contributes to an increase in the proportion of persons in the higher age-groups as is the case with more in mortality is sharper in lower age-groups than that in the older age-groups, it results in the falling of number in younger age-groups as in most of developing countries. Specific impact of migration upon age composition differs widely from that of fertility and mortality because migrants have their own typical age pattern as well as natural age pattern.

As migrants tend to be relatively younger and possessing high rate of natural increase, their usual short-term impact is the decline in the proportion of the older adults and aged population. This youthful effect continues if the volume of migration is maintained. The youthful effect will tend to decline, however, if the volume of immigrants tapers off or the new migrants happen to be of older ages. Thus, the impact of migration upon age-structure largely because of the fact that migration tends to be age-selective. People in the working age-groups of 15-30 are more mobile than the people in younger age-groups. Apart from the fertility, mortality and migration, age-sex structure of the population is also influence by wars (male selective), catastrophe, natural calamities and population policies of the government.

One of the most commonly used methods of analysing age composition is age-sex pyramids. Demographic history of area can be inferred precisely from the shape of the age-sex pyramid, yet since these pyramids do not identify the specific factors affecting their shape, knowledge about the history of the area is essential to understand and interpret these

irregularities. Since under normal circumstances the number of persons in each successive year is less than that in the preceding year, the representation of age composition in this form gives it the shape of pyramid. The shape is also significantly modified by a variety of factors like wars, epidemics, migrations, baby booms etc. Sometimes the distortion in age-sex pyramid are not the produce of any single factor, thus it becomes difficult to identify the role of each factor in giving a particular shape to the pyramid. In spite of immense significance of age-sex pyramids in the demographic analysis the most serious problems with it is that it doesn't have any spatial element. Thus regional analysis of age-sex composition at global, national or micro level is not possible.

According to the census of 1971, 1981, 1991, 2001 and 2011 the ratio of women per thousand men in Jaunpur city is 860, 875, 883, 901 and 925 respectively, which continuously increases decade by decade and indicates a balanced ratio of men and women in the city. There is minor significant improvement in the socio-economics status of women. This city is having rural mind set in the people, so women are not actively involved in the mainstream occupations. Even one active self help group of women is not there in the city, although in paper dozens of them are being run by their close male relatives. The decades following 90s have seen no significant out migration. The local workers are more engaged in the local industrial and commercial units. Since they are able to sustain their families with the merge amount they earn, they do not initiate to go to the larger cities for their means of livelihood. Quality of life has no meaning for them.

The condition of women in the city is below the standard of a livable city. The sex ratio is above 1001 females per thousand males in only two wards in 2011 of the city, viz. *Mirmust and Makhdum Shah Adahan* (Ward No. 24 & 28) which situated in inner part of the city. These are the places where families with good living standard reside. Thus, the condition of women here is better than the others. In only some women of low caste and humble background are involved in the small scale industries. Therefore, the sex ratio of this area is above 1001 females per thousand males.

The ward number 24 is highest sex ratio having 1011 females per thousand males due to majority of population is minorities Muslim living in this area. The sex ratio in between 951 to 1000 females per thousand males in only two wards of the city, viz. *Machharhatta & Katghara* (Ward No. 7 & 29). The sex ratio in 20 wards are in between 901 to 950 females per thousand males which are ward no. 1, 2, 8, 13, 25, 9, 10, 12, 14, 16, 17, 18, 19, 20, 21, 22, 23, 26, 27, 30, and 31 i.e. *Nakhas, Matapur, Husainabad, Olandgunj, Jahangirabad, Rashmandal, Ishapur, Dalgar Tola, Khwajagi Tola, Urdu Bazar, Begamgunj, Harakhpur, Mundi Nasib Khan, Abirgarh Tola, Bhandari, Tartala, Pandariba, Mufti Muhalla, Ahiyapur, Chachakpur&Rauja Arjan* in the city. The sex ratio below 900 females per

thousand males is consisting only 6 wards which are 3, 4, 5, 6, 11 and 15 i.e. *Ram Nagar, Miyanpur, Nayigunj, Wajidpur South, Umarpur&Pyar Ali* in the city. There is not any significant institution exclusively for women, although on paper there are some government intuitions, but they are very poor in quality. Thus, the status of women in general is not good due to which the main reason for the moderate sex ratio in the city. The sex ratio are high in 2 wards more 1001 females per thousand males and medium type sex ratio in between 951 to 1000 females per thousand males in only two wards of the city. The sex ratio is 901 to 950 females per thousand males in 20 wards are low and very low sex ratio is below 900 females per thousand males is consisting only in 6 wards. It clearly refers to the continuously increases area of the city due to pressure of population an urban expansion (Table 1.3 & Fig. 1.6). Fig. 1.6 shows spatial distribution of absolute no. of male and female population.

1.3.2 Literacy

In Jaunpur city, the proportion of literate people has been steadily increasing in the last 40 years, which is indicative of an encouraging trend. According to the census, the percentage of literate people was 42.3 in 1971, which increased to 47.3 percent in 1981. Similarly, it increased to 62.60 percent in 1991 and to 74.90 percent in 2001. According to census 2011, literacy rate is slightly decreases i.e. 71.0 percent due to which increase in area of outer periphery of the city. Spatial distribution of the literacy rate is high of the city in Sothern side of Gomati River (New settlement area) along Lucknow – Varanasi (NH-58) and Mirzapur road. The literacy rate is found more than 76 percent in total 7 wards which is 2, 6, 7, 8, 9, 11 and 12 i.e. *Matapur, Wajidpur South, Machharhatta, Husainabad, Rashmandal, Umarpur*and*Dalgar Tola.*

The literacy rate in 9 wards is in between 71 to 75 percent which is ward number 4, 5, 14, 22, 23, 24, 25, 27 and 28 i.e. *Miyanpur, Nayigunj, Khwajagi Tola, Tartala, Pandariba, Mirmust, Jahangirabad, Ahiyapur*and*Makhdum Shah Adahan* in the city. The literacy rate in 8 wards is in between 66 to 70 percent which is ward number 3, 10, 13, 15, 20, 21, 30 and 31 i.e. *Ram Nagar, Ishapur, Olandgunj, Pyar Ali, Abirgarh Tola, Bhandari, Chachakpur*and*Rauja Arjan* in the city. The literacy rate below 66 is consisting only 6 wards which are 1, 15, 17, 18, 26 and 29 i.e. *Nakhas, Urdu Bazar, Begamgunj, Harakhpur, Mufti Muhalla&Katghara* in the city (Table 1.3 & Fig. 1.7). Literacy is the index of socio-economic development of any urban area. Although schools and colleges are there in the city, but they lack for behind imparting quality education. The poor infrastructure of the government institutions in the city is common.

The majorities of the schools, colleges and other technical and professional institute are located in near railway station, and along national

highway (NH-56) and along shagunj road. The prejudices against the female's mobility and education in city exist everywhere. It is not possible for the girls and the poor students to attain education farther away from their home. The type of economy in the city is basically oriented towards labour class in manufacturing sector. The economic condition, in general, not good in urban population. It is in no way comparable to urban in quality, thus, can't be expected from them to maintain a good standard of living and afford the high cost of education. The people of the wealthy class send their children to Pryagraj, Varanasi, Lucknow and New Delhi for studies. The rest of population has no other alternative but to stay in the city for the education facilities. The shortage of both teaching and non-teaching staff makes the situation worse.

Conclusion

The Jaunpur city is a famous city of Purvanchal, which is situated in the fertile alluvial land of both southern (Right) and Northern (Left) bank of river *Gomati* in Eastern Uttar Pradesh. The average growth rate of the city is 1.73 percent (1901-2011) per annum, whereas average decadal growth rate is 17.36 percent (1901-2011). The average decadal growth rate during 1901 to 1951 is very low (5.92.77%), whereas during 1951 to 1981 decadal growth rate is high (33.9%) and during 1981 to 2011, it is moderate (19.91%). Taking this rate continued till 2011 A.D., the population has been calculated for the years 2021, 2031, and 2041, i.e., 2,03,245 persons, 2,29,032 persons and 2,58,090 persons respectively. The peripheral, part are areas of the city and Along Lucknow – Varanasi (NH-58) and Pryagraj road, which has scatter pattern and lies in the rural-urban fringe with agricultural land. In 2001, the population was 1,60,055 persons which increased to 1,80,362 persons in 2011.

The most of the population increased in Northern side of Gomati River (Old settlement area) and Along Lucknow – Varanasi (NH-58) and Pryagraj road (New settlement area) of these two clusters as well as peripheral areas of the city. In the last forty years, the population load on the limited area of Jaunpur city is continuously increasing which are 32, 42, 54, 63 and 74 persons per hectare in 1971, 1981, 1991, 2001 and 2011 respectively. The spatial pattern of density is very high in old area of the city like Northern side of Gomati River. The very low population density in along Varanasi road. According to the census of 1971, 1981, 1991, 2001 and 2011 the ratio of women per thousand men in Jaunpur city is 860, 875, 883, 901 and 925 respectively, which continuously increases decade by decade and indicates a balanced ratio of men and women in the city. According to the census, the percentage of literate people was 42.3 in 1971, which increased to 47.3 percent in 1981. Similarly, it increased to 62.60 percent in 1991 and to 74.90 percent in 2001. According to census 2011,

literacy rate is slightly decreasing i.e. 71.0 percent due to which increase in area of outer periphery of the city.

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