

A Study on Urbanization and Economic Development in Punjab

¹Ms. Faza Anjum

Research Scholar

Department of Applied Economics, University of Lucknow

<https://doi.org/10.64882/ijrt.v14.iS1.967>

Abstract

Punjab has experienced rapid urbanization in recent decades due to a decline in the proportion of agricultural activity and an increase in rural-to-urban migration. Using census data, this paper examines the recent patterns and trends of urbanization in Punjab between 1961 and 2011. It looks into Punjab's pertinent urbanization determinants. Lastly, it calculates how Punjab's urban economic growth is affected by urbanization. The empirical findings demonstrate that Punjab's urban population is growing at a faster rate than the state's overall population. Punjab's urban areas and agglomerations are also growing quickly. Most significantly, compared to other classes of cities and towns, Punjab's urban population is concentrated in and around Class I cities. The results of the OLS regression indicate that urbanization in Punjab, as measured by the size of the city population, is negatively impacted by the road distance to the sub division (or the closest city population of one lakh or more). Conversely, Punjab's urbanization is positively impacted by the overall length of the city's roads. Furthermore, as indicated by city population density, Punjab's urbanization is positively impacted by the overall number of schools, colleges, and electrical connections. The study also discovers a positive correlation between Punjab's urban economic growth as indicated by district domestic product and urbanization as indicated by the size of the district urban population. The study concludes by outlining a number of policy options for Punjab's planned urbanization that will enhance both the province's and India's economic growth.

Keywords: Urbanization, Urban Economic Growth, Punjab, India

Introduction

An important factor in a country's economic development is urbanization. One Urbanization and economic expansion are strongly correlated. In other words, rapid urbanization typically follows modernization and industrialization, and it does translate into rapid GDP growth. Without industrialization and modernization, which come from urbanization and raise people's standards of living and consumption, no nation has been able to transition from a poor to a developed economy.

The majority of people on the planet reside in cities. Singapore, Kuwait, Belgium, Qatar, Venezuela, Uruguay, Argentina, Israel, the United Kingdom, and Australia are among

the top ten urbanized nations in the world. This suggests that developed nations have a higher level of urbanization than do developing nations. However, due to an increase in both their share of the national economic growth rate and their urban population, developing nations are currently experiencing a faster rate of urbanization than developed ones. China's urban population grew to 51.27 percent in 2011 while the country's rural population fell to 48.73 percent, from 26.94 percent in 1991 and 73.06 percent in 2011. India is the world's second most populous nation. India is also experiencing a greater rate of urbanization. Urbanization has been linked to a number of external factors, including modernization (better infrastructure, medical facilities, communication, transportation, and technology), social factors (better schooling and college, higher standard of living), and rapid industrialization (increased employment opportunities). Urban growth is increasing as a result of the large-scale migration of people from rural to urban areas. India's fast urban economic growth has improved living standards by creating more jobs, decreasing reliance on agriculture, and reducing poverty.

India's economic growth is correlated with the country's rising urbanization rate. Because urbanization and growth are positively correlated, cities are catalysts for economic expansion. Between 2001 and 2011, India's urban population grew from 27.81 percent to 31.16 percent. However, the percentage of people living in rural areas fell from 72.19 percent in 2001 to 68.84 percent in 2011. Tamil Nadu (54.4 percent), Maharashtra (46.2 percent), Gujarat (40.3 percent), Punjab (39.5 percent), and Karnataka (36.02%) are the top five states with the highest rates of urbanization, according to the 2011 census. Between 2001 and 2011, India's urban agglomeration grew from 384 to 475. Mumbai (1.84 crore), Delhi (1.63 crore), Kolkata (1.40 crore), Chennai (86.54 lakh), and Bangalore (85.20 lakh) are India's top five agglomerated states. In 2001, there were 3799 Statutory Towns; by 2011, there were 4041.

The number of census towns increased from 1362 in 2001 to 3894 in 2011.4 Most importantly, cities and towns of India constitute the world's second largest urban system and contribute over 50 per cent of the country's gross domestic product (Tripathi, 2013).

Recently, many public policies have been introduced to promote urbanization in India for higher and sustainable economic growth. The Jawaharlal Nehru National Urban Renewal Mission (JNNURM), National Urban Sanitation Policy, Urban Transport Policy, Service Level Benchmarking, setting up of a high powered expert committee on urban infrastructure, public-private partnership, centers of excellence in urban development, 100 Smart Cities, Atal Mission for Rejuvenation and Urban Transformation (AMRUT), Swachh Bharat Abhiyan and Digital India are some of the actions launched by the government of India. Among these policies, JNNURM was one of the very important mission is launched in 2005. The main objective or aim of the JNNURM is to improve and speed up planned development of identical cities and to increase the efficiency of infrastructure and service delivery mechanism, community sharing and accountability of urban local bodies' parasternal agencies towards citizens. The 100 smart cities initiative was most recently proposed. Achieving inclusive growth is the primary goal of the 100 Smart Cities project. Three Punjabi cities—Ludhiana, Jalandhar, and Amritsar—were

included in this plan. The government has created detailed plans for maintaining urban green spaces. Under this program, the department of industrial policy will prepare the city as a smart city with advanced infrastructure features like transportation, energy, water, and solid waste management, as well as travel safety and security.

Similar to India, Punjab is experiencing urbanization as a result of modernization and industrialization, and people are moving from rural to urban areas due to fewer employment opportunities in the primary sector and in agriculture. About 19% of Punjabis moved from rural to urban areas in 2007–2008, compared to 20% of Indians. This suggests that Punjab is seeing a very high rate of rural-to-urban migration. Between 2004–05 and 2014–15, Punjab's average gross state domestic product (GSDP) growth rate was roughly 10.32%. Punjab's economy is predicted to expand at a slower rate of 5.32 percent in 2014–15 at constant 2004–05 prices, as opposed to 5.73% the year before. Punjab has been ranked first in India for infrastructure facilities. Punjab has good roads, bridge construction, rail, air transportation, connectivity, and infrastructure facilities. Between the 2001 and 2011 censuses, Punjab's urban population grew from 33.9% to 37.5%. This suggests that Punjab's proportion of the population living in cities is likewise rising quickly.

TABLE 1: Trends of Urban population in Punjab 1961-2011

Year	Size and share of urban population			Growth rate of urban population	
	Total Population (in lakh)	Urban Population (in lakh)	Percentage	Total Population	Urban Population
1961	111	26	23.06	-	-
1971	136	32	23.73	1.98	2.27
1981	168	46	27.68	2.17	3.75
1991	203	60	29.55	1.91	2.58
2000	243	82	33.95	1.82	3.24
2011	277	104	37.49	1.34	2.35

Source: Census of India for various years.

Punjab's population trends are shown in Table 1. Punjab is now one of the most urbanized states in India, with one in two people living in urban areas. This has led to a greater concentration of urban residents in these areas. Approximately 37% of Punjab's 277 lakh residents lived in urban areas, according to the 2011 census. In 1961, the state had 111 lakh people, in 1971, 135 lakh; in 1981, 1991, and 2001, the numbers were 167, 202, and 242 lakh, respectively. This suggests that over time, the population has been increasing. Over the course of several census years, the proportion of the population living in urban areas has been rising. According to the 1961 census, 23.06 percent of the population lived in urban areas, and by 2011, that number had risen to 37.49 percent. Compared to the overall population, the urban population's CAGR is higher. In 1971, for example, the CAGR of the urban population was 2.27 percent and the CAGR of the total population was 1.98 percent. In 2011, the urban population's CAGR was 2.35 percent and the overall population's CAGR was 1.34 percent. This suggests that, in Punjab's case, the urban population is growing at a faster rate than the overall population.

The aforementioned discussion makes it abundantly evident that urbanization is happening quickly in India, particularly in Punjab. One of India's most fertile areas is Punjab. Although it was founded primarily on agricultural activity during the Green Revolution, it is currently moving toward greater modernization and urbanization in tandem with India. For example, India's (or Punjab's) agricultural sector's share of the country's overall GDP dropped from 40% (or 48%) in 1950–51 to 17.9% (or 19%) in 2014–15. However, the proportion of Punjab that is urbanized has grown from 28% in 1981 to 38% in 2011. In light of this, the current study attempts to address the following three queries regarding Punjab's urbanization: first, it outlines the most recent historical trends and patterns of Punjab's urbanization between 1961 and 2011. 5 Second, it looks into the pertinent factors that contribute to Punjab's urbanization. Lastly, it calculates how Punjab's urban economic growth is affected by urbanization. Furthermore, it recommends pertinent policies to encourage urbanization in Punjab in order to boost economic growth.

Literature Review

According to Davis (1995), the three-fourths of the world's population that reside in developing nations are still in their infancy. In a century, the world's population doubles and simultaneously becomes highly urbanized. Cohen (2006) discovered that more than three quarters of people in high-income countries and nearly half of all people on the planet now reside in cities. Nearly 400 cities worldwide have a population of one million or more, and roughly 70% of them are in less developed nations. According to Chandrasekhar and Sharma (2015), techniques for concurrently estimating urban growth and migration must be developed. Punjab's scheduled caste urbanization follows a set of patterns in rural-urban migration, according to D'Souza (1982). Scheduled castes are less likely than the general population to live in cities, and their representation decreases with increasing occupational complexity.

Henderson (2003) maintained that urbanization is not a growth stimulus in and of itself, but rather reflects changes in fashion within an economy as development advances. According to Bhagat (2011), the national urban population growth rate reversed the downward trend that had been seen in the 1980s and 1990s, and the rate of urbanization accelerated between 2001 and 2011. In terms of proportions, the natural increase in urban growth's contribution has decreased. According to Datta (2006), policies should be linked to appropriate urban planning, and in order to create a robust urban economy, investment and growth initiatives should focus on small cities and the establishment of a solid economic foundation. Cali (2009) investigated the different ways that the urbanization process might affect India's development results. The author discovered that in Indian states, urbanization and economic development appear to be correlated over time. Kalamkar (2009) examined the connection between India's growing agricultural sector and urbanization. Since the 1950s, the amount of forest and agricultural land available per person has been declining due to population growth. Migration from rural areas is a major factor in the faster urban population growth.

Mundhe and Jaybhaye (2014) investigated Maharashtra's urbanization trends and patterns from 1991 to 2011. The author discovered that Maharashtra's urbanization is highly uneven. In contrast to the most urbanized areas of the state, which are Harathwada and Vidharbha, Western Maharashtra is more urbanized. The recent past trends and patterns of India's urbanization and urban economic growth were detailed by Tripathi (2015). According to the paper, the Indian government should accelerate the rate of urbanization since it increases the country's GDP share by reducing inequality and urban poverty. Sawhney (2012) examined the state's public policy concerns during the previous 20 years. In order to ensure that public funds are used in accordance with sound financial practices and are not diverted for political purposes through wasteful public functions and populist announcements, governance reforms, transparency in the development delivery mechanism, and fiscal reforms are urgently needed.

Vaidya (2009) examined a number of topics that are directly related to urban development in India, such as urban trends, projected population, service delivery, institutional arrangements, municipal finances, and financing innovation. The author recommended both administrative measures and constitutional amendments. Above all, intergovernmental transfers ought to include incentives for better performance, and future urban programs ought to prioritize capacity building. Henderson (2005) discovered that while larger cities in less developed nations may be centered on manufacturing, as a result of growth and technological advancement, these cities are increasingly specializing in service functions that are bought by smaller-town manufacturers and retailers. According to Harris (1990), urbanization will become more significant in developing nations as low-income nations begin the demographic shift to primarily urban societies. In order to create the means to ease this transition, the government plays a crucial role in making use of the required income increases that are one of the process's outcomes. Aid also plays a specific role in aiding in the process' management.

Lo (2010) conducted an empirical investigation into the Granger causality between economic growth and urbanization. The findings show that there is a long-term equilibrium relationship between the two processes. Additionally, by applying Granger causality techniques, we discover some evidence that, for developing nations, the causal relationship runs from urbanization to economic growth, whereas for developed nations, the opposite is true. Tripathi (2013) found that the bigger cities (as per population size) show lower level of inclusive growth in India. Mitra and Murayama (2009) examined the rate of male and female migration from rural to urban areas at the district level, both within and between states. They discovered that the rates of migration within states are significantly higher than those between states. Second, regardless of whether they migrate from rural areas inside or outside of states, the rates of migration for men and women are closely related. In order to reduce rural-urban migration and address issues of urban poverty and underemployment, Rhoda (1983) recommended that governments reevaluate policies that depend on rural development. Possibly the most effective strategy for reducing rural-urban migration is to alter urban areas. The systematic analysis of urbanization in India has been the subject of numerous papers, but the role of urbanization in Punjab has not received enough attention. Thus, our study intends to close this gap by taking into account pertinent empirical research and offering policy recommendations for Punjab's future urban development in order to promote greater economic growth.

Trends and patterns of urbanization in Punjab

Punjab has a total population of 277,04,236 according to the 2011 census, with 10,387,436 (37.49%) living in urban areas and 173,16,800 (62.51%) living in rural areas. Between 2001 and 2011, Punjab's total population grew from 2.45 to 2.77 crore. Between the 2001 and 2011 censuses, Punjab's urban population share grew from 33.9% to 37.5%. The percentage of people living in urban areas has increased in all of Punjab's districts, per the census data. In Punjab, two-thirds of the population still resides in rural areas. The four districts of Ludhiana (59.16 percent), Mohali (54.76%), Amritsar (53.58%), and Jalandhar (52.93%) are home to nearly half of Punjab's urban population. At 12.66 percent, Tarn Taran is Punjab's least urbanized district. Nawanshahr is the second least urbanized district, at 20.48 percent, followed by Mansa (21.25%) and Hoshiarpur (21.11%). In the year 2001, the urban population grew by 25.72 percent, while the rural population grew by 7.78 percent. The rate of urban population growth is three times faster than the rate of rural population growth. The district of Faridkot has the lowest urban population growth rate at 12.1%, while the district of Mohali has the highest at 90.2%. Mohali is being developed by the Punjabi government to the same standard as Chandigarh, and the surrounding areas are even being developed up to Kharar in terms of residential and educational facilities. There are 217 towns with a total urban population that is further divided into various classes.

Between 2001 and 2011, there were 217 urban agglomerations, an increase of roughly 38.22 percent. The findings indicate that, between 2001 and 2011, the number of urban

agglomerations (UAs) and towns increased. The percentage of Punjab's total area that is urban is shown in Table 2. Punjab's total area was 50235 square kilometers (sq. kms.) in 1961; this increased to 50362 sq. kms. in 1971 thanks to the Surveyor General of India (Table 3). In 1961, there were 106 towns and UAs; by 2011, that number had grown to 217. The urban area has been growing annually. The total area in 1961 was 50235 square kilometers, of which 627.71 square kilometers were in the urban area. According to census data from 1971, 1981, 1991, and 2001, the urban area had grown to 691.66, 1198.80, 1441.80, and 2096.62 square kilometers, respectively. People are moving from rural to urban areas in pursuit of employment and higher living standards, as evidenced by the growth of the urban area relative to the total area. However, the strain on the infrastructure has also increased complexity as a result of the urban population growth. The urban area's growth in relation to the overall area is proof that people are relocating from rural to urban areas in search of work and better living conditions. But the growing urban population has also put more strain on the infrastructure, making it more complex. From 1.25 percent in 1961 to 1.37, 2.38, 2.86, and 4.16 percent in 1971, 1981, 1991, and 2001, respectively, Punjab's urban area to total area ratio has increased. Punjab's urban area's CAGR was 0.97 percent in 1961 and rose to 5.65 percent, 1.86 percent, and 3.82 percent in 1971, 1981, 1991, and 2001, respectively.

Table 2: Trends of urbanization in Punjab: 1961-2011

Year	No. of Towns/UAs	Total area of Punjab (sq. kms)	Urban area of Punjab (sq. kms)	Urban area as Percentage to total area	Growth rate Urban area of Punjab (%)
1961	106	50235	627.71	1.25	-
1971	106	50362	691.66	1.37	0.97
1981	134	50362	1198.8	2.38	5.65
1991	120	50362	1441.8	2.86	1.86
2000	157	50362	2096.62	4.16	3.82
2011	217	50362	2097.5	4.16	0.00

Source: Author's estimation using Census data for various years.

The total urban area of Punjab and the area of various city classes from 1961 to 2001 are shown in Table 3. Between 1961 and 2001, Punjab's urban area grew by expanding the urban areas of Class I, II, III, IV, and V cities. The urban area of Class VI cities was 23.13 square kilometers in 1961; it is now 22.05 square kilometers. Class I cities had an area of

143.98 square kilometers in 1961, 174.57 square kilometers in 1971, and 448.16, 556.46, and 763.12 square kilometers in 1981, 1991, and 2001, respectively. Class II cities' areas grew from 57.18 square kilometers in 1961 to 94.15 square kilometers in 1971, and then to 140.17, 294.39, and 390.84 square kilometers in 1981, 1991, and 2001, respectively. Class III cities' urban areas increased from 229.65 square kilometers in 1961 to 418.74 square kilometers in 2001. Class IV cities had an area of 73.80 square kilometers, which grew to 129.82 square kilometers in 1971, 197.81 square kilometers in 1981, 242.07 square kilometers in 1991, and 367.19 square kilometers in 2001. In Class V cities, the urban area grew from 99.91 square kilometers to 134.68 square kilometers in 2001. Class VI cities had an area of 23.13 square kilometers, which dropped to 13.76 square kilometers in 1971, then rose to 16.27 square kilometers in 1981, then dropped once more to 13.55 square kilometers in 1991, and finally increased to 22.05 square kilometers in 2001. These findings show that, with the exception of Class VI, all Class cities had high rates of urban area growth.

Table 3: Urban area for different size and class of cities in Punjab from 1961 to 2001

Year	Total area (sq. kms)	Urban area(sq.kms)	Area (sq. kms)					
			Class I Cities	Class II cities	Class III cities	Class IV	Class V cities	Class VI cities
1961	50235	627.71	143.98	57.18	229.65	73.8	99.97	23.13
1971	50362	691.66	174.57	94.15	199.93	129.82	79.43	13.76
1981	50362	1198.8	448.16	140.17	302.57	197.81	93.82	16.27
1991	50362	1441.8	556.46	294.39	284.03	242.07	51.3	13.55
2001	50362	2096.62	763.12	390.84	418.74	367.19	134.68	22.05

Sources: Various Census data Note: According to 1961, 1971, 81, 91 and 2001 census all towns and U.A's have been grouped into classes according to their population size: Class I cities: Population of 1, 00,000 and above, Class II cities: Population of 50,000 to 99,999, Class III cities: Population of 20,000 to 49,999, Class II cities: Population of 10,000 to 19,999, Class II cities: Population of 5,000 to 9,999, Class II cities: Population of less than 5,000

Table 4 represents the classification of urban population in different Classes. From 1951 to 2011, the percentage of Punjab's total urban population living in Class I towns increased from 33.11 percent to 57.50 percent, while the percentage of Class II urban residents increased from 7.73 percent to 16.97 percent. However, Punjab's share of the urban population is declining, according to class III and class VI towns. This finding suggests that more people are moving to Class I cities than to other types of towns or cities. To make it clear how the share

of the urban population is growing across city classes in various Census years, Table 4 has been depicted in Figure 1. According to the figure, the population share of Class I and Class II cities has grown, while that of Class III, Class VI, Class V, and Class VI cities/towns has decreased. Figure 1 shows that the population share of Class I cities increased from 1951 to 2011, while the population share of Class II cities increased as well. However, the Class I cities' population share increased more than that of Class II cities. Between 1951 and 2011, the population share of Class III, Class VI, Class V, and Class VI cities and towns decreased; however, the Class VI towns' population share decreased more than that of the other classes of cities and towns. Most significantly, between 1951 and 2011, the population shares of Class III towns decreased the least.

Table 4: Trends in Urban Population in different size–categories of cities/towns in Punjab

Trends in Urban Population in different size- categories of Cities & Towns							
Year	Class I	Class II	Class III	Class IV	Class V	Class VI	All Classes
1951	[33.11]	[7.73]	[26.17]	[14.44]	[13.18]	[5.37]	[100.00]
	6,58,725	1,53,719	5,20,558	2,87,223	2,62,197	1,06,845	19,89,267
1961	[38.25]	[10.15]	[28.11]	[10.44]	[10.38]	[2.67]	[100.00]
	9,81,890	2,60,707	7,21,684	2,67,913	2,66,439	68,673	25,67,306
1971	[40.52]	[15.84]	[22.20]	[13.32]	[6.84]	[1.28]	[100.00]
	13,03,128	5,09,389	7,14,176	4,28,413	2,19,911	41,162	32,161,79
1981	[46.38]	[14.39]	[20.24]	[11.28]	[6.50]	[1.21]	[100.00]
	21,55,714	6,68,780	9,40,482	5,24,505	3,01,905	56,371	46,47,757
1991	[54.16]	[19.91]	[12.92]	[10.82]	[1.72]	[0.47]	[100.00]
	32,46,224	11,93,171	7,74,453	6,48,230	1,02,945	28,202	59,93,225
2001	[58.38]	[16.45]	[12.50]	[9.82]	[2.52]	[0.33]	[100.00]
	48,14,405	13,56,386	10,30,623	8,09,366	2,07,891	26,895	82,45,566
2011	[57.50]	[16.79]	[12.95]	[8.41]	[3.44]	[0.73]	[100.00]

	5958871	1759228	1342379	871157	356585	75481	10399146
--	---------	---------	---------	--------	--------	-------	----------

Source: Author’s calculation using Census data Note: -1. Percentage population in each class
2. Total population in each class (without bracket)

Table 5 presents the district-wise compound annual growth rate (CAGR) of urban population in different census years. In 1961-71, the highest growth rate of urban population has been experienced in Ludhiana and followed by Fatehgarh Sahib and Sahibzada Ajit Singh Nagar. However, Rupnager has experienced a negative growth rate over the same time frame. Sahibzada Ajit Singh Nagar had the highest CAGR in 1971–81. While it remains in second place, Ludhiana drops from first to fourth place. Sahibzada's Ajit Singh Nagar saw a decline in CAGR from 1981 to 1991, but it remains at the top, while Ludhiana's CAGR rose from fourth to second.

Table: 5 District- wise CAGR (%) of urban population in Punjab

District names	1961-71	1971-81	1981-1991	1991-01	2001-11
Sahibzada Ajit Singh Nagar	3.1	10.0	6.6	7.8	4.9
Gurdaspur	2.1	2.9	1.3	5.8	0.7
Shahid Bhagat Singh Nagar	1.6	3.1	1.8	5.5	2.3
Mansa	3.0	3.0	2.2	5.3	1.4
Amritsar	1.4	3.0	1.7	4.1	1.3
Fatehgarh	3.4	5.6	2.1	3.9	1.9
Jalandhar	2.3	3.4	1.9	3.6	2.0
Tarn Taran	1.4	3.9	1.4	3.5	0.6
Kapurthala	2.3	4.5	1.4	3.4	1.9
Ludhiana	4.3	4.3	5.2	3.4	1.7
Rupnager	-0.9	3.0	2.9	3.4	1.0

Sangrur	2.3	3.0	2.6	3.4	1.8
Barnala	1.3	2.3	1.5	3.1	9.0
Bathinda	1.3	2.3	1.5	3.1	9.0
Firozpur	1.0	2.5	2.3	3.0	1.4
Hoshiarpur	3.0	3.1	2.5	3.0	1.2
Patiyala	2.1	3.6	1.9	2.7	2.2
Faridkot	0.7	3.6	2.6	2.5	1.1
Muktsar	2.1	3.8	2.6	2.2	2.4
Moga	2.5	2.6	5.0	2.1	1.8

Source: Authors’ calculation using Census data for various years.

The urban population CAGR of Punjab's Class I towns is shown in Table 6. Between 1961 and 1971, Ludhiana (M Corp) had the highest urban population growth rate (CAGR) at 5.1%, followed by Jalandhar at 2.9%, Patiala at 1.9%, and Amritsar at 1.5% on average. However, Ludhiana's CAGR dropped to 4.2% in 1971–81, while Jalandhar's increased to 3.3%, and Patiala and Amritsar's increased to 3.2% and 1.7%, respectively. Ludhiana's CAGR increased by 5.6% between 1981 and 1991, while Jalandhar, Patiala, and Amritsar saw declines to 2.2%, 2.1%, and 1.8%, respectively. Two new towns, Bathinda and Pathankot, were added in 1981–1991, with respective CAGRs of 2.2% and 1.2%. Ludhiana's CAGR dropped to 3% in 1991–01, while Jalandhar, Patiala, Amritsar, Bathinda, and Pathankot saw increases to 3.3%, 2.5%, 3.2%, and 3.1%, respectively. Hoshiarpur, Moga, and Abohar are the three new towns that were added in the same year; their respective CAGRs were 2%, 1.5%, and 1.5%. Ludhiana's CAGR dropped to 1.5% in 2001–11, while Jalandhar, Patala, Amritsar, Bathinda, Pathankot, and Hoshiarpur saw declines to 2%, 2.3%, 1.2%, -0.5%, and 1.2%, respectively. Both Moga and Abohar saw increases in their CAGRs to 1.8% and 1.6%, respectively. The CAGRs of the five new towns—Batala, SAS Nagar, Malerkotla, Khanna, and Phagwara—that were added that same year were 0.6%, 1.7%, 2.4%, 2.2%, and 1.4%, respectively.

Table 6 CAGR of population of Class I cities in Punjab

Class I	CAGR (%)				
	1961-71	1971-81	1981-1991	1991-01	2001-11
Ludhiana	5.1	4.2	5.6	3.0	1.5

Amritsar (M Corp.)(Part)	1.5	2.7	1.8	3.5	1.2
Jalandhar (M Corp.+ OG)(Part)	2.9	3.3	2.2	3.3	2.0
Patiala (M Corp.+OG)	1.9	3.2	2.1	2.5	2.3
Bathinda (M Corp.)	-	-	2.2	3.2	2.8
Pathankot (M Corp.)	-	-	1.2	3.1	-0.5
Hoshiarpur (M CI)	-	-	-	2.0	1.2
Moga (M CI+OG)	-	-	-	1.5	1.8
Abohar (M CI)	-	-	-	1.5	1.6
Batala (M CI+OG)	-	-	-	-	0.6
SAS Nagar (Mohali) (M CI+OG)	-	-	-	-	1.7
Malerkotla(M CI)	-	-	-	-	2.4
Khanna (M CI)	-	-	-	-	2.2
Phagwara (M CI)	-	-	-	-	1.4

Source: Author’s calculation using Census data for various years.

The CAGR of Punjab's and India's urban populations across several census years is shown in Table 7 and Figure 3. India's population grew at a CAGR of 3.29 percent in 1971,

while Punjab's was 2.28 percent. The CAGR of India and Punjab rose to 3.87 percent and 3.75 percent, respectively, in 1981. However, in 1991, the CAGRs of India and Punjab fell to 3.14% and 2.58%, respectively. The CAGR of India fell to 2.77 percent in 2001, but it rose to 3.24 percent in Punjab. In 2011, the CAGR of India rose to 2.83 percent, but it fell to 2.35 percent in Punjab.

Table 7: CAGR of urban population in India and Punjab

	India			Punjab		
Year	Urban population (in lakh)	percentage	CAGR (%)	Urban population (in lakh)	percentage	CAGR
1961	789	17.97	-	26	23.03	-
1971	1091	19.91	3.29	32	23.73	2.28
1981	1595	23.34	3.87	46	27.68	3.75
1991	2172	25.72	3.14	60	29.55	2.58
2001	2854	27.86	2.77	82	33.95	3.24
2011	3771	31.16	2.83	104	37.49	2.35

Source: Authors' calculation using Census data for various years.

The population dynamics trends for Punjab and India between 2001 and 2011 are shown in Table 8. India's total population, which was 1027.2 million in 2001, increased to 1210.2 million with a 17.8% change, with the rural population moving up from 741.1 million to 833.1 million with a 12.3% improvement. With a 32.2 percent change, the urban population grew from 285.1 million to 377.1 million. Regarding Punjab, in 2001, the state's total population was 24.6 million, of which 16.1 million lived in rural areas and 8.5 million in urban areas. Conversely, the overall population in 2011 was approximately 27.6 million, with a 14.2 percent change; the rural population was 17.1 million, with a 26.1 percent change, and the urban population was 10.5 million. Between 2001 and 2011, the number of statutory towns in India increased from 3799 to 4041, with a percentage change of 6.4, while in Punjab, it increased from 139 to 143, with a percentage change of 2.9. Between 2001 and 2011, the number of census towns in India increased from 1362 to 3894, with a percentage change of 185.9, while in Punjab, it increased from 18 to 74, with a percentage change of 311.1. Between 2001 and 2011, the urban agglomeration in India grew from 384 to 475, with a 23.7 percent change, and in Punjab, it grew from 157 to 217, with a 38.2 percent change.

Table 8: Trends in Population in India and Punjab during 2001 and 2011

Sr No	Type of Town	Punjab			India		
		2001	2011	% change (2001-2011)	2001	2011	% change 2001-2011
1	Total population	24289296	27743338	14.2	1027015247	1210193422	17.8
(a)	Rural population	16096488	17344192	7.8	741660293	833087662	12.3
(b)	Urban population	8245566	10399146	26.1	285354954	377105760	32.2
2	Statutory town	139	143	2.9	3799	4041	6.4
3	Census town	18	74	311.1	1362	3894	185.9
4	Urban agglomeration	157	217	38.2	384	475	23.7

Source: Author’s calculation using Census data for various years.

Table 9: Class-wise numbers of cities/towns in India and Punjab

Year	India							Punjab						
	Class I	Class II	Class III	Class IV	Class V	Class VI	All Classes	Class I	Class II	Class III	Class IV	Class V	Class VI	All Classes
1951	76	91	327	608	1124	569	2795	3	2	17	19	33	26	100
1961	102	129	437	719	711	172	2270	4	5	23	19	35	18	104
1971	148	173	558	827	623	147	2476	4	8	22	32	27	11	104
1981	218	270	743	1059	758	253	3301	6	38	11	27	33	9	124

1991	300	345	947	1167	740	197	3696	9	18	23	47	16	8	121
2001	393	401	1151	1344	888	191	4368	14	18	37	59	55	25	208
2011	468	-	-	-	-	-	7935	17	24	48	60	50	18	217

Source: Author’s calculation using Census data for various years.

The number of towns in India and Punjab by class from 1951 to 2011 is shown in Table 9. Both Punjab and India now have a significantly higher number of class I cities. Between 1951 and 2011, it rose from 76 in India to 468 in 2011, and in Punjab, it rose from 3 to 17. Similarly, the number of class II towns in Punjab increased from 2 to 24 between 1951 and 2011, and the number of class II towns in all of India increased from 91 in 1951 to 401 in 2001. Between 1951 and 2001, the number of Class III towns in all of India rose from 327 to 1151, while in Punjab, it rose from 17 to 48. Comparably, Class IV towns grew from 608 to 1344 in India between 1951 and 2001, and from 19 to 60 in Punjab between 1951 and 2011. In contrast, Class V towns fell from 1124 to 888 in India between 1951 and 2001, but increased from 33 to 50 in Punjab between 1951 and 2011. . Between 1951 and 2001, the total number of Class VI towns in India fell from 569 to 191. In a similar vein, Punjab's Class VI town count dropped from 26 to 18 between 1951 and 2011, while the overall number of towns in Punjab and throughout India increased. In 1951, there were 2795 (or 100) cities and towns in all of India (or Punjab), but today there are 7935 (217).

Determinants of urban agglomeration in Punjab

We now look into Punjab's urban agglomerations' economic drivers. Examining the factors that contribute to urban agglomeration is crucial for recommending future urban policies. By concentrating on Punjab, this aids in our forecasting of future urbanization and economic growth in India.

To find out the determinants of urbanization in Punjab, we use the following OLS regression model:

$$UA = \alpha + \beta_1(RF) + \beta_2(TEMP) + \beta_3(SDRD) + \beta_4(NCP1L) + \beta_5(NCP5L) + \beta_6(NCP5L) + \beta_7(NS) + \beta_8(NC) + \beta_8(EC) + \epsilon$$

In this model urban agglomeration (UA) is measured by size of city population and density. In this model urban agglomeration (UA) is measured by size of city population and city density. On the other hand, rainfall (RF), temperature (TEMP), State H.Q. Road Distance (SRD), Sub division H.Q. Road Distance (SDRD), Nearest City with Population of 1 Lakh and more Road Distance (NCP1L), Nearest City with Population of 5 Lakh and more Road Distance (NCP5L), Road Length (RL), number of School (NS), number of College (NC), number of electricity connection (EC) are used as independent variables. As per the findings

of the previous studies (e.g., Tripathi, 2013; Sridhar, 2010), we expect that rainfall, lower temperature differences, road length, city-wise number of schools, and city-wise number of colleges have positive effect on urbanization in Punjab. On the other hand, distance from a state H.Q. from a city/town, distance from sub-division H.Q., distance from nearest city with population 1 lakh (or 5 lakh) or more people will have a negative effect on urbanization in Punjab.

Table 10 presents the summary statistics (means, standard deviations, minimum, and maximum) of the variables used for the regression estimations. Rainfall, temperature differences, state H.Q. Road distance appear to have a little difference in their means, implying a more symmetrical distribution. It does not, however, apply to a city's or town's population, road length (RL), number of colleges, or number of electrical connections.

Table 10: Description of data used in regression equation 1

Variables	Mean	Std.Dev	Min	Max	CV
Population size of city/town (PSC)	48178	151769	2744	1618879	315.0
Population density of city/town (PDC)	3206	2690	196	27729	83.9
Rainfall (RF)	675	211	130	1186	31.2
Temperature (TEMP)	40	3	31	49	8.4
State H.Q. Road Distance (SDRD)	158	78	1	320	49.4
Sub division H.Q. Road Distance (SDRD)	9	9	0	44	95.9
Nearest City with Population of 1 lakh and more Road Distance (NCP1L)	31	22	0	150	71.6
Nearest City with Population of 5 lakh and more Road Distance (NCP5L)	65	45	2	180	69.0
Road Length (RL)	67	312	1	3860	463.2
Number of School (NS)	7	16	0	169	219.2

Number of college (NC)	15173	51181	153	585335	337.3
Electricity connection (EC)	15165	51167	153	585241	337.3

Source: Author’s calculation based on 217 observations.

The raw correlation coefficients for the variables included in the regression model are displayed in Table 11. Road length has a positive correlation with a city or town's population size (PSC), while State H.Q. Road Distance and Sub division H.Q. Road Distance have a negative correlation. Conversely, city population density has a negative correlation with H.Q. Road Distance and a positive correlation with the number of schools, colleges, and electricity connections.

Table 11: Correlation coefficient of the variables used in regression equation 1

	PS C	PD C	RF	TEM P	SR D	SDR D	NCP1 L	NCP5 L	RL	NS	NC	EC
PSC	1.0 0											
PDC	0.0 1	1.00										
RF	0.0 1	0.06	1.0 0									
TEM P	0.0 9	0.03	0.0 8	1.00								
SRD	- 0.0 1	0.04	- 0.1 0	0.03	1.0 0							
SDRD	- 0.2 3	- 0.10	0.0 0	-0.02	0.0 7	1.00						
NCP1 L	0.1 9	0.05	- 0.2 6	-0.08	0.1 3	-0.06	1.00					

NCP5 L	0.0 0	0.04	- 0.1 9	-0.28	0.4 9	0.05	0.31	1.00				
RL	0.9 7	0.00	0.0 3	0.09	- 0.0 3	-0.17	0.16	0.00	1.0 0			
NS	- 0.0 3	0.30	- 0.0 4	0.07	- 0.0 5	-0.04	-0.16	-0.08	- 0.0 3	1.0 0		
NC	- 0.0 1	0.31	0.0 2	-0.03	- 0.0 5	-0.03	-0.11	-0.02	- 0.0 2	0.0 8	1.0 0	
EC	- 0.0 1	0.31	0.0 2	-0.03	- 0.0 5	-0.03	-0.11	-0.02	- 0.0 2	0.0 8	1.0 0	1.0 0

Source: Author’s calculation Note: The correlation coefficients are based on 217 observations.

The estimated regression results from equation 1 are shown in Table 12. Regression 1 calculates urbanization as the population of cities and towns and Urbanization is measured by Regression 2 as the population density of cities. Ninety-seven (or fourteen) percent of the variance in the dependent variables can be explained by Regression 1 or 2. Regression model 1 demonstrates that the size of the city or town's population is negatively and statistically significantly impacted by the sub division H.Q. Road distance (or the closest city with a population of one lakh or more) from the city or town. more road distance) to a city/town decreases city population by 1063 (or 271) %. At the 1% level, the road length distance significantly and favorably affects the size of the city's population. Rainfall, temperature variations, the distance by road to the closest city with a population of 5 lakh or more, the number of schools and colleges in each city, and the availability of electricity connections, however, have no discernible impact on the size of the city's population. However, regression model 2 demonstrates that the number of schools, colleges, and electrical connections in a city has a positive and statistically significant (at the 1% level) impact on the density of its population. Specifically, a 10% increase in the number of schools (or colleges or electricity connections) within a city results in a 507 (0.6 or 0.16%) increase in city density. Nevertheless, Punjab's urban population density is not significantly impacted by any other independent variables

Table 12: Determinants of urbanization in Punjab

Independent variables	Dependent variables	
	Urban population	City density
	(1)	(2)
Intercept	5601.716 (33862.26)	405.18 (2373.75)
Rainfall	-4.914 (12.56)	1.32 (.881)
Temperature	281.665 (806.86)	25.44 (56.561)
State H.Q. Road Distance	-29.171 (132.98)	1.52 (2.62)
Sub division H.Q. Road Distance	-1063.76*** (293.69)	-29.23 (20.580)
Nearest City with Population of 1 lakh and more Road Distance	-271.35** (123.49)	13.35 (8.65)
Nearest city with Population of 5 Lakh and more Road Distance	-49.504 (70.55)	2.32 (4.94)
Road Length	463.96*** (8.24)	-0.26 (.578)
Number of School	67.829 (268.40)	50.70*** (10.90)
Number of College	0.022	0.06***

	(0.2)	(.003)
Electricity connection	0.012 (0.08)	0.016*** (.003)
No. of Observation	217	217
R2	0.97	0.14
Adjusted R2	0.97	0.09

Source: Estimated by using equation 1. Figures in parentheses represent robust standard errors. *** and ** indicate statistical significance at 1% and 5% levels, respectively.

Impact of urbanization in economic growth in Punjab

Lastly, the study attempts to demonstrate the connection between Punjab's economic expansion and urbanization. Economic growth is positively correlated with urbanization (Tripathi, 2013). We can encourage urbanization in Punjab for greater economic growth because of the positive relationship between urbanization and economic growth.

To establish the link between urbanization and economic growth we run the following economic growth regression model.

$$\text{Urban GDP} = \alpha + \beta (\text{Urbanization}) + \varepsilon \quad \text{----- (2)}$$

Since city-level income data are not available in India. District domestic product (DDP) data serves as a proxy for urban GDP. We use the non-primary DDP (secondary and tertiary sector) as a better indicator of urban GDP. District-level urbanization is measured by the size of the urban population and density. We anticipate that both of the variables used to measure urbanization will have a positive impact on urban economic growth in Punjab.

Table 13: Description of data used in equation 2

Variables	Mean	Standard	Min	Max	Coefficient of Variation
GDDP	210494	176742	42842	788908	84
District urban population	851558	372740	357321	1568788	44

District urban density per sq. kms	484	162	297	805	33
---	-----	-----	-----	-----	----

Source: Authors’ calculation based on 17 observations.

Table 13 shows summary statistics (means, standard deviations, minimum and maximum values) for the variables used in growth model regression. City density has a more symmetrical distribution compared to GDDP, which is less symmetrical. We also find that GDDP is positively correlated with district urban population (i.e., r^2 is 0.53) and district urban density (i.e., r^2 is 0.79).

Table 14 shows the estimated results of the economic growth model. District urban density has a significant positive impact (at 1% level) on GDDP. In regression 4, increasing district urban density by 1% leads to an 867% increase in GDDP. Regression 5 demonstrates that a 10% increase in district urban population boosts GDDP by 2.5%. The study found that increasing district urban population and density leads to higher GDDP income. Specifically, urbanization promotes economic growth.

Table 14: Determinants of urban economic growth in Punjab

Independent variables	Dependent variable (GDDP)		
	(3)	(4)	(5)
Intercept	-240853.13* (90591.009)	-209052.09 (867.6)**	-2826.66 (96170.26)
District urban population	0.096 (0.083)	-	0.251** (0.104)
District urban density per sq. kms	764.738*** (191.842)	867.67*** (171.53)	
No. of observations	17	17	17
R2	0.662	0.630	0.528

Adjusted R2	0.614	0.606	0.279
F statistics	13.73***	5.80***	5.8***
VIF	1.278	1	1

Source: Estimated by using equation 2. Figures in parentheses represent robust standard errors and indicate statistical significance at 1%, 5%, and 10% levels, respectively.

Conclusions and policy suggestions

From 1951 to 2011, Punjab experienced rapid population growth. Following independence, the urban population also increased. The urban population of Punjab increased from 82 lakh in 1951 to 103 lakh in 2011. Most people moved to cities for economic reasons. According to the 2011 census, 37.49 percent of Punjab's population is urban. Punjab's urban to total area ratio increased from 1.25 percent in 1961 to 4.16 percent in 2001. Urban agglomeration has increased by 38.22 % from 2001 to 2011. During 1961-71 urban area increased by 2.91 %. Similarly urban areas of Class I, II, III, IV and V cities has also raised during 1961 to 2001, except Class VI cities in which the urban area was 23.13 (sq. kms.) in 1961 which decreased to 22.05 sq. kms. More people have moved to class I and II cities compared to other categories of cities/towns. Between 1951 and 2011, the number of Class I cities in Punjab steadily increased from 3 to 17. Among Punjab districts, Barnala had the highest population growth rate and Tarn Taran had the lowest growth rate from 2001 to 2011. In 2001, the CAGR in India was 2.77%, but in Punjab it was only 3.24%. In 2011, India's CAGR increased to 2.83%, while in Punjab it decreased to 2.35%.

Between 2001 and 2011, urban agglomeration increased by 23.7 percent in India and 38.2 percent in Punjab. The number of Class I towns is increasing in both India and Punjab. In India, it increased from 76 in 1951 to 468 in 2011, while in Punjab, it increased from 3 to 17. Between 1951 and 2001, India's Class VI towns decreased from 569 to 191. Between 1951 and 2011, the number of Class VI towns in Punjab decreased from 26 to 18, while the overall number of towns increased in both India and Punjab. The regression results indicate a significant negative correlation between road distance to sub-division headquarters and the nearest city with a population of 1 lakh or more, as well as urban population size. On the other hand, city-specific road length has a positive impact on the size of the city population in Punjab. The high correlation coefficient ($r = 0.528$) indicates a strong relationship between Punjab's urban population and GDP. The regression growth model indicates that district urban density (per sq. kms) has a significant impact on DDP, which represents urban GDP. Urbanization promotes economic growth in Punjab.

Punjab, one of India's most urbanized states, is experiencing imbalances in infrastructure, housing, and service quality, leading to slums, criminal activity, unemployment, and a high mortality rate. Punjab's small and medium towns experience the poorest conditions.

City governments are economically inefficient and functionally unbalanced. There is vital need of an ‘urbanization strategy’ to cover the entire population with water supply, housing, electricity, solid-waste management, sewerage, employment, basic amenities and infrastructure, civic services and effective transportation services with special importance on small and medium towns so cities and towns in Punjab will be the engine of economic growth not only in Punjab but also in India. ULBs require authorization from both Metropolitan and District Planning Committees. Municipal services suffer from inadequate quality, infrastructure, and volume. A state-level regulatory body should monitor service quality and prices, and encourage private sector participation in infrastructure development and urban service delivery. According to the Rangarajan committee report, Punjab's urban poverty rate is 17.6%, significantly higher than the rural poverty rate of 7.4% in 2011-12. In 2011-12, consumption inequality in Punjab's urban areas was approximately 32% higher than in rural areas (28%). Therefore, the reduction of urban poverty and inequality must be addressed in various urban policies and programs.

The Punjab Government should improve its housing system by offering affordable loans, increasing private sector funding, incorporating ULBs, and promoting the use of low-cost, locally available materials and technologies for building houses for the urban poor. Slums/slum populations require immediate care. In 2011, Punjab had 2.23% of the urban slum population, which amounted to approximately 15 lakh people. Improving slum residents' living conditions requires proper implementation of programs and schemes. To address this issue, the state must tap into central government resources. Slum residents should be involved in slum progress events, and assistance from national and international organizations should be arranged. Programmes and schemes must be reforms. Well-managed 'urbanization' will help and bear economic growth, develop service transportation, and improve environmental infrastructure, all of which will improve people's quality of life. The 'urban development strategy' aims to improve control, provide basic civic facilities and housing for the urban poor, reduce poverty, and promote effective management of municipal resources for income generation. This study can help planners and policymakers in Punjab address haphazard urban development and maintain a balance of regional development for sustainable economic growth in the state and across India.

References

1. Bhagat, R. B. (2011). Emerging pattern of urbanisation in India. *Economic and Political Weekly*, 46, 10-12
2. Calì, M. (2009). Urbanization, inequality and economic growth: Evidence from Indian states. World Bank. Available at: <https://www.odi.org/sites/odi.org.uk/files/odi-assets/publications-opinion-files/3387.pdf>.
3. Chandrasekhar, S., & Sharma, A. (2015). Urbanization and spatial patterns of internal migration in India. *Spatial Demography*, 3(2), 63-89.

4. Cohen, B. (2006). Urbanization in developing countries: Current trends, future projections, and key challenges for sustainability. *Technology in society*, 28(1), 63-80.
5. D’Souza, V. S. (1982). Economy, caste, religion and population distribution: An Analysis of Communal Tension in Punjab. *Economic and Political Weekly*, 17(19), 783-792.
6. Datta, P. (2006). Urbanization in India. In *European Population Conference, Bratislava, Slovak Republic*, June 21-24, Available at:
7. Davis, K. (1955). The origin and growth of urbanization in the world. *American Journal of Sociology*, 60 (5), 429-437.
8. Harris, N. (1990). Urbanisation, economic development and policy in developing countries. *Habitat International*, 14(4), 3-42.
9. Henderson, J.V. 2005. Urbanization and Growth. In Aghion, P. and Durlauf, S.N. (eds). *Handbook of Economic Growth*, Vol. 1B. Amsterdam, Elsevier: pp. 1543–1591.
10. Henderson, V. (2003). The urbanization process and economic growth: The so-what question. *Journal of Economic growth*, 8(1), 47-71.
11. <http://www.infostat.sk/vdc/epc2006/papers/epc2006s60134.pdf>.
12. Kalamkar, S. S. (2009). Urbanisation and agricultural growth in India. *Indian Journal of Agricultural Economics*, 35(3), 442
13. Lo, D. Y. F. (2010). Urbanization and Economic Growth: Testing for Causality. Paper presented in 16th Annual Pacific Rim Real Estate Conference, January 24th – 27th 2010 Wellington, New Zealand, Available at: http://www.prrs.net/papers/Lo_Urbanization_Economic_Growth_Testing_Causality.pdf.
14. Mitra, A., & Murayama, M. (2009). Rural to urban migration: a district-level analysis for India. *International Journal of Migration, Health and Social Care*, 5(2), 35-52.
15. Mundhe, N. N., & Jaybhaye, R. G. (2014). Monitoring level, trends and patterns of urbanisation in Maharashtra (1991-2011), *Indian Streams Research Journal*, 4(6), 1-12.
16. Rhoda, R. (1983). Rural development and urban migration: can we keep them down on the farm? *International Migration Review*, 17(1), 34-64.
17. Sawhney, U. (2012). Subnational Reforms and Public Policy Issues in Punjab. *Journal of Punjab Studies*, 19(1), 50.
18. Sridhar, K.S. 2010. Determinants of city growth and output in India. *Review of Urban and Regional Development Studies* 22 (1), 22–38.
19. Tripathi, S. (2013). Is urban economic growth inclusive in India? *Margin: The Journal of Applied Economic Research*, 7(4), 507-539.
20. Tripathi, S. (2015). An Overview of India’s urbanization, urban economic growth and urban equity, *International Journal of Economics and Empirical Research*. 3(3), 115-127
21. Vaidya C (2009) Urban issues, reforms and way forward India. Working Paper No.4/2009-DEA. Department of Economic Affairs, Ministry of Finance, Government of India, Available at: http://finmin.nic.in/workingpaper/urbanissues_reforms.pdf.