Original Research Article

A Socio-ecological Study of Population, Migration, Urbanization, and Socio-Climate Variation in Andhra Pradesh and Telangana, India

Abstract:
A socio-ecological system is a bio-geo-physical system that is inextricably linked to society and ecosystems, and in urban ecological science, a balance between the natural environment and human society and culture is sought. Migration is a common reason for population growth in urban areas because it gives people access to a better way to live and make money. Hypothetical ideas can be made about the ecological background of urban areas. For example, the growth of the population in rural or semi-rural areas creates pressure or flow of migrants to urban areas for various reasons. This helps the process of urbanisation, and urbanisation will affect the socio-ecological and socio-climate variation. Based on this background, this study explored the socio-ecological links between population growth, migration, urbanisation, and socio-climatic variation in Andhra Pradesh and Telangana. The data for this study were gathered from secondary sources such as the Census of India, the Planning Department, the State Portal, the Integrated Government Online Directory, and a few selected scientific reports. Some social sciences statistical techniques, general cartographic and GIS mapping techniques were used, and data were quantitatively and qualitatively measured. Key findings demonstrating the links and relationships between population growth, migration, and urbanisation at the district level in Andhra Pradesh and Telangana. The district's main city area also serves as a draw factor for migrants due to job opportunities and other amenities. Migration profile depicting the internal movement scenario of the study area, as well as the links to urban growth and expansion. The second set of findings discussed the socio-ecological implications of urbanisation and socio-climate variation in the study area. It is possible to conclude that the benefits of various opportunities, facilities, job scope, and income draw people away from rural areas and into cities. Finally, urbanisation causes socio-ecological variation, which can have both positive and negative consequences. This study uncovered some socio-environmental issues and made recommendations for mitigating urban socio-ecological problems and correcting haphazard urbanisation.

Keywords: Urban ecology; Socio-ecological system; Urbanization; Social climate; GIS; Andhra Pradesh and Telangana

1. Introduction:

A social-ecological system is a bio-geo-physical system that is linked to different socio-environmental factors that are complex and changeable. It is defined by the spatial boundaries that surround certain socio-environmental ecosystems and the problems they face (Kumar et al. 2021; Gainet et al. 2020; Francis and Bekera, 2014; Glaser et al. 2008). All socio-spatial issues, opportunities, strengths, and weaknesses are part of ecology, which can be seen from an environmental, economic, social, cultural, or political point of view. This study tries to figure out how population growth, migration, urbanisation, and socio-climate variation affect each other in a socio-ecological way.

The world's urban population is expected to grow from 3.6 billion to 6.3 billion between 2011 and 2050. The majority of this increase will occur in developing and less developed countries' cities and towns. As a result, half of Asia's and Africa's populations are expected to live in cities by 2020 and 2035, respectively. Between 2011 and 2030, the world's urban population is expected to grow by 1.4 billion. China will receive 276 million of this increase, while India will receive 218 million. India will account for slightly more than 15.5% of the global increase in urban population (UN, 2012). This increase in urban population can be divided into three components: natural growth in urban areas, reclassification of rural areas as urban, and net migration from rural to urban areas. This paper focuses on urbanisation and internal migration in the context of India, which is currently expected to be the world's largest by 2050. (UN, 2009). India is the least urbanised country among the world's top ten economies (Kotwal et al. 2011). Most scholars agree that migration, rural unemployment, a lack of proper infrastructure, poor medical facilities, backward transportation systems, and other push factors are the real reasons why people move to cities (Chandana, 2015; Sitaram, 2013; Census of India, 2011; 2001; 1991).

Given this situation, it is reasonable to anticipate an increase in rural-urban migration. The size of rural-urban migration will be determined by the type and extent of the rural area's relationship with the urban centre in its vicinity. The establishment of a three-tier structure for decentralised planning in urban areas under the Jawaharlal Nehru National Urban Renewal Mission (JNNURM), which was launched by the Government of India in 2005-2006, is expected to result in stronger rural-urban linkages (PMO, 2005). The Approach Paper to India's 11th Five Year Plan (Planning Commission, 2008) said that with 3682 urban local bodies spread across the country's 593 districts, these connections could allow urban economic engines with access to markets, infrastructure, and credit to become the flywheel of rural growth. This would lead to a more inclusive type of growth in the country as a whole. And stated that the District Planning Committees cannot function effectively unless rural and urban planning processes are clearly defined. Despite these declarations, policy posturing prevailed, with the 11th Five-Year Plan failing to usher in a new era of urban planning or significantly strengthen rural-urban linkages. Inter-district migration is very common due to work source in study area of Andhra Pradesh and Telangana, and people's migration flow is primarily from rural to urban areas, and population growth structure is also gradually high in urban areas (Census of India, 2011).

Local environmental change is exacerbated by population growth. Rapid population growth is one of the main reasons why there are more people on the move for work, and migration has been a major cause of rapid population growth in less developed countries' urban areas (LDCs). More importantly, consumption levels and technological advancements are expected to have a significant impact on overall environmental change (Vogel, 1991; Commoner et al. 1971). Some researchers argue that the rural environment is the driving force behind migration in LDCs, and believed that out-migration from rural areas was primarily caused by the local population exceeding the carrying capacity of the land (Ng, 1975 and Zelinsky et al. 1970). However, for the urban pull to be effective, the population in the hinterland must be dislocation-friendly, and this is the impact of the urban sector on urban migration. (Choithani et al. 2021; Parida, 2019; Goldscheider 1983; Todaro, 1976; and Lee, 1969). Furthermore, overuse of land resources and rising poverty are driving a large volume of migration (Haan, 1997; Zelinsky 1983; Kosinski and Mansell Prothero, 1975). Even though there is a lot of pressure on resources, poor people do not often move out. The poorer the people, the harder it is to move (Khan and Arokkiaraj, 2021; Gurung, 1989; Goldscheider, 1983).

People migrate in India based on gender dimension type, with men migrating more than women. Because women and men have significantly different migration intentions, motivations, patterns, options, and obstacles, the gender dimension of migration is critical.

Men and women experience migration in different ways; the challenges of re-negotiating work and care in a new setting frequently result in a 'feminization' of women's roles, with women taking on more traditional gender roles as wives and mothers (Ho, 2006). Men frequently make independent decisions, whereas women migrate as part of family strategies over which they have limited control (Hugo 1995 and Boyd 1989). Marriage is the most common reason for female migration in India (Srivastava and Sasikumar, 2003), and it is largely explained by the dual factors of marriage and reliance on the primary breadwinner (Premi, 1980). Internal migration in India is very different, and women's participation in geographic mobility is also quite different. Their migration tendencies and modes of migration depend on their social and economic positions of origin, cultural differences and rules for how women should act, demand for female labour, and other social and economic factors (Palriwala and Uberoi, 2008). Alterations in the economy of rural areas have also been a factor in the growing trend of female emigration. An increase in agricultural productivity has been linked to a decrease in the number of wage employment opportunities available to women in agriculture in comparison to men (Shanthi, 2006). There is no doubt that migration is gendered, as shown by the global migration literature (Hoang, 2011), and gender matters in our consideration of migration and mobilities (Lutz, 2010; Mahler and Pessar, 2006). As a result of various factors such as population pressure, migration, and so on, the population gradually increased. And that types of increased population in urban areas as a form of urbanisation in the Indian socio-spatial space, shaped and expanded the urban area and urbanisation (Onda et al. 2019; Krishna-Hensel, 1999).

A relative phenomenon that is giving urban environmental planners a great deal of cause for concern is the deterioration of the socio-environmental quality in large urban areas (NITI Aayog, 2021; Panagopoulos et al. 2016; and Moore et al. 2006). In this study, we try to find the links between Population, Migration, Urbanization, and Socio-Climate Variation. And here, the idea of socio-climate is a way of thinking about psycho-social climate change. It mostly refers to psychological climate facts in a social context, and it is usually defined as the way a group of people see their social environment perceptions (Bennett, 2010). The variation of socio-climate aspects in terms of urbanisation is a modern way of thinking in the bio-geo-physical system of socio-ecological aspects, such as climate change, land use/land cover changes, water resources, air pollution, COVID-19, and socio-economic aspects (Malakar, 2021; 2020a; 2020b; and Frank et al. 2017). Based on this context, this study examines the socio-ecological links between population, migration, urbanisation, and socio-climatic variation in Andhra Pradesh and Telangana. In this regard, the specific points of analysis of this study are as follows: the status of population growth, the profile of migration and its relationships with urban growth and expansion, the socio-ecological implications of urbanisation, and socio-climate variations.

2. Study area:

The area under study is in the southern part of India, in the states of Andhra Pradesh and Telangana (Fig. 1). Table 1 has a lot of information about the area being studied.

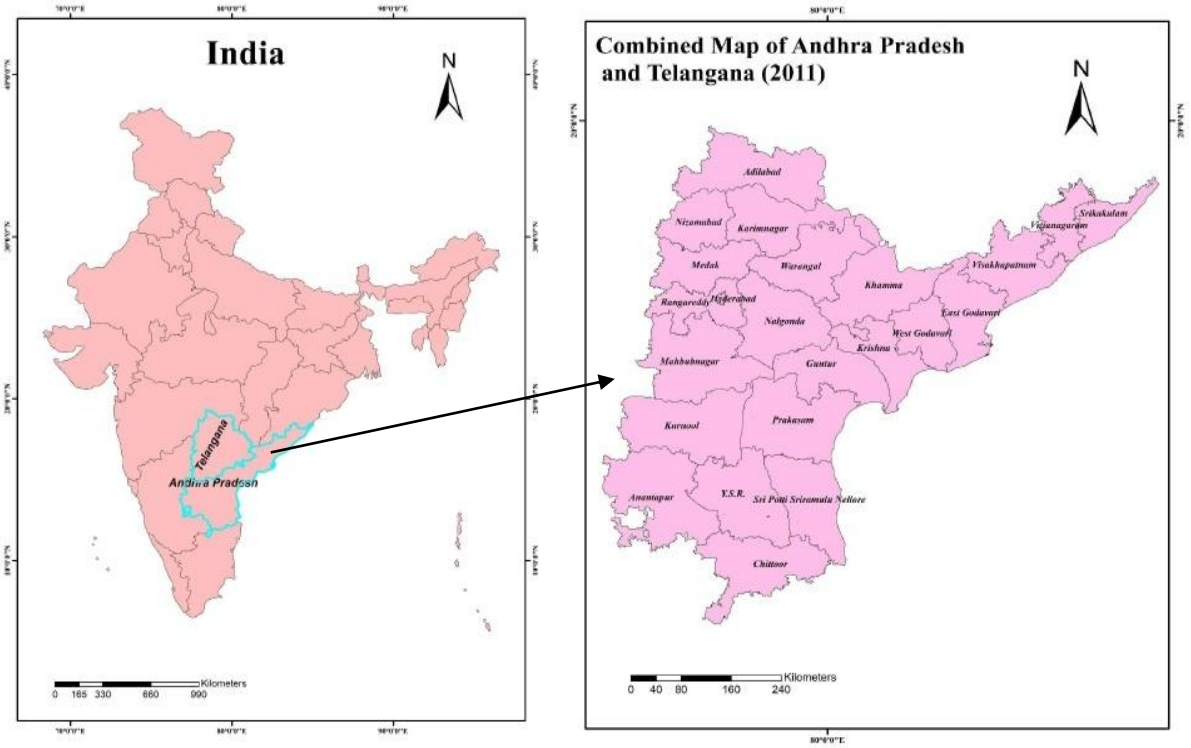


Fig. 1: Shows the study location (Andhra Pradesh and Telangana)

Table 1 Profile of Andhra Pradesh and Telangana		
Attribution	Andhra Pradesh	Telangana
Date of Formation	1st November 1956 2nd June 2014 (divided)	2nd June 2014
Capital of the state	Amaravati	Hyderabad
Area	1,60,200 km sq.	1,12,077 km. sq.
Population (2011)	4,93,86,799	3,50,03,674
Density	308/Km2	312/km2
Males Population (2011)	2,47,38,068	17611633
Females Population (2011)	2,46,48,731	17392041
Literacy Rate (2011)	67.41%	66.46%
Sex ratio	996	988
Rivers	Godavari, Krishna, Tungabhadra, Swarnamukhi Wainganga, Penner, etc.	Godavari
National Park and Forests	Nagarjunasagar-Srisailam Wildlife Sanctuary	Manjira, Shivaram Wildlife Sanctuary
Languages	Telugu, English, Hindi, Tamil, Urdu, Kannada, and Oriya.	Telugu, Urdu
Neighbours	Tamilnadu, Yanam (Puducherry), Karnataka,	Karnataka, Maharashtra, Chhattisgarh, Odisha, and

	Telangana, Chhattisgarh, and Odisha	Andhra Pradesh
Source: Census of India, 2011. AP State Portal, Telangana State Portal		

A brief socio-geographical overview of Andhra Pradesh and Telangana:

Physiography and climate:

Andhra Pradesh has a varied topography, ranging from the hills of the Eastern Ghats and the Nallamala Hills to the shores of the Bay of Bengal. As a result, the state is home to a wide variety of ecosystems, as well as a rich variety of flora and fauna. Along the Bay of Bengal, the coast of the state can be found all the way from Srikakulam to the Nellore district. The Godavari, Krishna, and Penner rivers all played a role in the formation of the delta areas that make up the majority of the coastal plains. The climate of Andhra Pradesh is extremely diverse due to the state's diverse geographical regions. The months of March through June make up the summer season. The summertime temperatures in the coastal plain can be anywhere from 20 degrees Celsius to 41 degrees Celsius, which is generally higher than they are in the rest of the state. Between the months of July and September, tropical rains typically fall. A little less than a third of annual precipitation can be attributed to the northeast monsoon. The months of October and November see the formation of low-pressure systems and tropical cyclones in the Bay of Bengal, which is responsible for bringing rain to the southern and coastal regions of the state.

Telangana is a state that sits on the Deccan Plateau, which is found in the middle of the eastern seaboard of the Indian Peninsula. It encompasses a total area of a staggering 112,077 square kilometres. The land is drained by two major rivers, with approximately 79% of the catchment area for the Godavari River and approximately 69% of the catchment area for the Krishna River, but the vast majority of the land is dry. In addition to these major rivers, Telangana is drained by a number of smaller rivers, such as the Bhima, Maner, Manjira, and Musi. Telangana is a region that is considered to be semi-arid and has a climate that is predominantly hot and dry. The beginning of summer is in March and it continues through May, with high temperatures averaging in the 42°C range. The monsoon season begins in June and continues through September, bringing a total of 755 millimetres of rainfall. Late November marks the beginning of a dry, mild winter that continues through early February. Temperatures tend to range between 22 and 23 degrees Celsius, and there is very little humidity during this time of year.

Demographic, Economic, and Social Capital:

According to the 2011 Indian census, there are 493,86,799 people living in the state of Andhra Pradesh. The population density is 308 people per square kilometre, and 70.4% of the people live in rural areas and 29.6% live in urban areas. Overall, 10.6% of the population is made up of children (0-6 years). Out of the total number of people living in the state, 17.1% are SC and 5.3% are ST. 90% of the people in Andhra Pradesh speak Telugu as their first language. Telugu is also the state's official language. Most people in the state are Hindu (90.87%), and agriculture and livestock are the main sources of income. The state is also known as the 'Rice Bowl of India' because it employs 62% of its people directly or indirectly (Planning Department, 2017). The World Bank says that the state is the easiest in country to do business in (The Hindu, 2016). Telangana is a beautiful state with a population of 3,50,03,674, a population density of 312 people per square kilometre, a ratio of 988 women for every 1000 men, and a growth rate of 13.58 percent from 2001 to 2011. Urdu is the second official language, after Telugu. Agriculture and manufacturing are the main economic drivers here. Hyderabad's main capital city is home to industries like auto parts, automobiles, mines and minerals, spices, pharmaceuticals, horticulture, textiles and clothing, and poultry farming (Shankar, 2014). Socio-culturally, both states have a lot of culture and history in the

form of infrastructure, tourism, social conditions, crafts, arts, artefacts, resources, transportation, and many other things.

3. Materials and Methods:

The data for this study were compiled from secondary sources such as Census of India, Planning Department (Govt. of Andhra Pradesh), AP State Portal, Telangana State Portal, Integrated Government Online Directory, and a few selected scientific reports. The data were quantitatively and qualitatively measured and plotted using general cartographic and GIS mapping techniques. The statistical techniques listed in Table 2 are also used for the quantification of demographic data analysis.

Table 2 : Statistical Techniques

Decadal growth Rate (G) = $\frac{(P1-P2)}{P1} \times 100$
Rate of In-migration (Im) = $\frac{I}{P} \times 1000$
Rate of Out-migration (Em) = $\frac{O}{P} \times 1000$
Rate of Net-migration (Im) = $\frac{I-o}{P} \times 1000$
Rate of Gross-migration (Gm) = $\frac{I+O}{P} \times 1000$
Reilly's Gravity Model (Tij) = $K\frac{PiPj}{dij^2}$
Expected Population = $\frac{Population\ of\ the\ First\ city}{Rank\ of\ the\ each\ individual\ city}$
Here, P1- Population of the base year; P2- Population of the present year; I- In-migration; O- Out- migration; P- Place of Origin or Place of destination; Tij- Proportionality Constant; Pi- Population size of region (city) I; Pj- Population size of region (city) j; dij^2- Distance between i and j.
Source: Chandana (2015), and Malakar (2020a)

4. Results and Discussion:

4.1 Population growth, Migration, and Urbanization:

Initially, this study focused on the growth of population in undivided Andhra Pradesh; however, the overall area is now divided into two separate states, Telangana and Andhra Pradesh. However, the latest census-based demographic data only represents the 23rd number of districts. This study analysed data availability in this regard. Table 3 depicts the district-level population growth rates in Andhra Pradesh and Telangana, while Figure 2 illustrates the combined comparison of population decadal growth rates. According to the study findings, the population growth rate was very high in 1981-1991, then moderate from 1991 to 2001, but the current decade (latest census, 2011), 2001-11, has a low rate of population growth. The district of Medak (12.23%), Rangareddi (33.80%), Mahbubnagar (13.48%), Visakhapatnam (11.67%), Prakasam (10.08%), Sri Potti Sriramulu Nellore (10.25%), Y.S.R. (10.72%), Kurnool (13.35%), Anantapur (10.83%), and Chittoor (10.51%) had significant to high growth rates between 2001 and 2011.

In-migration, birth rate, and people coming from other states due to pulling factors of sources of work in the urban area are the primary causes of population change in each district. Another recurring theme is that rapid population growth in the district headquarters area leads to rapid urbanisation. Migration is thought to be a significant contributor to the districts' rapid population growth. Other measurable fact of this study, the population growth rate (1981-91) is highest in Rangareddi (60.32%) and lowest in Vizianagaram (17%). Rangareddi had the highest population growth rate (37.41%), while Vizianagaram had the lowest (6.36%).

Rangareddi had the highest population growth rate (33.80%) in 2001-11, while West Godavari had the lowest (3.58%). As a result, while the rate of population growth in districts is gradually decreasing, the rate of population growth in cities is increasing.

Table 3
Population Growth rate (GR) (%) of Andhra Pradesh and Telangana

Districts	GR (1981-91)	GR (1990-2001)	GR (2001-2011)
Adilabad	26.95	19.06	9.55
Nizamabad	21.31	14.98	8.17
Karimnagar	24.68	14.47	7.92
Medak	25.6	17.29	12.23
Hyderabad	39.76	17.18	6.51
Rangareddi	60.32	37.41	33.8
Mahbubnagar	25.87	13.97	13.48
Nalgonda	25.11	13.55	7.18
Warangal	22.54	14.63	8.01
Khammam	26.5	15.78	8.29
Srikakulam	18.46	8.93	6.46
Vizianagaram	17	6.36	4.24
Visakhapatnam	27.5	15.36	11.67
East godavari	22.7	7.3	5.46
West godavari	22.39	7.92	3.58
Krishna	21.33	14.05	6.62
Guntur	19.57	7.27	9.87
Prakasam	18.44	10.72	10.08
Sri Potti Sriramulu Nellore	18.73	11.18	10.25
Y.S.R.	17.47	13.48	10.72
Kurnool	23.5	18.14	13.35
Anantapur	24.81	14.31	10.83
Chittoor	19.14	14.54	10.51

Source: Census of India.

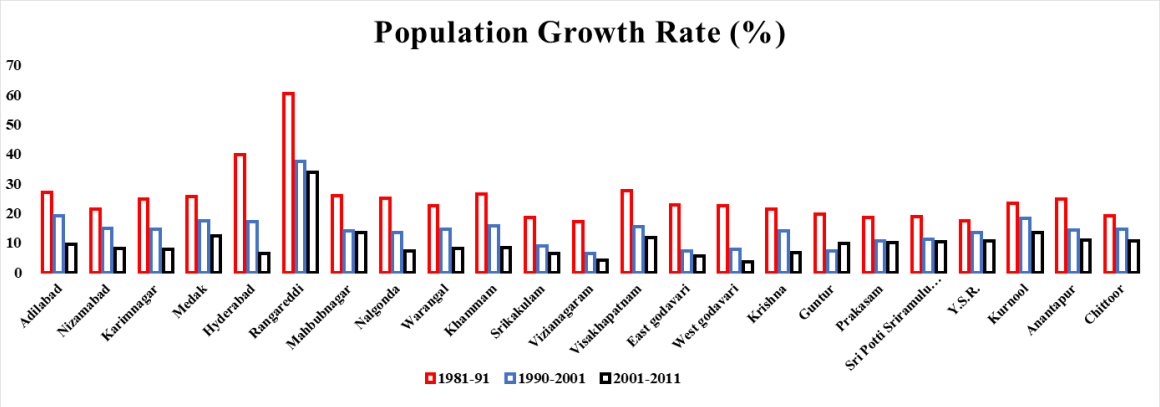


Figure 2: Population Growth rate of Andhra Pradesh and Telangana

Migration profile and links to urban growth and expansion:

Migration is the movement of people from one location to another with the intention of permanently or temporarily settling in a new location. As a result, the following general information on migration is provided. Following a discussion of general migration information, this paper focuses on the interior ground discussion of migration, which suggests the migration profile and causes urban growth and expansion.

The movement of people from one city, state, or country to another for work, shelter, or other reasons is referred to as migration. In recent years, migration from rural to urban areas in India has increased (Ng, 1975). Nowadays, many people decide to migrate in search of a better life. Better job opportunities are the most common reason for migration. In addition, villagers were forced to migrate to cities due to a lack of opportunities, better education, dam construction, globalisation, natural disaster (flood and drought), and crop failure (Malakar, 2020a; Kosinski et al., 1975). Migration is becoming a more prominent topic in urban life. Many people are drawn to big cities because of their numerous opportunities and attractions. Migration can have both positive and negative effects on migrants' lives. Here are a few examples: Positive Results (Unemployment is reduced and people get better job opportunities; Migration helps in improving the quality of life of people; It helps to improve the social life of people as they learn about a new culture, customs, and languages which helps to improve brotherhood among people; Migration of skilled workers leads to a greater economic growth of the region; Children get better opportunities for higher education, and The population density is reduced and the birth rate decreases.) and negative consequences (the loss of a person from rural areas affects rural output and development; the influx of workers in urban areas increases competition for jobs, houses, school facilities, and so on; a large population places an undue strain on natural resources, amenities, and services). A villager has a difficult time surviving in cities because there is no natural environment or clean air. They must cover all costs. India's population distribution is uneven due to migration, which alters a location's population. Many migrants are illiterate and uneducated, rendering them unsuitable for most jobs and lacking basic knowledge and life skills. Poverty makes it difficult for them to live a normal and healthy life. Poverty-stricken children lack access to adequate nutrition, education, and health care. Migration increased slum areas in cities, causing many problems such as unsanitary conditions, crime, pollution, and so on; migrants are sometimes exploited; and migration is one of the main causes of increasing nuclear families, where children grow up without a larger family circle.

People may wish to relocate from one location to another for a variety of reasons. These motivations could be economic, social, political, or environmental. When people migrate, there are usually push and pull factors at work. The reasons why someone decides to relocate are known as push factors. This is their own life experience in one place that motivates them to leave. Push factors include unemployment, crop failure, droughts, flooding, war, insufficient educational opportunities, and inadequate services and amenities. Pull factors, on the other hand, are the expectations that entice people to visit a new place. They are usually positive things like more job opportunities, a higher standard of living, better education, or better healthcare.

The following is a migration profile for Andhra Pradesh and Telangana:

(a) Distribution of Migrants (Reasons for Migration):

In this study, the main reason for migrant distribution is employment, business, education, marriage, and other opportunities. People migrate primarily for work and employment opportunities; 17.93% of the Rangareddi district's population migrated in 2011, compared to 17.8% in 2001. Others are business (16.5% to 16.86% from 2001 to 2011), education (8.66% to 8.91%), and marriage in East Godavari (6.61% from 2001 to 2011). So, in general, the migration rate has shifted over the last few decades, with the main reason being the benefits of employment and work, and males migrate more than females. Appendix 1 clearly states the district-by-district percentage of migrated people, as well as the male-female split, and profile.

(b) Duration of residence in the place of enumeration:

Figure 3 and Appendix 2 provide detailed information about the duration of residence in the place of enumeration by district. Migrants from the districts of Rangareddi, Visakhapatnam, East and West Godavari, Krishna, and Guntur are staying for an extended period of time here. However, many migrants in the Rangareddi districts stay for 1-4 years, whereas many migrants in the East Godavari districts stay for 20+ years.

(c) Age Distribution of Migrants in Urban Areas, 2000-01 and 2010-11:
Appendix 3 detailed the age distribution of urban migrants in Andhra Pradesh and Telangana districts. Migrants aged 15 to 50 are primarily active in migration for a variety of reasons,

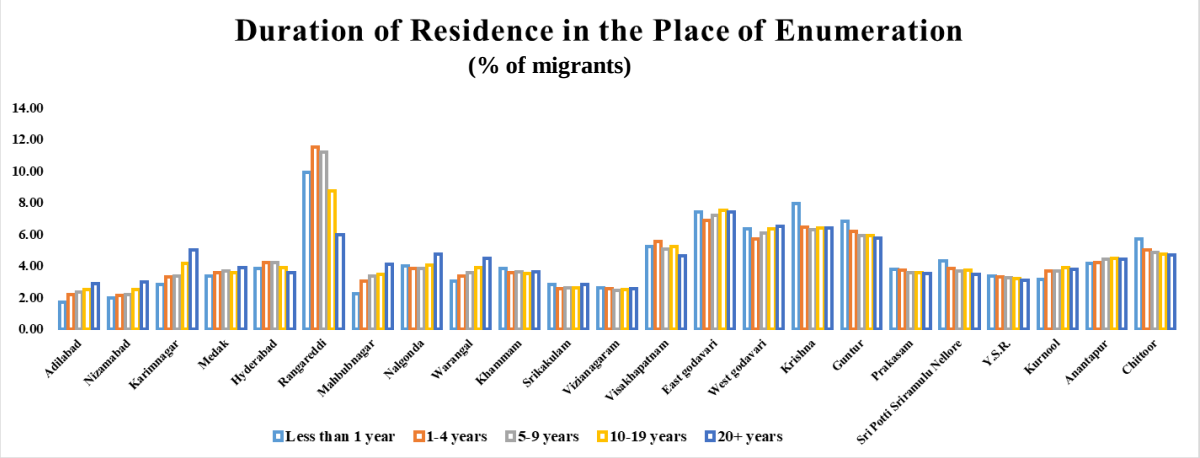


Figure 3: Duration of residence in the place of enumeration by district.

including employment, education, and others. People over 50 migrate at a lower rate than the young and working populations.
(d) Rate of In-Migration, Out-Migration, Gross Migration, and Net Migration:
In order to understand migration status and other related information, the estimation of In-migration, Out-migration, Gross Migration, and Net Migration rates is required in the study of migration profiles. Table 4. Figures 4 and 5 show the district-level rates of in-migration, out-migration, gross migration, and net migration.

Table 4
Estimation of Rate of In-migration, Out-migration, Gross migration, Net Migration

Districts	Rate of In-migration (Im)	Rate of Out-Migration (Em)	Rate of Gross Migration (Gm)	Rate of Net Migration (Nm)
Adilabad	53.69	57.18	110.88	-3.49
Nizamabad	68.3	59.77	128.07	8.53
Karimnagar	64.09	87.06	151.15	-22.96
Medak	101.73	101.98	203.71	-0.25
Hyderabad	155.36	177.53	332.9	-22.17
Rangareddy	402.7	40.48	443.19	362.22
Mahbubnagar	37.63	89.15	126.78	-51.52
Nalgonda	73.1	136.13	209.23	-63.03
Warangal	73.5	125.26	198.75	-51.76
Khamma	115.9	109.26	225.16	6.64
Srikakulam	30.26	138.29	168.55	-108.03
Vizianagaram	77.86	149.92	227.78	-72.06
Visakhapatnam	140.98	68.48	209.47	72.5
East Godavari	68.94	123.57	192.51	-54.63
West Godavari	112.96	146.48	259.44	-33.52
Krishna	152.01	147.4	299.41	4.61
Guntur	89.15	123.98	213.13	-34.83

Prakasam	70.16	144.1	214.26	-73.94
Sri Potti Sriramulu Nellore	70.38	72.38	142.76	-2
Y.S.R.	63.19	89.45	152.64	-26.25
Kurnool	45.12	68.18	113.3	-23.06
Anantapur	42.35	44.83	87.18	-2.47
Chittoor	53.86	35.75	89.6	18.11
				Source: Census of India, 2011

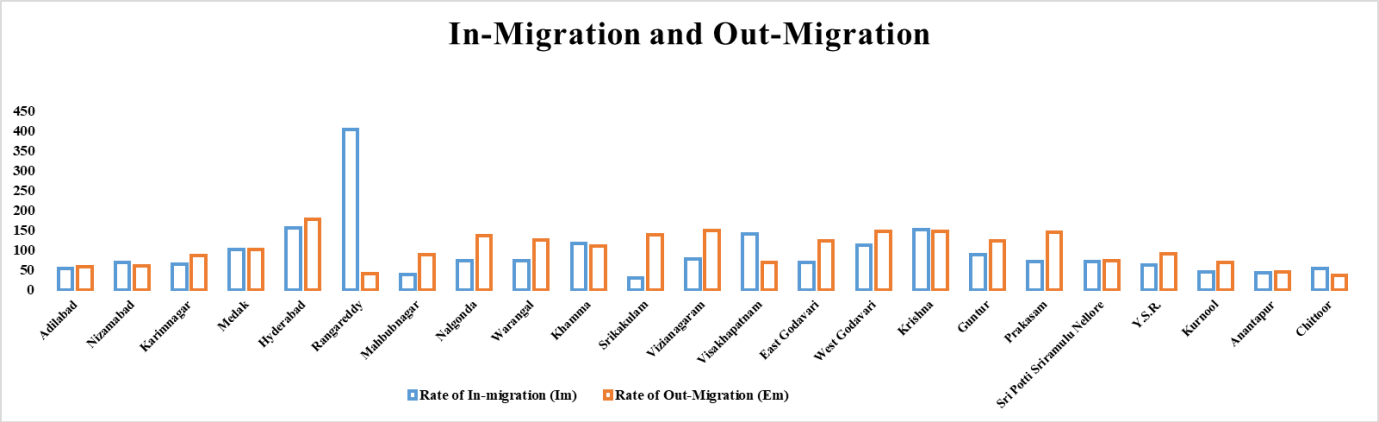


Figure 4: Rate of In-Migration, Out-Migration; migrants (/1000)

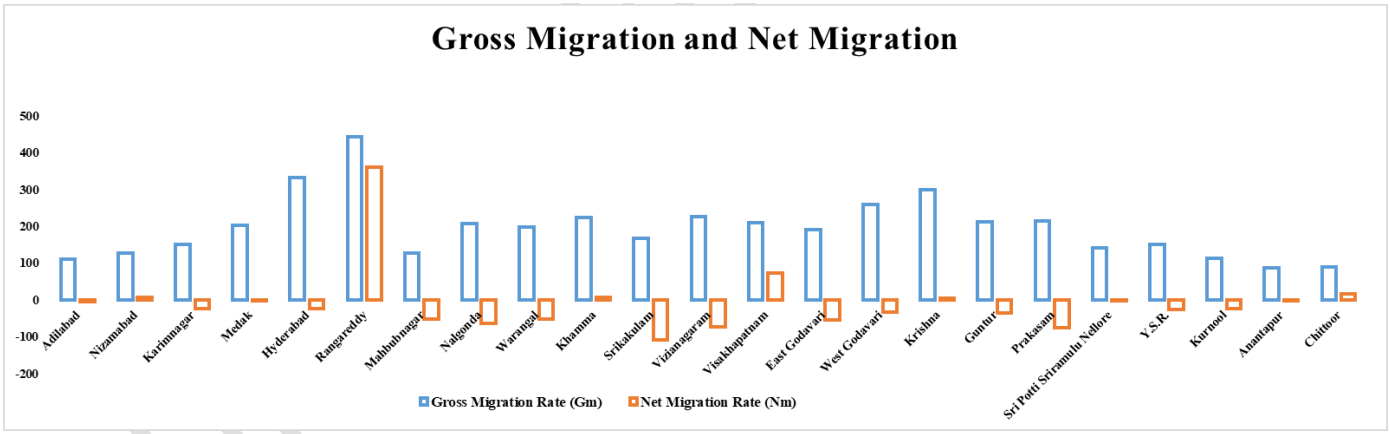


Figure 5: Rate of Gross migration, Net Migration; migrants (/1000)

In essence, in-migration and out-migration refer to the movement of people within their own country from one region to another. They refer to the various paths this process can take, but they are essentially the same process. The process by which people relocate to a new area of their country to live permanently is known as in-migration. Out-migration is the permanent relocation of people from one area of their country to another. When we speak of in- and out-migration, we usually refer to a large-scale or ongoing movement from one area to another. There are numerous reasons for in- and out-migration, but the majority involve people looking for a better life in a new area, such as a better job, better weather, or a lower cost of living. The rates of in-migration, out-migration, gross migration, and net migration by the

district are shown in Table 4. The rate of in-migration and out-migration per 1000 people is depicted in Figure 4. Rangareddy has a much higher in-migration rate (402 per 1000 population) than the others. After the Rangareddy district, migration has increased in Hyderabad (155 per 1000 population), while Srikakulam (30 per 1000 population) has a very low in-migration rate. Out-migration is very high in Hyderabad district (177 per 1000 population), followed by Visakhapatnam district (149 per 1000 population), and Chittoor district (35 per 1000 population), which has increased out-migration.

Gross and net migration are the other two migration profile measurements. The total flow of migrants across a border, including both in-migrants and out-migrants, or, in the case of international migration, immigrants and emigrants, is the broad definition of gross migration. And net migration is the difference between inward and outward migration flows, or in-migrants less out-migrants or immigrants less emigrants. Figure 5 depicts the gross and net migration rates per 1000 people. The district of Rangareddy has a significantly higher rate of gross migration (443 per 1000 people) than the other districts. Hyderabad (332 per 1000 population) has increased gross migration after Rangareddy's district, while Anantapur district (87 per 1000 population) has a very low gross migration rate. And the district of Rangareddy has the highest net migration rate (362 per 1000 people), followed by the districts of Hyderabad, Visakhapatnam (72 per 1000 people), and Srikakulam (72 per 1000 people) (-108 per 1000 populations).

(e) Migration between cities in Andhra Pradesh and Telangana (using the Gravity Model):

In this study, migration between Hyderabad (let the Nodal city; because this is a Megacity/A-One city; most of the activities and advantages are available here) and each other's cities were calculated using Reilly's Gravity Model (Reilly, 1931). This study, compute the migration status for two census years (2001 and 2011).

Table 5
Migration between cities (Hyderabad & each selected city) using Gravity Model

Cities	2011		2001	
	Tij_1	% of Tij_1	Tij_2	% of Tij_2
Vijayawada	3788442049	10.56	3688286212	11.39
Guntur	2250698785	6.28	2156772862	6.66
Warangal	3885496507	10.84	3711579898	11.46
Nellore	1028461893	2.87	973865611	3.01
Nizamabad	2636779551	7.35	2495209419	7.71
Kurnool	1592913613	4.44	1481880295	4.58
Nandyal	1123620927	3.13	1041937347	3.22
Rajahmundry	761440506	2.12	705132642	2.18
Kadapa	705050648	1.97	648010126	2
Ramagundam	1284664338	3.58	1178294293	3.64
Tirupati	511316811	1.43	468492586	1.45
Eluru	833214643	2.32	760570976	2.35
Kakinada	519741328	1.45	471281855	1.46
Ongole	766410861	2.14	692781510	2.14
Adoni	768144434	2.14	692037661	2.14
Vizianagaram	336262955	0.94	300705605	0.93
Jagtial	1009759832	2.82	897938323	2.77
Karimnagar	1295704993	3.61	1151197188	3.56
Machilipatnam	614016173	1.71	544360379	1.68
Guntakal	602472407	1.68	533837682	1.65
Narasaraopet	842945714	2.35	744384339	2.3
Khammam	1037237083	2.89	915931801	2.83

Anantapur	536606367	1.5	471704719	1.46
Tenali	647878395	1.81	569397232	1.76
Dharmavaram	469802615	1.31	411246809	1.27
Adilabad	596564593	1.66	519054330	1.6
Hindupur	368822368	1.03	318762581	0.98
Markapur	427663241	1.19	342386171	1.06
Gadwal	592564130	1.65	470757743	1.45
Nirmal	405334773	1.13	301454190	0.93
Tadepalligudem	179841920	0.5	149251711	0.46
Madanapalle	124189018	0.35	102945873	0.32
Jangaon	775973455	2.16	643204705	1.99
Narayanpet	383774018	1.07	317038418	0.98
Ponnur	155385275	0.43	120205639	0.37
Nidadavole	117315971	0.33	88898422	0.27
Jammalamadugu	123015670	0.34	92036419	0.28
Yellandu	179749966	0.5	132494333	0.41
Sadasivpet	554239788	1.55	402012814	1.24
Armur	213935244	0.6	151124429	0.47
Gudur	76621899	0.21	53286728	0.16
Amalapuram	83178800	0.23	57737853	0.18
Rajampet	74844222	0.21	50497829	0.16
Sathupalle	124423469	0.35	82778090	0.26
Nagari	57749996	0.16	38298377	0.12
Medak	319820853	0.89	198579589	0.61
Bapatla	75995262	0.21	38936939	0.12
Total	35860087359	100	32378580553	100
Tij: Values of gravity model/migration population. Data Source: Census of India (2001 and 2011).				

Table 5 and Figure 6 show the gravity model values, which are used to estimate migration between two cities. The gravity model of migration is an urban geography model that uses Newton's law of gravity to predict the degree of migration interaction between two locations. ‘Any two bodies attract one another with a force proportional to the product of their masses and inversely proportional to the square of the distance between them,’ Newton's law states. Rodrigue and his associates (2009) The gravity model of migration is thus based on the idea that as one or both of the locations becomes more important, so will movement between them. The greater the distance between the two points, the less movement between them. This is known as distance decay. Migration between Hyderabad and the cities of Vijayawada, Warangal, Nizamabad, and Guntur (both census years) is much higher than in the other cities, owing to a better transportation system, the availability of work or employment, and other factors that have contributed to the 'distance decay.' Other cities, such as Nagari, Gudur, Bapatla, and Madanapalle, have very low migration rates due to distance decay effects.

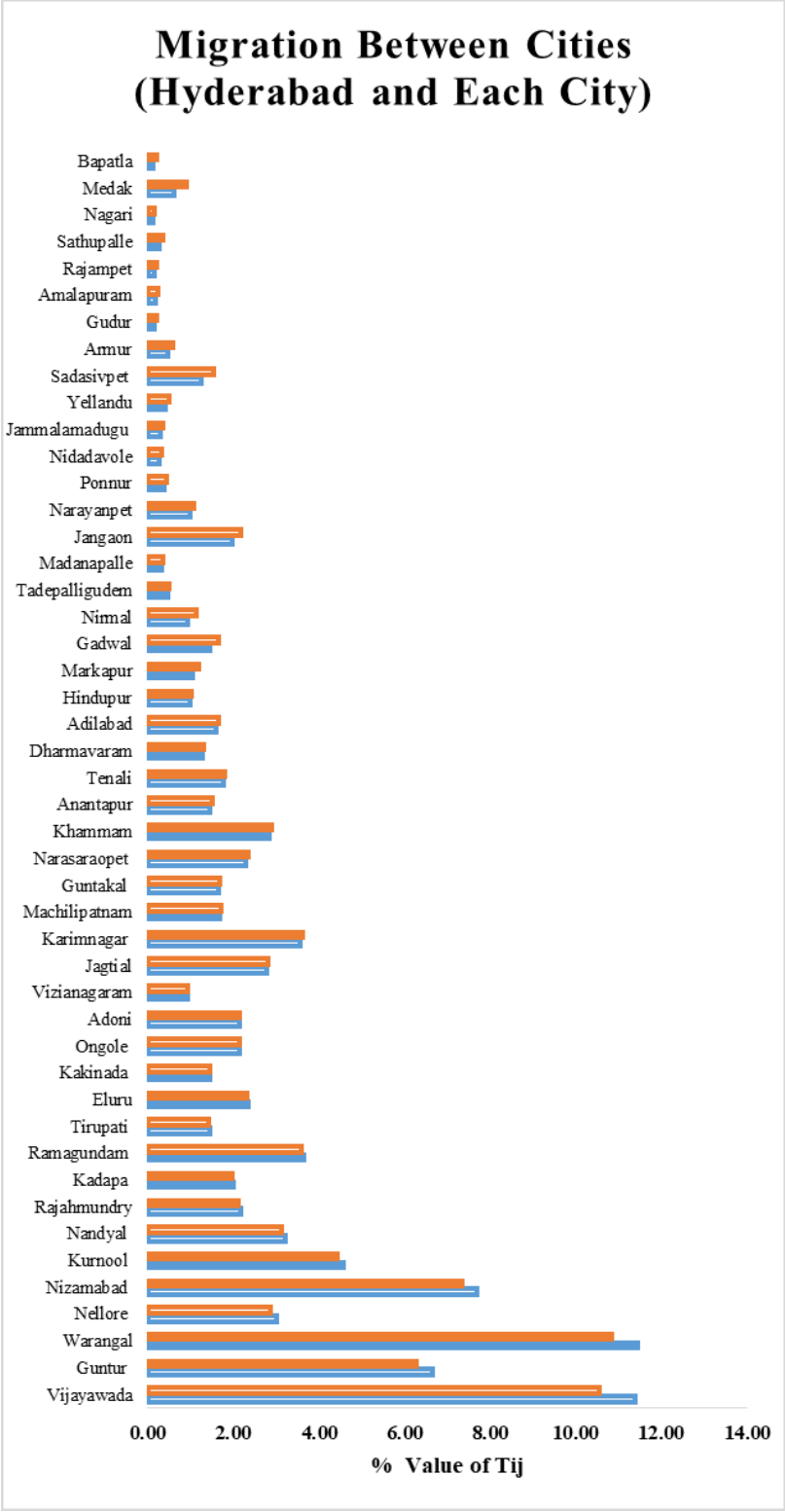


Fig. 6: Migration between cities (Hyderabad & each selected city), using Gravity Model

(f) Change in migrants by district in Andhra Pradesh and Telangana:

The percentage change in migrants is one of the most important aspects of analysing the migration profile (Table 6 and Figures 7 and 8). In this study, calculate the number of male, female, and overall migrants who migrate as a result of various pull and push factors. Srikakulam has a low total migrant population (1.90% in 2001 and 2.22% in 2011), whereas Rangareddi has a high total migrant population (8.22% in 2001 and 9.25% in 2011). Rangareddi has a significant male migrant population (10% in 2001 and 11.52% in 2011), whereas Srikakulam has a small male migrant population (1.50% in 2001 and 1.67% in 2011). In addition, whereas Rangareddi has a large female migrant population (7.8% in 2001 and 7.85% in 2011), Srikakulam has a small female migrant population (1.99% in 2001 and 2.56% in 2011). As a result, one of the most astounding findings is that female migrants are gradually increasing, implying that it is one of the best development indicators that has been working in the last decades, with the causes of this development being various policies of the Central government, state governments, and other private sectors, etc.

Table 6
District-wise percent change of migrants in Andhra Pradesh and Telangana

Districts	Total Migrants					
	2001			2011		
	Total	Male	Female	Total	Male	Female
Adilabad	3.1	3.12	2.99	3.2	3.22	3.19
Nizamabad	2.66	2.22	3	2.81	2.45	3.03
Karimnagar	3.88	3.12	4.21	4.21	3.65	4.55
Medak	3.22	3.55	3.41	3.58	3.1	3.87
Hyderabad	5.32	8.89	4.11	5.5	7.45	4.3
Rangareddi	8.22	10	7.8	9.25	11.52	7.85
Mahbubnagar	3.88	2.88	3.66	4.34	3.56	4.82
Nalgonda	3.9	2.99	3.52	4.02	3.38	4.41
Warangal	3.2	2.1	3.99	3.85	3.36	4.16
Khammam	2.99	3	3.11	3.33	3.27	3.37
Srikakulam	1.9	1.5	1.99	2.22	1.67	2.56
Vizianagaram	2.23	2.11	2.3	2.46	2.26	2.58
Visakhapatnam	4.9	4.99	4.66	5.3	5.99	4.88
East godavari	6.2	5.66	6.22	6.52	6.67	6.43
West godavari	4.98	4.02	4.99	5.07	5.04	5.08
Krishna	5.66	5.21	5.1	6.04	6.61	5.69
Guntur	4.88	5	4.89	5.87	6.06	5.76
Prakasam	3.11	2.11	3.2	3.26	2.84	3.52
Sri Potti Sriramulu Nellore	3.05	3.1	2.89	3.42	3.51	3.36
Y.S.R.	2.92	2.86	3	3.12	3.04	3.17
Kurnool	3.55	3.11	3.22	4.15	3.77	4.39
Anantapur	3.81	3.54	3.85	4.23	3.79	4.5
Chittoor	3.86	2.66	3.78	4.24	3.78	4.52
Source: Census of India 2001 and 2011						

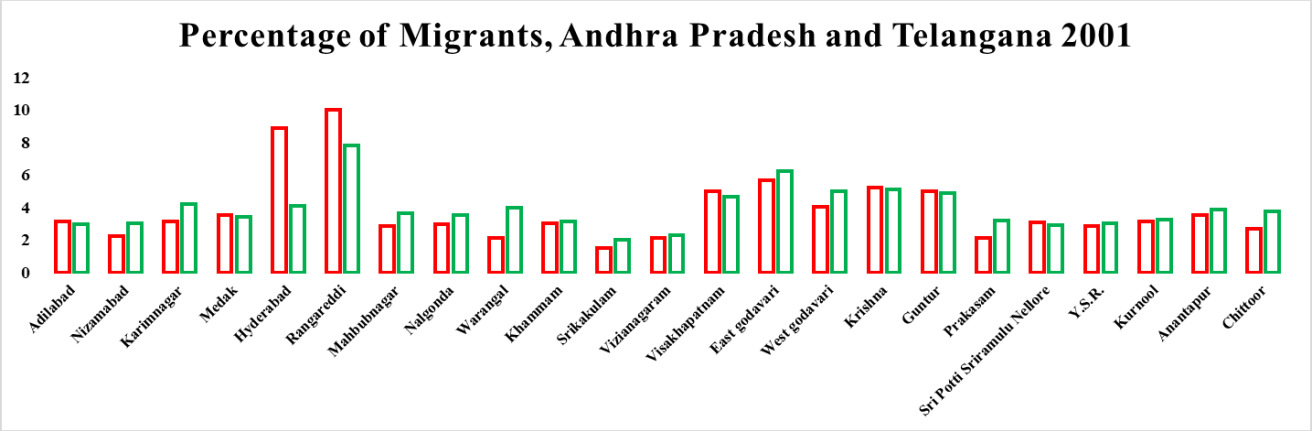


Figure 7: Percentage of Migrants, Andhra Pradesh and Telangana 2001

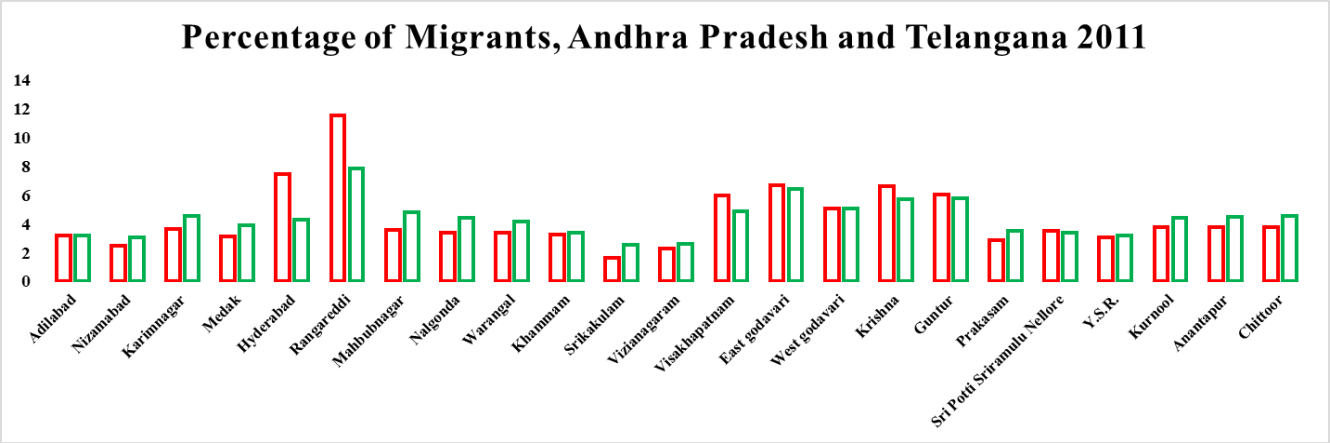


Figure 8: Percentage of Migrants, Andhra Pradesh and Telangana 2011

(g) Classification of urban areas based on size and migration of Population:

A town is a city that has more than one lakh people, whereas a town has less than one lakh people. Metropolitan cities have populations of one to five million people, while megacities have populations of more than five million people. Agglomerations comprise the vast majority of metropolitan and megacities. An urban agglomeration can be made up of any of the three types of structures listed below: I a town and its adjacent urban outgrowths, (ii) two or more contiguous towns with or without outgrowths, and (iii) a city and one or more adjoining towns with outgrowths forming a contiguous spread. Railway colonies, university campuses, port areas, military cantonments, and other urban outgrowths that are located within the revenue limits of a village or villages adjacent to the town or city are examples of urban outgrowths.

Table 7: Size- class distribution and population concentration

Size-Class	Populations
I	1,00,000 and above
II	50,000 to 99,999
III	20,000 to 49,999
IV	10,000 to 19,999
V	5,000 to 9,999
VI	Less than 5,000

Migration is a major factor in increasing the population of urban areas, and the gradual increase in migration of any city is based on the city having better infrastructure and providing better opportunities for a livelihood and an improved standard of living. We chose the major urban areas of Andhra Pradesh and Telangana for this study and tried to figure out what kind of urban areas exist here and if there are any effects on migration to increase the urbanisation of this area. Figure 9 depicts the size-class classification of Andhra Pradesh and Telangana urban areas. The 48 urban areas are essentially chosen at random. There are 46% Class-I cities, 46% Class-II cities, 6% Class-III cities, and 2% Class-IV cities here (fig. 10). The majority of Andhra Pradesh's class-I cities are concentrated along the coast, with many of them surrounding Hyderabad. Many Class II cities are concentrated in the southern states. And migration flow of these cities from primarily rural areas and other lower class cities areas due to improved infrastructure and better opportunities for a livelihood and an improved standard of living.

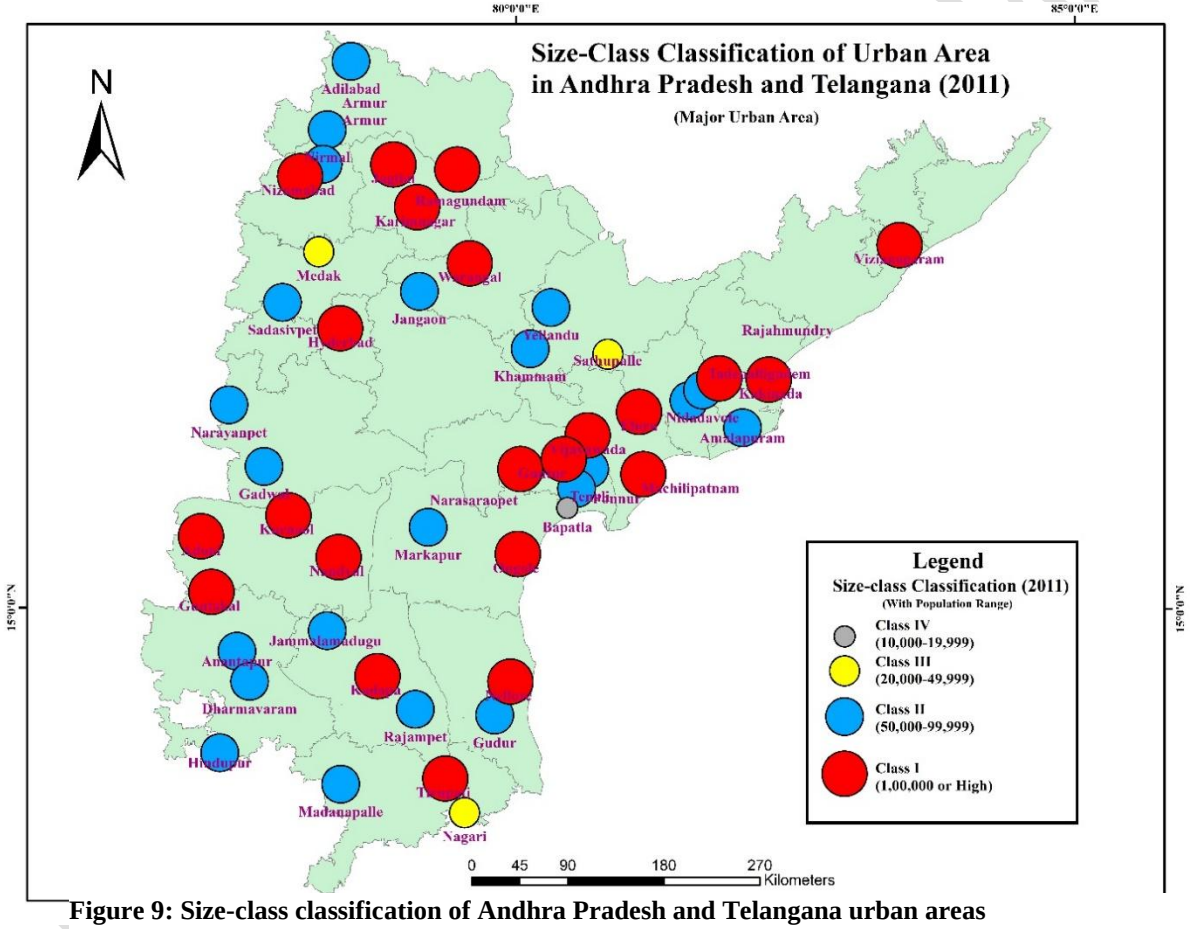


Figure 9: Size-class classification of Andhra Pradesh and Telangana urban areas

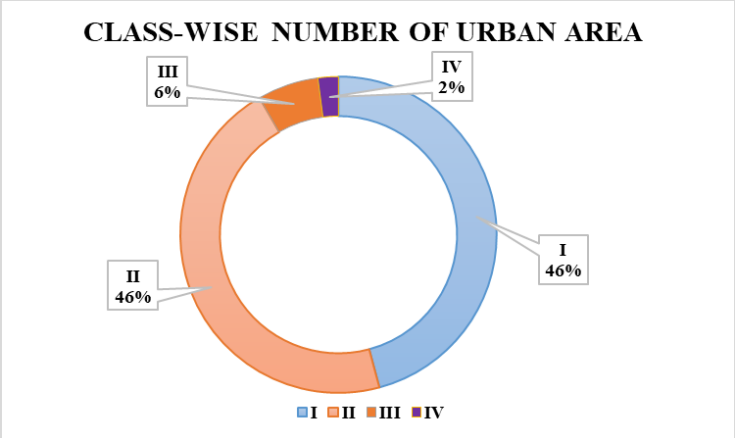


Figure 10: Class-wise number of urban area

According to the study, Hyderabad is the primate city (fig. 11). A primate city is defined as a city that is disproportionately large in a country's or regions urban hierarchy. Primate cities take pride in their superiority over other cities in the country or region. They are unrivalled political and economic hubs, and in most cases, they serve as the capital and administrative centre of the country or region. Because of its importance in the state's stagnant economy, Hyderabad is the state's primate city. Trade revenues, capital accumulation, agriculture and other economic activities, historical characteristics, and so on. As a result, capital and labour migrated to larger, more promising cities.

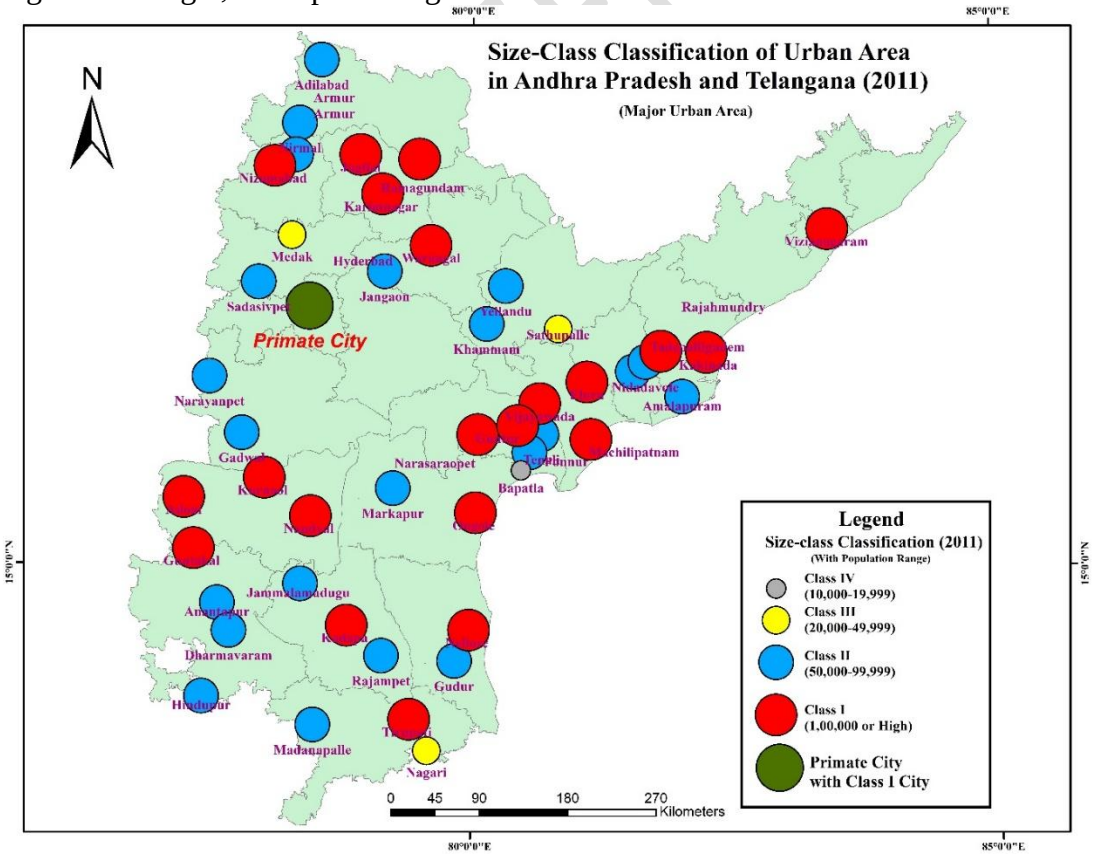


Figure 11: Size-class classification of Andhra Pradesh and Telangana urban areas (including Primate City)

(h) Trends in migration flows and urban area change:

In this study, people migrated from every district to Hyderabad's central primate city. However, people in Hyderabad's neighbouring cities are more migrants than those in other cities. It is primarily the flow of migration or the number of migrants crossing a border in a specific period to establish residence. The 12th figure depicts the overall state of migration flow trends. According to Census of India data (2011), all district peoples have migrated to primate cities (Hyderabad).

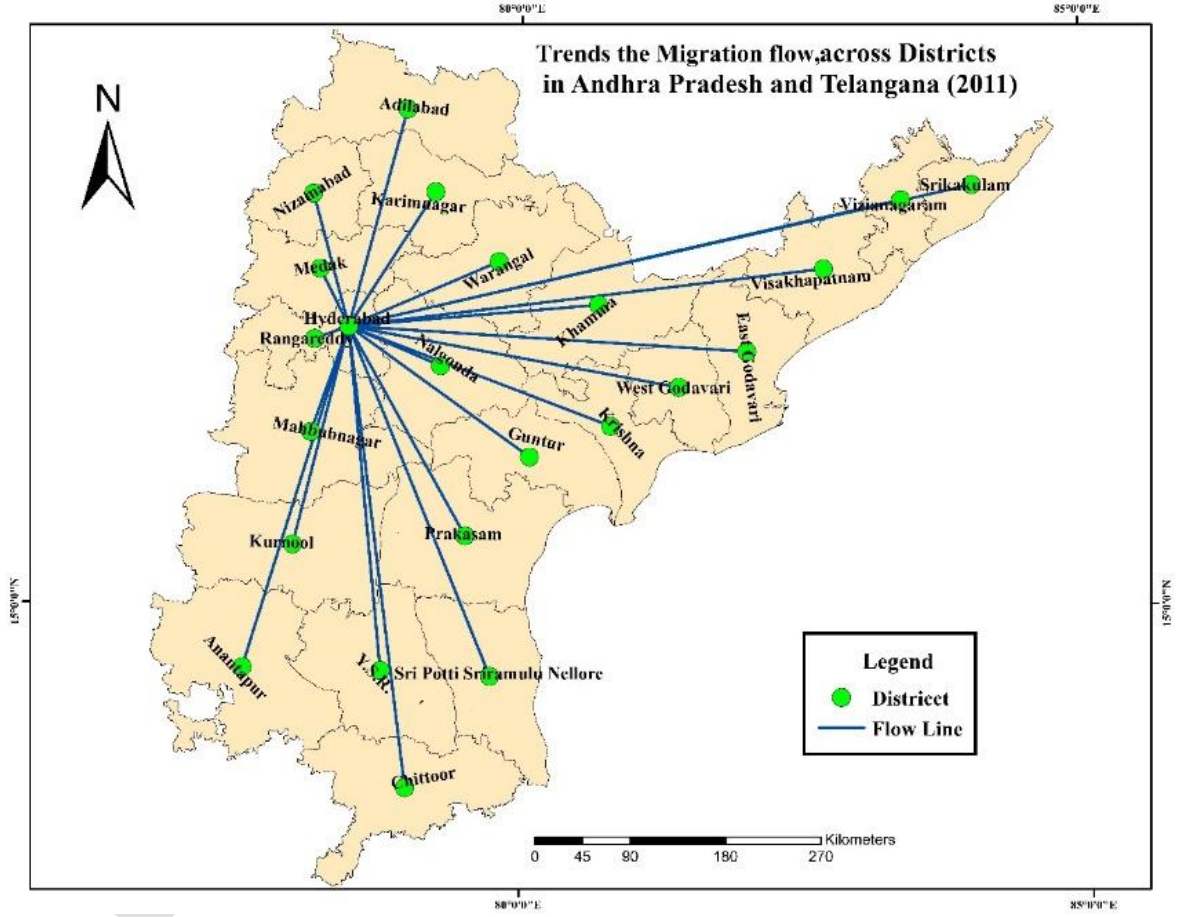


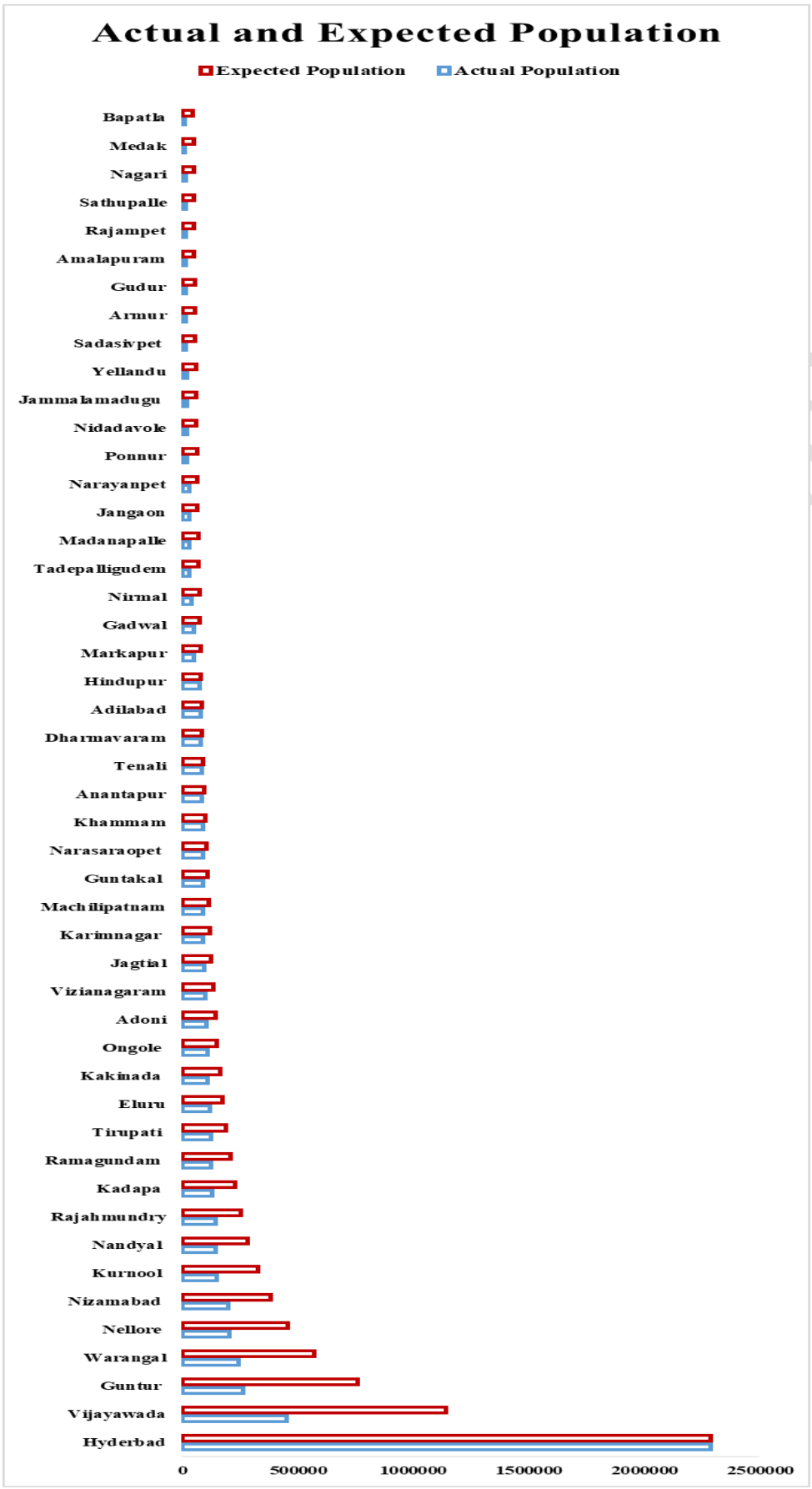
Figure 12: Trends in migration flows

(i) Migration, and the Actual and Expected Population of the City:

Migration and other factors will increase the population of every city. Table 8 shows the current and projected population of each city. The city of Hyderabad has the most people (2287014), while the city of Bapatla has the fewest (10301). Hyderabad has the highest expected population, while Bapatla has the lowest (figure 13.).

Table 8
Actual and Expected Population Status of some selected cities of

Andhra Pradesh and Telangana		
City	Actual Population	Expected Population
Hyderabad	2287014	2287014
Vijayawada	451231	1143507
Guntur	266500	762338
Warangal	246516	571754
Nellore	204387	457403
Nizamabad	201879	381169
Kurnool	152395	326716
Nandyal	145721	285877
Rajahmundry	143098	254113
Kadapa	130096	228701
Ramagundam	126949	207910
Tirupati	125425	190585
Eluru	120227	175924
Kakinada	112038	163358
Ongole	108577	152468
Adoni	105128	142938
Vizianagaram	98217	134530
Jagtial	93602	127056
Karimnagar	92914	120369
Machilipatnam	91283	114351
Guntakal	90884	108905
Narasaraopet	88459	103955
Khammam	88439	99435
Anantapur	85406	95292
Tenali	85269	91481
Dharmavaram	82785	87962
Adilabad	79298	84704
Hindupur	75796	81679
Markapur	51050	78863
Gadwal	49488	76234
Nirmal	39523	73775
Tadepalligudem	30039	71469
Madanapalle	29866	69303
Jangaon	29858	67265
Narayanpet	29366	65343
Ponnur	22421	63528
Nidadavole	20929	61811
Jammalamadugu	20117	60185
Yellandu	19256	58641
Sadasivpet	18418	57175
Armur	17212	55781
Gudur	16584	54453
Amalapuram	16512	53186
Rajampet	15512	51978
Sathupalle	15070	50823
Nagari	14974	49718
Medak	13285	48660
Bapatla	10301	47646
Source: Census of India, 2011		


Actual and Expected Population
Expected Population
Actual Population
Bapatla
Medak
Nagari
Sathupalle
Rajampet
Amalapuram
Gudur
Armur
Sadasivpet
Yellandu
Jammalamadugu
Nidadavole
Ponnur
Narayanpet
Jangaon
Madanapalle
Tadepalligudem
Nirmal
Gadwal
Markapur
Hindupur
Adilabad
Dharmavaram
Tenali
Anantapur
Khammam
Narasaraopet
Guntakal
Machilipatnam
Karimnagar
Jagtial
Vizianagaram
Adoni
Ongole
Kakinada
Eluru
Tirupati
Ramagundam
Kadapa
Rajahmundry
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Kurnool
Nizamabad
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Figure 13: Actual and Expected Population Status of some selected cities of Andhra Pradesh and Telangana

4.2 Socio-ecological implications of Urbanization, and Socio-climate Variation:

The physical, social, economic, cultural, political, and intellectual conceptions of an urban area, which are the primary factors for variations in social climate, are referred to as socio-ecological implications of urbanisation. The movement of people from rural to urban areas, as well as the increase in population in urban areas, are indicators of the urbanisation process. This movement is represented by an increase in the percentage of people who live in towns, cities, and urban areas. It is generally acknowledged that urbanisation is a process that results in a variety of outcomes, including environmental, economic, social, and cultural impacts, and that it typically takes place in developing nations. This intricate process has a significant global dimension, which helps it to overcome spatial barriers. These barriers act as real centres of progress, and they have a significant impact on the natural resources and the quality of life (Abd Aziz et al. 2012; Dociu and Dunarintu, 2012). In the current study, table 9 highlight the socio-ecological implications of urbanization and socio-climate variation.

Table 9
Socio-Ecological Implications of Urbanization and Socio-Climate Variation

Socio-ecological domains	Implications and Variation	References

Natural/ Environmental/ Physical	The expansion of urban areas without proper planning results in an increase in overall vulnerability and risk conditions. Another difficulty that arises from unplanned city development is an increase in the frequency of both natural and man-made disasters. Previous study has been explained, the effects of urban heat islands have already been observed in urban settings, which has had an effect on the natural environment of an urban area, specifically its surface ecology, as well as its weather, climate, and socio-economic life. The natural ecological system has been disrupted as a result of urban expansion; • Nandan et al. (2013) studied lakes in Hyderabad city and concluded that the area of lake space was reduced and water bodies decreased due to urban expansion, and suggested that attention should be paid right away to preserving and managing these lakes to protect urban systems. • In their studies on the environmental effects of urbanisation in Hyderabad, Bala Kishan et al. (2019) found the major source of air pollution, the quality of local environments, and the demands placed on natural resources. They also predicted that the increased in vulnerability conditions would occur. • Loss of habitat and deforestation as a result of urbanisation leads to a reduction in the ranges of species, as well as their populations and biodiversity. It can also lead to changes in the interactions that occur between various organisms. • The development of life cycles and characteristics that aid in the survival and reproduction of species in ecosystems that have been disrupted or otherwise changed. Some bird populations that have adapted to living in urban environments have, for instance, modified the shape of their beaks so that they are better able to consume the seeds that are contained in bird feeders that have been created by humans. • Local natural environments are an essential component of urban ecosystems, which carry out essential ecological and environmental functions to preserve the region's weather, groundwater, and habitat. These functions are carried out by urban ecosystems. The relentless increase in human population, combined with inadequate planning for urban areas, is having a devastating impact on urban ecosystems all over the state. • Travelling and importing and exporting goods into and out of cities increases the spread of invasive species. Invasive species often outcompete native species in disturbed urban environments. • The temperature of the region as a whole has fluctuated as a result of urban heat islands have formed as a direct result of rising land surface temperatures in urban areas. • One of the visible consequences of rapid urbanisation in urban areas is an insufficient supply of drinking water to meet the growing population's demand. Almost all groundwater in major cities has been tapped, and groundwater sources are now used for drinking water. • Polluted air is another major issue in Andhra Pradesh and Telangana's urban areas. Furthermore, the particles found in the air around the city centre are to blame for an increase in the number of people suffering from respiratory illnesses.	Malakar (2020b); Bala Kishan et al. (2019); Alfraihat et al. (2016); Madhu et al. (2015); Rao et al. (2014); Nandan et al. (2013); Basha et al. (2012); Weng and Schubring, (2004)

Socio-economic	As a result of urbanisation, the socioeconomic system has been transformed, such as; • The slum problem is on the rise, going to pose new health challenges for the public health system. • The rapid increase in urban population, which has occurred both naturally and as a result of migration, has placed significant strain on public utilities such as education, electricity, housing, water, sanitation, health care, transportation, and amongst others. • Some of the primary causes responsible for the alarming trends in urban crime are rising levels of consumerism, selfishness, materialism, appalling socio-economic disparities, competition in everyday life, lavishness, and rising levels of unemployment, as well as a feeling of isolation in the midst of a crowd. • One of the consequences of rapid urbanisation is a shift in urban land use and land cover, which resulted in the spatial Urban Heat Island in cities in Andhra Pradesh and Telangana (UHI). And this type of UHI raises Land Surface Temperature (LST), causing an Urban Hot Spot (UHS) and negatively impacting the urban environment. • Because of the rapidly growing population, changes in consumption patterns, and social behaviour, the volume of solid waste generated in urban areas has increased dramatically. Increased density of housing and small businesses, as well as diversification of economic and social activities such as hotels, industries, commercial establishments, hospitals/nursing homes, and so on, generate solid waste. As a result, the most visible issue appears to be solid waste heaping. • Poverty in cities is a very strange thing. The people who will be hurt the most by the changing urban ecology are street vendors, people who work in other informal jobs, women, children, and the elderly. • The rate of urbanisation is causing industries and transportation systems to expand at rates that are disproportionate to their size. These developments are primarily to blame for the pollution of the environment, most notably the pollution of the urban environment. • In the event that there is a problem with the management of waste, nuclear, digital, and plastic waste will present a significant obstacle for maintaining a clean and pollution-free urban environment. • The rapid growth of urban fringes presents a new challenge, which is the management of the rural-urban fringe, which is a new challenge that has emerged in recent years. In order to ensure that infringed areas can support sustainable development, there is an immediate need for long-term planning. • Squatting in public open space is a new urban phenomenon. The primary reason for people leaving their villages and moving to cities is the high level of unemployment in rural areas. A large influx of rural migrants has contributed to the growth of urban slums and squatters. In the absence of adequate income to own or rent a house, people choose the most neglected urban land for building shelter, and this, combined with improper management of this environment, has resulted in a variety of environmental problems. • During the COVID-19 Pandemic, a large number of migrant peoples, including workers, were moved from the city to rural areas for a variety of reasons, including a lack of income, transportation, proper health facilities, food, habitation, and other things. Therefore, this is another reason to understand the sudden situation for any city residents who are facing a health emergency. These individuals only moved to the city to improve their financial situation and their quality of life. Because without an adequate source of income, urban areas face greater challenges in terms of living standards and other aspects. In this regard, this study just stated one thinking the climate of social phenomena are complex and psychological perception	ep (2022); Koteswara Rao et al. (2021); Sapra and Nayak (2021); Rupakula and Kumar (2021); Rao (2021); Potnuru (2020); Sabarwal, (2020); Gurram and Kinthada 8); Jayalakshmi (2016); Dociu and Dunarintu, (2012); Rao (1981)

5. Conclusion and Recommendations:

This study found the links between Population, Migration, and Urbanization. The advantages of various opportunities, facilities, the scope of work and income draw people away from rural areas and into cities. Finally, urban growth causes socio-ecological variation, which can have both positive and negative consequences. This study uncovered some issues. Recommendations for mitigating urban socio-ecological problems and correcting haphazard urbanisation may be made based on the preceding discussions, such as; (a) Efforts should be made to educate and raise awareness about environmental conservation among urban and rural residents. It is possible to raise awareness by involving local residents in planned urban development and expansion activities; (b) To provide housing plots to poor urban communities such as slums and squatters, private sector investment in urban land development and low-cost housing development should be encouraged; (c) The private sector should be encouraged to collect and manage household solid waste in collaboration with non-governmental organisations; (d) The need to develop and establish green spaces in urban areas is necessary for the improvement of urban environments and the mental peace of urban residents; (e) Urban planning is being done piecemeal due to the lack of a modest urban land use zone policy. In order to delineate land use components such as urban built-up, historical, cultural, and religious sites, forest areas, agriculture areas, archaeological sites, industrial zones, road network, rivers and ponds, and others, this urban area requires comprehensive mapping. As a result, proper monitored administration, spatial-based research, and policy implementation are required. (f) Although urban planning is purely a matter of technical expertise, its actual execution is heavily reliant on the will of those in political leadership positions. Without a strong leader, the plans will not be able to be implemented. But, the fact that the current government of India is making efforts to improve urban development is another important aspect to consider.

Future prospect:

Throughout this study, the authors read various types of thinking and approaches. It also makes suggestions for future research in this field, such as "Migrant workers and their socioeconomic lives and livelihoods in relation to rural-urban and rurban migration and social-climate approach."

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Appendix 1
Distribution of Migrants in Andhra Pradesh and Telangana by Reasons for Migration, 2000-01 and 2010-11

Sr. No	Reasons for Migration / Districts	Year	Work/employment			Business			Education			Marriage			Moved after birth			Moved with household			Others		
			Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
1	Adilabad	2001	2.73	2.75	2.28	1.63	1.41	0.50	1.04	0.64	0.94	3.03	2.42	3.03	0.88	0.83	0.77	2.49	2.49	2.42	4.59	4.56	4.58
		2011	2.79	2.83	2.64	2.23	2.19	2.40	1.30	1.11	1.55	3.04	2.88	3.05	0.96	0.96	0.95	2.54	2.60	2.50	4.61	4.60	4.62
2	Nizamabad	2001	1.67	1.57	1.77	1.56	1.32	0.45	1.44	1.20	1.15	3.31	3.20	3.30	2.00	1.90	1.96	1.62	1.62	1.54	3.38	3.20	3.54
		2011	1.74	1.65	2.13	2.17	2.09	2.45	1.71	1.67	1.76	3.33	3.66	3.32	2.07	2.03	2.14	1.67	1.73	1.62	3.40	3.24	3.58
3	Karimnagar	2001	3.70	3.78	3.00	2.64	2.23	1.30	1.55	1.41	1.12	4.97	3.31	5.02	2.75	2.61	2.75	3.42	3.19	3.50	4.42	4.10	4.72
		2011	3.77	3.86	3.35	3.24	2.99	4.15	1.81	1.87	1.73	4.98	3.77	5.04	2.82	2.74	2.93	3.46	3.30	3.58	4.44	4.14	4.76
4	Medak	2001	3.04	3.05	2.60	1.62	1.45	0.64	1.76	1.72	1.20	4.64	3.12	4.68	2.94	2.82	2.92	2.97	2.87	2.96	3.09	3.22	2.91
		2011	3.10	3.13	2.96	2.23	2.22	2.26	2.02	2.19	1.81	4.66	3.58	4.70	3.02	2.95	3.10	3.01	2.97	3.04	3.11	3.26	2.95
5	Hyderabad	2001	7.50	7.21	8.49	12.05	11.53	11.40	4.96	5.32	3.89	1.16	1.00	1.15	2.45	2.28	2.49	5.80	5.93	5.63	10.09	9.98	10.17
		2011	7.57	7.28	8.82	12.59	12.22	13.95	5.21	5.77	4.48	1.18	1.47	1.16	2.52	2.41	2.67	5.84	6.03	5.70	10.11	10.02	10.21
6	Rangareddi	2001	17.88	17.56	19.01	16.35	15.73	16.19	8.66	9.39	7.15	4.49	3.62	4.51	6.27	5.93	6.56	14.57	14.06	14.88	9.85	9.66	10.02
		2011	17.93	17.63	19.30	16.86	16.39	18.61	8.91	9.82	7.72	4.51	4.08	4.53	6.34	6.06	6.73	14.61	14.16	14.94	9.87	9.69	10.06
7	Mahbubnagar	2001	1.52	1.44	1.51	1.90	1.58	0.20	2.89	2.67	2.57	5.66	3.60	5.73	1.56	1.50	1.47	1.49	1.50	1.40	5.90	5.92	5.83
		2011	1.59	1.52	1.87	2.51	2.35	3.08	3.15	3.14	3.16	5.68	4.06	5.75	1.64	1.63	1.65	1.54	1.61	1.48	5.92	5.96	5.87
8	Nalgonda	2001	3.28	3.21	3.23	2.37	2.25	0.09	3.35	3.05	3.14	5.17	2.81	5.25	3.54	3.45	3.48	3.15	2.97	3.21	3.46	3.46	3.41
		2011	3.34	3.29	3.58	2.97	3.02	2.80	3.61	3.51	3.73	5.19	3.27	5.27	3.61	3.58	3.65	3.20	3.08	3.29	3.48	3.50	3.46
9	Warangal	2001	3.00	3.00	2.64	2.33	2.28	0.40	4.13	4.18	3.48	4.75	2.94	4.81	2.65	2.55	2.61	3.10	3.07	3.04	3.69	3.64	3.71
		2011	3.07	3.08	3.00	2.93	3.05	2.50	4.39	4.64	4.07	4.77	3.40	4.83	2.72	2.68	2.79	3.14	3.18	3.12	3.71	3.67	3.75
10	Khammam	2001	3.79	3.72	3.75	2.33	2.22	0.18	3.04	2.29	3.40	3.46	3.61	3.44	2.93	2.81	2.91	3.96	3.87	3.95	2.77	2.78	2.72
		2011	3.85	3.80	4.10	2.93	2.99	2.71	3.30	2.76	3.99	3.48	4.07	3.46	3.00	2.94	3.09	4.00	3.98	4.02	2.79	2.82	2.76
11	Srikakulam	2001	1.24	1.25	0.80	1.09	0.99	1.49	2.81	2.62	2.46	3.26	1.69	3.30	2.44	2.41	2.30	1.82	1.84	1.73	1.34	1.25	1.39
		2011	1.30	1.33	1.16	1.70	1.77	1.44	3.07	3.09	3.06	3.28	2.16	3.32	2.51	2.54	2.47	1.87	1.95	1.81	1.36	1.29	1.44
12	Vizianagaram	2001	1.48	1.52	0.97	1.11	0.98	1.33	2.84	2.43	2.78	2.80	2.53	2.79	3.23	3.18	3.12	1.87	1.81	1.83	2.31	2.26	2.32
		2011	1.55	1.60	1.33	1.72	1.76	1.59	3.10	2.89	3.38	2.82	3.00	2.81	3.30	3.31	3.30	1.91	1.92	1.91	2.33	2.30	2.36
13	Visakhapatnam	2001	6.52	6.79	4.96	5.81	5.65	3.61	6.16	5.76	6.10	3.84	3.37	3.85	5.64	5.51	5.64	6.21	6.05	6.25	5.80	5.71	5.86
		2011	6.58	6.87	5.31	6.39	6.39	6.39	6.41	6.20	6.68	3.86	3.83	3.86	5.71	5.64	5.81	6.25	6.15	6.33	5.82	5.75	5.90
14	East godavari	2001	4.78	5.01	3.41	3.70	3.81	0.42	3.82	3.18	4.05	6.59	6.96	6.56	13.28	13.63	12.65	6.12	6.14	6.03	5.48	5.72	5.17
		2011	4.84	5.09	3.76	4.29	4.56	3.29	4.08	3.64	4.64	6.61	7.40	6.58	13.35	13.74	12.81	6.17	6.24	6.11	5.50	5.76	5.21

15	West godavari	2001	4.17	4.25	3.45	2.55	2.62	0.62	3.53	2.89	3.77	5.51	5.83	5.48	12.23	12.59	11.58	5.05	4.98	5.03	2.95	3.10	2.74
		2011	4.23	4.33	3.80	3.15	3.39	2.28	3.79	3.35	4.36	5.53	6.28	5.50	12.30	12.70	11.74	5.10	5.09	5.10	2.97	3.14	2.78
16	Krishna	2001	6.89	6.96	6.24	5.57	5.33	3.64	7.50	7.49	6.95	5.12	6.56	5.05	9.08	9.08	8.91	6.92	6.85	6.90	5.31	5.32	5.27
		2011	6.96	7.04	6.58	6.15	6.08	6.41	7.75	7.93	7.52	5.14	7.01	5.06	9.15	9.20	9.08	6.97	6.96	6.97	5.33	5.35	5.31
17	Guntur	2001	5.89	5.71	6.36	4.19	4.34	0.76	7.28	6.91	7.19	5.59	6.75	5.53	7.38	7.34	7.26	5.96	5.98	5.88	5.53	5.55	5.46
		2011	5.95	5.79	6.70	4.78	5.09	3.63	7.53	7.36	7.76	5.61	7.19	5.55	7.45	7.46	7.43	6.01	6.08	5.95	5.55	5.59	5.50
18	Prakasam	2001	2.83	2.81	2.60	2.08	2.11	0.94	3.07	2.85	2.75	4.14	3.69	4.14	2.70	2.66	2.58	3.17	3.10	3.15	2.52	2.51	2.50
		2011	2.90	2.89	2.95	2.69	2.88	1.97	3.33	3.32	3.35	4.16	4.15	4.16	2.77	2.79	2.76	3.22	3.21	3.23	2.54	2.55	2.54
19	Sri Potti Sriramulu Nellore	2001	3.17	3.24	2.47	2.31	2.39	0.90	7.83	8.26	6.69	3.44	4.92	3.36	3.99	3.89	3.95	4.02	3.96	3.99	2.58	2.62	2.49
		2011	3.23	3.32	2.82	2.91	3.16	2.00	8.07	8.70	7.26	3.46	5.37	3.38	4.06	4.02	4.12	4.07	4.06	4.07	2.60	2.66	2.54
20	Y.S.R.	2001	2.78	2.79	2.36	2.11	2.06	0.64	2.48	2.14	2.31	3.35	3.15	3.34	1.90	1.83	1.81	3.73	3.84	3.58	2.99	3.08	2.84
		2011	2.84	2.87	2.72	2.71	2.83	2.26	2.74	2.61	2.91	3.37	3.61	3.35	1.97	1.96	1.99	3.78	3.95	3.65	3.01	3.12	2.88
21	Kurnool	2001	2.70	2.63	2.65	3.05	2.78	1.18	4.32	4.01	4.13	4.86	3.76	4.89	2.36	2.30	2.26	2.73	2.81	2.59	4.86	4.90	4.77
		2011	2.76	2.71	3.00	3.65	3.54	4.03	4.58	4.47	4.72	4.88	4.22	4.91	2.44	2.43	2.44	2.77	2.92	2.66	4.88	4.94	4.82
22	Anantapur	2001	3.56	3.50	3.46	3.61	3.28	2.02	4.02	3.97	3.50	5.27	4.81	5.27	3.17	3.13	3.05	3.53	3.59	3.42	3.79	3.86	3.67
		2011	3.62	3.58	3.82	4.21	4.04	4.84	4.28	4.42	4.09	5.29	5.26	5.29	3.24	3.26	3.23	3.58	3.70	3.49	3.81	3.89	3.72
23	Chittoor	2001	4.42	4.45	3.95	4.39	4.23	2.14	5.61	5.09	5.69	5.14	5.83	5.10	2.95	2.84	2.92	5.25	5.03	5.33	2.82	2.69	2.91
		2011	4.48	4.52	4.30	4.98	4.98	4.96	5.86	5.54	6.27	5.16	6.28	5.11	3.02	2.97	3.10	5.29	5.14	5.40	2.84	2.73	2.96

Source: Census of India, 2001, 2011. Calculated by Author.

Appendix 2
Duration of residence in place of enumeration (2011)

Sl_No	Districts	Less than 1 year			1-4 years			5-9 years			10-19 years			20+ years		
		Persons	Males	Females	Persons	Males	Females	Persons	Males	Females	Persons	Males	Females	Persons	Males	Females
1	Adilabad	1.68	1.53	1.80	2.18	1.82	2.41	2.31	1.94	2.51	2.51	2.14	2.69	2.86	2.69	2.92
2	Nizamabad	1.96	1.66	2.19	2.12	1.67	2.40	2.17	1.63	2.47	2.46	1.79	2.79	2.94	2.08	3.29
3	Karimnagar	2.82	2.52	3.06	3.28	2.77	3.60	3.37	2.92	3.62	4.13	3.43	4.47	4.99	3.64	5.52
4	Medak	3.36	3.30	3.41	3.55	3.23	3.75	3.66	3.13	3.96	3.57	2.85	3.92	3.89	2.41	4.47
5	Hyderabad	3.81	4.52	3.24	4.19	5.47	3.40	4.18	6.03	3.17	3.87	6.01	2.82	3.56	6.85	2.26
6	Rangareddi	9.90	11.22	8.86	11.50	14.36	9.72	11.21	15.18	9.02	8.74	12.44	6.91	5.93	9.04	4.71
7	Mahbubnagar	2.23	1.79	2.57	3.01	1.94	3.68	3.33	1.83	4.15	3.45	1.72	4.30	4.10	1.73	5.04
8	Nalgonda	3.96	3.84	4.07	3.81	3.33	4.11	3.80	3.09	4.20	4.06	3.28	4.44	4.76	3.14	5.39
9	Warangal	3.00	2.92	3.07	3.32	3.03	3.50	3.55	3.13	3.78	3.87	3.18	4.21	4.46	2.94	5.05
10	Khammam	3.84	3.87	3.82	3.54	3.42	3.62	3.60	3.58	3.61	3.50	3.42	3.54	3.63	3.82	3.55
11	Srikakulam	2.78	2.73	2.83	2.57	2.33	2.71	2.57	2.10	2.83	2.61	2.03	2.89	2.79	1.89	3.15
12	Vizianagaram	2.60	2.48	2.69	2.53	2.50	2.55	2.45	2.22	2.57	2.48	2.16	2.64	2.56	2.20	2.70
13	Visakhapatnam	5.21	5.55	4.95	5.55	6.26	5.11	5.05	5.73	4.68	5.18	6.09	4.74	4.65	6.30	3.99

14	East godavari	7.42	7.28	7.54	6.85	6.76	6.90	7.17	7.32	7.10	7.51	8.03	7.25	7.39	8.92	6.78
15	West godavari	6.33	6.16	6.46	5.67	5.55	5.75	6.08	6.19	6.02	6.32	6.72	6.13	6.49	7.93	5.92
16	Krishna	7.94	8.29	7.66	6.45	6.94	6.14	6.27	6.94	5.90	6.36	7.38	5.86	6.36	8.31	5.60
17	Guntur	6.80	6.83	6.77	6.16	6.28	6.08	5.90	6.03	5.83	5.92	6.17	5.80	5.77	6.29	5.56
18	Prakasam	3.74	3.60	3.86	3.70	3.41	3.88	3.58	3.11	3.84	3.55	3.06	3.78	3.51	2.74	3.82
19	Sri Potti Sriramulu Nellore	4.30	4.40	4.22	3.82	3.96	3.73	3.65	3.71	3.63	3.70	3.86	3.62	3.46	3.78	3.33
20	Y.S.R.	3.32	3.27	3.36	3.28	3.18	3.34	3.23	3.09	3.31	3.17	3.00	3.25	3.08	2.86	3.16
21	Kurnool	3.15	2.91	3.33	3.69	3.09	4.06	3.64	2.74	4.13	3.86	2.91	4.32	3.75	2.85	4.11
22	Anantapur	4.16	3.82	4.43	4.22	3.86	4.44	4.39	3.75	4.74	4.46	3.87	4.75	4.43	3.65	4.74
23	Chittoor	5.68	5.50	5.82	5.02	4.86	5.12	4.82	4.63	4.93	4.74	4.44	4.88	4.66	3.95	4.94

Source: Census of India, 2011. Calculated by Author.

Appendix: 3
Distribution of Migrants in Urban area by Age-Group, 2000-01 and 2010-11

Sl_No	Districts	Age-groups	Year	0-4			5-9			10-14			15-19			20-24			25-29			30-34			35-39			40-44			45-49			50-54			55-59			60 and Plus		
				Persons	Males	Females	Persons	Males	Females	Persons	Males	Females	Persons	Males	Females	Persons	Males	Females	Persons	Males	Females	Persons	Males	Females	Persons	Males	Females	Persons	Males	Females	Persons	Males	Females	Persons	Males	Females	Persons	Males	Females	Persons	Males	Females
1	Adilabad		2001	0.78	0.52	0.49	1.02	0.83	0.76	1.61	1.20	1.37	1.70	0.65	1.82	2.48	0.94	2.59	2.46	1.42	2.56	2.03	1.47	1.91	1.74	1.24	1.34	1.57	0.90	0.92	1.33	0.43	0.47	0.87	-0.23	-0.63	0.22	-1.67	-1.43	-0.03	-2.27	-1.72
			1	1.04	1.04	1.04	1.25	1.27	1.23	1.94	1.83	2.06	1.98	1.48	2.24	2.62	1.86	2.75	2.61	2.09	2.76	2.34	2.17	2.48	2.19	2.11	2.27	2.22	2.12	2.33	2.19	2.09	2.30	2.12	2.20	2.04	1.92	1.86	1.98	1.85	1.66	2.04
2	Nizamabad		2001	1.47	1.23	1.19	1.46	1.23	1.23	1.43	1.08	1.12	1.76	0.84	1.81	2.56	0.56	2.75	2.36	0.91	2.59	1.64	0.86	1.70	1.30	0.74	0.96	1.02	0.26	0.47	0.67	-0.23	-0.18	0.22	-1.16	-0.99	-0.19	-2.24	-1.70	-0.25	-2.52	-1.93
			1	1.74	1.75	1.73	1.68	1.67	1.70	1.76	1.72	1.81	2.04	1.67	2.23	2.70	1.48	2.91	2.51	1.58	2.78	1.95	1.56	2.27	1.75	1.61	1.90	1.68	1.49	1.89	1.54	1.43	1.66	1.48	1.28	1.69	1.52	1.31	1.72	1.64	1.42	1.85
3	Karimnagar		2001	2.15	1.89	1.88	2.32	2.12	2.08	2.41	2.04	2.11	2.50	1.58	2.55	3.88	1.80	4.09	3.71	2.29	3.93	2.96	2.39	2.86	2.81	2.33	2.41	2.68	1.92	2.16	2.40	1.53	1.54	1.79	0.66	0.36	1.20	-0.71	-0.38	0.88	-1.25	-0.88
			1	2.42	2.41	2.43	2.55	2.55	2.54	2.73	2.67	2.80	2.78	2.41	2.97	4.02	2.71	4.25	3.86	2.95	4.12	3.27	3.09	3.42	3.26	3.18	3.34	3.32	3.12	3.55	3.25	3.16	3.35	3.03	3.06	3.00	2.89	2.78	2.99	2.75	2.64	2.86

10	9		8		7		6		5		4	
Khammam	Warangal		Nalgonda		Mahbubnagar		Rangareddi		Hyderabad		Medak	
2001	1	2001	2011	2001	1	2001	1	2001	2011	2001	1	2001
2.88	2.38	2.12	3.57	3.31	1.55	1.28	1	10.27	4.72	4.46	3.39	3.13
2.60	2.41	1.89	3.63	3.12	1.55	1.03	6	10.09	4.76	4.26	3.36	2.85
2.63	2.35	1.81	3.52	2.98	1.54	0.99	5	9.95	4.67	4.14	3.43	2.89
3.13	2.77	2.55	3.46	3.24	1.69	1.47	9.96	9.75	4.62	4.40	3.06	2.84
2.86	2.73	2.29	3.47	3.04	1.71	1.27	0	9.60	4.64	4.22	3.05	2.62
2.96	2.81	2.35	3.45	2.99	1.68	1.21	9.92	9.49	4.59	4.14	3.07	2.61
4.48	4.32	4.00	3.99	3.67	2.71	2.38	8.71	8.40	3.02	2.69	2.84	2.52
3.79	4.36	3.75	3.91	3.30	2.69	2.07	8.47	7.88	2.95	2.33	2.83	2.21
4.55	4.27	3.60	4.07	3.40	2.73	2.04	8.97	8.34	3.09	2.41	2.85	2.17
3.48	4.11	3.84	4.35	4.08	3.64	3.37	8.90	8.64	2.88	2.61	3.51	3.24
2.68	4.10	3.29	3.62	2.81	1.87	1.04	9	10.94	4.11	3.31	2.93	2.11
3.47	4.12	3.71	4.73	4.31	4.56	4.15	7.45	7.05	2.25	1.83	3.82	3.40
3.64	3.93	3.80	4.84	4.71	4.48	4.34	8.48	8.35	2.71	2.57	4.48	4.35
2.64	2.86	1.95	3.07	2.16	1.85	0.93	5	17.18	7.38	6.51	3.95	3.04
3.66	4.12	3.96	5.15	5.00	4.94	4.79	6.80	6.65	1.88	1.72	4.58	4.42
3.45	3.55	3.40	4.14	4.00	4.04	3.89	7	10.53	3.49	3.34	4.26	4.11
3.27	2.90	2.23	3.31	2.64	1.77	1.10	5	18.60	7.01	6.37	3.86	3.20
3.31	3.73	3.54	4.39	4.20	4.70	4.51	8.20	8.02	2.47	2.27	4.37	4.18
3.23	3.14	2.83	3.40	3.09	2.82	2.51	6	14.59	5.29	4.99	3.59	3.28
3.01	2.95	2.26	3.23	2.54	1.83	1.13	4	18.05	6.40	5.72	3.51	2.82
2.84	3.29	2.73	3.54	2.98	3.62	3.06	1	11.29	4.39	3.84	3.66	3.10
3.25	3.24	2.80	3.29	2.85	2.32	1.87	4	14.75	5.37	4.94	3.33	2.89
2.88	3.15	2.29	3.32	2.46	1.87	1.00	9	16.15	5.91	5.07	3.32	2.46
2.73	3.34	2.41	3.26	2.33	2.79	1.86	5	12.42	4.80	3.89	3.35	2.42
2.96	3.19	2.54	2.95	2.31	2.07	1.42	5	14.29	5.73	5.10	3.06	2.42
2.44	3.08	1.87	2.98	1.78	1.69	0.47	2	15.17	6.06	4.89	3.02	1.81
2.16	3.31	1.91	2.92	1.52	2.52	1.11	7	12.02	5.35	3.98	3.12	1.72
2.69	3.03	2.18	2.73	1.87	1.84	0.98	2	14.47	6.06	5.23	2.86	2.01
1.93	3.00	1.36	2.64	1.00	1.47	-0.20	1	14.89	6.47	4.89	2.84	1.20
1.70	3.06	1.25	2.82	1.01	2.26	0.44	2	12.41	5.61	3.85	2.88	1.07
2.14	2.75	1.51	2.54	1.29	1.63	0.37	0	14.62	6.68	5.48	2.62	1.37
1.10	2.85	0.44	2.41	0.00	1.29	-1.15	0	14.43	7.14	4.84	2.56	0.14
0.61	2.64	-0.01	2.69	0.03	2.01	-0.66	3	12.50	6.17	3.61	2.68	0.03
1.60	2.57	0.87	2.47	0.78	1.66	-0.05	9	14.74	6.53	4.91	2.48	0.78
-0.19	2.50	-1.01	2.29	-1.22	1.26	-2.29	3	14.56	7.45	4.12	2.39	-1.11
-0.09	2.63	-0.76	2.65	-0.74	2.05	-1.36	0	11.94	5.64	2.36	2.55	-0.84
1.39	2.52	0.64	2.56	0.69	1.53	-0.36	1	13.78	5.97	4.16	2.53	0.66
-0.82	2.30	-1.61	2.32	-1.58	1.14	-2.81	2	14.33	6.92	3.20	2.38	-1.52
-0.27	2.73	-1.01	2.80	-0.94	1.91	-1.86	7	9.94	5.06	1.41	2.68	-1.06

17	16		15		14		13		12		11		
Guntur	Krishna		West godavari		East godavari		Visakhapatnam		Vizianagaram		Srikakulam		
1	2011	1	1	1	2011	1	2011	1	2011	2001	1	2001	2011
6.29	7.93	7.68	9.65	9.40	11.11	6	5.81	5.55	3.03	2.77	2.60	2.33	3.14
6.04	7.91	7.43	9.61	9.13	11.00	3	5.77	5.27	3.01	2.49	2.59	2.07	3.12
6.02	7.95	7.44	9.69	9.18	11.21	2	5.84	5.32	3.06	2.53	2.60	2.06	3.16
6.42	7.54	7.33	9.24	9.04	10.66	6	5.91	5.70	3.00	2.78	2.87	2.65	3.35
6.26	7.44	7.03	9.18	8.78	10.53	3	5.91	5.49	3.01	2.58	2.92	2.48	3.29
6.15	7.64	7.20	9.31	8.88	10.81	9	5.92	5.47	2.99	2.53	2.83	2.37	3.42
5.55	6.17	5.86	5.46	5.14	6.77	6.46	6.71	6.40	3.54	3.21	3.87	3.55	4.79
5.41	6.16	5.56	5.34	4.73	6.63	6.03	7.08	6.49	3.66	3.04	3.93	3.31	4.41
5.04	6.19	5.53	5.59	4.93	6.92	6.27	6.30	5.64	3.40	2.72	3.81	3.14	5.22
7.33	7.91	7.65	5.19	4.92	5.74	5.48	5.04	4.77	2.39	2.12	2.69	2.41	3.75
6.67	9.92	9.16	5.19	4.39	5.14	4.34	5.87	5.08	2.20	1.38	2.39	1.57	3.49
7.26	6.88	6.47	5.19	4.78	6.06	5.65	4.61	4.19	2.49	2.07	2.84	2.42	3.89
6.02	5.36	5.23	5.37	5.24	6.20	6.07	4.27	4.13	2.32	2.19	2.75	2.62	3.78
5.38	6.29	5.41	4.39	3.49	5.09	4.20	5.43	4.54	1.64	0.71	1.77	0.85	3.55
5.98	5.19	5.04	5.55	5.39	6.40	6.25	4.06	3.90	2.44	2.28	2.93	2.76	3.81
5.33	5.31	5.16	5.14	4.99	6.16	6.01	4.57	4.42	2.39	2.24	2.83	2.68	3.59
5.25	6.13	5.49	4.23	3.57	5.28	4.63	5.53	4.88	1.65	0.97	1.55	0.88	3.93
5.16	5.07	4.88	5.41	5.22	6.42	6.23	4.29	4.10	2.61	2.41	3.20	3.01	3.50
5.17	5.76	5.46	4.76	4.46	6.00	5.70	5.41	5.10	2.20	1.88	2.47	2.16	3.53
5.05	5.95	5.28	4.38	3.70	5.56	4.88	5.76	5.09	1.85	1.14	1.83	1.12	3.70
4.72	5.61	5.06	5.07	4.52	6.35	5.81	5.12	4.57	2.48	1.91	3.00	2.43	3.40
5.45	6.34	5.91	4.75	4.32	5.93	5.50	5.79	5.36	2.03	1.58	2.24	1.80	3.69
5.01	6.27	5.44	4.46	3.61	5.67	4.83	5.90	5.07	1.98	1.11	2.04	1.18	3.73
5.01	6.42	5.52	5.07	4.16	6.20	5.31	5.67	4.77	2.08	1.14	2.46	1.52	3.65
5.48	6.64	6.02	4.91	4.28	6.02	5.40	5.98	5.36	2.04	1.39	2.22	1.57	3.60
4.92	6.47	5.30	4.60	3.41	5.93	4.75	6.17	5.00	1.99	0.77	2.17	0.95	3.64
4.77	6.85	5.50	5.28	3.91	6.13	4.78	5.77	4.41	2.10	0.68	2.28	0.87	3.56
5.49	6.96	6.14	4.88	4.04	6.06	5.23	5.87	5.04	1.95	1.09	2.12	1.26	3.53
4.71	6.99	5.42	4.63	3.02	5.98	4.39	6.26	4.68	1.87	0.21	2.02	0.37	3.56
4.58	6.93	5.19	5.15	3.38	6.14	4.39	5.43	3.66	2.04	0.21	2.24	0.41	3.50
5.15	6.94	5.74	4.82	3.60	6.10	4.89	5.71	4.50	2.04	0.79	2.07	0.82	3.37
4.13	6.91	4.60	4.66	2.29	6.05	3.73	5.80	3.46	1.93	-0.50	1.91	-0.52	3.49
3.68	6.96	4.43	4.99	2.40	6.14	3.58	5.60	3.03	2.17	-0.50	2.25	-0.41	3.25
4.54	7.12	5.51	4.83	3.17	6.07	4.44	5.70	4.06	2.17	0.47	2.12	0.42	3.28
2.94	6.98	3.63	4.69	1.26	6.09	2.72	5.89	2.50	1.98	-1.55	2.09	-1.43	3.29
2.76	7.27	4.04	4.96	1.65	6.05	2.78	5.52	2.23	2.35	-1.05	2.14	-1.26	3.28
4.65	6.93	5.14	5.12	3.30	6.39	4.59	5.73	3.92	2.21	0.33	2.20	0.32	3.25
2.68	6.87	3.15	4.83	1.03	6.34	2.59	5.94	2.19	2.11	-1.80	2.17	-1.73	3.05
2.88	6.99	3.41	5.40	1.76	6.44	2.84	5.53	1.90	2.30	-1.45	2.23	-1.53	3.44

23	22		21		20		19		18		
Chittoor	Anantapur		Kurnool		Y.S.R.		Sri Potti Sriramulu Nellore		Prakasam		
2001	1	2001	2011	2001	2011	1	2011	1	2011	2001	2011
3.44	3.25	2.99	2.49	2.22	2.36	2.10	4.10	3.84	2.97	2.71	6.54
3.21	3.29	2.78	2.48	1.96	2.41	1.89	4.11	3.60	2.96	2.44	6.54
3.14	3.21	2.68	2.49	1.95	2.31	1.77	4.08	3.55	2.99	2.45	6.54
3.51	3.36	3.14	2.76	2.54	2.66	2.43	3.97	3.75	3.26	3.03	6.63
3.32	3.38	2.95	2.84	2.41	2.73	2.29	3.98	3.55	3.28	2.85	6.68
3.24	3.35	2.89	2.68	2.22	2.58	2.12	3.97	3.51	3.23	2.77	6.59
4.31	4.17	3.85	3.80	3.48	3.45	3.13	4.48	4.16	4.27	3.95	5.86
3.92	4.37	3.76	4.20	3.58	3.34	2.72	4.55	3.94	4.35	3.73	6.01
4.06	3.96	3.28	3.37	2.70	3.57	2.89	4.41	3.74	4.19	3.52	5.70
5.19	4.37	4.10	4.39	4.12	3.14	2.87	3.87	3.59	4.26	3.99	7.59
5.06	4.15	3.34	3.45	2.63	3.17	2.35	4.25	3.45	3.59	2.78	7.45
4.84	4.49	4.07	4.88	4.47	3.13	2.71	3.67	3.25	4.61	4.19	7.66
4.96	4.63	4.50	4.63	4.50	3.37	3.24	3.61	3.47	4.21	4.08	6.15
4.94	4.04	3.14	2.66	1.74	3.43	2.53	3.48	2.57	3.01	2.10	6.27
4.80	4.74	4.58	4.98	4.83	3.36	3.20	3.63	3.47	4.43	4.27	6.13
5.11	4.82	4.68	4.24	4.09	3.63	3.48	3.65	3.50	3.83	3.68	5.47
4.17	3.61	2.95	2.73	2.06	3.18	2.51	3.67	3.01	3.19	2.52	5.90
5.19	5.17	4.99	4.68	4.49	3.76	3.57	3.64	3.45	4.01	3.82	5.35
5.19	4.32	4.02	3.29	2.98	3.57	3.26	3.71	3.40	3.34	3.03	5.47
4.28	3.71	3.02	2.80	2.10	3.34	2.65	3.73	3.04	3.31	2.61	5.72
5.38	4.82	4.27	3.68	3.12	3.76	3.20	3.69	3.13	3.37	2.80	5.27
5.15	4.13	3.69	3.08	2.63	3.59	3.15	3.75	3.31	3.33	2.88	5.88
4.46	3.86	3.01	2.93	2.07	3.56	2.71	3.81	2.96	3.28	2.42	5.85
4.99	4.41	3.50	3.23	2.31	3.63	2.70	3.68	2.76	3.38	2.45	5.91
5.15	3.83	3.20	3.07	2.43	3.61	2.97	3.77	3.13	3.33	2.69	6.11
4.47	3.70	2.50	2.93	1.72	3.70	2.50	3.88	2.68	3.33	2.13	6.09
4.57	3.99	2.60	3.25	1.85	3.52	2.12	3.65	2.26	3.32	1.93	6.13
5.15	3.88	3.03	3.01	2.15	3.68	2.84	3.81	2.96	3.24	2.39	6.31
4.38	3.60	1.97	2.76	1.12	3.66	2.03	3.81	2.19	3.19	1.56	6.29
4.24	4.19	2.40	3.28	1.47	3.72	1.92	3.80	2.00	3.30	1.49	6.33
4.80	4.01	2.78	2.97	1.72	3.74	2.50	4.00	2.77	3.33	2.10	6.35
3.58	3.74	1.36	2.84	0.43	3.68	1.29	3.99	1.61	3.35	0.95	6.45
3.54	4.29	1.68	3.11	0.47	3.81	1.18	4.00	1.39	3.32	0.69	6.24
4.47	4.21	2.55	2.95	1.27	3.86	2.19	4.03	2.36	3.17	1.49	6.17
2.42	3.75	0.29	2.75	-0.74	3.69	0.23	4.11	0.66	3.22	-0.26	6.31
3.13	4.66	1.34	3.14	-0.23	4.02	0.68	3.95	0.61	3.12	-0.25	6.03
4.01	4.31	2.47	2.95	1.08	4.39	2.55	4.18	2.34	3.30	1.44	6.45
1.89	3.95	0.11	2.70	-1.18	4.15	0.32	4.16	0.33	3.25	-0.62	6.42
2.36	4.66	0.99	3.19	-0.54	4.62	0.95	4.20	0.52	3.35	-0.37	6.47

		1	3.70	3.72	3.68	3.73	3.75	3.70	4.63	4.54	4.73	5.46	5.85	5.25	5.09	5.83	4.96	5.25	4.82	5.38	5.50	4.96	5.93	5.58	5.30	5.89	5.77	5.64	5.92	5.98	5.97	6.00	6.00	5.91	6.10	6.10	5.81	6.38	5.82	5.66	5.98
Source: Census of India, 2011. Calculated by Author.																																									

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