
POPULATION INDICATORS AND DEMOGRAPHIC CHANGE IN RAYALASEEMA REGION ANDHRA PRADESH: A CENSUS-BASED STUDY

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ABSTRACT

Population characteristics are important indicators of the demographic, social and economic development of a region. Population size, growth, density, sex ratio, literacy, age structure, urbanization and workforce characteristics provide an understanding of the spatial and temporal dimensions of population change. Rayalaseema, comprising the traditional districts of Anantapur, Chittoor, Kurnool and YSR Kadapa in Andhra Pradesh, has historically experienced distinctive demographic conditions associated with its semi-arid environment, agricultural economy, uneven urbanization and variations in social infrastructure.

The present study analyses major population indicators of the Rayalaseema region using Census of India data, particularly the 2001 and 2011 Censuses. The study examines population growth, density, sex composition, child population, literacy, gender differences in literacy and urbanization. Comparative analysis is undertaken at the district level to identify intra-regional demographic disparities. The four districts together recorded a population of about 15.19 million in 2011, compared with approximately 13.30 million in 2001. The region therefore experienced a decadal population increase of about 14.2 percent. Chittoor recorded the highest population and population density among the four districts, while YSR Kadapa recorded the lowest population and density. Chittoor also had the highest literacy rate, whereas Kurnool had the lowest. The regional sex ratio was close to 988 females per 1,000 males in 2011.

The findings indicate that Rayalaseema has undergone significant demographic transition, particularly through declining child population proportions, improvement in literacy and gradual urbanization. However, considerable differences remain between districts and between males and females. The study suggests strengthening female education, employment opportunities, urban infrastructure, health services, population-sensitive planning and sustainable livelihood programmes to achieve balanced demographic development in Rayalaseema.

KEYWORDS: Population Indicators, Demography, Population Growth, Sex Ratio, Literacy, Urbanization, Andhra Pradesh, Census.

INTRODUCTION

Population is one of the fundamental components of regional development. The size, distribution, composition and growth of population influence the demand for food, housing, education, health services, employment, transport, water supply and other basic facilities. Population indicators therefore provide an important framework for understanding the social and economic conditions of a geographical region.

Demographic change is not uniform across space. Regions differ in their population growth, density, fertility, mortality, migration, literacy, age composition, gender balance and urbanization. These differences are particularly significant in developing regions where demographic transition is closely associated with economic transformation and improvements in education, healthcare and living standards.

Rayalaseema occupies the southern and south-western part of Andhra Pradesh. Traditionally, the region consists of four districts- Anantapur, Chittoor, Kurnool and YSR Kadapa. The region is characterized by large geographical areas, relatively dry climatic conditions, dependence on agriculture, recurrent drought conditions in several areas, and a mixture of rural settlements and emerging urban centres. The population structure of the region has consequently developed differently from the more densely settled coastal parts of Andhra Pradesh.

According to Census 2011, the four traditional Rayalaseema districts together contained approximately 15.19 million people. Anantapur had 4.081 million people, Chittoor 4.174 million, Kurnool 4.053 million and YSR Kadapa 2.882 million. The corresponding district-level data also reveal substantial differences in density, literacy and urbanization.

Population indicators are particularly useful for Rayalaseema because regional averages can hide important intra-regional disparities. For example, Chittoor had a density of approximately 275 persons per sq. km., while YSR Kadapa had only about 188 persons per sq. km. Similarly, literacy ranged from approximately 59.97 percent in Kurnool to 71.53 percent in Chittoor.

The present study therefore attempts to provide a systematic assessment of major population indicators in Rayalaseema using Census data. The study also identifies major demographic disparities and discusses their implications for regional development planning.

Review of Literature

Sandip Sarkar (2008) examined trends and patterns of labour supply and unemployment in India. Parthasarathy, G and Jayshree Anand (1995) studied employment and unemployment in Andhra Pradesh: trends and dimensions. Regional disparities in Andhra Pradesh, India were studied by A Amarendra Reddy (2013). Growth and Structure of Workforce in India: An Analysis of Census 2011 Data studied by Venkatanarayana.M and Suresh Naik.V (2013). Amtul Waris, et al (2016) examined the gender gap and female workforce participation in agriculture in Andhra Pradesh, India and Gaurang Rami (2018) was studied trends and factors affecting to female labour force participation rate in India.

Study Area

Rayalaseema is a historically and geographically recognised region of Andhra Pradesh, comprising the four traditional districts of Anantapur, Chittoor, Kurnool, and YSR Kadapa. For the purpose of the present study, the 2011 Census district boundaries are adopted to ensure consistency and comparability in the analysis. This approach is particularly important because Andhra Pradesh subsequently underwent a major administrative reorganization, resulting in the creation of several new districts. Therefore, the present analysis retains the historical Census 2011 district units and does not attempt to integrate the newly created administrative districts with the original Census boundaries.

The four traditional districts of Rayalaseema occupy a substantial portion of the interior and southern parts of Andhra Pradesh and exhibit considerable geographical, demographic, and socio-economic variation. Anantapur is characterized by its extensive geographical area and relatively low population density, reflecting its predominantly semi-arid environment. Kurnool occupies a strategically important position within the region and has historically functioned as a major administrative, commercial, and service centre. YSR Kadapa is

characterized by relatively low population density and contains important urban centres, including Kadapa and Proddatur. In contrast, Chittoor has comparatively higher population concentration and includes major urban and pilgrimage centres, particularly Tirupati.

The considerable variation in population size, density, urbanization, demographic structure, and socio-economic characteristics among these four districts provides an appropriate geographical framework for examining regional population patterns. The diversity of physical and human conditions across Rayalaseema enables a comparative assessment of population indicators and helps identify spatial variations and demographic disparities within the region. Accordingly, the study considers the four traditional districts as the basic spatial units for analyzing the spatial patterns of population and demographic change in Rayalaseema based on Census 2011 data.

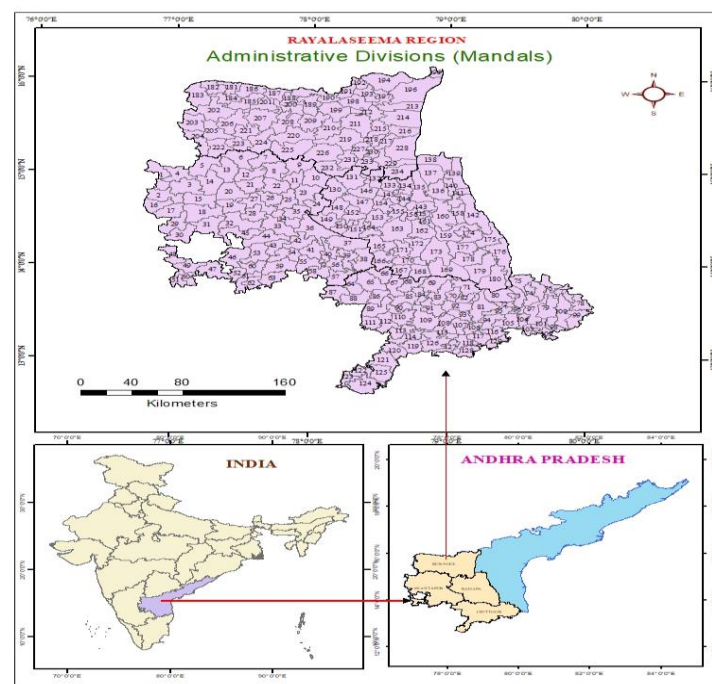


Fig-1.

Objectives of the Study

1. To analyze population size, growth, density, and spatial distribution in Rayalaseema between 2001 and 2011.
2. To examine key demographic characteristics, including sex ratio, child population, literacy, and urbanization, and identify intra-regional disparities.
3. To assess the implications of demographic patterns for regional development and suggest measures for balanced socio-economic development.

Data Sources and Methodology

The study is secondary data obtained from reliable official sources. The principal data sources are the Census of India 2001 and Census of India 2011, with particular emphasis on district-level Primary Census Abstracts (PCA), District Census Handbooks (DCHB) and relevant demographic and socio-economic tables. These datasets provide comprehensive information on population size, population growth, sex composition, age structure, sex ratio, literacy, workforce characteristics, rural–urban distribution, and other demographic indicators.

For ensuring temporal comparability and consistency, data for 2001 and 2011 were compiled using the traditional four-district administrative units of Rayalaseema region - Anantapur, Chittoor, Kurnool and YSR Kadapa. Relevant Census tables, including the Primary Census Abstract and educational-level data such as C-08, were utilized for the analysis of population and demographic characteristics. Additional supporting information was obtained from government publications, district statistical reports, and other official statistical sources.

The collected data were systematically compiled, standardized, and subjected to comparative and spatial analysis to identify temporal changes, spatial variations, and intra-regional demographic disparities across the Rayalaseema region.

Major indicators used

Table 1 indicates that Rayalaseema experienced moderate population growth during 2001–2011. The total population increased from 13,517,644 in 2001 to 15,191,144 in 2011, representing an absolute increase of about 1.67 million and a decadal growth rate of 12.38 per cent. However, population growth varied significantly among the districts. Kurnool recorded the highest growth rate of 14.85 per cent, followed by Anantapur (12.10%), Chittoor (11.43%) and YSR Kadapa (10.79%). The higher growth of Kurnool indicates relatively greater demographic expansion, whereas YSR Kadapa experienced comparatively slower growth.

Chittoor was the most populous district in 2011, with about 4.17 million people, followed by Anantapur and Kurnool. YSR Kadapa had the lowest population, with approximately 2.88 million. In terms of density, Chittoor recorded the highest value at 275 persons per sq. km., while YSR Kadapa had the lowest at 188 persons per sq. km. The regional average was 226 persons per sq. km. These differences indicate that population distribution was uneven and was influenced by variations in geographical area, settlement concentration and socio-economic opportunities.

The sex ratio showed a positive change during the decade. The regional sex ratio increased from 954 females per 1,000 males in 2001 to 988 in 2011. All districts registered improvement, with Chittoor recording the highest sex ratio of 997 in 2011. This indicates a substantial improvement in gender balance, although district-level differences remained. Overall, Table 1 demonstrates that Rayalaseema was characterized by moderate population growth, uneven spatial concentration and an improving sex ratio.

Table 2 highlights differences in child population, literacy and rural–urban composition. Children aged 0–6 years constituted 11.38 per cent of the regional population. Kurnool recorded the highest child-population share at 12.49 per cent, followed by YSR Kadapa (11.50%), Anantapur (10.93%) and Chittoor (10.65%). The higher child population in Kurnool suggests a relatively younger age structure, whereas the lower proportion in Chittoor may indicate a comparatively advanced demographic transition. These differences have implications for the future demand for education, healthcare and social infrastructure.

Literacy levels varied considerably among the districts. The regional literacy rate was 65.59 per cent, with Chittoor recording the highest literacy at 71.53 per cent and Kurnool the lowest at 59.97 per cent. YSR Kadapa and Anantapur occupied intermediate positions. The gender gap in literacy remained a major concern. Male literacy stood at 75.18 per cent, compared with only 55.95 per cent female literacy, resulting in a gap of 19.23 percentage points. Chittoor recorded the highest female literacy rate at 63.28 per cent and the smallest gender gap, while Kurnool had the lowest female literacy at 49.78 per cent. YSR Kadapa recorded a particularly wide gender literacy gap.

The rural–urban composition shows that Rayalaseema remained predominantly rural in 2011. About 70.34 per cent of the regional population lived in rural areas, compared with 29.66 per cent in urban areas. YSR Kadapa had the highest urban share at 33.97 per cent, while Anantapur had the highest rural share at 71.93 per cent. The relationship between urbanization and literacy was not uniform, suggesting that educational attainment depends on several factors, including institutional accessibility, socio-economic conditions and historical development of educational infrastructure.

Table 3 presents the work participation and occupational structure of the region. Rayalaseema had 7.32 million workers, accounting for 48.2 per cent of its total population. Main workers constituted 40.7 per cent, while marginal workers accounted for 7.5 per cent. Kurnool recorded the highest work participation rate at 50.1 per cent, followed by Anantapur at 49.9 per cent. Chittoor and YSR Kadapa recorded lower rates of 46.3 and 45.8 per cent respectively.

The relatively high marginal-worker shares in Anantapur (8.7%) and YSR Kadapa (8.3%) indicate greater dependence on seasonal or irregular employment. In contrast, Kurnool and Chittoor recorded lower marginal-worker shares. These differences suggest that employment conditions vary considerably across districts and that aggregate work participation alone cannot adequately measure employment security or quality.

The occupational structure confirms the strong agrarian character of Rayalaseema. Agricultural labourers accounted for 20.3 per cent of the regional population, while cultivators represented 9.0 per cent. Kurnool had the highest share of agricultural labourers at 24.2 per cent, followed by Anantapur (20.7%), YSR Kadapa (18.8%) and Chittoor (17.3%). In contrast, Chittoor had the highest share of cultivators at 10.2 per cent. Kurnool had the lowest cultivator share at 7.4 per cent but the highest agricultural-labour share. This contrast may reflect differences in landholding patterns, landlessness and dependence on agricultural wage employment.

The occupational structure also indicates that higher work participation does not necessarily imply better employment opportunities. Kurnool's high work participation is accompanied by substantial dependence on agricultural labour, suggesting that employment may be driven partly by the need to secure livelihoods rather than by diversified and stable economic opportunities. The high dependence on agriculture also makes rural households vulnerable to drought, rainfall variability, seasonal unemployment and fluctuations in agricultural demand.

Suggestions and Policy Implications

Rayalaseema requires integrated and district-specific development planning to address demographic and socio-economic disparities. Priority should be given to female education, rural educational infrastructure, skill development, and employment diversification. Drought-resilient measures such as watershed development, rainwater harvesting, micro-irrigation, and efficient water management are essential for sustainable livelihoods. Strengthening healthcare, women's economic empowerment, rural infrastructure, and social security can further improve human development. Urban centres also require better water supply, sanitation, housing, transport, and waste management. Systematic monitoring of migration is necessary to protect the social and economic well-being of migrant households.

Table-1: Population Indicators in Rayalaseema region 2001-2011.

Name of the District/Region	Population 2001	Population 2011	Growth (%)	Area (sq. km.)	Population 2011	Density (persons/sq. km.)	Sex Ratio 2001	Sex Ratio 2011
Anantapur	3,640,478	4,081,148	12.10	19,130	4,081,148	213	958	977
Chittoor	3,745,875	4,174,064	11.43	15,152	4,174,064	275	982	997
Kurnool	3,529,494	4,053,463	14.85	17,658	4,053,463	230	965	988
YSR Kadapa	2,601,797	2,882,469	10.79	15,359	2,882,469	188	974	985
Rayalaseema Region	13,517,644	15,191,144	12.38	67,299	15,191,144	226	954	988

Source: Census of India, 2001 and 2011

Table-2: Population Indicators in Rayalaseema region 2001-2011.

Name of the District/Region	Child Population (0-6)	Percentage of Total Population	Total Literacy (%)	Male Literacy (%)	Female Literacy (%)	Rural Population	Rural Share (%)	Urban Population	Urban Share (%)
Anantapur	445,956	10.93	63.57	73.02	53.97	29,35,437	71.93	1,145,711	28.07
Chittoor	444,572	10.65	71.53	79.83	63.28	29,42,678	70.05	1,231,386	29.50
Kurnool	506,239	12.49	59.97	70.10	49.78	29,04,177	71.65	1,149,286	28.35
YSR Kadapa	331,586	11.50	67.30	77.78	56.77	19,03,337	66.03	979,132	33.97
Rayalaseema Region	1,728,353	11.38	65.59	75.18	55.95	1,06,85,629	70.34	4,505,515	29.66

Source: Census of India, 2001 and 2011

Table-3: Population Indicators in Rayalaseema region 2001-2011.

Name of the District/Region	Total workers	Percentage	Main workers	Percentage	Marginal workers	Percentage	Cultivators	Percentage	Agriculture labour	Percentage
Anantapur	2036166	49.9	1679655	41.2	356511	8.7	402404	9.9	844061	20.7
Chittoor	1933357	46.3	1669852	40.1	263505	6.3	425263	10.2	720381	17.3
Kurnool	2029425	50.1	1757520	43.4	271905	6.7	301372	7.4	981683	24.2
YSR Kadapa	1320404	45.8	1079903	37.5	240501	8.3	243607	8.5	542455	18.8
Rayalaseema Region	7319352	48.2	6186930	40.7	1132422	7.5	1372646	9.0	3088580	20.3

Source: Census of India, 2001 and 2011

CONCLUSION

The analysis of Census 2001 and 2011 reveals significant demographic and socio-economic variations across Rayalaseema. The region had a population of 15.19 million in 2011, with substantial differences in growth, density, literacy, sex ratio, urbanisation, and employment. Chittoor demonstrated relatively favourable indicators, while Kurnool recorded the highest population growth but lower literacy. Anantapur remained sparsely populated, whereas YSR Kadapa showed relatively higher urbanisation. Overall, the findings highlight the need to address gender disparities, employment insecurity, educational deficits, healthcare access, and drought vulnerability through region-specific policies. Future research should incorporate recent census data, migration, fertility, GIS-based analysis, and socio-economic indicators for more effective regional planning.

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