8.1. A PERSPECTIVE ON THE STUDY

Industry is the most powerful catalyst which can spur the growth of other sectors like agriculture and services. Nevertheless worldwide the contribution of agriculture and service sectors to the gross domestic product is more than that of the manufacturing sector. In the present day world, we are contending with intractable problems of population growth, fast vanishing resources, a deteriorating physical environment, and widening disparities between regions and sections of people. Emergence of dynamic new industrial regions around urban centres increased and complicated these problems. This is true in the case of India and Andhra Pradesh as well.

To understand these problems of the study region, an attempt is made here through the analysis of the growth and development, structure, regional disparities and the problems and prospects of the industrial sector.
The Concept of Industry and Industrialisation

Prof. Robinson has defined the term industry as "a group of firms producing the same commodity for the same market." According to S.C. Kuchhal industrialisation is a process in which scales and ranges of return are continuously created and frequently prolonged and enlarged. Further, industrialisation is organically linked to both the social and economic past and to parallel process of economic and social development. Society progresses from the subsistence phase to commercial phase and to an industrial phase. This industrial phase further involves three stages. In the first stage secondary activity is concerned with possessing of primary products like milling grain, extracting oil, preparing skins, tanning leather, spinning vegetable fibres, preparing timber and smelting ores. The second stage comprises transformation of materials like making bread, footwear, metal goods, cloth and furniture. The third stage consists of manufacture of machines and other capital equipments.

Andhra Pradesh, though endowed with rich mineral resources is a late entrant on the industrial scene of India and still remains essentially an agricultural state without appreciable industrial development. Moreover most of the industries belonged to the first phase, engaged in processing of primary products and are located in small and medium towns. The second phase and third phase units are
very few in number and are confined to a few large cities like Hyderabad, Visakhapatnam and Vijayawada.

OBJECTIVES OF THE STUDY

(1) To study the regional setting to assess the resource potential in the study region.

(2) To study the spatial and temporal variations in the industrial development during the period 1970-1995.

(3) To find out the level of industrialisation and identification of industrial regions.

(4) To formulate a strategy for balanced industrial development in the future.

DATA BASE AND METHODOLOGY

The work is purely based on secondary data. The sources of the data are publications of Industries Informatic Centre, Hyderabad, Directorate of Economics and Statistics, Government of Andhra Pradesh, Hyderabad, Economic Surveys of India and Andhra Pradesh and VIIth & VIIIth Five Year Plans of Andhra Pradesh.

The industries are classified into two categories viz., (1) Small scale industries, (2) Large and medium scale industries. The small scale industries are further classified into 16 categories and large and medium scale industries are classified into 12 categories. For each
industrial category, data is collected on three parameters viz., (1) Number of units, (2) Capital investment, (3) Employment, taking district as the study unit. The data is analysed and presented using suitable statistical and cartographic techniques.

ORGANISATION OF THE STUDY

The study is divided into eight chapters.

1. A Prologue and Perspective.
2. A Profile of the Study Region.
3. An Appraisal of the Resource base
4. Industrial Growth and Development
5. Spatial Distribution of Industries.
6. Industrial Structure
7. Industrial Regions and Spatial Disparities
8. Summary and Conclusion.

8.2 A PROFILE OF THE STUDY REGION

The state of Andhra Pradesh extends over an area of 2.75 lakh Km² with a total population of 66.3 millions in 1991. It is the 5th largest State in the Indian Union both in terms of area and population. It lies between 12°37' N and 19° 54' N latitudes and 76° 45' E and 84° 4' E longitudes.
Relief: The region exhibits geomorphological diversity. It is divided into three broad relief zones viz., (1) The Coastal Plain, (2) The Eastern Ghats, and (3) The Plateau region.

The Coastal Plain: About 35 per cent of the total area of the state lies below 150 meters forming the Coastal Plain. The northern part of the plain, constituting the districts of Srikakulam, Vizianagaram and Visakhapatnam, is narrow. The central part the plain comprising the districts of East Godavari, West Godavari, Krishna and Guntur is the broadest. The Krishna Godavari delta forms part of this Coastal plain. The southern Coastal plain comprises Prakasam and Nellore districts. Agriculturally the Coastal plain in general and the middle part in particular is most important and is considered to be the granary of the state. The southern part of the plain is relatively poor in fertility.

The Eastern Ghats: These are a series of detached hilly ranges of heterogeneous composition running north-south between the Coastal plain on the East and the interior plateau on the west. North of Godavari river these are covered with dense forests while south of Krishna river the forest cover is thin. The Cuddapah system of these ghats is rich in mineral resources like limestone, barytes etc.

The Plateau Region: The region covers Telangana and Rayalaseema regions. The region is dotted with hillocks allover, and is covered with
red sandy soils. The western and northern part of the plateau is covered by black cotton soils.

**Drainage System:** Godavari, Krishna and Pennar are the three important river basins accounting for 71.88 per cent of the area of the state. The other important rivers are Vamsadhara, Nagavali, Gundlakamma, Manneru, Paleru, Swarnamukhi and Araniar. Of these only Godavari and Krishna are perennial, fed by both southwest and northeast monsoons. Apart from being a source of irrigation and hydro electricity these two rivers also serve as important inland waterways in the state. These two rivers have built up fertile deltas which serve as the granaries of the state. The Pennar river flowing through semi-arid districts of Anantapur and Cuddapah in its upper and middle courses is a boon to the agriculture in these districts.

**Climate:** The climate of Andhra Pradesh can be described as monsoonal type. The average rainfall of the state is 925 mm which spatially varies from 521 mm in Anantapur district to 1160 mm in the East Godavari district. The state receives 67 per cent of the annual rainfall through southwest monsoon and 25 per cent through north-east monsoon. The average number of rainy days is only 48.3 and the co-efficient variation is as much as 25 to 30 per cent. The mean annual temperature varies from 14°C to 19°C during winter and from 37°C to 44°C during summer.
Socio-Economic Setting of Andhra Pradesh

On the basis of combination of physical and socio-economic characteristic the State of Andhra Pradesh can be divided into three regions viz., (1) Coastal Andhra (2) Rayalaseema and (3) Telangana. These regions have disparities in the level and orientation of development.

Coastal Andhra Region: This region comprises of 9 Coastal districts viz., Srikakulam, Vizianagaram, Visakhapatnam, East Godavari, West Godavari, Krishna, Guntur, Prakasam and Nellore. It accounts for 33.8 per cent of the area and 43.2 per cent of the total population (1991). The decadal growth rate of population (1981-91) and the percentage of urban population is slightly less than that of the state. But the region accounts for nearly half the number of urban settlements in the state. The total number of workers account for 42.3 per cent of the total population with nearly 75 per cent of work force engaged in agricultural sector. The proportion of working force in the manufacturing sector is the lowest in this region (2.8%) when compared to 3.4 per cent in the state. The region has strong agricultural sector with 41.8 per cent of the net sown area, 16.8 per cent of the area sown more than once. Besides 58.2 per cent of the net cropped area and 51.9 per cent gross cropped area are under irrigation. The major rivers in peninsular India viz., Godavari and Krishna along with Pennar
formed fertile deltas in the Coastal belt, which support a flourishing agriculture with paddy as the dominant crop. Other important crops grown in this region are tobacco, chillies, sugarcane, cotton and fruits.

**Rayalaseema Region:** It is the smallest of the three regions accounting for 24.5 per cent of the area with 17.5 per cent of the population of the state. It covers the four southern districts viz., Kurnool, Cuddapah, Anantapur and Chittoor. The density of population is the lowest among the three regions (174/km²), but the decadal growth rate is slightly higher than that of the state. It has the lowest proportion of urban population (23.2%) but slightly higher literacy rate (45/44%). The working population accounts for 43.1 per cent of the total population. Manufacturing sector accounts for only 2.9 per cent of the workforce. Net sown area covers 40.3 per cent of the total geographical area but only 3.5 per cent is sown more than once. Agriculture in this region is mainly rainfed as only 21.9 per cent of net sown area has irrigational facilities. This region is a stalking ground of famines and nearly 60.0 per cent of the area is identified as drought prone. This region grows important commercial crops like groundnut, cotton, castor, sunflower and mulberry. It is also endowed with fairly rich mineral resources.

**Telangana Region:** It is the largest of the three regions covering 41.7 per cent of the area of the state and 39.2 per cent of the population. It
comprises ten districts of the state viz., Ranga Reddy, Hyderabad, Nizamabad, Medak, Mahaboobnagar, Nalgonda, Warangal, Khammam, Karimnagar and Adilabad. The density of population is moderate (227/km\(^2\)) but the growth rate is the highest (29.3\%) of all the three regions during the decade 1981-91. This region has the highest urban population (30.2\%) and the working population forms 43.1 per cent of the total population. The industrial sector accounts for 4.4 per cent of the total working population, which is the highest among the three regions. Net sown area covers only 33.9 per cent of the total geographical area which is the lowest among the three regions and 4.9 per cent of the area is sown more than once. The region has moderately dependent agriculture with 33.7 per cent of the net sown area and 38.6 per cent of the gross sown area, having irrigational facilities.

This region exhibits regional imbalance in economic development. Except the Hyderabad urban district and parts of surrounding Ranga Reddy and Medak districts the rest of the region is still predominantly rural and backward. The important crops grown are paddy, jowar, maize, millets, pulses, sugarcane, cotton and oil seeds. The region is rich in mineral resources like coal, iron ore, limestone, barytes, chromite, quartz etc.

**Transport and Communications:** The state of Andhra Pradesh is moderately well served by road and rail networks, a chain of sea ports
and a few air ports enabling easy mobility within the state and accessibility to the rest of the country and outside world.

8.3. AN APPRAISAL OF RESOURCE BASE

The resource potential of a region is crucial for its economic development. In the present study an attempt is made to appraise human, mineral, agricultural, forest, fisheries and animal resources of the region.

**Human Resources:** The state had a total population of 65.5 million with an average density of 242 persons/km² according to 1991 census. The Coastal Andhra region has the highest population density followed by Telangana and Rayalaseema regions. Except in the southern districts of Coastal Andhra i.e., Prakasam and Nellore in the rest of the region the density is over 300/km². In the districts like West Godavari (454/km²), East Godavari (420/km²), and Krishna (424/km²) very high density of population is noticed. In Rayalaseema the average density is 174/km² and ranges from 148/km² in Cuddapah district to 250/km² in Chittoor district. The variation in Telangana is quiet high ranging from as low as 129/km² in Adilabad to as high as 14499/km² in urban Hyderabad district.

**Urban Population:** The urban population comprises 26.9 per cent of the total population living in 264 urban settlements. Visakhapatnam (39.8%), Krishna (35.8%) and Guntur (28.9%) in Coastal Andhra,
Kurnool (28.8%) in Rayalaseema, Hyderabad urban district (100%), Ranga Reddy (47.2%) in Telangana region are the some of the relatively more urbanised districts. Districts like Mahaboobnagar (11.1%), Nalgonda (11.9%) and Medak (14.5%) in Telangana region, Chittoor (19.8%) in Rayalaseema region, Srikakulam (12.5%), Prakasam (16.5%), Vizianagaram (17.2%) in Coastal Andhra are some of the low urbanised districts.

Literacy: The state has an average literacy rate of 44.7 per cent which varies from 46.2 per cent in the Coastal region to 41.3 per cent in the Telangana region. West Godavari (53.4%), Krishna (53.2%) in Coastal region, Chittoor (49.8%), Hyderabad (71.5%), Cuddapah (48.1%) are some of the districts with very high literacy. Districts like Mahaboobnagar (299.6%), Adilabad (33.0%), Medak (32.4%), Vizianagaram (34.2%) Srikakulam (36.2%) are some of the districts with very low literacy.

Mineral Resources: Andhra Pradesh is fairly rich in mineral resources. A range of mineral deposits like coal, limestone, mica, clay, manganese, sand, shale, feldspar, and asbestos are available in the state. The bulk of the mineral deposits are found in Telangana and Rayalaseema regions. Some minerals are also found in Coastal Andhra. In 1993-94 the state produced 98.7 per cent of the barytes, 45.1 per cent of mica, 17.6 per cent of silver, 15.8 per cent of the gold, 15.4 per cent of
the lime kankar, 43.5 per cent of laterite, 18.3 per cent of limestone and over 50 per cent of the clay and 8 per cent of the coal produced in India.

(1) Barytes is almost entirely produced in Cuddapah district. (2) Andhra Pradesh ranks 6th in the coal production (estimated reserves 4.9 billions) and the coal belt in Godavari basin covers part of Adilabad, Karimnagar and Khammam districts. Coal alone accounts for 85 per cent of the value of the minerals produced in the state. (3) Limestone is mainly produced in the districts of Nalgonda, Cuddapah, Krishna, Guntur, Adilabad, Karimnagar, Kurnool and Anantapur. (4) Manganese is mainly produced in Vizianagaram district. (5) Iron ore deposits of small quantities are scattered all over the state. (6) The state ranks second in mica production mainly produced in Gudur and Atmakur areas of Nellore district. (7) Presently oil and natural gas is produced to a small extent in the Krishna and Godavari basin areas. (8) Clay minerals are mainly produced in West Godavari, Krishna, Kurnool, Anantapur and East Godavari districts. (9) Apatite (Visakhapatnam), Asbestos (Cuddapah), Corundum (Khammam), Dolomite (Khammam), Feldspar (Nellore, Ranga Reddy), Gold (Chittoor, Anantapur), Silver (Visakhapatnam), Laterite (East Godavari, Ranga Reddy, Warangal), lead concentrate (Guntur) are other important minerals produced.
Power Resources: The state is endowed with hydro-electric potential offered by the two largest peninsular rivers viz., Godavari and Krishna to the tune of 300 MW at 60 per cent load factor. The state has a proven coal reserves of 2500 million tonnes which can sustain a number of thermal power stations for a long period. The installed capacity of power plants increased from 688 MW in 1974 to 5080 MW in 1992. It is proposed to add another 2000 MW capacity by 2000 AD by commissioning of Super Thermal Power Stations at Visakhapatnam and Krishnapatnam.

Agricultural Resource Base: Andhra Pradesh has a vast agricultural resource base. The total value of agricultural produce is Rs.14,306.4 crores in 1992-93 which formed 32.5 per cent of the G.D.P. of the state. The average gross cropped area in the state was 12.99 million hectares (1987-92). Out of which 59.8 per cent was devoted to foodgrains constituting of paddy (30.2%), millets (17.4%) and pulses (12.1%) along with other food crops like fruits, vegetables. The total area under food crops was 67.9 per cent. Non-food crops covered 4.17 million hectares (32.1%), oil seeds account for a major share of non-food crops. Groundnut (17.5%) is the most important one. Other important commercial crops are sugarcane, chillies, cotton, tobacco, mango, citrus and cashewnut.
The production of paddy was 9.3 million tonnes of which 59.7 per cent is from Coastal Andhra, 32.5 per cent is from Telangana, only 7.8 per cent from Rayalaseema. West Godavari, East Godavari, Krishna, Guntur, Nellore in Coastal Andhra, Nalgonda, Karimnagar, Warangal, Khammam and Nizamabad in Telangana and Chittoor in Rayalaseema are the important producers. 2. Jowar is most important millet crop. Telangana (63.8%) is the important producer followed by Rayalaseema (29.5%) and Coastal Andhra (6.8%). The production is mainly concentrated in Mahaboobnagar, Adilabad, Ranga Reddy, Medak, Kurnool and Anantapur districts. 3. The coastal region produces 42.4 per cent of the bajra production mainly concentrated in Visakhapatnam and Prakasam, Kurnool, Cuddapah and Chittoor in Rayalaseema, Nalgonda and Mahaboobnagar in Telangana are the other important producers. 4. Ragi is a minor millet crop mainly concentrated in Visakhapatnam, Anantapur, Srikakulam, Prakasam and Mahaboobnagar districts. 5. Maize is an important crop in the state with a total production of 594.8 thousand tonnes. The production of maize is mainly concentrated in Telangana region which accounts for 91.6 per cent of the total production in the state. Karimnagar, Nizamabad and Medak are the main producers. 6. The total production of pulses in the state is 7.0 lakh tonnes. Redgram, greengram and blackgram are the important pulses produced in the state. Telangana is the major producer of redgram (52.0%), mostly concentrated in
Khammam and Adilabad districts. Coastal Andhra accounts for 29.8 per cent mostly concentrated in Prakasam, Guntur and Krishna districts. In Rayalaseema (18.2%), Kurnool, Anantapur are the important producers. The total production of greengram is 1.76 lakh tonnes mainly concentrated in Telangana region (75.2%) in the districts of Karimnagar, Khammam, Warangal and Nalgonda. In Coastal Andhra (24.0%). The production is mainly from Krishna, East Godavari and Srikakulam districts. The total production of blackgram is 3.56 lakh tonnes mainly concentrated in Coastal Andhra (94%) in the districts of Guntur (43.4%), Krishna (30.6%) and others like East Godavari, Prakasam, West Godavari and Srikakulam. 7. The combined production of oil seeds is 2.3 million tonnes, but groundnut is leading producer with 91.3 per cent of the seed production. Rayalaseema is the dominant producer of groundnut crop (62.2%) with a total of production of 1.32 million tonnes. Anantapur is the major producer (29.9%), followed by Chittoor (15.1%), Kurnool (11.5%). Vizianagaram, Prakasam, Nellore in Coastal Andhra, Mahaboobnagar, Warangal, Karimnagar and Nalgonda in Telangana are the other important producers. The total production of Sunflower is 99.4 thousand tonnes mainly concentrated in Kurnool district (58.5%). Mahaboobnagar, Anantapur and Medak are the other important producers. The total production of castor is 81.2 lakh tonnes concentrated mainly in Nalgonda (31.1 lakh tonnes), Mahaboobnagar (27.3 lakh tonnes)
districts. 8. Sugarcane is another important industrial crop. Coastal Andhra is the leading producer (58.0%). The production is mainly concentrated in Visakhapatnam, West Godavari, Krishna and East Godavari districts. Chittoor in Rayalaseema, Nizamabad and Medak district in Telangana are the other important producers. 9. The total production of chillies is 3.17 lakh tonnes mainly concentrated in Guntur, Krishna, Prakasam, Khammam, Warangal and Karimnagar districts. 10. The total production of cotton is 4.8 lakh tonnes (10.3%) of the country's production. Coastal Andhra is the leading producer (51.2%) mainly concentrated in Guntur and Prakasam districts. Telangana is the second important producer (37.4%) mainly concentrated in Warangal, Adilabad, Khammam, Karimnagar and Mahaboobnagar districts. Kurnool is an important producer in Rayalaseema region. 11. Andhra Pradesh accounted for 38.8 per cent of the tobacco production in the country during 1992-93. The average production was 1.88 lakh tonnes highly concentrated in Coastal Andhra region (71.3%). West Godavari, Prakasam, East Godavari, Krishna are the important producers. Kurnool, Khammam and Mahaboobnagar are the important producers. 12. The area under fruit gardens is 2.87 lakh hectares of which 65.9 per cent is occupied by mango gardens followed by citrus gardens (mostly lemon, 19.5%). The total mango production is 7.43 lakh tonnes mainly concentrated in Coastal region (61.8%) in the districts of Krishna, West Godavari and
East Godavari. Chittoor is the second important producer in the state. Khammam is the significant producer in Telangana region. Citrus gardens are mainly concentrated in Nellore, Anantapur, Cuddapah, West Godavari, Karimnagar and Nalgonda districts.

Forest Resource Base

The forest cover in the state extend over 63,800 km², most of it located in Godavari and Krishna valleys and along the eastern ghats. The economically important species are sal (Srikakulam), Teak (Adilabad, Karimnagar, Warangal, Khammam, Nizamabad), Laurel and Bijsul (Visakhapatnam, East Godavari, Khammam, Warangal and Kurnool), Red Sandars (Cuddapah, Chittoor), Bamboo (Adilabad, Khammam, East Godavari, West Godavari and Kurnool). The total value of the forest produce is 844.9 million rupees of which timber accounted for 28.1 per cent followed by bamboo (20.1%), beedi leaves (22.7%), and miscellaneous products (25%). The productivity is very high in Adilabad, Rajamundry and Warangal circles.

Fisheries Resource Base

The state has enormous potential for developing fishing industry in the form of a long coast line (974km), wide shelf area (31044 km²), perennial rivers like Godavari and Krishna, 102 large and medium reservoirs and several seasonal tanks. The potential is yet to be fully harnessed.
Livestock Resource Base

The livestock resources of the State consists of bovine population like cattle and buffaloes, ovine population like sheep and goats and other livestock like pigs, horses and poultry. Andhra Pradesh accounts for significant proportion of livestock population of India with 6.9 per cent of cattle, 12.9 per cent of buffaloes, 15.4 per cent of sheep, 5.8 per cent of goats and 7.8 per cent of pigs. It has also got 15.6 per cent of poultry population in India.

Andhra Pradesh has a total of 32.9 million units of livestock of which 46.1 per cent are in Telangana, 33.8 per cent are in Coastal Andhra, 20.1 per cent are in Rayalaseema.

1. The state has total of 3.0 million milch cattle of which 51.5 per cent is in Telangana, 27.1 per cent is in Coastal Andhra and 21.4 is in Rayalaseema. Chittoor district ranks first followed by Khammam, Nalgonda, Mahaboobnagar, Adilabad and Srikakulam. In general cattle population is less in middle and southern Coastal Andhra districts and northern Telangana districts. Milch buffaloes are concentrated mainly in Guntur, Prakasam, Krishna Nellore, Nalgonda and Khammam districts. 2. The state has 12.2 million ovine population, most of it concentrated in Telangana (46.9%), followed by Coastal Andhra (26.6%), and Rayalaseema (26.5%), Mahaboobnagar, Anantapur, Nalgonda, Prakasam, Kurnool, Warangal, Karimnagar,
Chittoor and Cuddapah are the important ones. The state has a total of 51.5 million poultry population of which 43.3 per cent is in Telangana, 43.2 per cent in Coastal Andhra, 13.6 per cent in Rayalaseema. Ranga Reddy, West Godavari, Chittoor, East Godavari, Krishna and Guntur are the important ones.

8.4 INDUSTRIAL GROWTH IN ANDHRA PRADESH

Industrial development in this state had been very slow till 1960s. The government took initiative in the beginning of 1960s and established various industrial promotional corporations because of which industrial activity slowly picked up since 1970. In the present study the growth and development of industries is studied for the 25 year period of 1970-95.

Growth of Small Scale Industries

The number of small scale industries increased from 49 to 4,500 during the period 1970-95 recording a growth rate of 9083.7 per cent. The growth rate is maximum during 1980-90 period, but during 1990-95 period the growth is comparatively low. This trend is also evident in the case of investment and employment growth rates.

Growth of Large and Medium Scale Industries

The number of large and medium scale industries increased from 118 to 1058 recording a growth rate of 796.6 per cent during 1970-
95 period. The annual growth rate is 12.4 per cent during 1970-80, 13.5 per cent during 1980-90 and 14 per cent during 1990-95 period. In contrast to the small scale sector which recorded a lower growth rate during 1990-95 period, the large and medium scale sector maintained the increasing growth rates even during 1990-95 period. But this trend is not maintained in the growth of investment and employment, in fact the lowest growth rate is in the case of employment.

Growth of Food and Agro-based Industry

The growth in number of units is 703.6 per cent, in investment, 627.4 per cent and in employment 165.5 per cent during 1970-95 period. The maximum growth rate is during 1970-80 period in the case of number of units and employment but in the case of investment it is during 1990-95 period.

In terms of units highest growth rate is in Coastal Andhra region when compared to Telangana and Rayalaseema regions. In general growth rate is very low to low in districts like Cuddapah, Anantapur, Warangal, Khammam, Karimnagar, Nizamabad, West Godavari, Vizianagaram, Srikakulam, East Godavari, Kurnool, Ranga Reddy, Hyderabad and Medak, moderate in Chittoor, high in Krishna and very high in Visakhapatnam, Guntur, Prakasam, Nellore and Nalgonda districts. But the investment growth is low in Krishna and moderate in Nalgonda, and very high in Chittoor, Vizianagaram, Medak, Ranga Reddy, Vizianagaram, Guntur, Prakasam, Nellore,
Khammam and Karimnagar districts. The highest investment in 1990-95 is in Chittoor district followed by Ranga Reddy. It is the Chittoor district which has shown a tremendous growth in agro-based industries. In terms of employment very high growth rate was recorded in districts like Khammam, Prakasam and Guntur, moderate growth in Nellore and Visakhapatnam and low to very low growth rates in rest of the districts.

Growth of Drugs and Pharmaceutical Industry

The number of units increased from 5 to 36, (626.0%), the investment increased from 3.4 billions to 13.2 billions (283.4%) and the employment increased from 6608 to 9983 (51.7%) during 1970-95 period. The industry has a nominal presence in Coastal Andhra, absent in Rayalaseema and is almost confined to Telangana region and in particular to Ranga Reddy, Hyderabad and Nalgonda district. The maximum growth rate is during the decade 1980-90. The growth rate is highest in Medak district though it has a strong presence in Ranga Reddy district since 1970s. The industry is almost stagnant in Hyderabad district and made a beginning in East Godavari, Nellore and Nalgonda districts recently.

Growth of Chemical and Allied Industry

The number of units increased from 14 to 179 (1178.6%), investment from 36.2 billions to 158.4 billions (337.1%) and
employment from 6394 to 29667 (363.9%) during 1970-95 period. The
growth is high during the decades 1970-80 and 1980-90. In terms of
units the highest growth rate is in Telangana while in terms of
investment and employment the highest growth is in Rayalaseema
followed by Telangana. But in real terms most of the growth is in
Telangana region particularly in Medak and Ranga Reddy districts.
Visakhapatnam and West Godavari, Anantapur and Chittoor are the
other districts which witnessed substantial growth.

Growth of Paper, Pulp and Forest based Industry

This industry has a limited presence and witnessed a growth
only since 1980s. The number of units increased from 2 to 47 (2260.0%)
total investment from 5.0 billions to 242.9 billions (743.8%) and the total
employment from 8192 to 19034 (132.3%) during the period 1970-95. At
regional level the number of units increased from 1 to 20 in Telangana
from 1 to 22 in Coastal Andhra and from 1 to 5 in Rayalaseema. The
highest growth rate of investment is in Telangana region (892.9%)
followed by Coastal Andhra (348.8%). The growth rate is only 9.8 per
cent in Rayalaseema.

Though the industry is present in 17 districts only 3 districts
viz., West Godavari, East Godavari and Medak are very important. The
highest growth rate in investment is in Medak district followed by
West Godavari and East Godavari and the highest investment is in
Khammam district. In districts like Srikakulam, Visakhapatnam, Krishna, Guntur, Nellore, Chittoor, Nizamabad, Nalgonda and Warangal this industry is established only during 1990-95 period. On the whole this industry has shown stagnation or very low growth at district level.

**Growth of Jute and Textile Industry**

The number of units in this industry increased from 29 to 135 (365.5%), the investment from 11.4 billion to 84.6 billions (640.9%) and the employment from 35052 to 71143 (100%) showing only a moderate to low growth during 1970-95 period. Telangana region recorded the highest growth rate in terms of units, employment and also investment followed by Rayalaseema and Coastal Andhra. Very high growth rate in units is found in Ranga Reddy and Medak districts, high growth rate in Mahaboobnagar, moderate growth rate in Srikakulam and Krishna and in the remaining districts low to very low growth rates. The growth rate is zero in districts like Warangal, Nizamabad, Cuddapah and Visakhapatnam.

**Growth of Engineering Industry**

Engineering industry though concentrated in a limited number of districts had shown high growth rate in the state. The number of units increased from 22 to 1088 (754.5%), the investment from 75.6 billion to 206.6 billions (173.3%) and the employment from 35103 to 394
79603 (126.8%) showing high growth rate in terms of units, but low growth rate in terms of investment and employment during the period 1970-95. The highest growth rate is during the decade 1970-80, but had shown declining trend during 1990-95 period. The growth rate is very high in Medak, Ranga Reddy and Nalgonda districts. It is low in Visakhapatnam, Krishna, Guntur, Anantapur, Chittoor and Hyderabad. The growth rate is zero in Khammam, Mahaboobnagar, Cuddapah, Kurnool and East Godavari. The industry is absent in Prakasam, Nizamabad, Warangal, Karimnagar and Adilabad. In terms of investment the growth rate is high in Chittoor, Anantapur, Guntur, Krishna and Nalgonda. In terms of employment the highest growth rate is in Chittoor district followed by Anantapur, Nellore, Ranga Reddy and Medak districts.

Growth of Mineral based and Ceramic Industry

The number of units in this industry increased from 2 to 80 (3900%). The investment increased from 3.3 billions to 82.0 billions and the employment increased from 38857 to 181984 (368.3%) recording a high growth rate in terms of units and investment, but low growth rate in terms of employment. Though accelerated growth is noticed since 1980s the highest growth rate is during period 1980-90.

Medak, Nalgonda, Khammam, Chittoor and Nellore witnessed moderate to high growth rates. The industry is stagnant in Adilabad

Most of the investment occurred during 1990-95 period in districts like Medak, Nalgonda, Khammam, Karimnagar, Chittoor, Warangal and Nellore. In terms of employment this industry is highly concentrated in Khammam, Karimnagar and Adilabad based on coal industry.

**Growth of Cement Industry**

The number of units increased from 3 to 46 (1433.3%), the total investment increased from 3.4 billions to 124.9 billions (3599.5%) and the employment increased from 2692 to 14738 (447.9%) recording a high growth rate in terms of units and investment at low growth rate in terms of employment.

The maximum growth rate is during 1980-90 period (750%) when 30 more units were added to the existing 4 units. Nalgonda, Adilabad, Guntur, Anantapur and Cuddapah are the important districts with respect to this industry in terms of units.

**Growth of Electrical Industry**

The number of units increased from 9 to 44 (388.8%), the investment increased from 4.7 billion to 206.8 billions and the
employment increased from 7440 to 20736 (178.7%) during 1970-95 period showing a high growth rate in investment but low growth rate in terms of units and employment. The high growth rate in investment is due to the establishment of Super Thermal Power Station in Karimnagar district. At regional level the highest growth rate is in Rayalaseema in terms of units, in Telangana in terms of investment and Coastal Andhra in terms of employment. But in real terms Telangana stands far ahead of others in terms of units, investment and also employment. The industry witnessed a slow growth rate till 1980 but afterwards it recorded some moderate growth in a few selected districts like Ranga Reddy, Medak, Hyderabad, Visakhapatnam, Nellore, Chittoor and Anantapur.

Growth of Electronic Industry

This industry is found only in 9 out of the 23 districts and majority of the units are located in 3 districts namely Ranga Reddy, Hyderabad and Medak. The number of units increased from 3 to 65 (2066%), the investment increased from 6.5 billions to 28.0 billions (334.1%) and the employment increased from 9322 to 17922 (92.3%) recording a high growth in terms of units but low and very low growth rates in terms of investment and employment during 1970-95 period. The maximum growth in this industry is during 1990-95 period, particularly in Ranga Reddy, Hyderabad and Medak districts. It made
a nominal presence in the districts of Mahaboobnagar, Nalgonda, Chittoor, Nellore, Krishna, East Godavari in 1990s.

**Growth of Leather Industry**

Leather industry is found only in 7 districts viz., Vizianagaram, Krishna, Chittoor, Ranga Reddy, Medak, Mahaboobnagar and Warangal. The number of units increased from 1 to 13, the total investment increased from 8.8 millions to 2.9 billions and the total employment increased from 300 to 2229 recording very high growth rates during 1970-95 period, but in real terms the growth rate is not in tune with the resource potential.

The industry has picked up some growth during 1990-95 period in terms of units as well as investment in districts like Ranga Reddy followed by Medak, Chittoor and Vizianagaram. When compared to other districts Ranga Reddy is far ahead of others, particularly in terms of investment and employment.

**8.5 Spatial Distribution of Industries**

The distributional aspects of industries are studied with respect to number of units, investment and employment of large and medium scale and small scale industries. The state has a total of 5,558 industrial units of which 4,500 are small scale units and 1,058 large and medium scale units.
The study has revealed that Telangana region has more industrial concentration than Coastal Andhra and Rayalaseema regions. Telangana region accounts for 57.1 per cent of the units, 62.7 per cent of the investment and 65.3 per cent of the employment. Coastal Andhra (31.6%, 24.3%, 26.4%) has a moderate industrial economy. Rayalaseema region is (11.3%, 13.0%, 8.3%) a low industrialised region. At district level Ranga Reddy ranks first followed by Medak, Hyderabad and Nalgonda in Telangana region. Adilabad, Nizamabad and Karimnagar are the least industrialised districts. In Coastal Andhra region Krishna, East Godavari and West Godavari are moderately industrialised districts. Nellore, Guntur are low to moderately industrialised districts, whereas Vizianagaram and Prakasam are very low industrialised districts. In Rayalaseema region Chittoor district occupies fairly significant place. The total industrial investment in Andhra Pradesh is 113.6 billions of which large and medium scale industries account for 94.7 per cent and the small scale industries account for only 5.3 per cent.

_distribution of small scale industries_. Telangana region tops with 56.8 per cent followed by 32.5 per cent in Coastal Andhra and 10.8 per cent in Rayalaseema. Ranga Reddy, Medak, Hyderabad and Nalgonda rank in that order in terms of number of industries. Adilabad and Nizamabad have very low number of industries. In Coastal Andhra region Krishna, East Godavari, West Godavari and Visakhapatnam
and Nellore are the important industrialised districts. In Rayalaseema region Chittoor is the most industrialised district followed by Kurnool.

*Distribution of Large and Medium Scale Industries.* Telangana accounts for 58.4 per cent of the industries followed by 27.9 per cent in Coastal Andhra and 13.7 per cent in Rayalaseema region. Medak district has the highest number of industries in the State followed by Ranga Reddy and Nalgonda. Nizamabad, Warangal, Khammam, Karimnagar and Adilabad have low number of industries. In Coastal Andhra, Visakhapatnam, East Godavari, Guntur, West Godavari, Nellore and Krishna are the important ones. Srikakulam and Prakasam are the poorly industrialized districts. Chittoor district ranks 4th in the State. In Rayalaseema the lowest number of industries are found in Cuddapah district.

*Distribution of Industrial Investment.* As much as 62.7 per cent of the total industrial investment is concentrated in Telangana region followed by Coastal Andhra (24.3%) and Rayalaseema region (13.0%). Karimnagar, Ranga Reddy and Medak are the important districts in Telangana. Karimnagar figures prominently because of the location of Super Thermal Power Station. Visakhapatnam, East Godavari and Guntur in Coastal Andhra and Chittoor district in Rayalaseema have significant industrial investment.
**Distribution of Industrial Investment in Small Scale Industries.** Telangana region accounts for 59.0 per cent followed by Coastal Andhra (30.4%) and Rayalaseema region (10.6%).

Ranga Reddy and Medak have very high investment followed by Hyderabad and Nalgonda. Districts like Adilabad, Nizamabad and Warangal have low share of the investment. In Coastal Andhra region Krishna, Visakhapatnam and West Godavari have prominent industrial investment but on the other hand districts like Vizianagaram and Prakasam have low investment. In Rayalaseema region Chittoor district ranks first followed by Kurnool.

**Distribution of Industrial Investment in Large and Medium Scale Industries.** In the case of large and medium scale industrial investment also Telangana ranks first with 62.9 per cent followed by Coastal Andhra (23.9%) and Rayalaseema (13.2%). Concentration is found in districts like Karimnagar, Ranga Reddy and Medak in Telangana, Visakhapatnam, East Godavari, Krishna and Guntur in Coastal Andhra.

**Distribution of Employment.** Telangana region accounts for 65.3 per cent of the total industrial employees, because of the labour intensive, coal mining activity. Districts like Khammam and Adilabad have very high concentration followed by Ranga Reddy, Medak, Karimnagar and Hyderabad districts. Low concentration is found in Nizamabad,
Warangal and Mahaboobnagar districts. In Coastal Andhra region the distribution is almost uniform except in Vizianagaram and Prakasam districts where it is low.

*Distribution of Employment in Small Scale Industries.* Telangana region accounts for 50 per cent of the employment followed by Coastal Andhra (40.2%) and Rayalaseema region (9.8%). With only 32.5 per cent of the total number of industries, Coastal Andhra accounts for 40.2 per cent of the employment indicating comparatively labour intensive nature of small scale industries in this region. Ranga Reddy, Medak, Nellore, East Godavari, Hyderabad and Nalgonda have moderate to high concentration while districts like Karimnagar, Prakasam, Vizianagaram, Warangal and Adilabad have low concentration.

*Distribution of Employment in Large and Medium Scale Industries.* Telangana region accounts for 68.7 per cent followed by Coastal Andhra (23.3%) and Rayalaseema region (8.0%). Khammam, Adilabad, Medak, Ranga Reddy, Karimnagar, Visakhapatnam, East Godavari, West Godavari and Chittoor have moderate to high concentration.

**CATEGORY-WISE DISTRIBUTION OF LARGE AND MEDIUM SCALE INDUSTRIES**

*Food and Agro-based Industries.* Coastal Andhra accounts for 55 per cent of the industries, 47 per cent of investment and 55.9 per cent of the employment. East Godavari, Guntur, Visakhapatnam, Krishna, West Godavari, Nellore and Prakasam are important districts. Most of the
industries are based on agriculture products like paddy, sugarcane, tobacco, milk and milk products.

Chittoor in Rayalaseema has a prominent place with highest investment in agro-based industries in the State. Agro-based industry occupies relatively less important place in Telangana region. But in districts like Ranga Reddy, Nalgonda and Medak this industry has significant concentration. The industries in Ranga Reddy, Nalgonda and Medak are producing value added food products whereas in other districts the emphasis is primary processing of foodgrains.

**Leather Industry:** Leather industry has a limited role in the industrial economy of the State. The industry is highly concentrated in Telangana region in general and in Ranga Reddy and Medak districts in particular. Ten out of thirteen units are located in this region. 82.9 per cent of the investment and 75.6 per cent of the employment is concentrated in and around Ranga Reddy and Medak districts.

**Chemical and Allied Industry:** Though this industry is present in many of the districts, it is concentrated in a few districts. Telangana region is prominent with 65.4 per cent of the units 44.3 per cent of the investment and 63.8 per cent of the employment. Medak district ranks first followed by Ranga Reddy. These two put together account for 50 per cent of the units. In Coastal Andhra, Visakhapatnam and West
Godavari are the important districts. In Rayalaseema, Anantapur ranks first followed by Chittoor.

Andhra region which has only 21.8 per cent of the units accounts for 48.3 per cent of the investment mainly because of some large scale petro-chemical and fertiliser units located in Visakhapatnam and East Godavari districts.

**Drugs and Pharmaceutical Industry:** The industry is highly localised. It is found only in 6 out of 23 districts. 33 out of 36 are located in Telangana region, Hyderabad, Medak and Ranga Reddy districts occupy a very prominent place.

**Paper, Pulp and Forest-based Industry:** As it is a raw material based industry it is concentrated in a few districts. East Godavari ranks first followed by Medak, West Godavari and Ranga Reddy districts in terms of units. In terms of capital investment Khammam ranks first with 22.4 per cent of the total outlay followed by Medak. East Godavari and West Godavari in Coastal Andhra, Kurnool in Rayalaseema occupy significant places.

**Jute and Textile Industry:** In Andhra Pradesh a total of 135 units are functioning in this category with a total capital investment of Rs.8,456 millions. The industry is present to a smaller or larger extent, in all districts except in Khammam district. Majority of the units are
concentrated in a few districts like Ranga Reddy, Medak, Chittoor, Anantapur and East Godavari. Majority of the units are spinning mills, producing cotton yarn. A few units are producing synthetic fibre. Some units located in Anantapur, Mahaboobnagar and Adilabad district are producing silk thread and silk fabrics. Jute based industries are found only in Vizianagaram, Srikakulam, Visakhapatnam and West Godavari districts.

**Cement Industry:** This industry is highly localised out of 45 units 29 (64.4%) are in Telangana region, 8 units (17.8%) each are in Coastal Andhra and Rayalaseema region. Nalgonda ranks first with 42.2 per cent of the units, 33.6 per cent of the investment and 23.5 per cent of the employment. Adilabad is the other important district in Telangana. Guntur and Krishna in Coastal Andhra, Cuddapah, Anantapur and Kurnool in Rayalaseema are the important cement producing districts.

**Mineral-based and Ceramic Industry:** This industry is highly concentrated in Telangana region with 73.0 per cent of the units, 88.4 per cent of the investment and 99.0 per cent of the employment. Medak, Nalgonda, Khammam, Karimnagar are the important districts in Telangana. Coastal Andhra region is not having an important place in the case of this industry. Rayalaseema region occupies second place where Chittoor occupies an important place followed by Anantapur.
**Engineering Industry:** This industry is highly concentrated in Telangana region in general, Ranga Reddy and Medak districts in particular. It accounts for 73.4 per cent of the units, 61.2 per cent of the capital investment and 70.7 per cent of the employment. In Coastal Andhra many of the units are located in Visakhapatnam, Krishna, Guntur and East Godavari. In Rayalaseema, Chittoor is the most prominent district.

**Electrical Industry:** This is also highly concentrated in the districts of Medak, Ranga Reddy, Hyderabad, Visakhapatnam, Nellore and East Godavari. Because of the location of Ramagundam Super Thermal Power Station, Karimnagar alone accounts for 87.0 per cent of the investment in this industry. As usual Telangana region occupies first place with 62.6 per cent of the units, 93.3 per cent of the investment and 62.1 per cent of the employment.

**Electronic Industry:** This industry is highly concentrated in the districts of Ranga Reddy, Hyderabad and Medak, which together account for 87.7 per cent of the units, 79.6 per cent of the investment and 89.9 per cent of the employment.

**Glass Industry:** There is only one glass industry in the state located in West Godavari district.
1. Coastal Andhra region has the highest share (49.4%) of the food products industry followed by Telangana (40.9%). Rayalaseema region (7.8%) has very poor share of this industry. Krishna, West Godavari, East Godavari, Srikakulam, Nellore, Ranga Reddy and Nalgonda are the important districts with respect to food products industries. 2. Beverages and tobacco industry is mostly concentrated in Coastal Andhra region in general and Guntur district in particular. Ranga Reddy, Hyderabad, East Godavari and Visakhapatnam are the other important districts. 3. Textile industry is found in all the regions, but is concentrated in a few districts like Guntur and Adilabad. 4. Wood products units are mainly concentrated in Telangana region in districts like Ranga Reddy, Hyderabad, Medak, Nalgonda and Telangana. Visakhapatnam and West Godavari are the important districts in Coastal Andhra. This industry appears to be an urban-oriented one in the small scale sector. 5. Paper and paper products industries is found in about all the districts but Ranga Reddy, Hyderabad, Krishna, Medak, Guntur, Visakhapatnam, East and West Godavari are the important ones. 6. Though leather industry is present in most of the districts, 71.4 per cent of the units are present in Telangana region and most of them in Ranga Reddy, Hyderabad and Medak districts. 7. Rubber and plastics industry is having a prominent place in the small scale industrial sector. Though this industry is present in all the
districts, Ranga Reddy district alone accounts for 40 per cent of the units. The other important districts are Medak, Krishna, Chittoor and Kurnool. 8. Chemical industry is another prominent small scale industry in the State occurring in 21 districts. But still it is mostly concentrated in Telangana region in general and Ranga Reddy and Medak districts in particular. Hyderabad, Mahaboobnagar and Krishna are the other important districts. 9. Mineral and ceramic industry is the second most important one after the food products industry. In fact it is the first rank industry in Rayalaseema region. Ranga Reddy, Kurnool, Khammam, Medak, Warangal and East Godavari are the important districts. 10. Basic Metal Industry is highly concentrated in Telangana region in general and Ranga Reddy, Medak, Hyderabad and Mahaboobnagar districts in particular. Visakhapatnam is the most important one in Coastal Andhra region. 11. Metal Products industry is also highly concentrated in Telangana region in general and Ranga Reddy district in particular. Hyderabad and Medak in Telangana, Visakhapatnam and Krishna in Coastal Andhra and other important districts. 12. Machinery and components industry is concentrated in Telangana region in general and Ranga Reddy in particular. Visakhapatnam, Krishna and Chittoor are the other important districts. 13. Electrical equipment and components industry is highly concentrated in Telangana region and particularly in Ranga Reddy and Medak districts. Medak and Krishna are the other important districts.
14. Transport equipment and components industry is mostly concentrated in Ranga Reddy district. It is also very important districts like East Godavari, Krishna and Hyderabad. 15. Most of the Miscellaneous are concentrated in Telangana and Rayalaseema regions. Nalgonda, Cuddapah, Hyderabad and Nizamabad are the important districts. 16. Hyderabad district occupies first place with respect to services industry. Ranga Reddy, Visakhapatnam, Krishna, East Godavari, and Anantapur are the other important districts.

8.6 INDUSTRIAL STRUCTURE

Industrial structure of Andhra Pradesh is analysed by categorising the large and medium scale industries into 12 groups and small scale industries into 16 groups. Andhra Pradesh has a total of 5558 industries of which 81.0 per cent are small scale units and 19.0 per cent are large and medium scale units. But the small scale units account for only 5.3 per cent of the investment and 17.9 per cent of employment while large and medium scale units account for as many as 94.7 per cent of the investment and 82.1 per cent of the employment.

Structure of Large and Medium Scale Industries

In terms of number of units food and agro based, engineering, chemical and allied, jute and textile, mineral based and ceramic occupy the first five places. Electronic, electrical, paper, pulp and forest based, cement and drugs and pharmaceutical industries have moderate
importance and leather industry has low importance. Glass industry is located in only one district.

In terms of investment electrical industry ranks first followed by engineering, chemicals and allied, cement and agro based industries in the first five places.

In terms of employment mineral based and ceramic category is the most important one followed by engineering, jute and textile, food and agro based, chemicals and allied. The others like cement, drugs and pharmaceuticals, leather and glass industry are limited importance.

District-wise Structure of Large and Medium Scale Industries

Srikakulam District: Only three categories of industries viz., food and agro based, jute and textiles and chemical and allied are present in the district. Food and agro based industry dominates the industrial scene. Jute and textile industry is the second important category.

Vizianagaram District: Though this district has six categories of industries jute and textile industry is the most important one followed by food and agro based and engineering industry. Jute and textiles in terms of number of units and employment and engineering industry in terms of investment are the important ones.
Visakhapatnam District. The industrial structure of this district is dominated by food and agro based, chemical and allied and engineering industry in terms of number of units in terms of investment chemical and allied industry dominates (72.5%) while in terms of employment engineering industry occupies first place.

East Godavari District. Food and agro based is the most important one in terms of number of units, while chemical and allied industry occupies first place in terms of investment followed by food and agro based and paper, pulp and forest based industries. Food and agro based and jute and textile industries are important in terms of employment.

West Godavari District. Food and agro based is the most dominant one followed by chemicals and allied, paper, pulp and forest based and jute and textile industry. In terms of employment jute and textile industry is the most important one. This district has the only glass industry present in the state.

Krishna District. This district has 33 units in 9 categories but food and agro based is the most important in terms of units and employment and cement industry in terms of investment followed by engineering industry.
Guntur District. This district has 7 categories of industries but food and agro based industry, is the most important one in terms of units, investment and employment (50.0%, 34.8%, 40.5%). Jute and textile, cement and engineering industries are the other important categories.

Prakasam District. It has only 3 categories of industries viz., food and agro based, jute and textile and chemical and allied. Food and agro based is the most important one followed by jute and textile industry.

Nellore District. This district has 9 categories of industries but food and agro based industry is the most important one (41.2%, 52.3%, 39.6%). Jute and textile, mineral based and ceramic, chemicals and allied, electricals and engineering are the other important categories.

Kurnool District. In this district the industrial structure is food and agro based along with textile and chemical and allied, paper, pulp and forest based and cement industries.

Anantapur District. In this district chemical and allied, textile and engineering are the most important category in terms of units, while in terms of investment, engineering, cement and textile industries rank in that order. In terms of employment, textile industry is the most important one.

Cuddapah District. Cement industry is the most important one followed by food and agro based, textile and chemical and allied industries.
**Chittoor District.** It has 73 units with a diversified industrial structure. Food and agro based is the most important one followed by textile, engineering, mineral based and ceramic and chemical and allied industries.

**Ranga Reddy District.** It is the second most industrialised district in Andhra Pradesh. The industrial structure is highly diversified. Engineering industry is the most important one (33.3%, 45.4%, 26.0%). The other important industries are food and agro based, electronic, textile, chemical and allied, drugs and pharmaceutical and electrical.

**Hyderabad District.** It has a diversified industrial structure. Electronic industry in terms of units, chemical and allied in terms of investment, engineering industry in terms of employment are the most important ones. The other important categories are food and agro based, textile, mineral based and ceramic.

**Nizamabad District.** It is one of the low industrialised districts. Food and agro based in terms of units and employment forest based industry in terms of investment are the important ones. Chemical and allied, textile and mineral based industries are other categories in this district.

**Medak District.** This is the most industrialised district with as many as 224 industrial units and has a diversified industrial structure. Chemical
and allied, engineering, mineral based and ceramic, drugs and pharmaceuticals, electronic and electrical industries, paper, pulp and forest based and textile industries are the important ones. But the industrial structure is dominated by engineering, chemical and allied and mineral based and ceramic industries.

**Mahaboobnagar District.** This district has 31 units in 9 categories. Textile, food and agro based chemical and allied, engineering are the important ones.

**Nalgonda District.** This district has 75 industries in 10 categories showing a diversified industrial structure. Cement industry is the most important one (25.3%, 59.9%, 25.6%) followed by mineral based and ceramic, engineering and food and agro based and textile industries.

**Warangal District.** This has only 13 units in 7 categories. Chemical and allied is the most important one followed by food and agro based, paper, pulp and forest based, mineral based and ceramic and textile industries. In terms of employment, textile industry is the most important one.

**Khammam District.** It has only 15 units in 5 categories. The industrial structure is dominated by mineral based and ceramic industry (40.0%, 58.8%, 96.7%). Paper, pulp and forest based, engineering, chemical and allied, food and agro based are the other categories.
**Karimnagar District.** It has only 11 industries in 6 categories. Chemical and allied in terms of number of units, mineral based and ceramic in terms of employment, electrical industry in terms of investment are the prominent ones. Textile, food and agro based and cement industries are other categories.

**Adilabad District.** It has only 13 units in 5 categories. Textile and cement industries in terms of number of units, cement industry in terms of investment and paper, pulp and forest based and mineral based and ceramic industry in terms of employment are the most important ones.

**Structure of Small Scale Industries**

The state has a total of 4500 units in 16 categories. Food products category is the most important one in terms of units investment and employment (28.2%, 22.8%, 22.3%). Mineral and ceramic, rubber and plastics, chemical, basic metal, electrical equipment and components, paper, paper products and printing, and machinery and components are other important categories in terms of number of units. In terms of investment, rubber and plastics, chemical, mineral and ceramic, basic metal, electrical equipment and components categories rank in that order. In terms of employment chemical industry, mineral and ceramic, basic metal and beverages and tobacco are the important ones.
District-wise Small Scale Industrial Structure

*Srikakulam District.* It has a total of 114 small scale units in 10 categories, but food products category is the most dominant one in terms of units (77.2%) investment (61.8%) and employment (69.9%). Basic metal, chemical, electrical equipment and components and jute industries are the other categories of some importance.

*Vizianagaram District.* This district has 51 units in 8 categories. Food products category is the most important one (52.9%, 36.2%, 35.4%) followed by mineral and ceramic and basic metal categories.

*Visakhapatnam District.* It has a total of 174 units in 15 categories indicating a diversified industrial structure. Food products category occupies first place followed by basic metal, machinery and components, mineral and ceramic, paper, paper products and printing, chemical, metal products and services categories with significant share in terms of units, investment and employment.

*East Godavari District.* It has a total of 225 units in 15 categories, but food products category is the dominant one (45.8%, 43.9%, 36.9%). Mineral and ceramic, paper, paper products and printing, basic metal, transport equipment and components are the other important categories.
West Godavari District: This district has a total of 199 units in 13 categories, yet food products category is the most important one (62.8%, 51.9%, 55.2%). Mineral and ceramic, chemical, paper, paper products and printing are the other categories of some importance.

Krishna District: It has a total of 320 units in 14 categories with food products category dominating the scene (41.2%, 34.4%, 35.8%). Rubber and plastics, chemical, paper, paper products and printing, mineral and ceramic, basic metal, electrical equipment and components and services also occupy significant places.

Guntur District: The district has a total of 168 units in 14 categories. Food products category occupies first place in terms of number of units and investment and beverages and tobacco industry in terms of employment. Mineral and ceramic, cotton textiles are the other two important industries. Chemical, rubber and plastics, paper, paper products and printing have also got some importance. Thus this district has a diversified industrial structure.

Prakasam District: It has only 69 units in 11 categories. Food products category is the dominant one (50.7%, 46.4%, 44.8%). Mineral and ceramic, chemical, rubber and plastics are the other important categories.
**Nellore District.** The district has a total of 141 industries in 13 categories. Food products category dominates in terms of units and investment. While chemical industry occupies first place with 79.8 percent of the employment. Mineral and ceramic, rubber and plastics, services, paper, paper products and printing are the other important ones.

**Kurnool District.** It has a total of 145 units in 12 categories. Mineral and ceramic category occupies first place closely followed by food products, rubber and plastics and chemical industries. Other categories are of minor importance.

**Anantapur District.** It has 98 units in 12 categories. Mineral and ceramic category occupies first place (23.5%, 22.5%, 16.8%). Food products, miscellaneous, rubber and plastics, services and basic metal are the other important categories.

**Cuddapah District.** It has a total of 94 units in 12 categories. Mineral and ceramic category occupies first place followed by food products and rubber and plastics. In fact miscellaneous category figures prominently (28.7%, 25.7%, 11.6%) along with others indicating a diversified industrial structure.

**Chittoor District.** It has 147 units in 16 categories. Food products category occupies the first place (22.4%, 15.6%, 32.1%) followed by
rubber and plastics, mineral and ceramic and chemical industries. This district has a diversified industrial structure. In fact in Rayalaseema this is only the district with food products category occupying the first place.

**Ranga Reddy District.** It has the highest number of small scale industries in the state. It has a total of 1079 units in 16 categories and exhibits diversified industrial structure. Rubber and plastics category occupies first place, closely followed by chemical, food products, basic metal, machinery and components, electrical equipment and components and metal products categories. Mineral and ceramic paper, paper products and printing also occupy dominant places.

**Hyderabad District.** It has a total of 310 units in 16 categories, electrical equipment and components occupies first place followed by services, paper and paper products, chemical, metal products, food products and rubber and plastics. No category is really dominant.

**Nizamabad District.** It has 80 units in 12 categories. Food products (36.2%, 30.4%, 18.9%) is the dominant one followed by miscellaneous and mineral and ceramic. In terms of employment beverages and tobacco occupies first place with 44.7 per cent of the employment.

**Medak District.** It has 377 units in 15 categories. Chemical industry occupies first place (25.7%, 33.9%, 28.5%) followed by food products,
basic metal, rubber and plastics, mineral and ceramic machinery and components categories.

**Mahaboobnagar District.** It has 124 units in 13 categories with food products category occupying first place (30.6%, 21.8%, 28.1%). Chemical, basic metal, mineral and ceramic, rubber and plastics are the other important categories.

**Nalgonda District.** It has a total of 235 units in 14 categories, dominated by food products category (46.0%, 44.9%, 52.1%). Rubber and plastics, mineral and ceramic, miscellaneous and chemical categories occupy other important places.

**Warangal District.** It has a total of 100 units in 12 categories. Food products is the most dominant one (47.0%, 49.5%, 38.7%). Mineral and ceramic is the other important category (28.0%, 26.7%, 38.8%). Others are of minor importance.

**Khammam District.** It has a total of 109 units in 13 categories. Mineral and ceramic category (40.4%, 43.5%, 48.4%) occupies first place, closely followed by food products category (37.4%, 26.7%, 29.1%). Others are of minor importance.

**Karimnagar District.** It has a total of 93 units in 11 categories. The industrial structure is dominated by food products category (59.1%,
51.1%, 73.1%). Mineral and ceramic occupies a poor second place. Others are of minor importance.

*Adilabad District*: This is a very low industrialised district in the state. It has only 48 units in only 5 categories. Food products category is the most dominant one (58.3%, 54.2%, 31.3%). Cotton textiles and mineral and ceramic are the other categories of importance particularly in terms of employment.

### 8.7 INDUSTRIAL REGIONS AND REGIONAL DISPARITIES

The industrial regions are identified based on a composite locational coefficient index. The spatial disparities in terms of number of industries, investment and employment in small scale as well as large and medium scale industries are analysed on the basis of separate locational coefficients. The spatial variation in industrial structure is examined with help of industrial combinations.

**Very Low Industrial Region**

It consists of 7 districts viz., Prakasam, Warangal, Nizamabad, Mahaboobnagar, Anantapur, Cuddapah and Kurnool.

Within this region Prakasam and Warangal districts are backward with respect to both small scale and large and medium scale industries.
**Prakasam District:** In this district food products, mineral and ceramic in small scale sector, food and agro based and textile industries in large and medium scale sector figure in the combinations.

**Warangal District:** In this district food products and mineral and ceramic in small scale sector chemical and allied, mineral and ceramic, textile, food and agro based and forest based industries in large and medium scale sector figure in the combinations.

**Nizamabad District:** The small scale industrial sector consisting of food products, miscellaneous and mineral and ceramic industries has developed to some extent. But in large and medium scale sector is very weak and it consists of mainly food and agro based, chemical and allied forest based and mineral based and ceramic industries.

**Mahaboobnagar District:** Both the small scale and large and medium scale sectors have low concentration in this district. Only small scale industry in terms of investment and employment shows some higher concentration. The small scale category mainly consists of food products, chemical, basic metal, mineral and ceramic and rubber and plastics categories. The large scale category comprises textile, food and agro based categories in the combinations.

**Anantapur District:** This district shows low intensity both in terms of units and employment. Only the large and medium scale sector
shows some higher intensity in terms of investment. The small scale sector consists of mineral and ceramic, food products, rubber and plastics, basic metal and services. The large scale category consists of chemical and allied, textile, engineering and cement industries.

**Cuddapah District:** It shows very low intensity in terms of units and also employment, but relatively high intensity in terms of investment. This is mainly due to investment in cement industry. The small scale sector consist of miscellaneous, mineral and ceramic, food products and rubber and plastics and the large scale industry mainly consists of food and agro based, cement, textile, chemical and allied.

**Kurnool District:** The small scale industry has relatively high intensity when compared to large scale industry. The small scale category consist of mineral and ceramic, food products, rubber and plastics and chemical industries. The large scale industry consists of food and agro based, textile, paper industry and cement industry. Unfortunately the paper industry which figures prominently in terms of investment is under closure now.

**Low Industrial Intensity Region**

It consists of 9 districts viz., Srikakulam, Vizianagaram, Guntur, East Godavari, Chittoor, West Godavari, Nellore, Adilabad and Krishna.
**Srikakulam District**: In this district small scale industry is relatively well developed in terms of number of units, investment and also employment. Large and medium scale industry has very low intensity in terms of investment and also employment. The small scale sector mainly consist of food products and basic metal industries and the large scale sector mainly consists of food and agro based and jute and textile categories in general and jute industry in particular.

**Vizianagaram District**: The large and medium scale industry is comparatively well developed than the small scale industry which reveals very low intensity in terms of number of units, investment and also employment. The small scale sector consists of food products, mineral based, basic metal and rubber and plastic industries. Large and medium scale sector consists of jute industry, food and agro based and engineering industries.

**Guntur District**: Small scale industry is more important in terms of units, investment and also employment. The large and medium scale industry is some what significant in terms of number of units, but not in terms of investment and employment. In small scale sector food products, mineral and ceramic, textiles, chemical, rubber and plastics, beverages and tobacco are the important ones in terms of units and investment. But beverages and tobacco category is the only important one in terms of employment. The large and medium
scale sector mainly consists of food and agro based, textile, engineering and cement industries.

**East Godavari District:** In terms of number of units this district records moderate intensity both in the case of small scale and large and medium scale industrial sectors. But in terms of investment and employment the small scale sector has low intensity while the large scale sector has very low intensity. In small scale sector food products and mineral and ceramic are the important categories. In large and medium scale sector food and agro based, forest based and textile industries are the important ones.

**Chittoor District:** When compared to small scale industry, large and medium scale industry is comparatively well developed. Small scale industry records low intensity whereas large and medium scale industry records moderate intensity. Food products, rubber and plastics, mineral and ceramic and chemical industries are the important categories in small scale sector. Food and agro based, textile, engineering, mineral based and ceramic are the important ones in large and medium scale sector.

**West Godavari District:** In this district small scale industry records high intensity in terms of units and low intensity in terms of investment and employment. The large and medium scale sector records moderate intensity in terms of units and very low intensity in terms of investment and low intensity in terms of employment.
Food products, cement, textile and mineral and ceramic are the important ones in small scale sector. In large and medium scale sector food and agro based, chemical and allied, textile and paper, pulp and forest based industries are the important categories.

**Nellore District:** Both small scale and large and medium scale record low intensity in terms of units and investment. But small scale industry records very high intensity in terms of employment mainly due to employment in miscellaneous, chemicals and products category of chemical industry. The large and medium scale sector records very low intensity in terms of employment. In small scale sector food products, mineral and ceramic, rubber and plastics, chemical and basic metal categories are the important ones. In large and medium scale sector food and agro based jute and textile, mineral based and ceramic and electrical categories figure in the combinations.

**Adilabad District:** The small scale sector industry records very low intensity. The large and medium scale industry records very low intensity in terms of units, low intensity in terms of investment and very high intensity in terms of employment. It is due to large investment in cement industry and large employment in coal mining. Food products, textile, mineral and ceramic are the important ones in small scale sector. Textile, cement, and mineral
based and ceramic industries are the important ones in large and medium scale sector.

**Krishna District:** In this district small scale sector records high intensity in terms of units, moderate intensity in terms of investment and low intensity in terms of employment. The large and medium scale industry records only low intensity in terms of units and very low intensity in terms of investment and employment. Food products, rubber and plastics, chemical, paper, paper products and printing, basic metal categories figure in the combinations of small scale sector. In large scale sector food and agro based, engineering and cement industries figure in the combinations.

**Moderate Industrial Region**

It consists of 3 districts viz., Visakhapatnam, Nalgonda and Karimnagar.

**Visakhapatnam District:** When compared to small scale sector, the large and medium scale sector is relatively well developed in this district. Small scale industry records low intensity in terms of units, investment and employment. Large and medium scale sector records moderate intensity in terms of units and employment, and high intensity in terms of investment. Food products, mineral and ceramic, basic metal, metal products, machinery and components,
wood products and services are the industries figuring in the combinations of small scale sector. In large scale sector food and agro based, chemical and allied, engineering and jute and textile categories figure in the combinations.

**Nalgonda District:** In this district large and medium scale category is comparatively well developed than small scale category. Small scale industry records low intensity in terms of number of units and employment but moderate intensity in terms of investment. Large and medium scale sector records high intensity in terms of investment, moderate intensity in terms of units but low intensity in terms of employment. In small scale category food products, rubber and plastics, miscellaneous, mineral and ceramic and chemical industries figure in the combinations. In large and medium scale sector, cement, mineral and ceramic, engineering and food products are the important ones.

**Karimnagar District:** The small scale sector has very low intensity of development in this district. The large and medium scale sector records very high intensity in terms of investment and high intensity in terms of employment but very low intensity in terms of number of units. This is because of location of Super Thermal Power Station and coal mining in this district. But for these two this district has very low intensity of industrial development. Food products, mineral and ceramic are the industries figuring small
scale combinations. Electrical, mineral based and ceramic, chemical and allied, food and agro based and textile industries figure in large and medium scale combinations.

**High Industrial Region**

Khammam is the only district that figures in this category.

**Khammam District:*** In this district the small scale industry records low intensity in terms of investment and employment and very low industry in terms of number of units. On the other hand the large and medium scale sector records very high intensity in terms of employment, moderate intensity in terms of investment and very low intensity in terms of number of units. This district is figuring in this category mainly because of high investment in coal industry and also paper, pulp and forest based industry and high employment in coal industry. Mineral and ceramic and food products industries figure in the small scale industrial combination. In large scale sector mineral based and ceramic, chemical and allied, food and agro based, paper, pulp and forest based categories figure in the combinations.

**Very High Industrial Region**

This region consists of 3 districts viz., Hyderabad, Ranga Reddy and Medak.
**Hyderabad District:** Both small scale and large and medium scale sectors record very high intensity in terms of number of units and moderate intensity in terms of investment and employment. This has a very highly diversified industrial structure. The small scale sectors mainly consists of electrical equipment and components, services, chemical, paper, paper products and printing, food products, basic metal and metal products. The large and medium scale sector mainly consists of electronic, engineering, chemical and allied, food and agro based and electrical industries.

**Ranga Reddy District:** This is the only district in which both small scale and large and medium scale sectors record very high intensity in terms of number of units, investment and employment. In small scale sector rubber and plastics, chemical, electrical equipment and components, machinery and components, food products, basic metal and metal products, paper, paper products and printing industries figure in the combinations. In large and medium scale sector engineering, food and agro based, electronic, chemical and allied, textile, drugs and pharmaceuticals and electrical industries figure in the combinations.

**Medak District:** Both large and medium and small scale sectors record very high intensity in this district, except in the case of number of units, where the small scale sector records only high intensity. In small scale sector chemical, food products, basic metal,
rubber and plastics, mineral and ceramic industries figure in the combinations. In large and medium scale sector chemical and allied, engineering, mineral based and ceramic, electronic and textile industries figure in the combinations.

CONCLUSIONS

1) The hypothesis that the study region has good resource potential is true on the whole, but the resources are not uniformly distributed. There is no dearth of human resources both in terms of quality and quantity. Moreover this resource is mobile. The hypotheses that there is spatial disparity in the location of industries even in the case of footloose industries and also there are regional imbalances in the level of industrial development, are true.

2) The location of some of the basic industries like cement industry, super thermal power stations, and most of the first phase mineral based industries in the state are determined by the distribution of mineral resources. But there are exceptions to these in the form of mini-thermal power stations all over the state, ceramic units and granite polishing units located away from the source of the raw materials. On the other hand the location of iron and steel, oil refinery, fertilizers industries at Visakhapatnam and also some units at Kakinada are due to port facilities.
3) Though the location of first phase food and agro based industries is near the source of the raw materials the location of second and third phase industries, is not near the source of the raw materials and in fact they are located near big urban centres like Hyderabad, Visakhapatnam, Vijayawada etc. For example ginning mills, small scale foodgrain mills, leather tanning units are located near the source of the raw materials. But spinning and weaving mills, garment units, leather products manufacturing units, food processing units etc., are mostly located in and around big cities like Hyderabad. In fact most of the electrical, electronic, engineering, chemical, wood products, drugs and pharmaceuticals industries are located in the hinterlands of very big urban centres due to the attraction of agglomeration factors. The disturbing feature is even the footloose industries are not uniformly distributed and are and have been gravitating towards the big urban centres.

4) It is surprising to notice that the small scale industry is also highly concentrated in a few districts. In districts like Anantapur, Cuddapah, Vizianagaram, Chittoor, Nellore, Adilabad, Nalgonda, Karimnagar and Khammam the large and medium scale industry has got moderate to high development, but at the same time the small scale industry has low intensity of development. Measures are to be taken to correct these structural imbalances.
5) In general the rate of growth of employment is at a lower rate than that of the number of units and investment. Though the industry, in general, picked up growth since 1970s there is a decline in the growth rate of small scale industries during the period 1990-95.

(6) The agricultural products are being exported in the raw state. Measures are to be taken to export processed goods. There is wide scope for starting of the second phase agro based industries in the Coastal Andhra region and both first phase, second phase units in Rayalaseema and Telangana regions.

7) There is still scope for the development of small scale millet processing units in Mahaboobnagar, Nalgonda, Adilabad, Ranga Reddy, Medak, Kurnool, Anantapur, Visakhapatnam and Prakasam.

8) Particular attention may be paid to maize based animal and poultry feed industries in the districts of Karimnagar, Nizamabad and Medak and small scale pulses processing units in Khammam, Adilabad, Prakasam, Guntur, Krishna, Kurnool, Anantapur, East Godavari and West Godavari districts.

9) There is vast potential for small scale groundnut shilers, and oil extraction and oil refining units in the districts of Anantapur, Chittoor, Kurnool, Vizianagaram, Prakasam, Mahaboobnagar, Warangal and Karimnagar.
10) There is still scope for sunflower based industry in the districts of Kurnool, Mahaboobnagar, Anantapur and Medak, castor seed based industries in Nalgonda and Mahaboobnagar, chilli based industry in Guntur, Krishna, Prakasam and Khammam, mango based industry in West Godavari, East Godavari, Chittoor and Khammam and citrus based industries in Nellore, Anantapur, West Godavari, Karimnagar and Nalgonda districts.

11) Steps are to be taken to strengthen the dairy industry particularly in the middle and southern Coastal Andhra and northern Telangana districts, ovine population based industries in Mahaboobnagar, Anantapur, Nalgonda, Prakasam, Kurnool, Warangal, Karimnagar, Chittoor and Cuddapah districts and the poultry based industry in the state, as the per capita availability of these products is still very low.

12) Measures are to be taken to attract chemical, engineering, electrical, electronic, metal products, and drugs and pharmaceutical industries to other areas other than the belt of Hyderabad, Ranga Reddy and Medak districts.

13) Cement industry is fast growing in the state. Based on the raw material potential, it can be stated that it still got vast potential for further growth.
14) Paper industry and cotton textile industries in Rayalaseema are in difficulties for reasons other than the raw materials. Measures are needed to keep them back on the rails.

15) There is vast scope for second phase wood products industry in Srikakulam, Adilabad, Karimnagar, Warangal, Nizamabad, Visakhapatnam, East Godavari and Kurnool districts. There is also good scope for the red sander based industry in Cuddapah district, which is being exported in raw state now.

If suitable measures are taken to correct the regional imbalances in the industrial development and to encourage industrial development by optimum utilization of resource potential of the state, there is a vast scope for promoting industrial economy in Andhra Pradesh.