Chapter – 4

SOCIO-ECONOMIC PROFILE OF STUDY AREA
The effective functioning of any sector of economy largely depends on the socio-economic environment in which it is functioning. It is especially true in case of agriculture sector which is more volatile in recent years. Hence, an attempt is made in this chapter to present a socio-economic, agricultural profile of Anantapur district which happens to be one of the areas of operation of under study.

Profile of Anantapur District

Anantapur offers some vivid glimpses of the pre-historic past. It is generally held that the place got its name from ‘Anantasagaram’, a big tank, which means ‘Endless Ocean’. The villages of Anantasagaram and Bukkarayasamudram were constructed by Chilkkavodeya, the Minister of Bukka-I, a Vijayanagar ruler. Some authorities assert that Anantasagaram was named after Bukka's queen, while some contend that it must have been known after Anantarasa Chikkavodeya himself, as Bukka had no queen by that name.

Anantapur is familiarly known as ‘Hande Anantapuram’. 'Hande' means chief of the Vijayanagar period. Anantapur and a few other places were gifted by the Vijayanagar rulers to Hanumappa Naidu of the Hande family. The place subsequently came under the Qutub Shahis, Mughals, and the Nawabs of Kadapa, although the Hande chiefs continued to rule as their subordinates. It was occupied by the Palegar of Bellary during the time of Ramappa but was eventually won back by
his son, Siddappa. Morari Rao Ghorpade attacked Anantapur in 1757. Though the army resisted for some time, Siddappa ultimately bought off the enemy for Rs.50,000.

Anantapur then came into the possession of Hyder Ali and Tipu Sultan. Tipu hanged all the male members of the Siddappa family except Siddappa who escaped from his confinement at Srirangapatnam. After Tipu’s death, it was once again taken back by Siddappa. Siddappa submitted himself to Nizam because of the treaty of 1799, who took the total control of the area. He was later pensioned off when British occupied the territory.¹

Anantapur district was formed in the year 1882 having been separated from Bellary district. Later on, it was expanded with the addition of Revenue Mandals of Kadiri, Mudigubba, Nallamada, N.P.Kunta, Talupula, Nallacheruvu, O.D.Cheruvu, Tanakal, Amadagur and Gandlapenta (previously Kadiri Taluk) from Kadapa district in the year 1910.

During the year 1956, the present Revenue Mandals of Rayadurg, D.Hirehal, Kanekal, Bommanahal and Gummagatta of Bellary district were added to Anantapur district.
Presently the district has been divided into 3 Revenue Divisions consisting of 63 Revenue Mandals (Anantapur Division 20, Dharmavaram Division 17 and Penukonda Division 26).

**Demographic Profile of the District**

As per 2011 census, Anantapur district has a population of 40.83 lakhs and a population density of 190 persons/sq. km which is growing at a decadal growth rate of 12.16 per cent. District is largely dominated by rural population comprising of 71.19 per cent of the total district population. The district has an average literacy rate of 56.1 per cent, which is lower than the average literacy rate of the state (average literacy rate – 61 per cent). Male population with nearly 68 per cent literacy rate dominates the literate population in the district. According to the 2011 census, Anantapur has nearly 7.8 lakh households with an average household size of five members. The growth of population in Anantapur since 1941 is given in the Table: 4.1.
Table 4.1: Population of Anantapur District-1941-2011

<table>
<thead>
<tr>
<th>Period</th>
<th>Rural Population</th>
<th>Urban Population</th>
<th>Total Population</th>
<th>Population Growth in %</th>
</tr>
</thead>
<tbody>
<tr>
<td>1941</td>
<td>1019639</td>
<td>146590</td>
<td>1166229</td>
<td>-</td>
</tr>
<tr>
<td>1951</td>
<td>1139998</td>
<td>221558</td>
<td>1361556</td>
<td>16.75</td>
</tr>
<tr>
<td>1961</td>
<td>1459837</td>
<td>307627</td>
<td>1767464</td>
<td>29.81</td>
</tr>
<tr>
<td>1971</td>
<td>1739531</td>
<td>375790</td>
<td>2115321</td>
<td>19.68</td>
</tr>
<tr>
<td>1981</td>
<td>2017095</td>
<td>530917</td>
<td>2548012</td>
<td>20.46</td>
</tr>
<tr>
<td>1991</td>
<td>2435761</td>
<td>748053</td>
<td>3183814</td>
<td>24.95</td>
</tr>
<tr>
<td>2001</td>
<td>2720915</td>
<td>919563</td>
<td>3640478</td>
<td>14.34</td>
</tr>
<tr>
<td>2011</td>
<td>2936359</td>
<td>1146956</td>
<td>4083315</td>
<td>12.16</td>
</tr>
</tbody>
</table>

Source: Chief Planning Office, Anantapur

The Table 4.1 shows that the population of the district increased more than three times in seven decades. During the same period the growth of rural population increased less than three times, whereas the urban population increased more than six times. It indicates that the people in the district are migrating to towns for several reasons. It is important to note that the decennial growth population during 1991-2001 was sharply declined from 24.95 per cent to 14.34 per cent. It further declined to 12.16 per cent in 2011.

The density of population of the district is 213 per Sq.km, against (308) of the state. The population of rural and urban to the total population of the district works out to 71.19 per cent and 28.81 per cent as per 2011 Census as against 75 per cent and 25 per cent of 2001.
Census. There are 977 Females per 1000 Males in the district as per 2011 Census.

The working force in the total population of district forms 48.83 per cent as per 2001 census out of which 26 per cent are in the agricultural sector. The bar diagram 4.1 clearly shows about the population of Anantapur district from 1941 to 2011.

**Literacy**

Literacy means the number of educated people to the total population in relative terms. It is the education, which provides knowledge and opens new vistas so as to finding better means of living. Education, thus, its vis-a-vis economic growth and development of mankind. The number of literates was which increase during 1991-2001-2001-11 accounted for 11.15 lakhs and 18.01 lakhs respectively. The improvement in literacy is mainly due to availability of educational facilities and also awareness among the population about the need of education.

The work force in the total population of district forms 48.83 per cent; of which 26 are in the Agriculture Sector.

**Educational Institutions**

The district is provided with two universities viz., Sri Krishnadevaraya University, Anantapur and Sri SatyaSai Baba Institute
of Higher Learning at Puttaparthy along with a branch of the N.G. Ranga Agricultural University, at Rekalakunta, near Narpala. There are six Engineering Colleges; 12 B.Ed. Colleges; one Medical college; one Pharmacy college; two Polytechnic Colleges; 35 Degree Colleges; 96 Junior Colleges; 465 High Schools; 610 Upper Primary Schools and six Industrial Training Institutions. Oil Technological Research Institute only one of its type in the south and dry land agriculture research station are situated in Anantapur. The presence of this infrastructure indicates that the district is poised to pick fast rate of economic growth.

Soils

The soil in Anantapur, Singanamala, Dharmavaram, Kalyanadurgam, C.K.Palli, Kambadur, Rayadurgam, Penukonda, Kadiri, Hindupur and Madakasira blocks is predominately red. In Uravakonda and Gooty blocks the red and black soils are almost in equal proportions. Red soil constituting 76 per cent and black soil 24 per cent of the total area in the district. The soil can be classified as red clay, red loamy, red-sand, black loamy and sand. The soils are shallow, poor in nutrients, with high water absorption capacity. 30 per cent of lands are saline and alkaline, especially under tanks ayacut and river banks. The PH of dry lands generally range from 7.5 to 8.5.²
Climate

Anantapur district is the driest part of the country with the second lowest average rainfall of 552 mm. after Jaisalmer district in the state of Rajasthan and is classified as tropical arid with an aridity index of 72.5. The rainfall is highly erratic. Normally southwest monsoon favours with 60 per cent of the total rainfall (310.8 mm.) and being far away from east cost. Northern monsoon will not be vigorous in the district (147 mm.). Intermittent dry spell ranging from 4 to 6 weeks in the crucial stage of crop growth period coupled with high velocity winds often result in low productivity of crops. 32 rainy days in a year yield meager precipitation of 520.4 mm., but this too is not realized many a year. The altitude varies from 990' above MSL (Mean Sea Level) at Tadipatri to 2000' above MSL in Madakasira taluk. The temperature in the range of 20.1 to 38.4 degrees Celsius recorded during the months of December-January to April-May, November and January are the cooler months with a minimum temperature of 17.2 degrees Celsius.
## TABLE – 4.2
DISTRICT AVERAGE RAINFALL, SEASON WISE AND MONTH WISE - 1999-00 TO 2007-08
(In M.Ms.,)

<table>
<thead>
<tr>
<th>Year</th>
<th>South West Monsoon Period</th>
<th>North East Monsoon Period</th>
<th>Winter Period</th>
<th>Hot Weather Period</th>
<th>Total For The Year</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>June</td>
<td>July</td>
<td>August</td>
<td>September- Total</td>
<td>October</td>
</tr>
<tr>
<td>NORMAL</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1999-2000</td>
<td>64.0</td>
<td>67.0</td>
<td>89.0</td>
<td>118.0</td>
<td>338.0</td>
</tr>
<tr>
<td>2000-2001</td>
<td>31.8</td>
<td>41.1</td>
<td>92.4</td>
<td>125</td>
<td>290.6</td>
</tr>
<tr>
<td>2001-2002</td>
<td>70.3</td>
<td>54.3</td>
<td>171.3</td>
<td>75.8</td>
<td>371.7</td>
</tr>
<tr>
<td>2002-2003</td>
<td>18.9</td>
<td>20.9</td>
<td>69.2</td>
<td>244</td>
<td>353.1</td>
</tr>
<tr>
<td>2003-2004</td>
<td>38.3</td>
<td>21.5</td>
<td>38.0</td>
<td>59.5</td>
<td>157.2</td>
</tr>
<tr>
<td>2004-2005</td>
<td>21.2</td>
<td>40.7</td>
<td>71.6</td>
<td>46.1</td>
<td>179.6</td>
</tr>
<tr>
<td>2005-2006</td>
<td>18.2</td>
<td>108.3</td>
<td>14.8</td>
<td>121.5</td>
<td>262.8</td>
</tr>
<tr>
<td>2006-2007</td>
<td>48.8</td>
<td>145.4</td>
<td>98.0</td>
<td>134.4</td>
<td>426.6</td>
</tr>
<tr>
<td>2007-2008</td>
<td>79.2</td>
<td>21.8</td>
<td>15.4</td>
<td>86.0</td>
<td>202.4</td>
</tr>
<tr>
<td>2007-2008</td>
<td>150.7</td>
<td>73.3</td>
<td>108.0</td>
<td>197.4</td>
<td>529.4</td>
</tr>
</tbody>
</table>

Source: Chief Planning Office, Anantapur
Rivers

The district is not endowed with perennial rivers. Seasonal rivers viz., Pennar, Jayamangala, Chitravati, Vedavati and Hagary rivers flow during the rainy days and benefit the seasonal requirements of the farmers on river banks in 3317 kms. route of the rivers. Streams like Kushavati in Hindupur, Swarna Mukhi in Madakasira, Tadakaleru and Pandameru in Anantapur block, Maddileru in Kadiri block and Papagni in Tanakal mandal are the important water supply sources to various large and medium irrigation tanks in the District.

Forest Resources

The district is very poor in forest wealth both in terms of area and richness of fauna and flora covering a geographical area of 4.86 lakh acres constituting 10.3 per cent of the total geo-area is classified as forest against optimal area of 33 per cent indicated in the National Forest Policy. The value of forest produce such as beedi leaves, custard apple, tamarind and soapnut is meager. Another resource is Agave (Sisil) which is a wild growth plant from which fiber is being extracted. The forest in Anantapur District means only wild bushes, bald hillocks and rocky terrain.

Irrigation Facilities

The table 4.3 shows that the development of ayacut particulars under major irrigated i.e., Tungabhadra Project, H.L.C and G.B.C; and medium irrigated projects i.e., B.T. Project, Upper Pennar Project,
Chennarayaswamygudi Project and Kumudravathi Project, in the year 2002-03 in the District.

The table indicates that the largest source of irrigation comes from Tungabhadra Project, H.L.C. and G.B.C. under registered area of hectares. Under B.T. Project the registered area of 4,847 hectares in the district.

Table 4.3

<table>
<thead>
<tr>
<th>Major/ Medium</th>
<th>Name of the Project</th>
<th>Register Ayacut</th>
<th>Actual area irrigated</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Net</td>
</tr>
<tr>
<td>Major</td>
<td>Tungabhadra project, H.L.C and G.B.C</td>
<td>51,771</td>
<td>19,243</td>
</tr>
<tr>
<td>Medium</td>
<td>B.T.Project,</td>
<td>4,847</td>
<td>921</td>
</tr>
<tr>
<td></td>
<td>Upper Pennar Project</td>
<td>4,068</td>
<td>Nil</td>
</tr>
<tr>
<td></td>
<td>Chennarayaswamygudi Project</td>
<td>364</td>
<td>Nil</td>
</tr>
<tr>
<td></td>
<td>Kumudravathi Project</td>
<td>2,840</td>
<td>Nil</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>63,890</strong></td>
<td><strong>20,164</strong></td>
</tr>
</tbody>
</table>

Source: Chief Planning Officer, Anantapur - 2002-03.

**Source of Irrigation**

The area irrigated through various sources of irrigation is as fallsows. Through Canals 20,285 hectares of area is irrigated and 2,147 hectares is irrigated under tanks. Using Tube Wells and Filter Points 79,195 hectares, from other Wells 24,465 hectares is irrigated. Through other sources 1,721 hectares of land is irrigated.
Ground Water Potential

The total ground water reserves as estimated by the Ground Water Department are to the order of 1061.71 Mcm. The present level of utilization has been estimated at 391.20 Mcm. leaving a balance of 67.5 Mcm. for further development. Ground water is available at a depth of 100 feet approximately. But the recharge of the underground water is very much dependent upon the quantum of rainfall. ³

Utilization of land

The total geographical area of the district is 19.13 lakh hectares. The data in the table 4.4 reveals that the area under forests in the district is 10.17 per cent of total geographical area in 2003-04. It slightly increased to 10.28 per cent in 2004-05 and remained constant in 2005-06. Again it increased to 10.30 per cent in 2006-07 and remained constant in 2007-08. During first three years of study barren and uncultivable land decreased gradually from 10.31 per cent in 2003-04 to 9.16 per cent in 2005-06. But in 2006-07 it increased to 9.89 per cent and again decreased to 9.59 per cent during last year of study. On the other hand, land under non-agricultural use is also gradually increased during first four years of study from 5.50 per cent to 6.29 per cent. But in the last year of study it decreased only 0.03 per cent. The same trend can be observed in case of cultivable waste. It is important to note that the permanent pasture and other grazing lands are gradually declining during five years of study. The drought conditions in the
district resulted in the gradual decrease of plantation crops, which reduced from 1.96 per cent in 2003-04 to 0.47 per cent in 2007-08. The current and other follow lands area is showing declining trends during five years of the study. The net area sown is increased during first three years of study but it sharply declined nearly 8.8 per cent in 2006-07. Again it increased in 2007-08. The total cropped area and area sown more than once are also showing the same trends.

Table 4.4
Land Utilization (From 2003-04 to 2008-09) (Area in Hectares)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Forests</td>
<td>194678</td>
<td>196797</td>
<td>196797</td>
<td>196978</td>
<td>196978</td>
<td>196978</td>
<td>196978</td>
</tr>
<tr>
<td>2</td>
<td>Barren &amp; Uncultivable Land</td>
<td>197211</td>
<td>178499</td>
<td>175344</td>
<td>189205</td>
<td>183451</td>
<td>185105</td>
<td>180305</td>
</tr>
<tr>
<td>3</td>
<td>Land Put To Non-Agricultural Uses</td>
<td>105320</td>
<td>112855</td>
<td>113492</td>
<td>120310</td>
<td>119810</td>
<td>120791</td>
<td>120310</td>
</tr>
<tr>
<td>4</td>
<td>Cultivable Waste</td>
<td>51003</td>
<td>49296</td>
<td>50276</td>
<td>56115</td>
<td>52819</td>
<td>52829</td>
<td>50992</td>
</tr>
<tr>
<td>5</td>
<td>Permanent Pastures And Other Grazing Lands</td>
<td>35480</td>
<td>20023</td>
<td>20356</td>
<td>9045</td>
<td>8951</td>
<td>8952</td>
<td>8952</td>
</tr>
<tr>
<td>6</td>
<td>Land Under Miscellaneous Tree Crops &amp; Groves Not Included In Net Area Sown</td>
<td>37600</td>
<td>17925</td>
<td>18060</td>
<td>9924</td>
<td>9652</td>
<td>7416</td>
<td>9416</td>
</tr>
<tr>
<td>7</td>
<td>Current Fallows</td>
<td>205625</td>
<td>161056</td>
<td>136973</td>
<td>305645</td>
<td>143119</td>
<td>167560</td>
<td>432555</td>
</tr>
<tr>
<td>8</td>
<td>Other Fallow Lands</td>
<td>123466</td>
<td>105812</td>
<td>98534</td>
<td>102470</td>
<td>84254</td>
<td>88502</td>
<td>87610</td>
</tr>
<tr>
<td>9</td>
<td>Net Area Sown</td>
<td>963109</td>
<td>1071228</td>
<td>1103659</td>
<td>923308</td>
<td>1113966</td>
<td>1082867</td>
<td>824955</td>
</tr>
<tr>
<td>10</td>
<td>TOTAL GEOGRAPHICAL AREA</td>
<td>1913491</td>
<td>1913491</td>
<td>1913491</td>
<td>1913000</td>
<td>1913000</td>
<td>1913000</td>
<td>1913000</td>
</tr>
<tr>
<td>11</td>
<td>Total Cropped Area</td>
<td>1001938</td>
<td>1135888</td>
<td>1169238</td>
<td>975432</td>
<td>1187767</td>
<td>1153739</td>
<td>900528</td>
</tr>
<tr>
<td>12</td>
<td>Area Sown More Than Once</td>
<td>38829</td>
<td>64660</td>
<td>65579</td>
<td>52124</td>
<td>73801</td>
<td>70872</td>
<td>75573</td>
</tr>
</tbody>
</table>

Live Stock

As per the live stock census of 2001, the total livestock population in the district is 53.60 lakh of which 12.40 lakh is the bovine population. The cattle and buffaloes accounted for 40.93 and 4.67 lakh respectively and the population of sheep and goat aggregated 16.79 and 3.15 lakh respectively. The poultry population in the district is 3.45 lakh and pig population is 2.21 lakh. This is attributed to continuous droughts experienced by the district and resultant disposal animals at throwaway prices.

Natural Resources

Anantapur district is rich in mineral resources and is well known for Gold and Diamond deposits. The minor mineral deposits are limestone, barites, dolomite, iron ore, corundum, steatite, white shale, serpentine and quartz. Black, pink and multi-coloured granites are also available in the district. Tadipatri area is rich in cement grade like stone deposits.4

Industries

The district is industrially backward with the lowest number of workers employed in registered factories. The industrial development is concentrated mostly in urban areas. The District Industries Centre has been functioning since 1978. There are (1) seven industrial estates at Anantapur, Tadipatri, Guntakal, Kadiri, Hindupur, Rayadurgam and
Gooty. (2) There are four Mini Industrial estates to benefit Scheduled Caste. The industrial estates and industrial development areas are expected to be developed in Dharmavaram and Madakasira. There are 44 large and medium scale industries and 10,043 small scale industries with investment of Rs. 311.39 crores and Rs. 96.35 crores providing employment to 8,052 and 54,172 persons respectively. Further as per the information available from the following large and medium scale industries are coming up in Anantapur District.  

**Power**

The domestic and industrial power requirements of the district are drawn from Thungabadhra Hydel Project at Hospet. Integrated power grid is established at Gooty connecting Nagarjunasagar, Kothagudem and Thungabadhra. The district is provided with 88 electrical substations with 2,474.16 kms. length transmission lines as on 31.3.2001. All the revenue villages in the district have been electrified and some hamlets are yet to receive the electricity. Power shortage has been constraining factor in improving agricultural productivity and also industrial development in the district.

**Places of Tourism**

Anantapur district is "home of tourist centres' worth visiting. Gugudu is village in Narpala mandal is situated among the Muchukota hills. It is known for its grand celebration of Moharam Festival and
Kullaiswamy, a village deity attracting the worshippers irrespective of caste and religion.

Lepakshi of Hindupur mandal is popular for its Veerabhara temple and the huge monolithic Nandi stands nearby. The place is also associated with worshippers of Lord Sri Rama. Temple and is a veritable treasure of sculpture and architecture. Pilgrims visit the place largely for Shivaratri.

Penna Ahobilam is famous for its temple of Sri Lakshimi Narasimha Swamy. The temple of Lakshmi, the Lord's consort is situated by the side of the main shrines. There is a spring channel known as Bugga Koneru.

Puttaparthi situated on the banks of Chitravati which is universally famous with the abode of Sri SatyaSai Baba who is credited with occult powers. A World reputed super specialty hospital is also located in Puttaparthi where free treatment is given to all.

Likewise Penakacherla dam is also a sightseeing place. Kadiri, Alurkona, Kasapuram. Gutibayalu, Gorantla and Hemavati are also of important tourist attractions because of the temples situated in these areas. The Thimmamma Marri Manu (banyan tree) which has spread over more than five acres area has become an important tourist center
which is near Kadiri town, the place where the shrine of Sri Lakshmi Narasimhaswami is found in the district.

**Hills**

The forest in the district is thin and scanty. The Muchukota hills about 35 kms in length run from North of Gooty town upon extreme southern corner of Tadipatri, Yadiki mandal. Another line of hills starts from west of Gooty mandal, run 80 kms. called by name Nagasamtidram hills. The Mallappakonda range begins at Dhrmavaram runs into the state of Karnataka. The Penukonda range starts in the South of Dhrmavaram through Penukonda and Hindupur proceeds to the state of Karnataka.\(^6\)

In Madakasira, the hill divides Rolla and Agali mandals into southern and Northern portions. There are numerous isolated peaks and rocky clusters which are devoid of any vegetation.

**Transport and Communication**

National Highway No: 7 runs through in the district, with a total length of 160 Kms. The district has 8,674 kms. of road and 379 kms. of railway line. The district is linked with Chennai, Delhi, Mumbai, Bangalore and also Hyderabad by the railways. Guntakal is one of the biggest railway junction in the country. Andhra Pradesh State Road Transport Corporation provides commuting facilities in the district for the movement of goods. There are 861 post offices, 98 telegraph offices
and 100 telephone exchanges. Number of cities in the country are connected through the STD facilities. Anantapur town is provided with a TV relay station with 75 km. radius of operation and TV relay stations are at Hindupur and Guntakal and FM Radio Station is situated at Anantapur. The district has also an Airport at Puttaparthi which has been inaugurated in the 1991.  

**Economic Features of Anantapur District**

Anantapur District is one of the backward districts in Andhra Pradesh. It has the record of the lowest Annual rainfall and depending upon the dry land cultivation only. The district have 61.45 per cent BPL population with Agricultural Labor is the major occupation. The working force in the population of the district farms 48.83 per cent as per 2001 census out of which 26 per cent are in the agriculture sector. The increase in agriculture workers is 26 per cent from 5.33 lakhs in 1991 to 6.71 lakhs in 2001. The district has the 74.74 per cent rural population mainly with SCs and OBCs.

The population of the urban and rural to the total population of the district works out to 75 per cent and 25 per cent in 2001 census as against 76.5 per cent and 23.5 per cent of 1991 census.
Per Capita Income

According to the 2001 census provisional estimates, the per capita annual income of Anantapur district was gradually increased from Rs.7610/- in 1993–94 to Rs.10239/- in 2000–01.

Status of Agriculture in Anantapur District

Anantapur is the southern-most district of the Rayalaseema region of Andhra Pradesh. While agriculture remains the most important economic activity of the district, it is characterized by high levels of instability and uncertainty. Being located in the rain-shadow region of Andhra Pradesh, the district is drought-prone. By now, it is well established that while a generalized rural crisis is prevalent across the country, a disproportionate burden has fallen on its drier tracts. In 2006, Anantapur was one of the thirty-one districts identified by the Government of India as being prone to agriculture-related suicides. 8

Almost 75 per cent of the population in the district lives in rural areas. Agriculture remains the predominant activity in the villages, with 80 per cent of total workers engaged in agriculture, either as cultivators or agricultural labourers. In urban areas, about 11 per cent of the workforce is engaged in agriculture. Mining is also an important activity in Anantapur District as it is endowed with rich deposits of iron ore and lime stone, as well as other minerals. There are more than fifty small-scale industrial units in the district, of which nearly one-half are to do
with granite. There is also couple of cement industries and steel industries in the district.

**Agro-ecological Characteristics**

Anantapur District is in the arid agro-ecological zone and is marked by hot arid bioclimatic condition with dry summers and mild winters. The district is characterized by hills, ridges, and undulating and gently sloping lands. Of the total geographical area of the district, hills and ridges cover 14 per cent; undulating lands, 27 per cent; gently sloping lands and very gently sloping plains extend over 54 per cent; and valleys cover 5 per cent.9

**Rainfall**

The geographical location of Anantapur District is such that it does not get the full benefit of either of the monsoons. The south-west monsoon gets cut off by the Western Ghats, while the full benefit of the north-east monsoon is not derived, either, as the district lies far from the eastern coastline. The district is in the rain-shadow area and the normal rainfall is 553 mm. There are four distinct rainfall zones in the district as illustrated by Map 4.1. An analysis of monthly rain fall over ninety-four years-from 1911 to 2004-indicates an annual mean rainfall of 568.5 mm with a coefficient of variation (CV) of 28 per cent. That the coefficient of variation of rainfall is higher than the threshold level of 25 per cent for annual rainfall suggests variability and lower degree of dependability on rainfall in the district.
In more than one-half of the years studied, the actual rainfall is below the annual mean rainfall of 568.5 mm. That is, fifty-one out of ninety-four years have experienced below mean rainfall in Anantapur district. Further, on average once in every five years, the district experiences drought conditions. Eighteen out of ninety-four years are classified as drought years, as the annual actual rainfall in these years has been 75 per cent below the annual mean rainfall of 568.5 mm.
Fourteen out of these eighteen years are moderate-drought years while four may be classified as severe-drought years.

An analysis of the contribution of seasonal rainfall to total annual rainfall of the district, from 1911 to 2004, shows that the south-west monsoon (June to September) contributes 58 per cent; north-east monsoon (October to December) 28 per cent; hot weather period (March to May) about 13 per cent; and cold weather period (January and February) 1 per cent. Normal rainfall shows a marginally declining trend across all the seasons in the district over a ninety-year period. 

In addition to the marginally declining trend of the quantum of rainfall, variability in rainfall is also an important issue affecting the agricultural prospects of Anantapur District. Variability in rainfall is noticed in all seasons, except the southwest monsoon, as testified by the values of the coefficient of variation calculated over 1911 to 2004. That is, on average, about 42 per cent of annual rainfall is subject to a high degree of variability. However, rainfall is assured during the south-west monsoon, though with a low mean of 329.9 mm. Yet, the effective rainfall (which indicates the part of the rainfall that is available as soil moisture in the root zone to meet the crop evapotranspiration requirement) is computed to be 198 mm for south-west monsoon over the period 1911 to 2004. The effective rainfall in the district is at least 50 per cent below the amount required to reap potential groundnut yield.
Further, comparing mean rainfall and potential evapotranspiration (PET) indicates that during the main crop-growing period of south west monsoon, quantum of rainfall is lower than the levels of potential evapotranspiration in the district. The rainfall deficit with respect to PET was 70 per cent in June; 64 per cent in July; 52 per cent in August; and 2 per cent in September. The soil-moisture stress condition under different stages of crop growth would result in inadequate plant population; higher percentage of flower drop; poor seed setting etc; and thereby have implications for crop yields.

The length of growing period (LGP), which is an assessment of the period during the year when both moisture availability and temperature are conducive to crop growth, is calculated to be 119 days in Anantapur district. The mean growing period dates between 7 July and 2 November. An analysis of the probability of dry-spell occurrence during the mean growing period (7 July to 2 Nov) by employing Markov-Chain Analysis indicates that out of a total of eighteen weeks of growing period in the district, thirteen weeks experience dry spells with a probability of more than 60 per cent and fifteen weeks experience dry spell with a probability of more than 50 per cent. A high probability of dry spell would have significant implications for yield of rain-fed/dry land crops as yield would depend not only on the quantum of rainfall but also on the distribution within the season. Gadgil notes, "Dry spells induce moisture stress and have a major impact on growth and development
when they occur at some life history stages. Dry spells and wet spells can also trigger the growth of pests/diseases/weeds and hence have impact on the yield. The impact may also be on the operational efficiency, as in the case of an intense dry spell during harvest which results in difficulty in retrieving all the pods from the hard soil”.11

The analysis clearly brings out the limitations posed by rainfall pattern for crop growth in Anantapur district. Level of rainfall as well as effective rainfall is low with a high probability of dry-spell occurrence in the growing period. During southwest monsoon, the quantum of rainfall is lower than potential evapotranspiration, thus having serious implications for crop growth.

**Soil Characteristics**

The soils of Anantapur originated from both the granite and granite-gneiss land forms, as well as the Dharwar landforms. Both these land forms are characterised by hills and ridges and undulating and gently-sloping lands. There are about thirty-four soil families in the district of Anantapur, and among these, the Anantapur and Penukonda soil families are the most predominant.12

The land capability classification which describes the capability of soils for different uses classifies soil into eight classes. The classification is based on inherent soil characteristics as well as external land features and other environmental factors that limit the use of land.
Any land capability class is thus a grouping of land units that have equal relative degrees of limitation or advantage. Soils suitable for cultivation are grouped under classes I to IV while soils not suitable for cultivation but very well suited for forestry, wild life, and grassland are under classes V to VIII. In Anantapur district, less than 4 per cent is classified as class II; 44 per cent as class III; and 25 per cent as class IV (Table 4.5).

Table 4.5
Land Capability Classes - Anantapur District

<table>
<thead>
<tr>
<th>Land Capability Class</th>
<th>Area (in hectares)</th>
<th>Percentage of Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>nil</td>
<td>nil</td>
</tr>
<tr>
<td>II</td>
<td>65,082</td>
<td>3.43</td>
</tr>
<tr>
<td>III</td>
<td>831,895</td>
<td>43.89</td>
</tr>
<tr>
<td>IV</td>
<td>482,122</td>
<td>25.43</td>
</tr>
<tr>
<td>V</td>
<td>nil</td>
<td>nil</td>
</tr>
<tr>
<td>VI</td>
<td>177,453</td>
<td>9.36</td>
</tr>
<tr>
<td>VII</td>
<td>339,048</td>
<td>17.89</td>
</tr>
<tr>
<td>Geographical Area</td>
<td>1,895,600</td>
<td>100.00</td>
</tr>
</tbody>
</table>


To bring to recall the significance of this soil classification, Class I lands are defined as, 'level lands with deep, well-drained soils of a satisfactory texture and structure. They are suitable for growing a variety of crops by adopting ordinary good farming practices. They are very fertile lands.' These are totally absent in Anantapur district. Class II lands are those that may be cultivated regularly although special
conservation practices like contour farming are to be followed for maintaining the productivity of lands. The available nutrients on Class II lands are poor. Class III lands, which account for the majority of cultivable land, can be cultivated only by following intensive soil-conservation practices like terracing. Class III lands are 'moderately sloping lands with a moderately deep soil. They are more severely affected by salinity and alkalinity and soil erosion than Class II lands.\textsuperscript{13}

They have poor nutrient content and moisture-retention capacity'. Class IV lands are suitable for occasional cultivation. That is, Class IV lands can be brought under intensive cultivation only once in four years, and the remaining years it should be left under grasses. Land capability classification in a nutshell indicates that while 73 per cent of geographical area of the district is cultivable, 25 per cent of this can be cultivated only once in four years and the remaining 48 per cent can be cultivated only if conservation measures are adopted rigorously. In other words, water erosion; shallow rooting depth; gravelliness; moderate slopes; and salinity, as well as climatic limitations affect successful crop cultivation in the district.

In the district, red alfisol soils are predominant, accounting for 78 per cent, while black soils are found in 20 per cent of the total geographical area. It is estimated that 63 per cent of the total geographical area of the district is covered by sandy loam; 14 per cent
is under rock land; and about 19 per cent is under clay. Large areas in
the district have coarse soil-surface texture, are poor in water and
nutrient retention, and are prone to wind and water erosion. The strong
westerly winds that blow across the district are also a factor that
contributes to soil erosion. An estimate of soil loss due to erosion
suggests that the total estimated soil loss from the entire district to be
91.7-lakh ton per annum. Using this estimate, in the total geographical
area of 19, 10,000 hectare of the district, the estimated soil loss per
hectare is 4.8 ton per annum. In addition to this, large areas in
Anantapur have shallow rooting depth for plant growth. Further, it is
estimated that about 59 per cent of soils of Anantapur have low
‘available water capacity’, a measure which indicates the amount of
moisture that can be easily absorbed by the plant from the soil for its
optimum vegetative growth. The soils of the district having very low
water storage capacity, Anantapur suffers from excessive water
runoff.\textsuperscript{14}

In the district, 31 per cent of the total geographical area is
classified as strong water-erosion class; 2 per cent as extreme water-
erosion class; 50 per cent as moderate water-erosion class and 17 per
cent under slight water-erosion class. This again is attributed to the
predominantly sandy loam texture of the soils and the poor water-
holding capacity of the soils. The high water-erosion tendency exhibited
by the soils make the already scarce rainfall unavailable for effective plant growth, thereby reducing the length of the growing period.

To analyse the chemical properties of soils, the organic carbon measure is of great significance as it gives an indirect measure of available nitrogen; soil microbial activity; and nutrient absorption capacity of the soil. The soil fertility analysis done by the Department of Agriculture in the district of Anantapur in 2007-08, which take into account a total of 19,192 soil samples, suggests that 80 per cent of the samples are low in nitrogen while phosphorous and potassium are available in moderately high levels. They are also deficient in micro-nutrients like zinc and iron, and on the whole the district has low organic carbon content in the soils. Further analysis of the chemical properties of soils in the district indicates that the problem of salinity/sodicity is mostly prevalent in the black soils. The important characteristics of saline soils are the presence of excessive amount of neutral soluble salts like chloride and sulphate of sodium. Soil sodicity is characterised by the presence of high levels of exchangeable sodium. A saline-sodic soil is one which has both a high amount of soluble salts and high percentage of exchangeable sodium. Both, salinity and sodicity, pose problems for crop growth and performance. On the one hand, there is excessive absorption of sodium and chloride that leads to crop-growth retardation, and on the other, there is reduced uptake of some essential plant nutrients like potassium and calcium, often resulting in nutrient
imbalances and deficiencies. This is of serious implication to a rain-fed/dry land groundnut growing tract like Anantapur. Potassium is of utmost importance to rain-fed crops, to tide over moderate moisture stress in the upper layers, as greater root generation and penetration helps the crop to effectively source soil moisture from the lower layers. Lack of calcium will affect the proper shell formation of groundnut. The problem with sodicity is expressed in the soil physical properties. A higher proportion of exchangeable sodium percentage in the soil, results in the breakdown of soil aggregates, and lowers the permeability of the soils to air and water. Sodicity also tends to make the soil more dispersed. Soil dispersion results in the formation of a dense impermeable surface crust that poses difficulty for the emergence of seedlings.\textsuperscript{15}

The effect of sodicity on soil chemical properties is by its influence on the soil pH, which further leads to the soil becoming calcareous. A higher pH created by sodicity results in lowering the solubility and availability of some essential plant nutrients like phosphorous, calcium, magnesium, iron, manganese, and zinc. Calcium and magnesium react with carbonates of sodium and form the insoluble calcium and magnesium carbonates, resulting in calcareousness of the soil. It is estimated that 12 per cent of the geographical area of Anantapur district has problems of soil calcareousness.
This has direct implication for availability of phosphorous to the plants. Phosphorous reacts with calcium carbonate and gets fixed as calcium phosphate in the soil, which is highly immobile and unavailable to the plants. The soils of Anantapur are classified to have medium cation-exchange capacity, an indication of the medium capacity of the soils to supply nutrients as well as the medium responsiveness of the soil to application of fertilizers.

To sum up, the soil of Anantapur has great limitation in terms of its physical and chemical properties. These limitations have serious implication for crop productivity in the district. The coarse texture; shallow depth; poor water-retention capacity; high erodability of soil; as well as the undulating topography promoting easy soil and water runoff are some of the dominant physical constraints for cultivation in the district. The low-medium organic content, low-medium cation exchange capacity and per cent base saturation, the tendency for acidity/alkalinity-sodicity, etc are the major chemical characteristics of the soils of the district that act as the limiting factors for proper crop establishment and growth.16

**Land-Use Classification and Land Holding Structure**

While a cursory look at the land-use pattern in the district of Anantapur, over 1961-62 to 2005-06, suggests a more or less stable pattern, a more thorough analysis brings out two important changes in
land use. First, cultivable waste land has declined sharply over the years, from an extent of 1.7- lakh hectare in early 1960s to about 0.5- lakh hectare in mid-2000s. In 1961-62, cultivable wastes formed 9 per cent of geographical area, while by 2005-06, this percentage decreased to less than 3 per cent.

The decline in cultivable wastes is accounted for partly by an increase in land put to non-agricultural use; an expansion in area that remains barren; an increase in area under trees; as well as a general tendency to bring cultivable waste land under cultivation. The cultivable wastes that are brought under cultivation in a year, however do not get cultivated every year and perhaps remain as fallows in some years, as is suggested by a fluctuating pattern of current and other fallows in the district. Non-agricultural land has increased from 5.83 per cent of geographical area of the district to 7.73 per cent over 1961-62 to 2005-06. As regards other classifications of land-use, the area under forests remains stable at about 10 per cent of geographical area throughout the period under consideration while the areas cultivated with trees and pasture land, each accounting for less than 2 per cent of geographical area, have registered moderate increase in the recent years. Though a considerable extent of the area is under forests in Anantapur District, the nature of these forests is such that this does not contribute towards improving the arid climate in the region. The *Anantapur District Gazetteer*, published in 1905, notes, 'The forests of the district nowhere
consist of really dense growth or large timber and in many parts they contain practically no tree at all. That the nature of forests have remained as pathetic as they were a hundred years ago is clear from the description of forests in the recent publication of the state government as, ‘The forests in the District are thin and scanty. There are numerous isolated peaks and rocky clusters which are devoid of any vegetation’. 17
Table 4.6
Changes in Land-Use Pattern in Anantapur District, 1961-62 to 2005-06

<table>
<thead>
<tr>
<th>Three averages around the year Centred</th>
<th>Net sown Area</th>
<th>Current Fallows</th>
<th>Other Fallows</th>
<th>Cultivable Waste</th>
<th>Barren Land</th>
<th>Permanent Pastures</th>
<th>Forest Area</th>
<th>Misc. Trees</th>
<th>Non-Agriculture Land</th>
</tr>
</thead>
<tbody>
<tr>
<td>1961-62</td>
<td>10246 52.4</td>
<td>1058.58 5.41</td>
<td>1183.34 6.05</td>
<td>1761.54 9.01</td>
<td>1785.07 9.13</td>
<td>268.45 1.37</td>
<td>1930.26 9.87</td>
<td>180.13 0.92</td>
<td>1139.63 5.83</td>
</tr>
<tr>
<td>1971-72</td>
<td>9345.88 48.84</td>
<td>1138.43 5.95</td>
<td>1129.86 5.9</td>
<td>1695.15 8.86</td>
<td>1929.36 10.08</td>
<td>258.82 1.35</td>
<td>1935.94 10.12</td>
<td>236.87 1.24</td>
<td>1464.62 7.65</td>
</tr>
<tr>
<td>1981-82</td>
<td>8900.24 46.51</td>
<td>2235.27 11.68</td>
<td>1220.92 6.38</td>
<td>856.11 4.47</td>
<td>1895.53 9.91</td>
<td>233.26 1.22</td>
<td>2017.2 10.54</td>
<td>194.61 1.02</td>
<td>1581.78 8.27</td>
</tr>
<tr>
<td>1991-92</td>
<td>9682.69 50.6</td>
<td>2072.34 10.83</td>
<td>1024.81 5.36</td>
<td>701.91 3.67</td>
<td>1741.01 9.1</td>
<td>236.69 1.24</td>
<td>1967.97 10.28</td>
<td>114.2 0.6</td>
<td>1593.3 8.33</td>
</tr>
<tr>
<td>2001-02</td>
<td>10361 54.15</td>
<td>1191.42 6.23</td>
<td>952.02 4.98</td>
<td>533.86 2.79</td>
<td>1888.48 9.87</td>
<td>270.37 1.41</td>
<td>1967.78 10.28</td>
<td>352.21 1.84</td>
<td>1617.74 8.45</td>
</tr>
<tr>
<td>2005-06</td>
<td>10327.3 53.97</td>
<td>1279.95 6.69</td>
<td>1055.73 5.52</td>
<td>527.31 2.76</td>
<td>1942.66 10.15</td>
<td>259.68 1.36</td>
<td>1968.45 10.29</td>
<td>286.41 1.5</td>
<td>1479.59 7.73</td>
</tr>
</tbody>
</table>

Second, net sown area as well as gross cropped area in the district of Anantapur over four and a half decades fluctuates a great deal. This is clearly indicative of a high degree of instability in agriculture in the district. The extent of net sown area was more than 10-lakh hectare in early 1960s and it went down to 8-lakh hectare during the mid-1980s and it expanded again to reach 10-lakh hectare by the mid-2000s. A declining trend in net sown area as well as gross cropped area in the district is observed during the 1960s and 1970s but this gets reversed in the mid-1980s, a feature perhaps related to the promotion of tube-well. The division of sown areas is shown in Figure 6, when one can see that over the four decades under consideration, whenever net sown area registers a fall, current fallows have registered a rise. The pattern of change exhibited by current fallows is almost like a mirror image of net sown area. While the close correspondence between net sown area and current fallows is clearly a sign of an agricultural system that depends on the vagaries of monsoon, the extent of fallows also appears to be related to the occurrence of land degradation that is taking place. An analysis made by scholars using data from National Remote Sensing Authority, shows that while the extent of land degradation in the state of Andhra Pradesh accounts for 10 per cent of geographical area and 19 per cent of the cultivable area, in Anantapur district it accounts for 15 per cent of geographical area and 21 per cent of cultivable area in the year 1988-89. (Reddy, Ratna. 2002) The practice of leaving land fallow is quite substantial across all size classes of farmers in Anantapur district.
Landholdings

In the year 2001, as Table 4 illustrates, 7.78 per cent of total area under land holdings is classified under current fallows. Farmers in both ends of the spectrum—marginal and large—record a high percentage of land as fallow, namely, 11 per cent, while farmers in other size classes also leave a considerable extent, 6 per cent to 8 per cent, as fallows. While the exact reasons for withdrawal of land from cultivation would vary from one farmer to another, considering the high magnitude of degraded land that is prevalent in the district, it is reasonable to assume that treatment of degraded land would help reduce the extent of fallows across all size classes of farmers. The relationship that prevails between land degradation and fallows thus has an important policy implication. By addressing the issue of land degradation, the fallow lands, at least in part, can be brought back to cultivation.

Landholdings

As regards the structure of land holdings in Anantapur district, marginal and small holdings (less than 2 hectare) account for two-thirds of operational holdings with a share of one-third of total operated area in the district in 2001. As regards bigger holdings, nearly one-tenth of all holdings in the district are above 4 hectare in size, accounting for one-third of total operated area in 2001 (Table 4). The state of Andhra Pradesh provides a contrasting picture as compared to Anantapur district. In 2001, 82.7 per cent of all operational holdings are marginal and small (less than 2 hectare) with the share of operated area being 46
per cent in the state. Similarly, 4.92 per cent of all holdings are medium and large (above 4 hectare) accounting for 27.33 per cent of operated area. Average size of holdings in Anantapur district, at 2 hectare, is higher than that in the state as a whole at 1.25 hectare, in the year 2001. While the extent of land concentration in Anantapur district is relatively higher than that in the state as a whole, it is important to note that the condition of even semi-medium farmers owning less than 4 hectare in a dry region such as Anantapur would be no better than the small farmers in irrigated areas.

Table 4.7

Landholdings in Anantapur District

<table>
<thead>
<tr>
<th>Size Class of Operational Holdings</th>
<th>Number of Holdings</th>
<th>Area in Ha.</th>
<th>Area under Current Fallows in Ha.</th>
<th>Current Fallows as percentage of total area</th>
<th>Average Size of Holdings (in Ha.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marginal</td>
<td>206,326 (34.46)</td>
<td>113,902 (9.51)</td>
<td>12,287</td>
<td>10.79</td>
<td>0.55</td>
</tr>
<tr>
<td>Small</td>
<td>185,705 (31.02)</td>
<td>272,953 (22.78)</td>
<td>18,109</td>
<td>6.63</td>
<td>1.47</td>
</tr>
<tr>
<td>Semi-Medium</td>
<td>146,238 (24.43)</td>
<td>373,874 (31.21)</td>
<td>23,497</td>
<td>6.28</td>
<td>2.56</td>
</tr>
<tr>
<td>Medium</td>
<td>51,434 (8.59)</td>
<td>299,541 (25.00)</td>
<td>23,870</td>
<td>7.97</td>
<td>5.82</td>
</tr>
<tr>
<td>Large</td>
<td>8,969 (1.50)</td>
<td>137,726 (11.50)</td>
<td>15,443</td>
<td>11.21</td>
<td>15.36</td>
</tr>
<tr>
<td>All Classes</td>
<td>598,672 (100.00)</td>
<td>1,197,996 (100.00)</td>
<td>93,205</td>
<td>7.78</td>
<td>2.00</td>
</tr>
</tbody>
</table>

Source: Chief Planning Office, Anantapur
References


4. Ibid, p. 2

5. District Credit Plan, Anantapur District, Office of Lead Bank, 2007-08, p.2.


11. Ibid, p.36.

12. Ibid, p.47.

District, M S Swaminathan Research Foundation Chennai, 2009, p.11.


15. Ibid., pp.30-31.

16. Ibid., p.35.

17. Ibid, p.36.

18. Ibid., p.38.