In the recent times, modernisation, development of irrigation and improved socio-economic conditions have brought about a revolutionary change in the crop scenario of the district. Consequently, cropping patterns and cropping structures have undergone radical transformation resulting in increased agricultural production. "The diffusion of High Yielding varieties have accelerated the growth of market oriented economy resulting into the destruction of the traditional agriculture". (Majid Hussain, 1991, p. 95). In view of all these achievements of the new agricultural strategy, a critical study of the changing patterns of crop landuse is of paramount importance for understanding the new cropping patterns and cropping structures.

The pattern of crop farming is a complex, dynamic and spatially variable. "The most striking characteristic of the present
day agriculture is its great diversity of practice, products and organisation" (Grigg, 1969, p. 95). The diversity in the spatial pattern of crop landuse and crop structures is due to diversity in topographical, agro-climatic, adaphic, hydrological, socio-economic and technological conditions. "A systematic study of cropland relationship not only helps ... agricultural regionalisation but also provides a scientific basis for land resource allocation to various agricultural crops and planning for maximum productivity" (Singh and Singh, 1970, p. 221). As such the study of spatial pattern and dynamics of cropland utilisation and identification of cropping patterns received due importance in the scientific investigation of geography of regional agriculture. Such a study provides the basis for delineating the farming types and systems including the economic and dietary aspects of the people and ultimately help to design crop planning at the regional scale.

The Concept of Cropping Pattern:

Cropping pattern represents the spatial crop sequence in a given area at a particular point of time. It indicates the proportion of area under different crops at a point of time. Cropping pattern may be defined as "the spatial and hierarchical arrangement and/or association of different crops at a point of time in a particular areal unit." (Ramanaiah, 1984, p. 136). Such an exercise helps to identify the most important crops of the region and their area
differentiation. The degree of agricultural prosperity of the region may also be understood with the help of cropping pattern analysis.

Objectives of the Study:

In Cuddapah district, where agriculture is the chief occupation of the people, the study of cropland utilisation is of paramount significance. The present study endeavours to examine: (i) the spatial distribution of all crops, (ii) the temporal changes and trend in each crop-landuse, and (iii) the spatio-temporal distribution of HYV cultivation.

Methodology Employed:

In the present study, the analysis of spatial pattern of crop-landuse is made at 'mandal' level for the period 1986-89. The changing patterns are examined between three points of time namely, 1962-65, 1972-75 and 1982-85 at 'taluk' level. The trend of each crop-landuse from 1962-63 to 1984-85 is found out with the help of regression equation. The goodness of fit of a linear trend is measured with the help of co-efficient of determination. An endeavour is also made to examine the spatio-temporal distribution of HYV cultivation and differential adoption of HYVs between 1975 and 1985.
The Agricultural Calendar:

The agricultural year in the district is divided into two main seasons namely, (i) Kharif and (ii) Rabi. Kharif is the principal crop farming season starts with the advent of monsoon in June-July and generally extends up to October - November. Kharif cropping accounts for about 80 per cent of the gross cropped area of the district. The success of Kharif cropping depends greatly on the intensity and distribution of monsoonal rainfall except in the case of few crops which depend on irrigation facilities. Rabi cropping season starts in November - December and extends upto March - April. Rabi cropping is influenced by retreating monsoon but it mostly depends on the availability of irrigation facilities. During rabi season the rainfall is usually meagre, uncertain and highly spatially variable. Because of low rainfall conditions and scanty irrigation facilities for the second crop, rabi cropping is less significant in Cuddapah district which accounts for 20 per cent of the total cropped area.

General Cropping Pattern:

The most important crops of the district are groundnut, jowar, paddy, spices and condiments, fruits, pulses and minor
millets. All these crops are grown in different seasons of the agricultural year. The crop farming is largely rainfed which accounts for 65 per cent of the total cropped area. The success of the rainfed farming depends on the intensity and distribution of monsoonal rainfall.

**Distribution of Foodgrains:**

The foodgrain crops are grown under a diversified range of physical conditions. "Foodgrain crops are generally less demanding and less exacting in their soil and moisture requirements than fibre crops and are favoured by both natural and manmade conditions suitable for farming in moisture problem areas." (Jasbir Singh, 1974, p. 154). Foodgrains play a major role in the cropland utilisation in the country due to high population pressure, huge requirements of food materials and subsistence nature of agricultural economy. It is very interesting to note here, that the land under foodgrains is not that significant in Cuddapah district. Area under foodgrains account for about 43 per cent of the gross sown area of the district in 1986-89 which is very less than the State's average value of 70 per cent. The low proportion of area under foodgrains is due to the low development of irrigation and heavy competition from more remunerative and dry crops like oilseeds.

Among the foodgrains jowar and paddy are the most important crops accounting to three-fourths of the area under foodgrains in the district. It is due to (i) the dietary preference of the people, (ii) intensive cultivation of paddy, which is monopoly under canal irrigation, and (iii) large scale cultivation of jowar crop
in the black soil area of western plains in the district.

**Distribution of Paddy Cultivation (1986-89):**

Owing to dietary aspects of the people, paddy is the most important crop among the foodgrains cultivated in the district. Paddy can grow extensively irrespective of the fertility of the soil, but its spatiotemporal distribution is closely related with the water. Paddy is the most preferable foodgrain in the canal irrigated areas in the district.

Relatively the cultivation of paddy occupied third rank next to groundnut and jowar in the cropping pattern of the district. The area under paddy cultivation accounted for 12.7 per cent of the total cropped area of the district in 1986-89. The distribution of paddy cultivation in the district has exhibited a great spatial variation ranging from a maximum of 89.6 per cent in Cuddapah mandal to a minimum of 0.1 per cent in Vemula and Thondur mandals.

High (20.1-30%) and very high ( >• 30%) concentrations of paddy cultivation are found in 16 mandals distributed over central part and south-eastern valley areas of the district. There are four mandals which accounted half of the total cropped area under paddy cultivation. They are Cuddapah (89.6%), Chennur (72.9%), Khajipet (67.7%) and Nandalur (57.9%). The K.C. canal irrigation system in the central part and development of well irrigation in eastern valley region favours for intensive cultivation of paddy.
CUDDAPAH DISTRICT
Paddy Cultivation - 1986-89

INDEX
(as Percentage to the Total Cropped area)

- < 10
- 10-1-20
- 20-1-30
- > 30

Fig: 7.1
Moderate concentration of paddy (10.1-20%) is found in the high rainfall zone of north-eastern and south-eastern parts as well as K.C. canal irrigated area of the district.

Low concentration (<10%) of paddy is noticed in 50 per cent of the total mandals of the district distributed over rain-shadow areas of western, north-western and south-western parts of the district. In these areas, the large coverage of black soil, low rainfall conditions and very low development of irrigation are not conducive for paddy cultivation in to significant proportion.

Paddy Cultivation (Kharif) (1986-89):

Paddy is widely cultivated throughout the district in kharif season and it occupied third largest area among the kharif crops accounting for 32.5 per cent of the total kharif crop area. The high proportion of paddy in this season is noticed in K.C. canal irrigated areas and high rainfall areas as eastern valley region. There are five mandals namely, Cuddapah, Chennur, Sidhout, Badvel and Nandalur which accounted to under paddy cultivation more than half of the kharif crop area. Concentration of kharif paddy is less significant in large number of mandals in western plains and southern plateau region.

Paddy Cultivation (Rabi) (1986-89):

Paddy is the most important crop in rabi and occupies the largest area among the rabi crops accounting for 24.6 per cent of the total area under rabi crops in the district. The concentration of rabi paddy is high in the areas of eastern valley and southern
plateau. Significant amount of rainfall received from north-east monsoon and development of canal as well as tank irrigation in the eastern valley and southern plateau areas are favourable conditions for the cultivation of paddy. It is significant to state that the cultivation of rabi paddy is not found in 9 mandals located in the western plains of the district.

In general, paddy is cultivated in the high rainfall and irrigated areas under different edaphic and relief conditions. In Cuddapah district high concentration of Paddy is found under canal irrigation (64%) followed by well irrigation (25%) and tank irrigation (11%). It is clear that the irrigation and rainfall profoundly influence its spatial distribution.

Changing Pattern of Paddy Cultivation (1962-65 to 1982-85):

Paddy area has registered a decrease of 1.5 per cent in the district i.e. from 16.8 per cent in 1962-65 to 15.3 per cent in 1982-85. In actual area, it has decreased from 73 thousand hectares in 1962-65 to 61 thousand hectares in 1982-85, thus registering a net decrease of 12 thousand hectares. At the lowest level of concentration, it has decreased from 1.5 per cent in 1962-65 to 0.9 per cent (Pulivendula taluk) in 1982-85. At the highest level, there was also a decrease in the concentration of paddy from 39.8 per cent (Rajampet taluk) in 1962-65 to 36.4 per cent (Sidhout taluk) in 1982-85. It indicates that the decrease in the concentration of paddy cultivation is found at all levels i.e. the lowest, the highest and an average level.
Table 7.1

Changing distribution of paddy Cultivation in Cuddapah District

<table>
<thead>
<tr>
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<th></th>
</tr>
</thead>
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<td>33.7</td>
<td>1.4</td>
<td>-1.4</td>
<td>-1.0</td>
</tr>
<tr>
<td>Rayachoty</td>
<td>18.3</td>
<td>17.0</td>
<td>8.9</td>
<td>-1.3</td>
<td>-8.1</td>
<td>-9.4</td>
</tr>
<tr>
<td>Kamalapuram</td>
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<td>5.9</td>
<td>1.5</td>
<td>-1.0</td>
<td>0.5</td>
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<td>Rajampet</td>
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<td>36.1</td>
<td>-3.5</td>
<td>-0.2</td>
<td>-3.7</td>
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<tr>
<td>Sidhout</td>
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<td>36.4</td>
<td>0.2</td>
<td>15.2</td>
<td>13.6</td>
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<tr>
<td>Badvel</td>
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<td>24.6</td>
<td>-3.7</td>
<td>0.2</td>
<td>-3.5</td>
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<tr>
<td>Jammalamadugu</td>
<td>4.2</td>
<td>4.9</td>
<td>4.7</td>
<td>0.7</td>
<td>-0.2</td>
<td>0.5</td>
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<tr>
<td>Proddatur</td>
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<td>25.4</td>
<td>27.2</td>
<td>-2.3</td>
<td>1.8</td>
<td>-0.9</td>
</tr>
<tr>
<td>Pulivendula</td>
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<td>1.2</td>
<td>0.9</td>
<td>-0.3</td>
<td>-0.3</td>
<td>-0.6</td>
</tr>
<tr>
<td>District</td>
<td>16.8</td>
<td>16.2</td>
<td>15.3</td>
<td>-0.6</td>
<td>-0.9</td>
<td>-1.5</td>
</tr>
</tbody>
</table>
CUDDAPAH DISTRICT
Trend Of Paddy Crop Area

Scale
Y = 1 = 10,000
X = 1 = 2 Years

Area in Hectares (1,000)

Fig 7-1a
The increase in the concentration of paddy crop area is noticed in three taluks. The highest increase is recorded in Sidhout (13.6%) taluk, followed by Kamalapuram and Jammalamadugu. A decrease in paddy cultivation is found in six taluks namely, Rayachoty (9.4%), Rajampet (3.7%), Badvel (3.5%), Cuddapah (1.1%) and Pulivendula (0.6%) taluks. The competition that has existed from more remunerative crops like high yielding groundnut, fruit farming and etc., has tended to replace the paddy fields in the red soil areas of Rayachoty and Pulivendula taluks.

Trend of Paddy Crop Area (1962-84):

The regression trend analysis has also revealed that there has been a negative trend in the area under paddy cultivation in the district. On an average, the rate of decrease is accounted for 2 per cent per annum. The negative trend in the area under paddy cultivation is noticed in 6 taluks namely, Cuddapah, Rayachoty, Rajampet, Badvel, Proddatur and Pulivendula. High rate of decrease is found in Cuddapah (1.5%) and Rayachoty taluks (1.1%). The trend lines of Cuddapah and Rayachoty taluks are confirmed by 49 per cent and 16 per cent of coefficient of determination respectively. The value of coefficient of determination is much less in the case of other taluks. It shows that the decrease in the area under paddy cultivation is not exactly constant since it is not fully accounted by time factor. This suggests that there are striking yearly fluctuations in the area under paddy cultivation particularly in Rayachoty, Rajampet and Badvel taluks. These high fluctuations are exhibited
Plate 7.1a  A view of the paddy crop which is to be harvested.

Plate 7.1b  The irrigated Jowar crop after harvest near Pullampet village in south-eastern valley region.
due to fluctuations in the availability of irrigation water supplemented by tanks and wells. The positive trend in the area under paddy is found in Sidhout, Kamalapuram and Jammalamadugu. The rate of increase is 0.3 per cent per annum in Sidhout, and 0.03 per cent in Kamalapuram.

From the preceeding analysis, it is observed that paddy cultivation is gradually losing its spatial ground and slowly its concentration has been mostly confined to the canal and tank irrigated areas. Under well irrigation, its cultivation has been only for subsistence purpose. Barring canal irrigation, extensive paddy cultivation is not economically valuable under other sources of irrigation.

It would be more prudent if the per hectare yields are improved rather than areal extension of the paddy cultivation. Demand for water by paddy is rather exacting and to that effect nonextension of paddy cultivation itself is a measure of water conservation. It is better to grow economically valuable crops which require less water than extending paddy crop area especially in the rabi season when soil moisture is less.

Spatial Distribution of Jowar Cultivation (1986-89):

Jowar is the second most important crop in the district only next to groundnut. Among foodgrains, it is the single largest crop cultivated in the district. It is cultivated in both the seasons mostly as a rainfed crop. Its pre-eminence lies in the fact that it
is an ideal, economic, productive and sustainable crop for drought prone conditions in the district. Jowar grows well under low rainfall condition and on a variety of soils, however, it is generally grown in the poorer and light black soils.

In 1986-89, Jowar cultivation accounted for 19.8 per cent of the total cropped area in the district. Within the district its proportion varies from a maximum of 69.2 per cent in Rajupalem mandal to nil cultivation in some mandals (Kodur, Chitvel, T. Sundupalli, Obulavari palli and Nandalur) in southeastern part of the district.

More than one-third of the total kharif crop area occupies by jowar is recorded in Rajupalem (69.2%), Proddatur (64.5%) Jammalamadugu (43.7%), Mylavaram (40.5%) and Mydukur (35.7%) mandals. High (20.1 - 30%) and very high ( > 30%) concentrations of jowar cultivation are found in 18 mandals and all these mandals located in the rain-shadow area of western plains. The low rainfall conditions, occurrence of droughts, prolonged dry spells and extensive black soil cover in the western plains are important contributing factors for high and very high concentrations of jowar cultivation.

Moderate concentration (10.1 - 20%) of jowar crop area is noticed in 9 mandals. They are distributed in the Pulivendula basin and north-eastern valley area.

Low (< 10%) concentration of jowar cultivation is extensively found in the southern plateau, south-eastern valley and central part of the K.C. canal irrigation region. Here, the prevalence
CUDDAPAH DISTRICT
Jowar Cultivation-1986-89

INDEX
(as Percentage to the total Cropped area)

FIG: 7-2
of red soils, moderate to high rainfall conditions and high intensity of irrigation do not offer jowar cultivation. Jowar cultivation under irrigation is quite insignificant as it accounts for only 2.4 per cent of the total jowar cultivated area in the district.

**Jowar Cultivation (Kharif) (1986-89):**

In Kharif, the proportion of area under jowar cultivation is high (21.9%) than in the rabi due to its rainfed cultivation depending on the monsoonal rainfall in the black soils. The entire black soil cover of western plains is very important for spectacular spread of jowar cultivation in kharif. For instance, Vemula, Jammalamadugu, Proddatur, Mylavaram, Peddamudiam and Rajupalem mandals accounted more than half of their kharif crop area under jowar cultivation.

**Jowar Cultivation (Rabi) (1986-89):**

In rabi, jowar cultivation is less important and accounts for 10.4 per cent of the total rabi crop area in the district in 1986-1989. It is significant to state here that jowar cultivation in the rabi is practically absent in more than half (54%) of the total mandals in the district. The highest percentage of jowar cultivation of 87.7 per cent is recorded in Rajupalem mandal. The rabi jowar is usually cultivated in eastern valley region where the considerable rainfall from north-east monsoon is favourable for its cultivation. The absence of rabi jowar cultivation is found in the whole of rain-shadow region of western plains of the district. Significant proportion of rabi jowar is registered in B. Kodur (36.7%), Badvel (27.6%),
Atloor (20.2%), B. Mattam (16%) and Gopavaram (15.1%) mandals located in the south-eastern valley.

**Changing Pattern of Jowar Cultivation (1962-65 to 1982-85):**

The percentage of jowar area in the district has decreased from 20.8 per cent in 1962-65 to 20 per cent in 1982-85, indicating an overall decrease of 0.8 per cent. In hectarage, the area under jowar cultivation decreased from 91 thousand hectares in 1962-65 to 83 thousand hectares, showing a net decrease of 8 thousand hectares.

At the highest level of concentration, jowar cultivation has decreased from 38.5 per cent in 1962-65 to 38.2 per cent in 1982-85 (Jammalamadugu taluk), thus showing a net decrease of 0.3 per cent in the last 20 years period. At the lowest level of concentration, its proportion has decreased from 2.1 per cent (Rayachoty taluk) to 1.6 per cent (Rajampet taluk) in 1982-85. It infers that decrease in the concentration of jowar cultivation is found both at the lowest and the highest levels of concentration.

Increase in the proportion of jowar cultivation is found in 4 taluks, out of which, Pulivendula has registered a maximum increase of 6 per cent followed by Proddatur (4.6%), and Kamalapuram (3.4%). It is found that the increase in jowar crop area mostly in the high concentration areas of jowar cultivation confining to the rain-shadow region of western plains.
Table 7.2
Changing Distribution of Jowar Cultivation in Cuddapah District

<table>
<thead>
<tr>
<th>Taluk</th>
<th>Percentage of Jowar to total cropped area</th>
<th>Percentage of variation between</th>
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</thead>
<tbody>
<tr>
<td>Cuddapah</td>
<td>27.6</td>
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<td>Rayachoty</td>
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<tr>
<td>Kamalapuram</td>
<td>27.1</td>
<td>32.7</td>
</tr>
<tr>
<td>Rajampet</td>
<td>4.1</td>
<td>3.3</td>
</tr>
<tr>
<td>Sidhout</td>
<td>9.8</td>
<td>6.3</td>
</tr>
<tr>
<td>Badvel</td>
<td>11.6</td>
<td>10.6</td>
</tr>
<tr>
<td>Jammalamadugu</td>
<td>38.5</td>
<td>52.4</td>
</tr>
<tr>
<td>Proddatur</td>
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<td>40.2</td>
</tr>
<tr>
<td>Pulivendula</td>
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<td>39.8</td>
</tr>
<tr>
<td>District</td>
<td>20.8</td>
<td>26.5</td>
</tr>
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</table>
CUDDAPAH DISTRICT
Trend Of Jowar Crop Area

Scale
Y 1 10,000 ha.
X 1 2 Years

Area In Hectares (/000)

Years

1962 1974 1984

Fig7.2a
The decrease in the proportion of jowar cultivation is noticed in 6 taluks, Cuddapah taluk has registered the highest decrease of 14.1 per cent followed by Sidhout (4.5%). In the remaining three taluks namely, Badvel, Rajampet, Rayachoty and Jammalamadugu, the decrease is negligible. In Cuddapah taluk the high decrease is due to development of K.C. canal irrigation as a result, the jowar cultivating fields have been transformed to paddy and other irrigated crops.

In general it is observed that the area under jowar cultivation has shrunk with the increase of irrigation in central and eastern taluks. In the areas of high concentration of jowar cultivation of western plains, the increase or decrease in jowar crop area all depends on the amount and distribution of rainfall. If the rainfall is high and timely occurred, the farmers prefer for the cultivation of more groundnut. In other words, if rainfall is low and delayed, farmers prefer for jowar crop in large area. In Cuddapah district particularly in the black soil area, there is a good scope for protective and productive cultivation of jowar if it could overcome some of the constraints The new methods of dry farming techniques, introduction of drought resistant HYV and improvement in the yield levels under light irrigation will certainly do good hope for its successful farming in the district.

Trend of Jowar Crop Area (1962-84):

The regression trend analysis has also revealed that there has been a decreasing trend in the area under jowar cultivation.
in the district. This trend of decrease is confirmed by a low value of 8 per cent coefficient of determination. It indicates that this decline in the area under jowar cultivation has not been highly accounted due to marked yearly fluctuations in its cultivation. To that extent the rate of decrease was marginal accounted for 0.03 per cent per annum. From the figure 7.2a, it is observed that the differences between actual values and trend values are very wide. It indicates that the spatial spread of jowar cultivation is highly fluctuating and differing from year to year.

The trend of decrease is registered in six taluks namely, Cuddapah, Rayachoty, Rajampet, Sidhout, Badvel and Jammalamadugu. A high negative trend is found in Cuddapah taluk in which the rate of decrease is 3.5 per cent per annum. In the remaining taluks the rate of decrease is marginal ranging from 0.6 per cent (Sidhout) to 0.01 per cent (Jammalamadugu) per annum.

An increasing trend in the area under jowar cultivation is found in Kamalapuram, Pulivendula and Proddatur taluks. The rate of increase is high in Kamalapuram taluk accounting for 0.1 per cent per annum.

Spatial Distribution of Bajra Cultivation (1986-89):

Bajra is the inferior foodgrain and forms an important item in the diet of the people belonging to poorer state of society. Bajra claims eighth rank in the district in respect of gross sown area. Bajra is predominantly a kharif crop cultivated both as irrigated and rainfed crop or poorer and light soils. In the high rainfall areas
Cuddapah District

Bajra Cultivation - 1986-89

Index
(as Percentage to the total Cropped area)

- Nil
- < 5
- 51-10
- 101-15
- > 15

FIG: 7-3
where two cropping systems are practiced in an agricultural year, it is one cultivated as an intensive rotation crop.

Bajra cultivation accounts for 2.2 per cent of the gross cropped area in the district. It is significant to state that 56 per cent of the bajra cultivation in the district is under irrigation and much of it is a hybrid variety.

The spatial distribution of bajra cultivation is limited to 72 per cent of the total mandals in the district. With in the areas of its cultivation, the proportion of the crop ranges between a maximum of 19.7 per cent in Porumamilla mandal to a minimum of 0.1 per cent in Pulivendula mandal. High (10.1-15%) and very high ( > 15%) concentration of bajra cultivation are confined to 8 mandals confined to the eastern valley region. In this region the crop is largely cultivated as an irrigated crop. In the north-eastern part of the valley, the high monsoonal rainfall is favourable for its extensive cultivation in kharif.

Moderate concentration (5.1-10%) of bajra cultivation is also confined to six mandals found mostly in the eastern valley region. Low (< 5%) proportion of bajra cultivation is found in 22 mandals distributed over the southern plateau and western plains. In these areas, bajra is cultivated as a rainfed crop.

**Bajra Cultivation (Kharif) (1986-89):**

Bajra is essentially a kharif crop in the district. But it is not a common crop for cultivation in all the mandals of the
district. Its cultivation in the kharif is confined to 66 per cent of the total mandals of the district. Bajra cultivation in kharif season accounted for 2.6 per cent of the total kharif crop area. The highest proportion of bajra cultivation is found in Atloor mandal (38.7%) while the lowest in Pulivendula and Vemula mandals. High concentration of bajra cultivation in kharif is observed in the eastern valley region.

**Bajra Cultivation (Rabi) (1986-89):**

Bajra cultivation is very insignificant in rabi. It is evident from the fact that rabi bajra accounted for 0.1 per cent to the total rabi crop area in the district. In rabi its cultivation is limited to 8 mandals distributed in the eastern part of the district. The maximum proportion of 3.4 per cent is found in the Rayachoty mandal.

**Changing Pattern of Bajra Cultivation (1962-65 to 1982-85):**

The concentration of bajra cultivation has decreased by 2.5 per cent in the 20 years period. In 1962-65, bajra crop accounted for 8 per cent and it decreased to 5.7 per cent in 1972-75 and further decreased to 5.5 per cent in 1982-85. In terms of actual area, bajra cultivation has decreased from 37 thousand hectares in 1962-65 to 22 thousand hectares, showing a net decrease of 15 thousand hectares.

It is interesting to state that the area under bajra cultivation has declined in all taluks of the district. The highest decrease is recorded in the areas where its concentration is high namely, Rajampet, (10.4%), Rayachoty (9.8%), Proddatur (9.3%) and Sidhout (7.3%).
### Table 7.3

**Changing Distribution of Bajra Cultivation in Cuddapah District**

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<td>Sidhout</td>
<td>23.3</td>
<td>23.9</td>
<td>16.0</td>
<td>0.6</td>
<td>-7.9</td>
<td>-7.3</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Badvel</td>
<td>6.8</td>
<td>9.7</td>
<td>6.7</td>
<td>2.9</td>
<td>-3.0</td>
<td>-0.1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jammalamadugu</td>
<td>--</td>
<td>1.0</td>
<td>0.1</td>
<td>--</td>
<td>0.9</td>
<td>--</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proddatur</td>
<td>11.1</td>
<td>0.4</td>
<td>1.8</td>
<td>-10.7</td>
<td>1.4</td>
<td>-9.3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pulivendula</td>
<td>2.5</td>
<td>0.2</td>
<td>0.2</td>
<td>-2.3</td>
<td>--</td>
<td>-2.3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>District</strong></td>
<td>20.8</td>
<td>26.5</td>
<td>20.0</td>
<td></td>
<td>5.7</td>
<td>-6.5</td>
<td>-9.8</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


CUDDAPAH DISTRICT
Trend Of Bajra Crop Area

Scale
Y 1 cm 4,000 hectares
X 1 cm 2 years

Fig: 7.3a
Trend of Bajra Crop Area (1962-84):

The regression trend analysis too has revealed that there has been a decreasing trend in the area under bajra cultivation in the district. This negative trend is accounted by a low value of 10 per cent coefficient of determination. It indicates that the decrease in the bajra crop area is not highly significant because the area under bajra cultivation has been accounting to significant fluctuations as seen in the figure 7.3a. The rate of decrease of bajra crop area is 1.4 per cent per annum in the district. The negative trend in the area under bajra cultivation is found in all taluks of the district.

In conclusion, it may be stated that the interest of the farmers in bajra cultivation is conspicuously decreasing and this trend of decrease is significant in the areas of high concentration of its cultivation particularly in eastern valley region. The competition from more remunerative crops like groundnut and paddy etc., has been increasing, as a result, the bajra crop is gradually losing its ground and significance in the areas of eastern valley of the district.

Spatial Distribution of Ragi Cultivation (1986-89):

Ragi is an inferior foodgrain. It is the staple food for the poorer classes. It is grown in poor soils both as an irrigated and rainfed crop. It is cultivated both in kharif and rabi.

Ragi cultivation accounted for 1.2 per cent to the total gross sown area of the district. But its cultivation was confined to 41 mandals while in the remaining 9 mandals ragi cultivation remained
CUDDAPAH DISTRICT
Ragi Cultivation-1986-89

INDEX
(as percentage to the total cropped area)

- Nil
- \leq 5
- 5.1 - 10
- > 10

FIG: 7-4
practically absent. The proportion of ragi cultivation appears to be widely varied ranging between a maximum of 17.3 per cent in Narsapuram mandal to a minimum of 0.1 per cent in eight mandals.

Moderate (5.1 - 10%) to high ( > 10%) proportions of ragi cultivation are noticed in 8 mandals distributed in north-eastern valley part of the district. In this region, ragi is cultivated as an irrigated crop.

Low (< 5%) concentration of ragi cultivation is found in 33 mandals distributed in all over the district.

Ragi Cultivation Kharif (1986-89):

In kharif season ragi is cultivated as a rainfed crop and it accounted for 0.3 per cent of the total kharif crop area in the district. In this season, its cultivation is confined to 35 mandals with different proportion. The highest percentage of its cultivation is recorded in Porumamilla mandal (9.9%) followed by Obulavaripalli (9%) and Narasapuram (6.8%). In 20 mandals the proportion of ragi cultivation is less than 1 per cent.

Ragi Cultivation (Rabi) (1986-89):

In rabi season ragi is cultivated as an irrigated crop and it accounted for 5.3 per cent of the total rabi crop area in the district. Ragi cultivation is confined to 70 per cent of the total mandals in the district. The highest percentage of rabi cultivation is noticed in Narasapuram (45.7%) followed by Pulivendula (29%), Porumamilla (23.5%), Vallur (20.5%), Obulavaripalli (18.9%), Dadvol
(14.8%), Chakrayapet (14.3%), B. Kodur (12.8%), Ramapuram (12.1%) and L.R.Palli (12%). In this season ragi cultivation is widespread and intensive in eastern valley areas, and southern plateau region.

**Changing Pattern of Ragi Cultivation (1962-65 to 1982-85):**

The percentage variation of the area under ragi cultivation during the 20 years period has been -0.3 per cent only. In hectarage, it decreased from 18 thousand hectares in 1962-65 to 15 thousand hectares in 1982-85 indicating a net decrease of 3 thousand hectares. At taluk level, the decrease in its concentration is recorded in 7 taluks and increase in one taluk.

The highest percentage decrease in ragi cultivation has taken place in Rayachoty taluk (17.1%) due to competition from oil seed crops. The highest increase in the percentage of ragi is found in Badvel taluk (5.4%).

**Trend of Ragi Cultivation (1962-84):**

The regression trend analysis has also shown a decreasing trend in the area under ragi cultivation in the district. This negative trend is confirmed by 50 per cent coefficient of determination. The rate of decrease is 0.1 per cent per annum. This trend of decrease is found in 7 taluks. A high negative trend is noticed in Rayachoty, Cuddapah, Rajampet and Sidhout taluks. In all the taluks the trend of decrease is confirmed by significant value of coefficient of determination. For example, the trend line of Rayachoty is confirmed by 82 per cent coefficient of determination.
Table 7.4

Changing Distribution of Ragi Cultivation in Cuddapah District

<table>
<thead>
<tr>
<th>Taluk</th>
<th>Percentage of Ragi to total cropped area</th>
<th>Percentage variation between 1962-65 and 1982-85</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cuddapah</td>
<td>5.3</td>
<td>4.6</td>
</tr>
<tr>
<td>Rayachoty</td>
<td>17.9</td>
<td>2.0</td>
</tr>
<tr>
<td>Kamalapuram</td>
<td>1.7</td>
<td>1.7</td>
</tr>
<tr>
<td>Rajampet</td>
<td>8.6</td>
<td>6.0</td>
</tr>
<tr>
<td>Sidhout</td>
<td>15.4</td>
<td>14.7</td>
</tr>
<tr>
<td>Badvel</td>
<td>11.3</td>
<td>15.2</td>
</tr>
<tr>
<td>Jammalamadugu</td>
<td>1.1</td>
<td>2.1</td>
</tr>
<tr>
<td>Proddatur</td>
<td>3.7</td>
<td>2.8</td>
</tr>
<tr>
<td>Pulivendula</td>
<td>1.2</td>
<td>1.7</td>
</tr>
<tr>
<td>District</td>
<td>4.1</td>
<td>3.9</td>
</tr>
</tbody>
</table>
CUDDAPAH DISTRICT
Trend Of Ragi Crop Area

Area in Hectares (10000)

Scale

Y 1 cm  2,000 ha.
X 1 cm  2 years

Years

1962  74  84

Fig: 74a
It suggests that ragi cultivation has been losing some ground gradually i.e. from year to year.

The positive trend in the area under ragi cultivation is found in Badvel taluk only. But this positive trend is low and marginal.

It is significant to note that the high concentration of ragi cultivation is associated with the rice dominated areas of eastern valley. Here, it forms a supplementary foodgrain to paddy. But ragi as a supplementary foodgrain is gradually losing its importance in the dietary habits of poor people.

**Spatial Distribution of Small Millet Cultivation (1986-89):**

Small millets are the inferior millet crops which serve as poor man's food in the district. Korra, varagu, samai and other minor millets are referred as small millets. The small millets are cultivated under rainfed conditions in kharif and rabi season.

Small millets accounted for 3.4 per cent of the gross cropped area in the district and occupied sixth rank in the cropping pattern. Cultivation of small millets have been confined to 33 mandals and in the rest of 17 mandals the cultivation is practically absent. The highest percentage of small millets cultivation registered in Simhadripuram mandal (16.2%) followed by Lingal (16.1%), Thondur (12.6%) and Muddanur (11.6%). Moderate concentration (5.1 - 10%) of small millet cultivation is found in 6 mandals located in the north-eastern and western parts of the district.
Low concentration (< 5%) of small millet cultivation is found in 23 mandals distributed in western plains of the district. The cultivation of small millets is practically absent in south-eastern valley region and southern plateau part of the district.

Small Millet Cultivation (Kharif) (1986-89):

Small millets accounted for 4 per cent of the total kharif crop area in the district indicating that it is predominantly a kharif crop grown in low rainfall areas where soils are too poor for the cultivation of other crops. In kharif season the highest percentage of small millet cultivation is found in Muddanur mandal (21%) followed by Lingala (20%), B. Mattam (13%) and Thondur (12.9%) mandals. Significant concentration of small millet cultivation observed in the rain-shadow areas of western part of the district.

Small Millet Cultivation (Rabi) (1986-89):

In rabi, small millet cultivation is negligible and accounted for 0.5 per cent of the total rabi crop area in the district. Small millet cultivation in rabi season is confined to 12 mandals. The highest concentration is found in B. Kodur mandal (7%) followed by Kondapuram (5.1%) and Chapadu (5%) mandals.

Changing Pattern of Small Millet Cultivation (1962-65 to 1982-85):

In terms of percentage variation, small millet cultivation has shown a significant decrease from 12.2 per cent in 1962-65 to 7.6 per cent in 1982-85, showing a net decrease of 4.6 per cent. In terms
Table 7.5
Changing Distribution of Small Millet Cultivation in Cuddapah District

<table>
<thead>
<tr>
<th>Taluk</th>
<th>Percentage of small millets to total cropped area</th>
<th>Percentage variation between</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cuddapah</td>
<td>12.2</td>
<td>3.3</td>
</tr>
<tr>
<td>Rayachoty</td>
<td>1.2</td>
<td>0.8</td>
</tr>
<tr>
<td>Kamalapuram</td>
<td>19.2</td>
<td>12.9</td>
</tr>
<tr>
<td>Rajampet</td>
<td>3.0</td>
<td>0.8</td>
</tr>
<tr>
<td>Sidhout</td>
<td>2.4</td>
<td>0.9</td>
</tr>
<tr>
<td>Badvel</td>
<td>21.0</td>
<td>14.8</td>
</tr>
<tr>
<td>Jammalamadugu</td>
<td>19.4</td>
<td>11.9</td>
</tr>
<tr>
<td>Proddatur</td>
<td>10.9</td>
<td>4.0</td>
</tr>
<tr>
<td>Pulivendula</td>
<td>2.5</td>
<td>23.1</td>
</tr>
<tr>
<td>District</td>
<td>12.2</td>
<td>8.6</td>
</tr>
</tbody>
</table>
CUDDAPAH DISTRICT
Trend Of Small Millet Crop Area

Scale
Y 1 cm 2,000 ha.
X 1 cm 2 Years

Area in Hectares (0000)

YEARS
1962
'74
'84

Fig: 75a
of actual area, the area under small millets decreased from 55 thousand hectares in 1962-65 to 30 thousand hectares in 1982-85, thus registering a net decrease of 25 thousand hectares.

The decrease in the proportion of the area under small millets is recorded in 8 taluks, out of which, Jammalamadugu taluk has registered the highest decrease of 12 per cent followed by Cuddapah (7.8%), Proddatur (7.3%), Kamalapuram (7.2%) and Badvel (6%). The increase in the area under small millets has taken place only in Pulivendula taluk (15.2%).

Trend of Small Millet Crop Area (1962-84):

The trend analysis has also indicated that there has been a decreasing trend in the area under small millet cultivation. This negative trend is accounted by 49 per cent coefficient of determination. The rate of decrease is 0.1 per cent per annum. This trend of decrease is recorded in all taluks except Pulivendula taluk of the district. The trend of high decrease is found in Jammalamadugu, Badvel, Cuddapah and Kamalapuram taluks.

It is observed that the cultivation of small millets has been confining to the rain-shadow areas, very poor soil cover and undulating grounds which are marginal cultivable lands in the district. The changing dietary habits of the poor people, competition from oil seeds and major millets like jowar and improved socio-economic conditions have cumulatively accounted for significant decrease in the area under small millet cultivation in the district. But in the marginal lands of rain-shadow area, the cultivation of small millets
is the ideal crop for utilisation of fallow lands and other wastelands especially when there is a delay or failure in the monsoonal rainfall.

**Spatial Distribution of Pulses and Grams Cultivation (1986-89):**

Pulses and grams are the principal leguminous crops grown in the district. They are grown both in kharif and rabi seasons under rainfed conditions. Their importance lies in that they form an important human diet as well as rich cattle feed. In addition, they are cultivated as green manure crops to improve the soil fertility especially for nitrogen fixation in the soil. Pulses and grams are often cultivated as mixed crops in combination with oil seeds and millets and their cultivation presents an important cyclical trend in crop rotation fostered for soil management. Cultivation of pulses and grams do not require much care and investment.

Pulses and grams occupied sixth rank in the cropping pattern by accounting 3.4 per cent of the total cropped area in the district. The important pulses and grams cultivated in the district are horsegram (56%), redgram (31%) and green gram (12%), and others. The cultivation of pulses and grams is found in 46 mandals and practically absent in 4 mandals. The highest percentage of pulses and grams is recorded in Peddamudiam mandal (9.4%) followed by Narasapuram (9.1%).

High (4.1 - 6%) and very high (≥ 6%) proportions of pulses cultivation is exhibited in 9 mandals. Moderate concentration (2.1-4%) of pulses cultivation is found in 14 mandals. They are all
distributed in the millet and oilseeds dominated areas of western, south-western and northern parts of the district. In these areas pulses and grams are cultivated as interculture crops with oilseeds and millets. This type of mixed cropping is a flourishing agricultural formation in the dry areas where rainfall is low and uncertain, soils are poor and droughts are prevalent.

Low (< 2%) concentration of pulses and grams cultivation is found in 23 mandals distributed in central, southern and eastern parts where paddy, fruit farming and other irrigated crops are predominant in their spatial spread.

Pulses and Grams Cultivation (Kharif) (1986-89):

In the kharif season, pulses and grams cultivation has accounted for 2.9 per cent of the total kharif crop area in the district. Significant concentration of pulses cultivation is noticed in Gopavaram mandal (11%) followed by Peddamudiam (9.7%), Narasapuram (9.6%), Rajupalem (8.9%) and Galivedu (8.6%). In kharif pulses, redgram is a predominant gram cultivated as a interculture crop in groundnut and jowar fields.

Pulses and Grams Cultivation (Rabi) (1986-89):

In rabi season, cultivation of pulses and grams accounted for 6 per cent of the rabi crop area in the district. But its cultivation has been confined to 33 mandals and in the remaining 17 mandals the crop is found absent. The spatial distribution of rabi pulses exhibits a great regional variation ranging from nil to as high
as 39.3 per cent in Vemula mandal. High concentration of rabi pulses is also noticed in Pulivendula (35.1%), Galiveedu (23.6%) and Ramapuram (14.3%) mandals. Horsegram is also an important gram extensively cultivated in the rabi pulses.

Changing Pattern of Pulses and Grams Cultivation (1962-65 to 1982-85):

The proportion of the area under pulses and grams has decreased from 4.4 per cent in 1962-65 to 3.4 per cent in 1982-85, thus showing a net decrease of 1 per cent. In hectarage, the area under pulses has decreased from 19 thousand hectares in 1962-65 to 14 thousand hectares in 1982-85, indicating a net decrease of 5 thousand hectares. The decrease in the concentration of pulses cultivation is noticed in 5 taluks while the increase in 4 taluks. The highest increase is recorded in Rayachoty taluk (4.3%) while the highest decrease in Sidhout taluk (3.4%).

Trend of Pulses and Grams Cultivation (1962-84) :

The regression trend too has shown that there has been a negative trend in the area under pulses and grams cultivation in the district. This negative trend is accounted by 12 per cent of coefficient of determination. The rate of decrease is 0.02 per cent per annum. It indicates that the area under pulses cultivation has been highly fluctuating from year to year as it is seen in the figure 7.6a. The trend of decrease is found in five taluks namely, Badvel, Sidhout, Cuddapah, Rajampet and Jammalamadugu.
### Table 7.6

**Changing Distribution of Pulses and Grams Cultivation in Cuddapah District**

<table>
<thead>
<tr>
<th>Taluk</th>
<th>1962-65</th>
<th>1972-75</th>
<th>1982-85</th>
<th>Percentage of pulses and grams to total cropped area</th>
<th>Percentage variation between</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cuddapah</td>
<td>2.7</td>
<td>1.9</td>
<td>0.7</td>
<td>-0.8</td>
<td>-1.2</td>
</tr>
<tr>
<td>Rayachoty</td>
<td>5.6</td>
<td>6.7</td>
<td>9.9</td>
<td>1.1</td>
<td>3.2</td>
</tr>
<tr>
<td>Kamalapuram</td>
<td>2.2</td>
<td>2.7</td>
<td>2.5</td>
<td>0.5</td>
<td>-0.2</td>
</tr>
<tr>
<td>Rajampet</td>
<td>2.5</td>
<td>1.9</td>
<td>2.6</td>
<td>-0.6</td>
<td>0.7</td>
</tr>
<tr>
<td>Sidhout</td>
<td>4.6</td>
<td>3.9</td>
<td>1.2</td>
<td>-0.7</td>
<td>-2.7</td>
</tr>
<tr>
<td>Badvel</td>
<td>7.8</td>
<td>7.5</td>
<td>7.4</td>
<td>-0.3</td>
<td>-0.1</td>
</tr>
<tr>
<td>Jammalamadugu</td>
<td>5.3</td>
<td>5.0</td>
<td>5.1</td>
<td>-0.2</td>
<td>0.1</td>
</tr>
<tr>
<td>Proddatur</td>
<td>2.7</td>
<td>2.6</td>
<td>3.8</td>
<td>-0.1</td>
<td>1.2</td>
</tr>
<tr>
<td>Pulivendula</td>
<td>1.9</td>
<td>3.0</td>
<td>4.1</td>
<td>1.1</td>
<td>1.1</td>
</tr>
<tr>
<td>District</td>
<td>4.4</td>
<td>4.2</td>
<td>3.4</td>
<td>-0.2</td>
<td>-0.8</td>
</tr>
</tbody>
</table>
CUDDAPAH DISTRICT
Trend Of Pulses Crop Area

Scale
Y 1 cm 2,000 ha.
X 1 cm 2 Years

Fig: 7.6a
The trend of increase is found in four taluks namely, Rayachoty, Proddatur, Pulivendula and Kamalapuram. This positive trend is more conspicuous in Rayachoty taluk.

The study has revealed that the concentration of pulses and grams has been confined to rain-shadow region where millets and oil seeds are predominant. This crop can also be extended to irrigated areas as a rotative crop in paddy fallows. In dry areas of western, northern and southern parts of the district, the crop can be extensively and successfully cultivated as a mixed crop in groundnut and jowar cultivated lands.

Spatial Distribution of Groundnut Cultivation (1986-89):

Groundnut is an important oil seed as well as cash crop cultivated in the district. It is the leading crop in the cropping pattern which occupied the first rank accounting 42.2 per cent of the gross cropped area of the district. The crop is cultivated both in the kharif and rabi season under irrigation and rainfed conditions. Groundnut is essentially a kharif crop in the sense that its main concentration is found in kharif. It is largely a rainfed crop and only 13 per cent of its area is irrigated.

The distribution of groundnut cultivation exhibits a great spatial variation ranging from a minimum of 2.4 per cent in Cuddapah mandal to a maximum of 86.8 per cent in Sambepalli mandal. There are 10 mandals namely, Sambepalli, Ramapuram, Rayachoty, Galiveedu, Chakrayapet, L.R. Palli, Chinnamandem, T. Sundupalli, Vemula and Vempalli have accounted three-fourths of their total cropped area under
CUDDAPAH DISTRICT
Groundnut Cultivation—1986-89

INDEX
(as Percentage to the total Cropped area)

\begin{enumerate}
\item \textless{} 30
\item 30.1 - 40
\item 40.1 - 50
\item 50.1 - 60
\item \textgreater{} 60
\end{enumerate}
groundnut cultivation. High (50.1 - 60%) and very high (≥ 60%) concentrations of groundnut cultivation are found in 18 mandals. All these mandals are situated in southern plateau area and Pulivendula basin where the red and red and black soils, moderate rainfall conditions between 50 cm. and 70 cm. per annum and undulating topographical conditions are the favourable contributing factors for spectacular spatial spread of groundnut cultivation.

Low (30.1 - 40%) and very low (<30%) proportions of groundnut cultivation are noticed in 30 mandals distributed largely in the entire eastern valley, K.C. canal irrigated area of central part north and north-western parts of the district. The preference for the cultivation of groundnut is comparatively less in the irrigated areas of paddy, spices and fruits. Its concentration is less in the very low rainfall zone of north-western part where jowar is the suitable crop.

Groundnut Cultivation (Kharif) 1986-89):

In kharif, groundnut accounted for 46.2 per cent of the total kharif crop area in the district. It occupied the first rank in the kharif cropping pattern. Kharif groundnut is almost a rainfed crop cultivated extensively in the southern plateau area and Pulivendula basin of western plains. Low proportion of kharif groundnut found in the eastern valley area of the district.
Plate 7.2a An intensive cultivation of HYV groundnut in a limited cropland near Kamalapuram.

Plate 7.2b Cultivation of groundnut with high input application under well irrigation near Kamalapuram.
Groundnut Cultivation (Rabi) (1986-89):

The rabi groundnut is largely cultivated under irrigation and as a result it gives generally high per hectare yields than the kharif groundnut. In rabi season, wherever the water supply is sufficient, groundnut cultivation is practiced as a rotation crop in the fields where paddy, bajra, ragi are grown as the first crops.

Rabi groundnut crop accounted for 23.8 per cent of the total rabi crop area and occupied third rank in rabi cropping pattern in the district. The highest concentration of rabi groundnut is found in Chapadu mandal (87.9%). High concentration of rabi groundnut is observed under K.C. canal irrigated area of central portion of the district, some parts of western plains and eastern valley area. In the recent years, some of the paddy fields under K.C. canal irrigation and in the areas of eastern valley have been shifted to groundnut cultivation in rabi season because of remunerative prices and less requirement of water to the crop than paddy.

Changing Pattern of Groundnut Cultivation (1962-65 to 1982-85):

Between 1962-65 and 1982-85, the concentration of groundnut cultivation increased by 7.7 per cent. In terms of hectarage, the area under groundnut cultivation has increased from 99 thousand hectares in 1962-65 to 118 thousand hectares in 1982-85 thus indicating a net increase of 19 thousand hectares. In the last 4 years i.e. from 1982-85 to 1986-89, there has been a spectacular increase in the concentration of groundnut cultivation i.e. from 29.9 per cent to 42.2 per cent, indicating a net increase of 12.3 per cent.
Table 7.7

Changing Distribution of Groundnut Cultivation in Cuddapah District

<table>
<thead>
<tr>
<th>Taluk</th>
<th>Percentage of Groundnut to gross sown area</th>
<th>Percentage variation between</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cuddapah</td>
<td>18.3</td>
<td>20.2</td>
</tr>
<tr>
<td>Rayachoty</td>
<td>38.8</td>
<td>51.9</td>
</tr>
<tr>
<td>Kamalapuram</td>
<td>30.0</td>
<td>34.3</td>
</tr>
<tr>
<td>Rajampet</td>
<td>0.9</td>
<td>3.8</td>
</tr>
<tr>
<td>Sidhout</td>
<td>3.7</td>
<td>3.5</td>
</tr>
<tr>
<td>Badvel</td>
<td>0.5</td>
<td>4.8</td>
</tr>
<tr>
<td>Jammalamadugu</td>
<td>15.5</td>
<td>10.1</td>
</tr>
<tr>
<td>Proddatur</td>
<td>21.4</td>
<td>15.6</td>
</tr>
<tr>
<td>Pulivendula</td>
<td>33.8</td>
<td>25.6</td>
</tr>
<tr>
<td></td>
<td>22.2</td>
<td>23.8</td>
</tr>
</tbody>
</table>
CUDDAPAH DISTRICT

Trend Of Groundnut Crop Area

Scale

$y - 1 \text{ cm} = 10,000 \text{ hectares}$

$x - 1 \text{ cm} = 2 \text{ years}$

Area In Hectares (000)

Fig: 77a
The increase in the concentration of groundnut cultivation is registered in all the levels i.e. at average, the lowest and the highest levels. On an average, it has increased from 22.2 per cent in 1962-65 to 23.8 per cent in 1972-75 and further it increased to 29.9 per cent in 1982-85. At the lowest level of concentration, it increased from 0.5 per cent (Badvel taluk) in 1962-65 to 3.5 per cent (Sidhout taluk) in 1972-75 and a further increase to 3.9 per cent (Rajampet taluk) in 1982-85. At the highest level of concentration, the cultivation of groundnut increased from 38.8 per cent in 1962-65 to 51.9 per cent in 1972-75 and further increased to 62.5 per cent in 1982-85.

The increase in the proportion of groundnut cultivation is recorded in 7 taluks, while the decrease in 2 taluks. The highest increase is found in Rayachoty taluk (23.7%) while the highest decrease in Proddatur (4%) taluk.

**Trend of Groundnut Crop Area (1962-84):**

An increasing trend in the area under groundnut cultivation is noticed in Cuddapah district. This positive trend is accounted by 7 per cent of coefficient of determination. It shows that the actual groundnut crop area is highly fluctuating from year to year. Hence, the trend of increase is confirmed by a low value of coefficient of determination. The rate of increase is accounted for 0.7 per cent per annum in the district.

The trend of increase in groundnut crop area is recorded in 7 taluks while the decrease in two taluks (Proddatur and Pulivendula).
The study has revealed that groundnut cultivation is highly favoured by the farmers of Cuddapah district because (i) it is a cash crop, (ii) it fetches good income, (iii) it is a short growing crop, (iv) the cost of its cultivation is moderate, (v) it has a good market, (vi) it requires less water than any other irrigated crop, (vii) its cultivation is easy, (viii) it is less disease-prone, (ix) the red sandy and red and black soils are more suitable and (x) it can be cultivated under rainfed conditions. Groundnut cultivation has tended to replace millet crops and paddy and some of the minor millets are getting eliminated from the cropping pattern.

Distribution of Sugarcane Cultivation (1986-89):

Cultivation of sugarcane is insignificant in Cuddapah district and it accounted for only 0.3 per cent of the total cropped area in the district. Its cultivation has been confined to only 20 mandals and in the remaining 30 mandals the cultivation of sugarcane is practically absent. Generally, its cultivation is determined by the location of sugar factory than the other factors.

The highest percentage of sugarcane cultivation is found in Chapadu (2.8%) mandal followed by Narasapuram (2.7%), Porumamilla (2.2%), Khajipet (2.1%), Rajampet (1.7%) and Duvvur (1.1%). It is observed that the significant concentration of sugarcane cultivation is noticed around the two sugar factories located near Khajipet and Porumamilla. These two sugar factories are not functioning properly and most of the time they were under lockouts. As a result...
cane cultivation in and around these two factories is also negligible and not very encouraging.

The percentage of sugarcane cultivation is less than 1 per cent found in 14 mandals. The cultivation of sugarcane is practically absent in the rainshadow area of western plains.

**Changing Pattern of Sugarcane Cultivation (1962-65 to 1982-85):**

The concentration of sugarcane cultivation increased by 0.1 per cent in the last 20 years period. In terms of hectarage, the area under sugarcane increased from one thousand hectares in 1962-65 to 2 thousand hectares in 1982-85, showing a net increase of one thousand hectares. The highest increase is recorded in Cuddapah taluk (1.4%) followed by Proddatur (0.9%) and Kamalapuram (0.6%).

**Distribution of Cotton Cultivation (1986-89):**

Cuddapah district is rich in black cotton soil resource and yet, paradoxically enough, has remained insignificant in the area under cotton cultivation. It is due to low and precarious condition of rainfall, subsistence nature of agricultural economy with poor socio-economic conditions of the farmers, low yields per hectare due to prolonged dry spells or complete failure of the crop due to severe drought occurrences, glut in the market conditions and competition from oilseeds and millets. As a result, the area under cotton cultivation is negligible and accounted for 0.3 per cent of the total cropped area in the district.

It is found that the cultivation of cotton is confined to
17 mandals. The highest concentration of cotton cultivation is found in Narasapuram mandal (4.7%) followed by Kondapuram (4.5%), Thondur (1.4%), Pendlimarri (1.4%) and Simhadripuram (1.3%). In these areas the black clay soil is favourable for its cultivation. In all the areas, cotton is cultivated as a rainfed crop.

Changing Pattern of Cotton Cultivation (1962-65 to 1982-85):

There has been a significant decrease in the proportion of cotton cultivation in Cuddapah district. It is decreased by 3.3 per cent between 1962-65 and 1982-85. In terms of hectarage the area under cotton decreased from 17 thousand hectares in 1962-65 to 2 thousand hectares in 1982-85, thus indicating a net decrease of 15 thousand hectares.

The decrease in the percentage of cotton cultivation has taken place in 5 taluks. High decrease is noticed in the high concentrated areas of cotton cultivation of western plains. Jammmlamadugu taluk has registered the highest decrease of 9.8 per cent. Actually the black soils of western plains are rightly suitable for cotton cultivation. Uneconomic and unprotected cultivation of cotton as well as competition from groundnut and jowar crops may be attributed to the considerable decrease of cotton cultivation.

Increase in the proportion of cotton cultivation is very negligible found in 3 taluks. The highest increase is 1.1 per cent in Badvel taluk.
Cotton cultivation has bright prospects in the black soil area of western plains if some of the following inhibiting factors are eliminated through dry farming technology, (i) low per hectare yields, (ii) moisture deficiency adverse effects of prolonged dry spells and droughts, (iii) lack of protective irrigation, and (iv) fluctuations in price structure and glut in the market conditions.

Spatial Distribution of Spices and Condiments (1986-89):

The cultivation of spices and condiments as commercial crops in the district is wide spread. The important spices and condiments cultivated in the district are turmeric, chillies and coriander. The area under spices and condiments accounted for 5.4 per cent of the total cropped area in the district. The cultivation of spices occupied fourth rank in the cropping pattern of the district. Spices and condiments are mostly cultivated under irrigation both in kharif and rabi season.

The distribution of spices and condiments exhibits a great spatial variation ranging from a nil to a maximum of 42 per cent in Peddamudiam mandal.

Moderate (5.1-10%) to high (> 10%) concentrations of spices cultivation are found in 12 mandals distributed in north-western and central parts of the district. Of the spices, coriander is the most important in the northwestern part of the western plains, turmeric under K.C. canal irrigated area and chillies...
CUDDAPAH DISTRICT
Spices and Condiments Cultivation
1986 – 89

INDEX
(as Percentage to the total Cropped area)

- Nil
- ≤ 5
- 51 – 10
- > 10

FIG: 7-8
in the eastern valley area. The spices in these areas are intensively cultivated and are the valuable commercial crops. Coriander is extensively cultivated as a rainfed crop in the north-western part of western plains. Turmeric and chillies are intensively cultivated under irrigation in the central and eastern parts of the district.

Low (< 5%) concentration of spices is noticed in 36 mandals distributed in all over the district.

Spices and Condiments Cultivation (Kharif) (1986-89):

The cultivation of spices and condiments is less significant in kharif season than rabi season. The kharif spices accounted for 1.6 per cent of the gross sown area in the district. The highest concentration of spices and condiments is recorded in Sidhout mandal (16.4%) followed by Vontimitta (13.9%), Pullampet (11.5%), Mydukur (11.2%) and Yerraguntla (10.4%). In the kharif season, turmeric and chillies are important spices cultivated significantly in eastern valley areas.

Spices and Condiments Cultivation (Rabi) (1986-89):

The cultivation of spices and condiments is significant in rabi season which occupied the third rank by accounting 23.6 per cent of the total rabi cropped area in the district. The highest percentage of rabi spices is noticed in Peddamudiam mandal (75%); coriander is the important spices cultivated extensively in north-western region during rabi season.
Table 7.8

Changing Distribution of Spices and Condiments Cultivation in Cuddapah District

<table>
<thead>
<tr>
<th>Taluk</th>
<th>Percentage of Spices &amp; condiments to gross sown area</th>
<th>Percentage variation between</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cuddapah</td>
<td>3.9 3.1 2.1 -0.8 -1.0 -1.8</td>
<td></td>
</tr>
<tr>
<td>Rayachoty</td>
<td>0.5 3.7 0.2 3.2 -3.5 0.3</td>
<td></td>
</tr>
<tr>
<td>Kamalapuram</td>
<td>0.7 0.5 1.6 -0.2 1.1 0.9</td>
<td></td>
</tr>
<tr>
<td>Rajampet</td>
<td>0.2 2.7 1.1 2.5 -1.6 0.9</td>
<td></td>
</tr>
<tr>
<td>Sidhout</td>
<td>4.2 3.7 4.8 -0.5 1.1 0.6</td>
<td></td>
</tr>
<tr>
<td>Badvel</td>
<td>1.8 1.8 2.4 - 0.6 0.6</td>
<td></td>
</tr>
<tr>
<td>Jammalamadugu</td>
<td>0.1 5.5 6.1 5.4 0.6 6.0</td>
<td></td>
</tr>
<tr>
<td>Proddatur</td>
<td>2.2 2.8 5.8 0.6 3.0 3.6</td>
<td></td>
</tr>
<tr>
<td>Pulivendula</td>
<td>1.0 1.3 4.2 0.3 2.9 3.2</td>
<td></td>
</tr>
</tbody>
</table>

District | 1.6 2.2 3.0 0.6 0.8 1.4 |
Plate 7.3a Harvesting of turmeric crop with agricultural labourers. It is an important cash crop among spices cultivated intensively in small sized fields.

Plate 7.3b A view of the orange gardens which are significant in the cropping pattern especially in southeastern region.
Changing Pattern of Spices and Condiments Cultivation
(1962-65 to 1982-85):

Between 1962-65 and 1982-85 the concentration of spices and condiments cultivation increased by 1.4 per cent. In hectarage, the area under spices increased from 7 thousand hectares in 1962-65 to 12 thousand hectares in 1982-85, showing a net areal gain of 5 thousand hectares. Barring Cuddapah, the proportion of the area under spices has increased in all taluks of the district.

The highest increase in concentration under spices and condiments is found in Jammalamadugu taluk with 6 per cent, followed by Proddatur (3.6%) and Pulivendula (3.2%). In the northwestern part of the western plains, coriander is the important spices cultivated with the help of residual soil moisture available in black soils.

Spatial Distribution of Fruit Farming (1986-89):

Fruit farming is a significant commercial farming type which occupied the fifth rank in the gross cropped area of the district. The total area under fruit crops accounted for 4.5 per cent of the total cropped area. The important fruit crops grown in the district are mangoes, plantains, lemons and other citrus fruit crops. Except mangoes, the remaining fruit crops are intensively cultivated under irrigation facilities.

There is a significant spatial variation in the distribution of fruit crops ranging from a nil to a maximum of 47.6
per cent in Penagalur and 47.2 per cent in Kodur mandals.

High concentration (\(>10\%\)) of fruit farming is confined to south-eastern valley area. Here, mangoes, plantains and lemons are important fruit crops cultivated intensively under well irrigation. This zone of fruit farming is not only significant in the district but also in the State as a whole.

Moderate concentration (5.1 - 10\%) of fruit farming is found in 3 mandals namely Vempalli, Pendlimarri and Chinnamandem. Lemon and other citrus fruits are grown in widespread and the cultivation is intensive in those areas.

Low concentration (<5\%) of fruit farming is found in widespread in 36 mandals distributed in all over the district. The fruit farming is very much negligible in the dry areas of western plains of the district due to lack of irrigation facilities.

**Changing Pattern of Fruit Farming (1962-65 to 1982-85):**

The area under fruit farming increased from 17 thousand hectares in 1962-65 to 19 thousand hectares in 1982-85 showing a net areal gain of 2 thousand hectares or an increase of 0.2 per cent in concentration. Except Sidhout taluk, all the taluks in the district have shown an increase in concentration of fruit crops.

The highest increase of 9.7 per cent in the proportion of fruit farming is recorded in Rajampet taluk which is the specialised area in the cultivation of fruit crops. In order to specialise the fruit farming here, Fruit Canning industry was also
Table 7.9
Changing Distribution of Fruit Farming in Cuddapah District

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Cuddapah</td>
<td>2.2</td>
<td>2.1</td>
<td>3.0</td>
<td>-0.1 - 0.9 - 0.8</td>
</tr>
<tr>
<td>Rayachoty</td>
<td>2.9</td>
<td>2.5</td>
<td>4.4</td>
<td>-0.4 - 1.9 1.5</td>
</tr>
<tr>
<td>Kamalapuram</td>
<td>0.7</td>
<td>2.1</td>
<td>1.9</td>
<td>1.4 - 0.2 1.2</td>
</tr>
<tr>
<td>Rajampet</td>
<td>13.0</td>
<td>18.4</td>
<td>22.7</td>
<td>5.4 4.3 9.7</td>
</tr>
<tr>
<td>Sidhout</td>
<td>8.7</td>
<td>5.6</td>
<td>3.5</td>
<td>-3.1 - 2.1 - 5.2</td>
</tr>
<tr>
<td>Badvel</td>
<td>0.7</td>
<td>1.2</td>
<td>1.5</td>
<td>0.5 0.3 0.8</td>
</tr>
<tr>
<td>Jammalamadugu</td>
<td>0.6</td>
<td>0.5</td>
<td>1.0</td>
<td>-0.1 0.5 0.4</td>
</tr>
<tr>
<td>Proddatur</td>
<td>0.6</td>
<td>1.0</td>
<td>0.9</td>
<td>0.4 - 0.1 0.3</td>
</tr>
<tr>
<td>Pulivendula</td>
<td>3.4</td>
<td>5.3</td>
<td>4.7</td>
<td>1.9 - 0.6 1.3</td>
</tr>
<tr>
<td>District</td>
<td>3.9</td>
<td>3.8</td>
<td>4.1</td>
<td>-0.1 0.3 0.2</td>
</tr>
</tbody>
</table>
established in this region. The fertile soils in this valley area are mostly favourable for the cultivation of different fruits belonged to citrus varieties, plantains and mangoes. Lemons, oranges and bananas are intensively cultivated under well irrigation. But in the recent times, the fluctuations in the market especially for lemons and oranges created some sort of unwillingness towards the cultivation of citrus fruits. As a result, the farmers have been marching towards the cultivation of bananas and mangoes. Depending upon rainfall conditions, and irrigation facilities, mango gardens have been spreading to extensive areas of this region. Mango is the most adaptable fruit crop to dry climatic conditions as well as rugged terrain conditions.

**Distribution of Vegetables (1986-89):**

The area under vegetable cultivation accounted for 0.6 per cent of the gross sown area of the district. Vegetables are of several varieties and their huge concentrations are generally observed around urban centres and the areas of good transportation system by virtue of the availability of easy market.

High concentration of vegetable cultivation is found in Mydukur (9.7%), Duvvur (5.3%), Pendlimarri (3.3%), Sidhout (2.7%), B. Kodur (2.7%), B. Mattam (2.6%) and Muddanur (2.3%) mandals.

Significant change either decrease or increase has not been found in the area under vegetable cultivation in Cuddapah district.
Spatial Distribution of High Yielding Varieties:

The innovations and diffusion of the high yielding varieties and new technology have transformed the agricultural scenario in this country. Besides creating a tremendous amount of interest in scientific agriculture, the new varieties and hybrids have had another extremely important effect on Indian agriculture stimulating and creating an opportunity for altered and more intensive cropping system (House, 1972, p. 284). Since the introduction and popularisation of HYV, dynamic changes are taking place not only in the new multiple cropping cycles, but also in fertilisers, plant protection, water use and mechanisation of crop farming.

The cultivation of HYV crops requires heavy investment and protective irrigation. The farmers of drought prone area of Cuddapah district can not afford to take the risk of heavy investment due to low development of irrigation and large scale of rainfed farming. However, in the irrigated and high rainfall areas, the HYV technology envisaged popularisation of the HYV paddy, jowar, bajra and groundnut in the district. As expected the low proportion of cropping in dry areas; the drought prone Cuddapah district has also registered very low percentage of the area under HYV accounted for 9.3 per cent of the gross sown area of the district in 1985. This low proportion is not uncommon because of low development of irrigation, low and precarious condition of rainfall and poor socio-economic conditions of the farmers in the district.
It is observed that HYV cultivation is raised in almost all the taluks in varied proportions. Relatively, the highest proportion of HYV is found in Rayachoty taluk with accounted for 66.9 per cent of the gross sown area. It was followed by Rajampet (45.4%), Cuddapah (30.8%), Sidhout (30.8%) and Badvel (27%). It is interesting to state that significant concentrations of the area under HYV lie in the paddy dominated areas of the eastern valley and K.C. canal irrigated area of the central portion of the district. Recently the introduction of a new HYV JL-24 in groundnut cultivation in Rayachoty taluk has enhanced the spread of HYV cultivation.

Very low concentration of HYV cultivation is noticed in the rain-shadow area of western taluks namely, Proddatur (5.7%), Pulivendula (3.4%) and Jammalamadugu (2.7%). The low and uncertain rainfall, scanty irrigation facilities and cultivation of millet crops and traditional oilseeds are accounted for low concentration of HYV cultivation in the dry zone of western taluks.

Volume of Change in HYVs Cultivation (1974-75 to 1984-85):

The concentration of HYV cultivation has increased from 7.6 per cent in 1974-75 to 9.3 per cent in 1984-85 showing a net increase of 1.7 per cent in concentration. The highest increase in the concentration of HYV cultivation is noticed in Rayachoty taluk (44.2%). It is due to significant change in the cultivation of groundnut from traditional varieties to HYVs and an increase of hybrid paddy cultivation under Pincha medium irrigation project.
Table 7.10
Changing Distribution of HYV Cultivation in Cuddapah District

<table>
<thead>
<tr>
<th>Taluk</th>
<th>Percentage of HYV crops to total cropped area</th>
<th>Percentage variation between 1972-75 &amp; 1982-85</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cuddapah</td>
<td>12.9</td>
<td>17.9</td>
</tr>
<tr>
<td>Rayachoty</td>
<td>22.7</td>
<td>44.2</td>
</tr>
<tr>
<td>Kamalapuram</td>
<td>0.5</td>
<td>3.5</td>
</tr>
<tr>
<td>Rajampet</td>
<td>33.2</td>
<td>12.2</td>
</tr>
<tr>
<td>Sidhout</td>
<td>15.0</td>
<td>15.8</td>
</tr>
<tr>
<td>Badvel</td>
<td>16.7</td>
<td>10.3</td>
</tr>
<tr>
<td>Jammalamadugu</td>
<td>1.9</td>
<td>0.8</td>
</tr>
<tr>
<td>Proddatur</td>
<td>7.6</td>
<td>-1.9</td>
</tr>
<tr>
<td>Pulivendula</td>
<td>0.2</td>
<td>3.2</td>
</tr>
<tr>
<td>District</td>
<td>7.6</td>
<td>1.7</td>
</tr>
</tbody>
</table>
The development of canal irrigation in Cuddapah taluk enhanced the hybrid paddy cultivation.

All the eastern taluks located in the eastern valley are also witnessed with significant increase in the concentration of HYV cultivation due to development of irrigation.

Small increases in the concentration of HYV cultivation are found in western taluks. The decrease in the concentration of HYV cultivation is found in Proddatur taluk (1.9%).

The study has revealed that there has been a clear spatial variation in the adoption of HYVs. The success of the 'Green Revolution' and the various developmental programmes in agriculture have not yet achieved any significant results in the district as a whole. The land under cropping is more in the rain-shadow areas of western plains but the development of hybrid agriculture there is very negligible due to limited irrigation facilities, low rainfall conditions and lack of awareness among the farmers on dry land farming technology. On the whole, the district has not much benefitted by HYV technology. It is quite imperative to develop and diffuse drought resistant hybrid technology as well as dry farming techniques for prosperous agriculture in the district.