CHAPTER VI

STRUCTURAL ATTRIBUTES

The main purpose of this chapter is to draw sequence of cases of previous chapter together in threads to understand the type in a complete and comprehensive way. Structural attributes indicate the leading elements of agricultural production which they are unusually called orientation of agricultural commodities and livestock. Here, the main emphasis is laid on the analysis of landaus orientations resulting into the production of different commodities of crop and livestock production. Structural attributes answer the question like what is proportion between various branches of agriculture i.e., the enterprise combinations, in terms of landuse, gross and commercial agricultural input.
The IGU Commission on Agricultural Typology has proposed seven variables pertaining to structural attributes. They are:


Attribute-22 Percentage of Land Under Perennial and Semi-perennial Crops in the Total Agricultural Land:

This variable refers to the description of perennial crops (trees, shrubs, and vines) and semi-perennial crops (covering land without rotation for several years such as hop and sugarcane) and their proportion in the total agricultural land.

The area under perennial food and commercial crops help in determining whether the particular region is specialized in grain farming, fruit farming or commercial farming in nature. With the limited monsoon rains, irrigation, fertilizer and adaptation of rotational system, farmers are enforced to get maximum products from limited agricultural land in any geographical environment. This is the reason why food and other non-food crops which are non-perennial receive maximum attention.
CHITTOOR DISTRICT
PERENNIAL AND
SEMI-PERENNIAL CROPS (1991-92)

INDEX

10
10-15
15-20
20-25
> 25

Area under perennial crops as percentage of total agricultural land

FIG. 6.1
In Chittoor district land under perennial and non perennial crops amounted to 76,161 hectares which accounted for 11 per cent of the total agricultural land. Chittoor division has the highest proportion of land under perennial and semi-perennial crops which accounted for 21 per cent and it is followed by Tirupati (11%) and Madanapalle (7%) divisions.

The spatial distribution of percentage of perennial crops at mandal level ranges from a maximum of 39 per cent in B.Kothakota mandal to a minimum of 2 per cent in Kurabalakota and Peddamandyam mandals. Though B.Kothakota mandal comes under Madanapalle (Lowest percentage of perennial crops) division but it ranks first position in perennial crop percentage due to local concentration of tamarind tree population.

The high (20-25%) and very high (25%) proportions of perennial and semi-perennial crops are found in 14 mandals distributed largely in south-central part of the district. Here the significant proportion of sugarcane cultivation, mango gardens and high concentration of tamarind tree population together accounted for high proportion of perennial and semi-perennial crops. Moderate (15-20%) proportion of perennial cropping is found in 10 mandals and they are also distributed in southern part of the district.

Low percentage of perennial cropping is found in 8 mandals and they are scattered in distributed throughout the district. Very low percentage of perennial cropland is found in 51.5 per cent of the total mandals and they are mostly located in western, except (Madanapalle and B.Kothakota) northern and eastern parts of the district.
district. In these areas the commercial fruit farming, sugarcane cultivation and tamarind tree population are less significant due to non-suitability of the lands and heavy competition from rotative short duration commercial crops like groundnut, spices and vegetables.

Attribute -23 Percentage of Permanent Grass Land in the Total Agricultural Land:

This variable deals with the proportion of permanent grass lands (including leys within field gross systems and current fallow is used for grazing) in the total agricultural land. It represents the relationship between livestock breeding and the available grazing land. The agrarian structure as presented by this variable, reflects the actual intensity of cultivation of the available land by various sources.

The average proportion of permanent grasslands accounted for 31 per cent of the total agricultural land. Within the district, Madanapalle division has the highest proportion of grassland of 33 per cent. Tirupati and Chittoor divisions accounted for 29 per cent of grasslands in the agricultural land. In mandal-wise distribution, the highest percentage of grassland (59%) is found in Tirupati Rural mandal while the lowest (3%) proportion of grassland in Molakalacheruvu mandal. High (30-40%) and very high (40%) proportion of grassland is found in 36 mandals distributed in northern, north-central and eastern parts of the district. Extensive dry pastures, frequent failure of monsoons, large proportion of current fallows in the upland areas of northern part of the district accounted for higher proportion of permanent grasslands. The high density of livestock population in the eastern region naturally demands higher proportion of grasslands. Moderate (20-30%) proportion of grassland is found in 14 mandals distributed mostly in eastern region.
Area under grass land as percentage of total agricultural land.

CHITTOOR DISTRICT
PERMANENT GRASSLAND (1991-92)

FIG. 6-2
Low (10-20%) and very low (10%) proportion of grassland is found in 16 mandals located largely in south western part of the district.

Attribute-24 Percentage of Land Under Primary Food Crops in the Total Agricultural Land:

The primary food crops include edible grains, tuber, root and bulb crops, vegetables and fruits. The proportion of primary food crops in the total agricultural land generally indicates the nature and orientation of crop farming i.e. into food oriented or market oriented agriculture. And also the emphasis on primary food crops is to indicate the extent and intensity of subsistence type of agriculture. The role of food production in different sub- types is a major factor in identifying agricultural typology.

In Chittoor district, the average proportion of the area under primary food crops accounted for 27 per cent of the total agricultural land which reveals a low level of primary food cropping as per the normalised values of the typological classification. It indicates that the subsistence nature of agriculture is not significant in the district. Among the three divisions, Tirupati division has the highest proportion of land under primary food crops which accounted for 46 per cent while the lowest in Madanapalle division (22%). In Chittoor division the proportion of the land under food crop is also low (23 per cent). There has been a significant spatial variation in the distribution of the land under food crops which is ranging from a maximum of 82 per cent in Nagalapuram mandal to a minimum of 9 per cent in Thamballapalle mandal.

High (40-50%) and very high (50%) percentages of land under primary food crops are noticed in 18 mandals which are mostly located in eastern plains and south
CHITTOOR DISTRICT
PRIMARY FOOD CROPS
(1991-92)

Area under primary food crops as percentage of total agricultural land.

INDEX

\( \leq 20 \)

\( 20 - 30 \)

\( 30 - 40 \)

\( 40 - 50 \)

\( \geq 50 \)

FIG. 6.3
western part of the district. The high rainfall conditions during north-east monsoon, development of irrigation facilities suitable terrain and edaphic conditions and large number of small size of land holdings are together favourable for cultivation of food crops especially paddy cultivation in eastern plains of the district. Cultivation of millet crops especially ragi is significant in south-western part of the district. Moderate (30-40%) food cropped area is found in 9 mandals distributed in eastern and south-western parts of the district.

Low (20-39%) and very low (20%) concentration of food cropped area is found in as many as 39 mandals which accounted for 59.2 per cent of the total mandals of the district. They are located in central, western and northern parts of the district. The spectacular spatial spread of rainfed groundnut cultivation in the upland areas of the western and northern regions and significant proportion of both groundnut and sugarcane cultivation in the central region are together diminished the spatial spread of food crops. In these areas paddy and other foodgrains are cultivated for subsistence purpose only.

Attribute-25: Percentage of Animal Products in Gross Agricultural Output:

This variable refers to the nature and orientation of agricultural production leading to either crop production or animal production. It emphasizes the role of livestock as a part and parcel of agricultural as well as a subsidiary occupation of small and marginal farmers in their agricultural economy. In general livestock population forms an inseparable part and parcel of Indian Agricultural structure. Livestock
CHITTOOR DISTRICT
(1991-92)

ANIMAL PRODUCTS

INDEX

Animal production as percentage of gross agricultural production.

< 5
5 - 10
10 - 15
15 - 20
> 20
enterprise inevitably thrives side by side in regions where either soils are not suitable for cultivation or rainfall is very low and precarious.

The district has got an average of 8 per cent animal production in the gross agricultural output which is considerably very low value when compared with the normalised values of typological classification. There is no significant variation in animal production among the three divisions. Madanapalle and Chittoor division are found with 8 per cent of animal production in the gross agricultural production while in Tirupati it is 7 per cent.

There has been a significant spatial variation in the distribution of animal production at mandal level ranging from a maximum of 67 per cent in Tirupati urban mandal to a minimum of 3 per cent in Thamballapalle mandal. Very high (20%) proportion animal production is found in attracts and encourages the development of milk, egg and chicken production. Two mandals, namely puttur and Vedurakuppam are found with high (15-20%) proportion of animal production. Moderate (10-15%) proportion of animal production is found in 9 mandals.

Low (15-20%) and very low (0%) proportion of animal production in the gross agricultural output is found in as many as 51 mandals which accounted for 77.3 per cent of the total mandals of the district. This reflects the predominant nature of crop production in all over the district and insignificant nature of animal husbandry production orientation. The cattle population are by and large employed for agricultural operations rather than animal production purpose in the district.
Attribute-26: Percentage of Commercial Animal Production in Total Commercial Agricultural Output:

This variable presents the general commercial emphasis of livestock farming as a part of commercial agricultural economy. The commercial animal production includes meat, wool, milk, chicken, eggs, hides, skin, bones etc. Livestock enterprise thrives where the crop farming is precarious and unproductive. The low rainfall, scanty irrigation facilities, presence of large number of small holdings and poor socio-economic conditions of people encourage in taking livestock breeding as a source of income and subsidiary occupation for livelihood.

Even though the chittoor district does not indicate any stage of developed livestock economy contributing for monopolized items of livestock production, but the district has been contributing animal products to a significant extent in the state livestock economy. On an average, the district has 6 per cent of commercial animal production in its total commercial agricultural output, which is very insignificant when compared with the normalised values of typological classification. Among the three divisions of the district, chittoor division has the highest commercial animal production of 7 per cent in the total commercial agricultural output and it is followed by Madanapalfe division with 6 per cent and Tirupati division with 5 per cent.

There has been a significant spatial variation in distribution of commercial animal production ranging from a maximum of 64 per cent in Tirupati Urban mandal to a minimum of 2 per cent in 4 mandals namely, Gangadhara Nellore, Puliherla, Thavanampalle and Peddamandyam. It is significant to state that about 85 per cent (56 mandals) of the total mandals of the district are found with low (5-10%) and very low (5%) categories of commercial animal production in the total commercial
agricultural output. It indicates that the district is predominant in commercial crop production rather than animal production. High (15-20%) and very high (20%) proportion of animal production is found in 5 mandals namely, Tirupati Urban, Kalikiri, Tirupati Rural, Madanapalle and Narayanavaram. In these areas the urban environment naturally demands more commercial animal production because of high consumption as well as high purchasing power of the people.

Moderate (10-15%) proportion of animal production is found in 5 mandals namely, Ramakuppam, Kurbalakota, Kalakada, Kammappalle and Nagari mandals.

Attribute-27: Percentage of Industrial Crop Production in Gross Agricultural Production:

This variable deals with the proportion of industrial crop production used mainly for industrial purposes or requiring industrial processing in gross agricultural production. It indicates the degree of relative strength of the industry related crops and give comprehensive understanding between crop and industry relationship and development. The industrial crop production includes sugarcane, oil seeds, fiber crops and spices and condiments. Baker (1925) and Chisholm (1962) have very appropriately emphasized the relationship between industrial cash crops, transportation and market prices.

It is pertinent to state that the district is significant in industrial crop production which is evident from the fact that the industrial crop production accounted for 56 per cent in the total agricultural production. Among the three divisions, Madanapalle division has accounted for the highest industrial crop production which ranks 62 per
CHITTOOR DISTRICT
INDUSTRIAL CROPS
(1991–92)

INDEX

- < 40
- 40 - 50
- 50 - 60
- 60 - 70
- > 70

Industrial crop production as percentage of gross agricultural production

FIG. 6.6
cent while Tirupati has the lowest industrial production of 40 per cent in the respective gross agricultural outputs. Chittoor division accounted for 58 per cent of industrial production in its total agricultural production. The spectacular cultivation and production of groundnut in Madanapalle division and sugarcane and groundnut production in Chittoor division accounted for large share of industrial production in total agricultural production.

At mandal administrative unit level, there has been significant spatial variation in the distribution of industrial crop production ranging from a maximum of 88 per cent in Peddamandyam mandal to a minimum of 14 per cent in Tirupati Urban mandal. High (60-70%) and very high (>70%) proportion of industrial production is recorded in 31 mandals, distributed in the upland areas of north-western, northern, and transitional areas of central and south-central parts of the district. In all these areas groundnut is the predominant crop. Next to groundnut, sugarcane cultivation is very much significant in the central region where sugar industry is located at Chittoor town. Moderate (50-60%) proportion of industrial crop production is found in 13 mandals distributed in groundnut and sugarcane dominated areas of western and central regions. Low (40-50%) and very low (<40%) concentration of industrial crop production are found in 22 mandals located in the foodgrain dominated areas of eastern plains and south-western part of the district. The geographical environment and the location of sugar industry have had a strong influence on regionalisation of industrial crop production in the district.

Attribute-28: Percentage of Herbivorous Animals in the Total Number of Farm Animals:

This variable deals with the proportion of herbivorous animals including bovines, vines and equestrians in the total livestock breeding. This variable is newly
included as 28th attribute in the typification of agriculture which emphasizes the orientation of animal breeding into herbivorous or non-herbivorous.

In Chittoor district, the herbivorous animal population accounted for 98 per cent of the total livestock population which is a very high proportion indeed. Chittoor division has low herbivorous animal population of 96 per cent. At mandal level, Yadamarri mandal has accounted for the lowest herbivorous animal proportion of 91 per cent and as many as 20 mandals accounted about 99 per cent of herbivorous animal population. In Yadamarri, the development of poultry farming is the chief contributing factor for low percentage of herbivorous animal percentage in total livestock units. It is clear that the district is very rich in herbivorous animal population because of their essential services rendered in agricultural practices and development.

From the above analysis, it is found that different orientations of landuse, livestock and industrial cropping have been noticed with significant spatial variation. Perennial and semi-perennial cropping is very limited and confined to sugarcane, mango and tamarind dominated central region. Permanent grasslands are distributed with low to moderate proportions in the uplands and valley areas of western and central region of the district. The significant foodgrain crop orientation is confined to limited areas of eastern plains where the geographical environment has a profound influence on it. There is low emphasis on animal production in the total agricultural production in all over the district. In the entire district most of the livestock breeding is herbivorous. The orientation of industrial cropping is dominant in the groundnut and sugarcane cultivation areas of western uplands and central valley region.