LIVESTOCK : AN ALTERNATIVE ENTERPRISE FOR SUSTAINABLE AGRICULTURAL DEVELOPMENT IN ANDHRA PRADESH

Y. V. RAMANAIAH, Anantapur

ABSTRACT : Livestock are considered to be a part and parcel of agriculture, but paradoxically, the most neglected branch of Indian agriculture. Today, Mixed farming and diversification of agriculture are recognised as an essential modifications to bring about a redical change and to vitalise the small scale agricultural marketing economy all over the country in general and drought-prone areas in particular. The present paper attempts to highlight the importance of animal husbandry, and its distributional patterns, areal differences and associations in the agriculturally important State of Andhra Pradesh.

INTRODUCTION :

Livestock are of vital significance in the rural agrarian system in all parts of the country. Structurally, livestock are considered as an important part of Indian ag:culural economy. Though India is very rich in livestock wealth in the world but very poor in production economy. The reasons for such a state of affair are not far to seek but may be ascribed as sociological, religious, demographic, economic, political and technological etc. Basically the Indian agricultural policy from the beginning of Five Year plans onwards has been predominantly foodgrain oriented. The traditional outlook, economic backwardness, very poor level of agrotechnification and small nature of farming have prompted the Indian farmer by and large to make use of livestock as draught force rather than dairy or meat stock. Especially, cattle are the best companions to the Indian farmer in the agriculture field by day, and live beside his house or even under his roof, at night (Jasbir Singh,1974). Andhra Pradesh is not an exception to this fact, where majority of the peasant community could never be thought of without draught animals in their farm operations.

The agricultural scene has been changing radically especially with the expansion of dairy and livestock farming during the present century (Chisholm, 1971). The crop production has reached its optimum levels in some of the agricultural pockets in the State. The next alternative for sustainable development of agriculture has to go for diversification of agricultural economy which immediately calls for dairying and livestock development. In dry areas, where the income from crop husbandry is uncertain and inadequate, the developemt of animal husbandry as an alternative agricultural enterprise claims an unrivalled place in affording a fillip to the rural agrarian economy. "Mixed farming is more valuable in an agrarian economy and it makes farmer more progressive in his out look on agriculture" (Jasbir Singh, 1974, p. 264). Thus, the livestock development

has become decisive element in the spread andstrngthening of the regional agriculture. Now, the urgent call for diversification of agricultural economy and the advantage of mixed farming speak volumes on the significance of livestock within agrarian system.

THE STUDY REGION :

The present study region, Andhra Pradesh is one of the States located in the southern part of the country. It ranks fifth both in terms of area and population among the States of the country. About 70 per cent of the working population of the State depends upon agriculture for their livelihood. Hence, the cornerstone of the economic development of the State lies in the development of agricultural sector. The State has diversified physical and socio-economic environment to represent varied crop and livestock systems. Administratively, the State is divided into 23 districts and 1,104 revenue mandals.

OBJECTIVES OF THE STUDY :

The main objectives of the present study are (1) to examine the areal differences in distribution of vaious categories of livestock, and (ii) to identify livestock association regions on the basis of Doi's method.

LIVESTOCK UNITS :

In the case of animal husbandry, it is impossible to find accurate comparisons in the distribution of different categories of livestock with their absolute numbers. Because,the differnt categories of livestock, namely, bovines, ovines, equistrains etc., differ greatly in their requirements of land, labour and capital, and the income which the farmer may derive from them. In order to obtain any comparison, the various species must be reduced to some more or less common denominator (Talman, 1979, p.156). The immediate concept which is

available, on the basis of which the numbers of different animal species may be related one with another on the basis of fodder consumption and compared with other branches of livestock production is called the livestock unit or animal feed unit.

METHODOLOGY ADOPTED :

For the analysis of areal differences in the distribution of various categories of livestock and highlighting the regional interests and importance, the animal feed unit developed by Indian Council of Agricultural Research, 1971 is adoped as criterion for the conversion of absolute numbers into homogeneous livestock units. The concentration of each kind of animal is calculated to the total livestock units of the component areal unit and mapped at mandal level (1104 mandals) for the year 1987 livestock census. Since the proporation of grazing land especially meant for livestock is scanty, the overall density of livestock is calculated to 100 hectares of arable land. The livestock association regions are delineated with the help of Doi's method.

TAXONOMY OF LIVESTOCK AND SPATIAL DISTRIBUTION :

The rearing of livestock in the State consists of bovine population like cattle and buffaloes, ovine population like sheep and goats and other livestock including pigs, horses, donkey's, ponies etc., inclusive of poultry also. In an agricultural economy like the one in Andhra Pradesh, the upkeep of livestock associated with crop farming is most important because of the necessity of draught and milch stock.

The spatial distribution of livestock units is related to many factors such as the suitability of physical environment, availability of fodder, and pasture land, nature of agricultural economy, type of farming, size of land holding,

type of cropping pattern, purchasing power of the people and standard of living, nutritional aspects of people, density of population, transport and marketing facilities, attitude of the farmer, Government policies etc.

DISTRIBUTIONAL PATTERN OF CATTLE UNITS

Cattle includes both cows and bullocks. Cattle are overwhelmingly the most important livestock accounting for 54.2 per cent of the total livestock units in the State. Distinct regional differences in the distribution of cattle units are noticed in the State. High (70-80%) and very high (>80%) proportions of cattle units are found in 462 mandals which account for 47.8 per cent of the total mandals of the State. Very high proportion of cattle units is distributed in the agency areas of East Godavari, Visakhapatnam, Warangal and Karimnagar districts. Here cattle are the main source of energy in the traditional agricultural operations of tribal communities. High proportion of cattle units is distributed heavily in southern and western parts of Rayalaseema, most of Telangana and a small portion in the north Coastal plain. The high concentration of cattle population in the plateau region is due to (i) low rainfall and dry climatic conditions are suitable for cattle population rather than buffaloes, (ii) they can withstand to drought occurrences, (iii) bullocks are the chief source of animal power in agriculture and they are regarded as the consummation of regional agriculture and (iv) cattle are the chief source of milk production.

It is found that varied physical conditions and regional agricultural patterns have vividly brought out a clear distinction in the distribution of cattle population in the State. In agriculturally developed areas of Coastal plains, the importance of cattle as a draught force is insignificant where as in the agriculturally

backward areas of interior parts of the state cattle are the sustainable breeds both for work and milk.

DISTRIBUTIONAL PATTERN OF BUFFALOES

Buffaloes constitute the second most important category of livestock production in Andhra Pradesh accounting for 34.4 per cent of the total livestock units of the State. Buffaloes are reared both for agricultural work and for milk production, however, buffalo as a milk breed is more prevalent and pronouned rather than as a draught animal. When compared with the distribution of cattle, the regional pattern is practically reversed in the case of buffalo rearing. High (60.1 - 80%) or very high (>80%) proportions of beffalo units are noticed in 154 mandals, (13.9% of the total mandals of the State). Out of them, 147 mandals are situated in the Coastal plain, 4 mandals in Rayalaseema and 3 mandals in Telangana. It has shown their akiness to the coastal plains due to favourable humid climatic conditions and plenty of water facilities. The stable irrigated farming, availability of fodder round the year, high density of population and agricultural prosperity, large number of urban settlements, high purchasing power of the people, high standard of living and well communication network etc., are the other favourable socio-economic conditions for overwhelming dominance of buffalo population in the Coastal plain. Moderate (40.1 - 60%) proportion of buffalo units is found in 220 mandals (19.9% of the total mandals of the State). Out of them, 141 mandals are located in the Coastal plain. The environmental conditions of plateau region are more restrictive for the growth of buffalo population. The arid and semi-arid climatic conditions, scanty water facilities, non-availability of fodder round the year for stall feeding are not favourable for high densities

of buffalo production in many parts of Telangana and Rayalaseema. In these two regions where cattle population are more prevalent, the buffalo population is low or very low.

The above study has revealed that the regional pattern of buffalo rearing is conditioned by both environmental conditions as well as the agronomic and production systems. Leaving aside the environment, in general, the concentration of buffaloe population is very close to canal irrigated areas and prosperous and productive agricultural zones.

DISTRIBUTIONAL PATTERNS OF DRAUGHT UNITS

Draught force is mainly confined to bullocks and he-buffaloes. However, bullocks are the predominant draught force units because the he-buffalo has not proved as useful working animal as the bullock. As per the 1987 census, on an average, the draught force accounted for 35.5 per cent of the total livestock units in the State. The regional importance and areal differences in the density of draught force is linked with the nature of the soil, intensity of irrigation, cropping pattern and level of machanisation. High (>60%) proportion of draught force to the total livestock production is found in 31 mandals mostly distributed in the agency areas of north Coastal plain. In the forest belt of agency areas draught force is the chief source of energy for tribal agriculture. Moderately high proportion (40-60%) of draught force is noticed in 426 mandals which account for 38.6 per cent of the total mandals of the State. Out of them, 259 mandals are situated in Telangana, 85 in Coastal plain, and 82 mandals in Rayalaseema. Many parts of Telangana, Western portion of Rayalaseema and upland and forest areas of north Coastal plain are found with moderately high concentration of draught force. Most of these

areas are known for rainfed agriculture. The poor socio-economic conditions of the farmers, extensive rainfed farming, limited pressure on agricultural operations due to cultivation of rainfed crops confining to one season are not favourable and encouraging conditions to go for mechanisation, and hence, most of the peasants try to maintain a pair of bullocks to carry out their agricultural work at low cost.

Here, it is observed that wherever the agriculture is stable, dynamic and progressive, there the modernisation of agriculture has reduced the importance of draught force as chief source of energy in agricultural development. On the other hand, where the rainfed agriculture is more prevalent and agriculture is precarious; the presence of dominant cattle population and poor socio-economic conditions, motivate to continue the draught force in agricultural operations.

DISTRIBUTIONAL PATTERN OF MILCH STOCK UNITS.

The milch stock in the State is chiefly confined to cows and she-buffaloes. Numerically, the she-buffalo is the most important milch breed when compared with cow as it accounts for about 65 per cent of the total milch stock in the State. It indicater that cattle is mainly meant for workforce where as buffaloes for milch stock. The total milch stock units accounted for 26.2 per cent of the total livestock units in the State. High (30-40%) and very high (>40%) proportions of milch stock are found in 296 mandals which account for 26.8 per cent of the total mandals of the State. Out of them, 228 mandals are located in the Coastal plain, 43 mandals in Telangana and 25 mandals in Rayalaseema. It indicates that the Coastal plain, especially the deltaic districts are very significant for milk yielding animals, rather than draught force or other livestock. It is inferred here that she-buffalo is the most
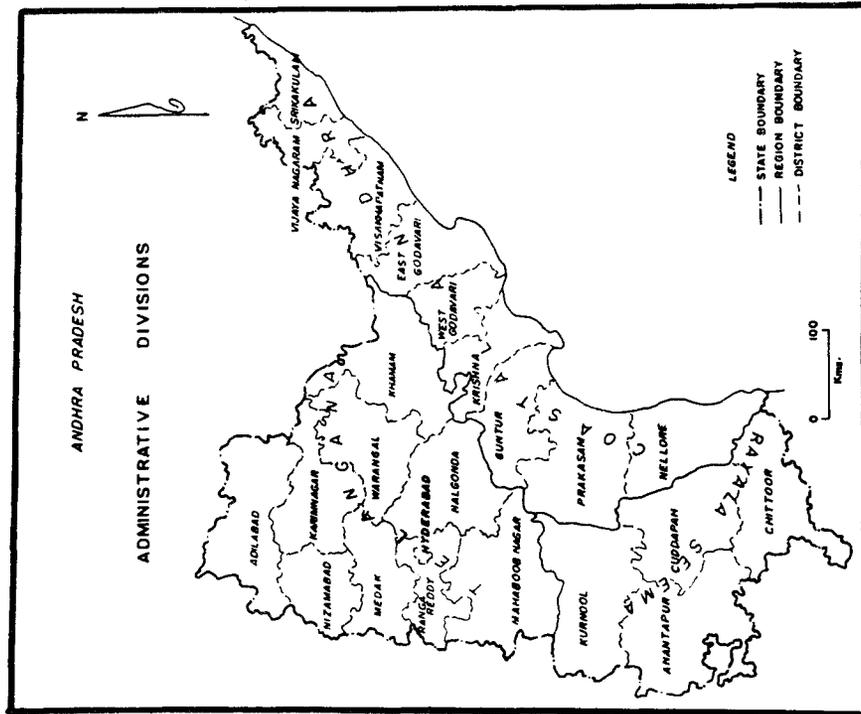
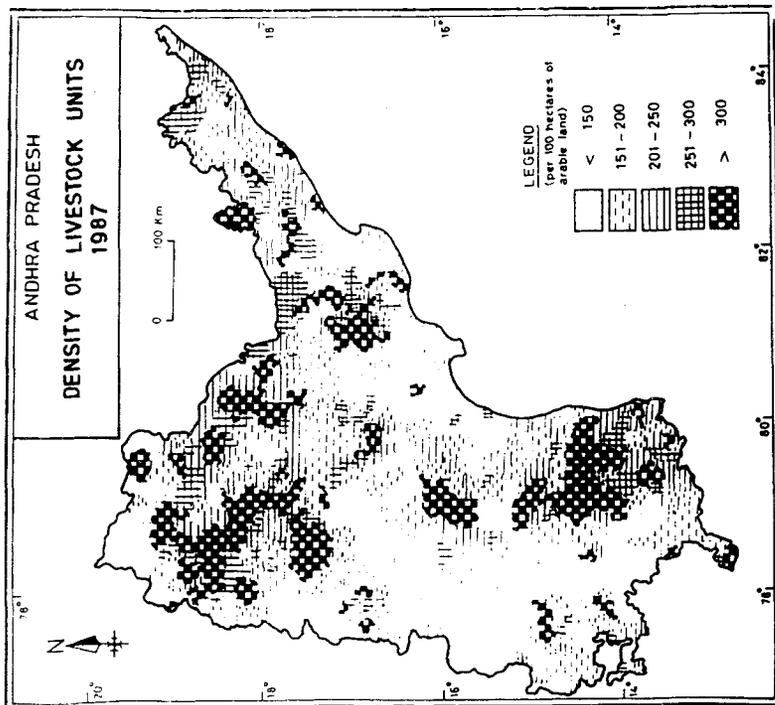**Fig. 1 : Andhra Pradesh - Administrative Divisions**

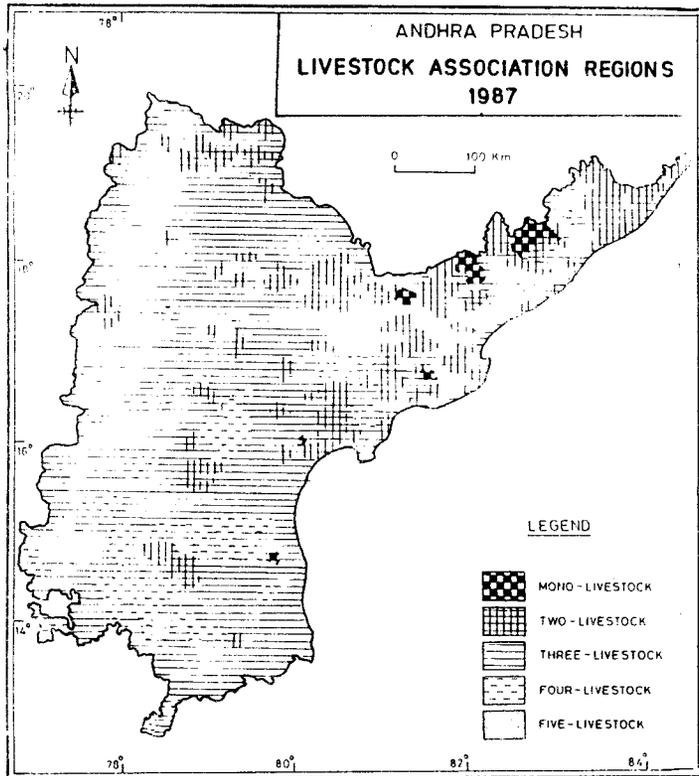**Fig. 2 : Andhra Pradesh - Density of Livestock Units 1987**

Fig. 3 : Andhra Pradesh - Livestock Association Regions 1987

important milk yielding animal in the State. Its pre-eminence in the Coastal plains is unquestionable in milk production. The Coastal plains are identified as the pre-dominant areas of milk yielding animals because of favourable physical, agrogeographical and socio-economic condtions. In the recent years the small-scale house-hold confined dairying has to be excogitated as a subsidary occupation to alleviate the tribulations of the small and marginal farmers in the State.

DISTRIBUTIONAL PATTERN OF SHEEP UNITS

Sheep are more suited to arid and semi-arid climatic conditions and poor grassland vegetative system. They are least affected by fodder famines and seems even to have made sturdy progress in the years of distress. The proportion of sheep units in the total livestock of the State accounted for 5.6 per cent. High (10-15%) and very high (>15%) proportions of sheep units are found in 142 mandals, out of them, 72 mandals are located in Rayalaseema, 41 Telangana and 29 mandals in the Coastal plain. The districts important for these concentrations are Anantapur, Chittoor, Cuddapah, Mahabubnagar and Nellore. The sheep rearing is common in the rain-shadow region of Rayalaseema and southern Telanagana and some upland portions of south Coastal plains. Extensive fallow cover, rough wastelands and dry meadows are the other favourable aspects besides the dry climate for sustainable sheep production. If good breeding facilities are extended, certainly, sheep rearing will become a prosperous agricultural activity of weaker sections in the

drought prone areas of Rayalaseema and Telangana.

DISTRIBUTIONAL PATTERN OF GOAT UNITS

Goats are allied to sheep, but are much harder and more active. In arid and semi-arid areas, goat breeding is more lucrative than the other breeds on account of the low cost of maintenance and their sturdy nature. The goat units accounted for 3.7 per cent of the total livestock units in the State. High (10-15%) and very high (> 15%) proportions of goat units are found in 45 mandals, lut of them, 22 mandals are located in Rayalaseema, 14 mandals in the Coastal plain and 9 mandals in Telangana. The districts important for high concentration of goat units are Anantapur, prakasam, Kurnool, Medak, Chittoor and Nellore. The dry climatic conditions of Rayalaseema are congenial for the development of goat rearing.

DENSITY OF TOTAL LIVESTOCK UNITS

The density of total livestock units is calculated on the basis of arable land but not on grazing land, because the land specifically used for grazing is very meagre. Since the dry fodder consists of the residual material and by - product of the most of non-leguminous and leguminous crops, it is the main source of livestock feed through-out the year, and hence the arable land is heavily supporting the distribution of livestock. The average density of livestock units was 160 units per 100 hectares of arable land in the State. High (251-300 units) and very high (>300 units) concentrations of livestock per 100 hectares of arable land are found in 275 mandals (24.9% of the total mandals of the State). Our of them, 138 mandals are located in Telangana, 96 mandals in the Coastal plain, and 41 mandals

in Rayalaseema. They are distributed in the south Coastal plain, upland areas of north Coastal plain, agency areas of northern part of the State and northern Telangana. The districts important for higher densities of livestock are Karimnagar, Warangal, Nizamabad, Visakhapatnam, West Godavari, Nellore, Cuddapah, Chittoor, Range Reddy, Nalgonda and Adilabad. These areas are the significantly potential areas for the sustenance of large number of livestock units because of high carrying capacity of arable land.

LIVESTOCK ASSOCIATION TYPES

In a subsistence and semi-subsistence agriculutral economy, generally, the farmers extend patronage to several categories of livestock rather than a single one, and hence the concentration on a single class of livestock is uncommon as in the case of crops. In the present study, livestock association types are identified on the basis of Doi's crop combination method. There are five major livestock association types identified in the State with various sub-combinations, on the basis of rank differences of the categories of livestock.

MONO-LIVESTOCK ASSOCIATION

Mono-livestock association is found in 11 mandals distrubuted in Visakhapatnam, West Godavari, Prakasam, Nellore and Khammam districts. Two categories of livestock namely, draught force and sheep emerged as mono-livestock classes. Draught force as a mono-livestock is found in 10 mandals located in the agency area where cattle is the main work force for tribal agriculture. The tribals rear cattle mainly meant for agriculutral work. Sheep as a mono-livestock is found in Sangam mandal of Nellore district.

TWO-LIVESTOCK ASSOCIATION

In terms of spatial spread, the livestock association with two classes of animals is the second most important one, distributed in 176 mandals. Out of them, 118 mandals are situated in the Coastal plain, 42 mandals in Telangana and 16 mandals in Rayalaseems. Draught force as the main category of livestock formed two different sets of association distributed in 90 mandals. Draught force with other bovines is the significant two-livestock association found in 71 mandals, distributed in Srikakulam, Vijayanagaram,Cuddapah, and in the agency areas of Khammam, West Godavari and East Godavari districts. Draught force and milch stock combination is found in 19 mandals in Warangal, West Godavari, khammam and Ranga Reddy districts.

Milch stock as the first ranking category formed two sets of associations distributed in 57 mandals. Milch stock and other bovines association is the most significant one and found in 50 mandals heavily concentrated in Guntur, Krishna, East Godavari and West Godavari districts. In these deltaic areas, the importance is given to the buffalo for milk and next only to the other animals.

THREE-LIVESTOCK ASSOCIATION

In terms of area, three livestock association type is the largest one with 853 mandals (77.3% of the total mandals of the State). Out of them, 399 mandals are situated in Telangana, 273 mandals in the Coastal plain and 181 mandals in Rayalaseema. There are5 types of animals forming 28 different sub-livestock assoications on the basis of rank differences in the proportion of animal categories.

Draught force surpassed as the major type in forming three different sets of livestock associations in 498 mandals. The leading three-livestock association is draught force-other bovines-milch stock found in 308 mandals distributed in Karimnagar, Khamam, Warangal, Nalgonda, Mahabubnagar. Chittoor, Anantapur and Kurnool districts. It indicates that this combination is more prevalent in the plateau region. Draught force-milch stock-other bovines is the second most common three-livestock association found in 180 mandals distributed in Visakhapatnam, Guntur, Kurnool, Cuddapah, Chittoor, Medak, Mahabubnagar, Nalgonda and Karimnagar districts. In these areas more or less equal importance is being given to draught force and milch stock.

Milch stock as the first ranking category of livestock formed 5 different sets of associations found in 167 mandals. Milch stock-other bovines- draught force is the most common combination found in 114 mandals distributed in East Godavari,West Godavari, Krishna, Guntur, Prakasam, Nellore and Chittoor districts. It reveals that milch stock is the most dominant animal category reared in the Coastal districts. Milch stock draught force-other bovines is another association of animals found in 48 mandals distributed in East Godavari, Nellore, Guntur and Chittoor district.

FOUR -LIVESTOCK ASSOCIATION REGION

This region embraces 62 mandals, out of them, 33 are located in Rayalaseems, 23 in Coatal Andhra and two mandals in Telangana. In Krishna and Guntur districts milch stock as the primary livestock formed combination with the association of draught force, other bovines, poultry and goat. The significant four-lievestock asssociation is milch stock with other bovines, poultry and draught force found in Krishna district. Draught force as the primary livestock unit formed combinations with the association

of different animal like goat, sheep, milch stock, and other bovines, most frequent in Rayalaseema districts.

FIVE- LIVESTOCK COMBINATION REGION

This combination is insignificant and found in two mandals located in Anantapur and Chittoor districts. Draught force, milch stock, other bovines, sheep and goat have participated in five-lievestock association.

CONCLUSION :

From the present study, it is found that where the cattle population is dominant in Telangana and Rayalaseema, the main category of livestock may either be draught force or other bovines, next only the milch stock. So in the buffalo dominated areas of the central Coastal plain, milch stock is the primay category followed by other bovines or draught force. On the whole, draught force, milch stock and other bovines are important classes of livestock in forming the livestock associations. The diversified livestock associations are frequent in Rayalaseema and south Coastal Andhra where the physical, agro-geographic and socio-economic conditions are conducive for the growth of heterorgeneous livestock types. Sheep and goat are included in the livestock association only in Rayalaseema and south coastal plain. Although poultry is there in all areas of the State, they are not that sufficient and important to place in livestock combination except in few cases in Krishna and Ranga Reddy districts.

Distinct Regional differences are to be found between the different types of livestock in the State. It is revealed that the state has propituous environment for a plentitude of livestock resources especially cattle, buffaloes, sheep, goat and poultry. The livestock combinations showed that mixed livestock farming is commmon and no one category of animal is ever sufficiently dominant to exclude all other types to from any one type. The mixed character is more clearly revealed by the livestock associations. However, the draught and milch stock types of livestock are most distinctive aspects of livestock associations in many parts of the State.

Since crop-husbandry is unstable, and unproductive in most of the rain-shadow areas of the state, animal husbandry has to be excogitated as an alternative possible primary occupation to improve the economy of these agriculturally backward areas. An agricultural planning aiming at greater diversification of agriculture will certainly offset some of the risks involved in specialisation and monoculture crop farming. At the same time it reflects the new tradition of small-scale marketing agriculture, gainful employment to the farm people and sustainable agricultural development of the region. The diversification of agriculture leading to the development of mixed farming must be brought to lessen the environmental and socio-economic problems and to make maximum use of available bio-diversity for sustainable regional agricultural development in the State. Here the concepts of Green Revolution and White Revolution are to be placed more are less on equal plane and the twins must be made to travel together to achieve the noble destination of the rural economic uplift and balanced regional agricultural development in the State. Any official agricultural policy of the State or Centre may be designed to encourage such a trend of agricultural diversification and mixed farming.

REFERENCES

Chisholm, M. (1971) *Research in Human Geography*, SSRC, p.32.

Coppock, J. T. (1964) Crop, Livestock and Agricultural Enterprise Combinations in England and Wales, *Economic Geography*, Vol.40, pp.65-81.

Doi, K. (1959) The Industrial Structure of Japanese Prefectures, *Proceedings of IGU*, Japan, pp. 310-316.

Gillmor, D. A. (1970) Spatial Distribution of Livestock in the Republic of Ireland, *Economic Geography*, Vol.46, No. 4, pp. 587-597.

Jasbir Singh (1974) *An Agricultural Atlas of India : A Geographical Analysis*, Vishal Publications, Kurukshetra.

Singh, V. R. and Ramanaiah, Y. V. (1979) Spatial Distribution of Livestock and Its Combinations in /Rayalaseema, *National Geographical Journal of India*, Vol. XXV, pp. 118-128.

Talman, O. (1979) Areal Livestock Combinations on Finnish Farms, *Fennia*, 157:2, pp. 155-170.

ADDRESS OF THE AUTHOR

Y. V. Ramanaiah
Reader and Head,
Department of Geography,
Sri Krishnadevaraya University,
ANANTAPUR 515 003 (A. P.)