Chapter – IX

FINDINGS, STRATEGIES AND CONCLUSION

FINDINGS

Koppal district extending over an area of 552495 hectares is situated in the Northern position of the Karnataka State. Physiographically the district is situated in the maidan area. The normal annual rainfall in the Koppal district is 572 mms. All the talukas face drought conditions of atleast twice in a period of five years. The district has 1389920 populations (2011 census) with a density of 254 persons per sq.kms. The district is poor in forest land. The red sandy, loamy and black are the important soil types in Koppal district. The net sown area is 369857 hectares (2010-11) which constitutes 66.94 percent of the total geographical area. Out of the net sown area 30.64 percent (113326 hectares) land is under irrigation (during 2010-11). Out of the irrigated land 35.20 percent is under canal irrigation, 0.20 percent is under tank irrigation, no well irrigation is found in 2010-11, 63.83 percent by tube wells and 0.77 percent by other sources. Jowar, Minor Millets are the important rain fed crops in the district. The Rice, Cotton, Groundnut and Sugarcane are irrigated crops. Bajra, Tur and other Pulses are usually rain fed and dry resisting crops.

Considering the physical background of the district it can be observed that the district is under drought conditions, where, the development of agriculture is very uncertain unless the water resources (surface and underground) are made use at extensive and intensive
level. The soils of the district in most of the parts are very favourable for intensive irrigation. The black soil belt can be used with less irrigation intensity so that such soils can remain without alkalinity and salinity. The district has about 3.16 percent under uncultivable and 18.09 percent under fallow land (during 2010-11) which needs an urgent attention for the economic use. This land can be put to use like forest growth, parks and arable purpose. The technology for treatment of waste land is available which has to be implemented in the district at the earliest.

The intensity of irrigation in the Koppal district indicates a positive trend. However, there is an oscillation of irrigation, to one taluka to another, when compared to 1999-2000 to 2010-11, which is mainly on the type of irrigation and amount of distribution of rainfall. The existing tanks in the district have to be dredged so as to enhance their water storage capacity during rainy season. Such works can be extensively undertaken during drought periods as the funds are released by the government for specific works. There is an increase of net sown area of 19915 hectares as compared to 1999-2000 to 2010-11, thus in the range of 12 years the area under net sown has been increased mainly because of the impact of irrigation development.

As per 2010-11 groundnut is the dominant commercial crop occupying 11.11 percent of net sown area. The next important cereal is Jowar occupying 14.43 percent of net sown area whereas, Bajra with 15.81 percent of net sown area, is the dominant cereal crop. The district shows an increase of 38977 hectares of land as sown more
than once than compared with 91608 hectares during 1999-2000 to 130585 hectares in 2010-11. Thus, this trend to increase is associated with increase of area under irrigation as well as increase for the demand of food requirement etc. The non-existence of monoculture and lesser number of crops combinations (as per J.C. Weaver Method) indicates that Koppal district has remained as subsistence farming region.

Therefore, the study reveals that their is a need to strengthen the cropping pattern by way of introducing new technology for soil and water management, so that the agriculture can lead to commercial grain farming cum commercial non food crops pattern.

The indicators of agricultural development explain about agricultural productivity, efficiency and levels of agricultural development. The results of agricultural productivity as per the Yang (1965) method, shows that Koppal taluka has high productivity (2010-11) in spite of its physical constraints. The Gangavati taluka is placed at medium productivity as compared to Kushtagi and Yelburga talukas stands in low productivity due to physical constraints. This situation can occur when there is some sort of diffusion innovations in Koppal taluka being a district head quarter.

The agricultural efficiency based on several factors shows that there are two talukas under very high efficiency during 2010-11. This indicates that the overall trend of development of agriculture in two talukas is on slow rate and not definitely in a swift change. However, as per V. Vidyanath’s Method the result of arable land use efficiency
for the year 2010-11 show encouraging results, wherein Gangavati and Kushtagi are very high efficient talukas, while Koppal appears to be medium efficient taluka and Yelburga low efficient taluka. The variations in the levels of arable land use efficiency as shown on the map clearly reveals that physical factors like topography, soil, rainfall and irrigation facilities have strong influence both on the net sown area and yield of crops.

Agriculture development is normally associated with regional developments, if the region is strong enough in its social indicators, economic indicators and demographic indicators. Accordingly, Gangavati taluka appears as very high developed (2010-11), whereas Koppal, Kushtagi and Yelburga talukas are medium developed during 2010-11.

The regional disparities in the levels of Agricultural development and agricultural efficiency and agricultural productivity show a positive correlationship. This itself speaks that the regional disparities have some role to play in the agricultural development of Koppal district. In this regard care has to be taken on such talukas which are lagging behind in the overall development. For example, Yelburga taluka need high priority while planning for the development of agriculture and socio-economic development. After careful examination of aspects of productivity, efficiency, regional disparities in the levels of agricultural development, the district is broadly divided by this research study into three regions for the development of agriculture (as well as other aspects) viz.,
1. Prosperous Region : Gangavati
2. Moderate Region : Koppal and Kushtagi
3. Backward Region : Yelburga

It is noted that Gangavati taluka stands prosperous followed by Koppal and Kushtagi talukas as moderate and Yelburga taluka as backward region according the research data analyzed.

Thus, in this thesis chapter on water resources land use and cropping pattern, aspects of agricultural development, infrastructural facilities and regional disparities explain certain clue to consider for further development of agriculture.

The land management, water management artificial rain making, maintaining of ecology development of use of indigenous biotechnology, extension of medical aids for men and animals, spread and growth of literacy, extension of financial assistance to the poor and the farmers of smaller sizes of landholdings and well development of market and transport facility are some of the urgent needs to be tackled in Koppal district on top priority. In this direction the present research study has shown some guidelines in respective chapter.

STRATEGIES

During the last fifteen years in India, since the NCA (National Commission on Agriculture) submitted its reports, attention has generally been directed towards target rather than the goals set by the commission. Agriculture experts have been expressing satisfaction over achieving the prescribed targets for certain crops. For instance, wheat production targets as gone up to well over 76.37 million tonnes.
by 1999-2000 as against for 86.87 million tonnes by 2010-11. Though, the position is satisfactory for rice, the target of 95.98 million tonnes was almost achieved in the year 2010-11. Realization of the target by itself does not solve vital problems. On the contrary, there may be fresh problems. The fact that the production has already surpassed the contemplated target for wheat proves that a production level in excess of what was contemplated by the NCA can be attained. Sadly however, the NCA’s hopes for three important groups of crops – coarse cereals, pulses and oilseeds may not materialize. In coarse cereals, production has been changed around 30.33 million tonnes to 42.22 million tonnes for the last twelve years with increase or decrease depending upon the monsoons. It is the same with pulses with their production around 18.24 million tonnes for the last twelve years.

Thus, in India the per capita availability of pulses is not less than 50 percent of what it was at the time of independence and imports may have to continue to meet the minimum nutritional standards. The NCA had expected a production level of 30.4 million tonnes for coarse grains and 13.8 million tonnes for pulses by 1996-97 which will have to be raised to 38.1 million tonnes and 23.05 million tonnes respectively by 2020 AD. The production thus, laying behind the targets by at least 5 to 8 million tonnes for coarse grains and 10 million tonnes for pulses. On the other hand the capacity to produce 81.1 million tonnes of wheat the target contemplated for 2020 A.D. The NCA’s expectations of 254.35 million tonnes of food grains might
be fulfilled but the country will be left with un saleable surplus, wheat and rice, and huge deficit in certain other crops. The policy makers have laid great emphasis on rain fed areas and production of pulses and oil seeds. The twelfth 5 year plan contemplated only a marginal increase of 5 to 29 million tonnes in cause of these two groups of crops which are predominantly grown under rain fed conditions of India. The position is shaky for oil seeds also, that is why technology mission has been initiated for their production by introducing the new technology.

In India progress of agriculture during the last 40 years can be classified under three broad areas: First considerable progress has been made in developing the research and educational infrastructure essential for the development and testing of technologies suitable for the different agro ecological regions. There are number of agriculture universities, at least one in each state and there are many central institutions, national bureaus, and all India coordinated research projects, dealing with crop husbandry, animal husbandry fisheries and forestry.

Secondly, a reasonably efficient input production and delivery systems has been developed. Thus there are fairly effective instruments for knowledge and skill transfer, credit supply and production and distribution of seeds, fertilizer and other inputs.

Thirdly, the policies essential for stimulating higher production by small farmers and increased consumption by the rural and urban, poor have been gradually evolving.
Lastly, the following enlisted programmes are to be undertaken in Koppal district.

Widespread use of underground water, increase of lift irrigation along the river bank of Tungabhadra should be taken. The water should be used preferably as sprinkled irrigation and drip irrigation so as to avoid wastage of water as well as consequent effects like degradation of soil structure etc.

Development of dry land farming in district should be undertaken as per the guidelines ICRISAT. This will ensure to utilize heavy wastage of rain water and thereby also reduce soil erosion. This type of practice is to be limited to dry land crops like Jowar, Bajra, Minor millets, Groundnut, etc., surely not for wet crops like Sugarcane, Rice, etc. The stored water in the “Farm Ponds” should be used only when rains fails. In this regard except the irrigated talukas and heavy rainfall talukas the rest of the talukas in Koppal district are very well suited.

**Controlling Soil Erosion**

Though bunding and terrace cultivation should be encouraged in the suitable areas of the district for which the departments of agriculture should take lead to finance and diffuse the ideas.

**Artificial Rain Making**

During South West monsoon season the moisture laden clouds which are moving towards east at a speed of 40 to 60 kms per hour usually do not downpour in the rain shadow region of the district. This situation happens due to nonexistence of vegetation covered hill
ranges. Therefore, this type of situation creates uncertainty of distribution and occurrence of rainfall. Hence, in order to get rainfall from such moisture laden thick clouds an artificial rain making is very essential. Though, this involves lot of financial expenses but it become unavoidable to mitigate the need of moisture to the crops.

**The Maintaining of Ecology**

The ecological imbalance can be reduced in the district, if social forestry is undertaken in all those areas where wastelands exist. The quick growing plants species have to be used even on the farm boundaries roadsides, hills slopes and in the existing forest lands of Koppal district. This programmes is undertaken on a massive scale can surely boost the ecological development and thereby it will result in stopping soil erosion to some extent, development of micro level and other related ecological and environmental aspects.

**Extensive use of Modern Technology**

In the entire Koppal district most of the farmers are still using the age old agricultural implements which do not provide an efficient and effective result in deriving higher agricultural outputs from the soil. The Indian agricultural universities and various other scientific organizations like ICRISAT and ICAR have already come out with such forms of tools that can be used even by the poorest farmers who possess the smallest land holdings.

Secondly, the farmers in the district though they are illiterate can be trained in using the modern implements and other agricultural inputs for which a scientist (with B.Sc. agriculture science) should be
appointed to look after the farm and the farmers in an area covering a radius of or for every 10,000 population. Further, the increase of agriculture productivity in the district can be increased it’s indigenous bio-technological researches is intensively carried in different parts of the district in order to suit the local ecology of the areas.

**Need for Increase of Literacy**

It is another target to be achieved in Koppal district. The general literacy of Koppal district is 68.09 percent. This rate is lower than the state average of 75.60 percent. However, it is not a factor to be satisfied. Therefore, creation of awareness in every farmer is needed by making him literate. If the literacy is widespread in the district it will indirectly give yields in the form of higher agricultural efficiency through farmers. In this regard adult education programme which is already undertaken should function effectively to educate rural illiterate farmers. They should be made aware of the importance of modern technology.

For the regional developmental at the higher levels in the hierarchic systems, intercity linkages are more important, and in lower orders urban, rural links are more important. The impact of primacy (dominance and hence the shadow effect) of the metropolis does not percolate to all levels in the hierarchy. The primacy is related to the whole system or sub-system, and can be reduced through regional development policies. Larger villages have the potential to function has service centre to the adjoining rural areas. These attributes of the settlement system need to be explicitly recognized in
allocating investment for development of infrastructures along with plans to provide economic base, which is necessary to sustain the infrastructure for better living. Economic base need not always be equated with industry.

**Commercialization of Agriculture**

If properly harnessed the water of Tungabhadra river could contribute to the improvement in the economic states of the people of Koppal district. There is empirical evidence to show that some of the positive tendencies towards urban, rural continuum exists, at least in the commercialized irrigation farming regions and within the higher order urban fringes. Therefore, Koppal district needs the strengthening of marketing system and transport system for which the rural service centers have to be considered as the nodal and focal points to develop and diffuse the agricultural changes in the district.

For periodical examination (at least once in five years) of the agricultural situations, right from grass root levels needs an inventory of village wise data. This scheme should be under-taken as early as possible. So, that accurate and adequate measures can be undertaken at an appropriate stage to correct the mistakes being done in the farm management, crop productivity etc.

Therefore, we must have a computerized system of data bank on various aspects of agricultural of each village and of each land holding. Such data will be immense use to the geographers and to other scientists who are interested in the development of agriculture, regional planning.
Thus, the length of comprehensive study carried out in this thesis indicates that Koppal district will emerge as a commercial farming area especially in canal and lift irrigation parts. In rainfed areas thrust will be made by the farmers on high yielding varieties based on micro bio-technological results.

It is hoped that, this type of study will certainty give enough clues about problems and prosperities of agriculture and rural development of micro level areas. Therefore, it is anticipated that the present research endeavors will certainly add to the knowledge of regional dimensions of agriculture of India in general and Koppal district in particular.

CONCLUSION

Interesting element is that rural population is declined due to migration from rural to urban area. The highest rural population is found in Yelburga taluka (94.46%) followed by Kushtagi (91.26%), Koppal (78.99%) and Gangavati (75.07%) talukas of the district. In density of population and Land Population ratio and sex ratio of the Gangavati taluka in Koppal district is highest in the study region. Koppal district stands 25th rank in terms of literary rate according to 2011 census. Highest literacy is found in Koppal taluka (70.58%) of the study region. Yelburga taluka (76.50%) exhibits highest population engaged in primary activity as well as highest agricultural labourers are found (47.60%) in this taluka of the Koppal district.

The visit of these four villages and discussions with farmers revealed that, they are need of bank loan with high subsidy. High
prices for their agricultural products, supply of fertilizers, pesticides at subsidized price from the government and also modern agricultural utensils with very low cost. The people of these villages also need primary health centre, veterinary hospital, depot for purchase of fertilizers, pesticides and new variety of seeds and location of commercial bank in their villages. This type of micro level sampling study will give the general clue to understand the landuse and agricultural aspects of the study in particular villages, the taluka, the district and the state in general.

Due to the irrigation there will be change in the agriculture, not only in the crop production, but also economic structure of the society. In this respect the study region is not exceptional one. Now a days, farmers have shifted from traditional crop pattern to the commercial farming pattern by irrigating the crops. There will be economic improvement in village or tahasil provided whole or part of the agricultural area of the study region is irrigated by pacewise development.

Conservation and management of soil are also important factors for a stable and sustained agricultural growth. Because of inadequate rainfall it is essential to make use of the underground and surface water resources for agricultural growth. We must also test the water whether it is saline-free or not, if it is saline-free then only we can make use of such water for agriculture development. Because of the fast growth of population and livestock, we have to raise the yields per unit area and we cannot bring new land for agriculture. We must
adopt new methods and technology for the modern agricultural development to meet the food requirement of growing population whatever water is available for irrigation purposes we must use it properly without wasting any type of water resources.

In both the study periods more than fourteen crops were grown in the study region. The ranking pattern of crops changing from one taluka to another taluka indicates the changing importance of crop value and its utility. The crop concentration study helps us to know which are the talukas that can be affected by degradation of the soil ecology and how it can be reduced by changing the range of concentration. The high concentration of crop is associated with high intensity of irrigation and vice-versa. The crop combination analysis indicates no eight and above in the entire study region. As per the J.C. Weaver method the district exhibits monoculture to seven crop combination. It can be noted that lesser number of crops (one or two crops) combination, lower is the taluka irrigated or lower is the share of commercial crops. In case of more number of crops (7 crops) combination, the higher is the talukas is irrigated or higher is the share of commercial crops. The cropping intensity indicates the frequently use of arable land. Higher degree of intensity is created with higher percentage of irrigated land, whereas, the low intensity is well noticed in dry farming talukas. Similarly, the crop diversification is related to quality of soil, amount of rainfall received and percentage of irrigation. Thus, the whole chapter gives us certain clues to work the regionalization of agriculture in Koppal district of Karnataka state.
The agricultural development in Koppal district is co-related with regional disparities. Therefore, it is necessary to reduce the gap of disparity of development from one taluka to another. So that, this may lead to reduce the disparities in the levels of Agricultural Development.

It is hoped that, this type of study will certainty give enough clues about problems and prosperities of agriculture and rural development of micro level areas. Therefore, it is anticipated that the present research endeavors will certainly add to the knowledge of regional dimensions of agriculture of India in general and Koppal district in particular.