CHAPTER VII

SUMMARY AND CONCLUSION

The present research work was designed to test validity of several hypotheses, important among which was the role of physical features and climatic factors in the development and expansion of irrigation and in Aurangabad district. Different physical features characterize the district and it is divided into three physiographic units. Relief features of the district have affected the sources of irrigation. In Ajanta and Satmala ranges, the network of canals has not developed and wells have become dominant sources for irrigation. Godavari basin favours canals and lift irrigation. The whole district depends for its rainfall on southwest monsoon, which is concentrated in a brief period of about fifty days. The annual co-efficient of variation is over 22, which implies a great risk in crop cultivation. This fact clearly underlies the need of irrigation in both kharif and rabi seasons. The district is covered with Shallow and Medium black soils, which vary greatly in texture and depth. These soils give better yield if adequate water supply is made available. The district has high potentiality of groundwater, which can be exploited for irrigation, but deficient in surface water as most of the rivers are non-perennial. Hence, lift irrigation is not feasible in the district.

The demographic aspects are also responsible, to some extent, in influencing the growth of irrigation. The rural density and proportion of cultivators are high in cultivated
as well as irrigated area. However, the density of agricultural labourer is low in irrigated and cultivated area because of the subsistence farming. As evidence suggests that the well is an important source of irrigation constituting 64 percent of the total irrigated area and 33 percent being by canals. Tank and lift irrigation are not feasible in the district. It is found that surface flow methods of water supply are commonly practiced, whereas sprinkler and drip methods are recently adapted. These methods are economic to the water deficient district. The overall intensity of irrigation is high in scarcity zone, moderate in assured zone and low in moderate to moderately high rainfall zone. The percentage of net irrigated area is above 5 percent, which is less than the State's average.

The second significant hypothesis of the present work is to test the association of irrigation development with other inputs used in agricultural activities. The association of major inputs and irrigation has been considered by examining the use of inputs per unit of irrigated area. It is observed that the use of mechanical and bio-chemical has increased in irrigated area. Iron ploughs and oil engines replace wooden ploughs by electric pumps. However, the use of tractor is insignificant. The use of chemical fertilizers and HYV seeds is confined only to the irrigated pockets of the district. The use of said inputs is low in other areas because of seasonal and non-assured nature of the water supply. About 61 percent of the cultivated land is devoid of modern inputs as per computation of composite index of the inputs under study.
The hypothesis relating to influence of irrigation on landuse, is tested by assessing the changes in landuse categories, cropping pattern in general and irrigated area in particular. It is observed that the area under forest is negligible and no change has been recorded in last twenty five years. The area under fallow has decreased but net area sown recorded increase. The cultivated land of the district occupies 55 percent of the total geographical area. The entire cropping pattern seems to be controlled by agro-climatic conditions. However, the advat of irrigation has changed the cropping pattern. The percentage of area under wheat, kharif, jowar, bajara has increased. But area under cotton, groundnut and rabi jowar, etc. has decreased. Wheat ranks first in the irrigated cropping pattern. The area under sugarcane cultivation also shows increasing trend.

The changes in crop combination zones are noted in the district which have also resulted due to irrigation. The crop diversity is high throughout the district. The intensity of cropping has increased and it is high in river basins and low in hilly and drought prone areas of the district. The intensity of cropping is low to moderate in the cultivated area, which reflects the low intensity of irrigation. It is proved by regression analysis that more than 95 percent of the cultivated area under sugarcane and wheat has positive correlation with irrigated area. The area under sugarcane and wheat has increased with increasing irrigation facilities. However, increased irrigated area has not influenced the
hectarage under rice and cotton as correlationship stands negative in the district.

The yields of wheat, jowar, cotton and sugarcane have increased with the development of irrigation facilities as relationship between yields and irrigated area under selected crops stands positive throughout the district.

Of the total cultivated area, under jowar area is 25.66 p.c and under wheat area 22.23 p.c its record high productivity. In case of wheat, productivity is high throughout the district.

However, the performance of districts agricultural productivity due to adoption of irrigation and other associated inputs in terms of yields suggest some improvement. It has been noted in 23 percent of the total cultivated area confined to relatively more irrigated pockets of the district. About 77 percent of the cultivated land recorded low to moderate overall productivity's thereby indicating the urgent need of irrigation facilities and use of modern inputs. High productivity is noted in irrigated areas whereas it is low in the areas having meager irrigation facilities. Therefore, it can be concluded that the development of agriculture in the district is commensurate with the development of irrigation.

In the context of the findings stated above some suggestions for improving irrigated farming and agricultural productivity have been made. They are as follows:
1. Irrigation is the best answer to the problem raised by scarcity of water and therefore, there is a greater need of expansion and improvement in the existing facilities of the irrigation.

2. Physical features, rainfall and soils conditions should be treated as basis for irrigation development.

3. Landuse capability maps need to be prepared for better utilization of land and water resources of the district.

4. Groundwater is the major source of irrigation in the district, therefore, groundwater potentiality should be scientifically assessed and mapped.

5. Groundwater is more dependable than surface water in the district; therefore, its potentiality has to be increased by different measures like contour bunding, percolation tanks and afforestation. This may bring additional land under irrigation.

6. Electric motor pumps are significant water lifting devices, therefore cheap and assured power supply should be made available to the farmers.

7. Canal irrigation is new in most of the talukas, which require knowledge about irrigated cultivation practices.

8. The application of the surface flow methods have some drawbacks and cannot be tolerated in water scarcity area in Aurangabad, therefore, efforts should be made to remove these drawbacks and popularise the new methods like sprinkler and drips.

9. The cropping pattern in the irrigated area has to be altered and crops like fruits, vegetables and cotton should be increased to get more yields. Grass too needs some place
under irrigated farming, which will enable to feed milch cattle for dairy products.

10. According to the estimate made, only 18 percent of the surface irrigation potentiality is being utilized at present. Thus, there is a large scope to bring additional land under irrigation.

11. The efforts are to be taken to popularise the use of mechanical and bio-chemical inputs among the farmers in the district.

12. The irrigation facilities should be equally distributed according to the need of the area. Unirrigated land should be made irrigated by extending and improving existing facilities in order to diffuse the benefits of agricultural development.

13. Moreover, irrigation should be considered not only as security measures but also as a productive measure.