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1. NEED AND IMPORTANCE OF STUDY :

Agriculture occupies the most vital place in India's economy. Over 70 percent of the total population of India is engaged in agricultural sector. Hence, since 1950-51 high priority has been given to agricultural development in all the five year plans. As a result agricultural productivity has gone up in the recent years. But, the progress is not uniform all over the country. The development of agriculture is determined by the physiography and socio-economic conditions of a region. In view of this, it is important to assess the physical factors such as topography, soil, climate and socio-economic factors viz. type and methods of agriculture, irrigation, use of modern inputs, size of holding and their influence on the development of agriculture in the study region. There is positive relationship between irrigation and crop productivity. Therefore, an attempt has been made to highlight irrigation and (it's) impact on crop productivity in the region. "The crop productivity studies are of particular importance in the country like India where food problem is acute and horizontal expansion of agriculture has reached its maximum physical frontiers" (Mohammad and Singh, 1980). The Agricultural production can also be increased by using modern inputs such as, fertilizer, plant protection, HYV etc. But irrigation is the basic input for the adoption of new technology in agriculture. To be successful and well developed, agriculture requires supply of water at regular intervals and in required quantities. Development of irrigation leads to change in the

cropping pattern as well as per hectare yield. It also helps a farmer to take two or more than two crops from the same field within a year and it increases the productivity of the land by transforming the agriculture. In view of this, it is very important to study the spatial variation in the development of irrigation facilities in the study area.

The area selected for present investigation is a small administrative unit of district Satara. It is situated in the upper reaches of river Krishna. Across this river the Dhom dam is constructed recently (1977). By virtue of this, canal irrigation is provided ^{for the} first time to this area.

The region also experiences varied physiographic and climatic conditions from the west to the east (Fig.1.2 & 1.3) resulting in varied agricultural and irrigation practices. There is wide scope to study the above mentioned aspects of agriculture in the region. These aspects have not been studied at micro level so far. It is, therefore, felt that this study can be a modest contribution to the study of irrigation and its influence on crop productivity of this area.

2. OBJECTIVES :

In view of the above present study has the following objectives.

- i) To analyse the spatio-temporal pattern of irrigation facilities.
- ii) To study the sources of irrigation in relation to physiography and climate.

- iii) To ascertain the impact of irrigation on cropping pattern, use of agricultural inputs and crop productivity in Wai taluka.

3. SOURCES OF DATA AND METHODOLOGY :

In order to study the above mentioned aspects, the data have been collected from two sources viz. primary and secondary.

The primary data is collected through intensive fieldwork, for which interview and questionnaire techniques were employed. The villagewise landuse, area under different crops, area under different sources of irrigation are obtained from four Circle Inspectors of Wai taluka. The yield per hectare of the crops grown for 1970-71 and 1985-86 has been collected through the schedules.

The secondary data were collected from the published records like census handbook, socio-economic review and district statistical abstracts.

The data collected through primary and secondary sources were processed and analysed, which are further represented through the tables, graphs and maps. Choropleth technique is used for showing the areal difference in particular elements. It is shown by the density of shading. The village is considered as a unit of study. The study is confined to the period 1970-71 to 1985-86. The selection of villages for sampling was based on stratified random sampling. Whereas the random sampling design is adopted

for the selection of farmers. Interviews were taken of hundred farmers selected from ten percent sample villages. The agricultural productivity is measured by the method of crop yield and concentration indices and ranking co-efficient developed by Jasbir Singh et al.

4. THE REVIEW OF WORK DONE SO FAR :

The geographical studies on landuse, cropping pattern are plenty in India and abroad; but the studies with special emphasis on irrigation are comparatively few. However, irrigation, being an inter-disciplinary study, is also studied by agronomists, irrigation engineers, agricultural economists, administrators and policy-makers.

Carter (1967) has given a synoptic picture of irrigated agriculture of the world. The book contains systematic outline of the history of irrigation methods and brings out different problems connected with them. It also includes the present condition of irrigated agriculture in various regions of the world. 'Water', a year book of agriculture (United States, 1955) contains the information regarding the conservation of water in agriculture, basic principles and problems of irrigated farming. Fakunda (1976) has highlighted studies of irrigation and drainage through out the world. 'India's Water Wealth' by Rao (1975) deals with India's resources development. Kulkarni (1970), an agronomist, tried to highlight the problems of irrigated agriculture. Ganguli (1948) has attempted to explain the economic

→ O.K., but in reference it is not mentioned. Mention is made in I.S.E.C (1976), Bangalore.

effects of irrigation. The Institute of Social and Economic Change, Bangalore (Ed.Nadakarni,1976) has highlighted the impact of canal, wells and tank irrigation, which is based on case studies.

The central and state governments have published different irrigation commission reports (1901-03, 1962-63, 1973). National Commission on Agriculture (Govt. of India, 1976) has published a separate volume of irrigation as a resource development.

Krishnaswami (1939), David Firman (1952), Sinha (1954), Unissa (1962), Shingare et al., (1967-68), Prasad (1968), Chaturvedi (1968) have given regional account of irrigation. Some of the important studies of the previous decade include those by Singh (1974), Sudhakaran (1974), Shanmugham (1976), Dayal (1977), Pawar and Shinde (1979) and Khare (1980).

5. THE DESIGN OF THE WORK :

The whole work is organised into five chapters. The first chapter deals with physical landscape which includes physiography, drainage, climate and soils of the region. The sources and pattern of irrigation are highlighted in the second chapter, whereas the third chapter deals with the general landuse and cropping pattern of the region. The agricultural productivity is analysed in chapter four. The last chapter summarises the findings. The general references are given at the end.

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