INTRODUCTION

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PROBLEM, SCOPE AND PURPOSE

Geography of Agriculture is the study of agricultural activities in a spatial context, it is also includes physical and socio-economics determinants of agricultural activities. In physical environment, Climate in general and faithful in particular play a significant role to determine agricultural land use of a region. In areas of rainfall deficiency, irrigation is significant determinant of crop production. The present study deals with an irrigation development and its impact on agricultural activities.

Irrigation is generally the artificial application of water to the soil for crop production. It encourages the farmer to adopt scientific techniques and go in for more intensive cropping thereby creating new opportunities for a gainful employment. Irrigation can’t be considered for its protective role of insurance against the vagaries of rainfall and drought, but has to be studies in the context of the adoption of high yielding varieties of crops, chemical fertilizers and overall development of agriculture as well.

The District Aurangabad selected for present study is predominantly agricultural. Being the backbone of its economy the stability and development of agriculture in a District Aurangabad depend on the availability of a perennial supply of water for plant growth. The spatial differences in irrigation development are common in Maharashtra in general and Aurangabad district in particular. 1) Average irrigated area in all district 2) Find out the position of the district in the state. The need of irrigation in this district arises in
order to mitigate the uneven distribution and overall shortage of rainfall.

Aurangabad district was under the Nizam’s regime till 1948 and became part of Maharashtra State in 1956. Since 1960 it has been treated as one of the administrative units of the State. This district has been identified as ‘backward District’ by both the National Committee on the development of backward areas (1981) and the working Group on Identification of Backward Areas by Pande Committee (1968). Very few scientific studies on such backward areas by scholars are available. This fact motivated the author to undertake such study.

The aim of the present investigation is to analyse the spatio-temporal development of different modes of irrigation in relation to the physical and demographic setting of the district. The impact of irrigation and associated inputs on land use, cropping pattern and yield. Proposes to be assessed at micro and macro levels. But it must be pointed out that no attempt is made to examine negative aspects like environmental degradations. For the purpose of this study, the impact of irrigation is referred to as spatial changes in land use, cropping pattern and also crop yield. The specific objectives of the present study are:

- To observe the patterns of physical and socio-economic factors that determines the development of irrigation.
- To assess the means and methods of irrigation in the District.
- To analyze the effects of irrigation on general land use and cropping pattern in the area under study.
- To examine the irrigated area under main crops.
- To investigate the impact of irrigation on yield and productivity.
In the light of the above objectives following hypotheses are formulated and proposed to be treated.

- The sources of irrigation are determined by physical factors.
- The development of irrigation mostly depends on the distribution of rainfall.
- Soci-economics factors are also responsible for extension of irrigation in the district.
- The development of irrigation affects the cropping pattern in the region.
- There is noticeable increase in Irrigation facilities and the agricultural productivity in the district.

**REVIEW OF LITERATURE**

There is a fairly long tradition of study and research on agriculture in India by a very wide range of disciplines. Geographers have studied land use, cropping pattern and agricultural regions in general but irrigation studies as such have remained rather neglected by Geographers in Maharashtra.

Among the few scientific studies on irrigation, Cantor’s (1967) is the most important. He had studied history of irrigation, methods and problems involved in it. Besides, he has also examined impact of irrigation on agriculture in different parts of the world. Fukuda (1976) has made comparative studies of irrigation and drainage throughout the world.

“Irrigation, theory and practice” by Michael (1976) offers a comprehensive and coherent account of water resources, irrigation wells, irrigation pumps, water application methods and salt problems
related to agricultural irrigation in India. India's water resource development has been dealt by Rao (1975) in his book “India’s Water Health”. It includes the assessment of water, its present utilization problems, the requirement of water in the future. Problems of irrigated agriculture are highlighted by Kulkarni (1976) as an agronomist. Gadgil (1948) has studied the economic effects of irrigation. In, “Impact of Irrigation” (Ed. Nadkarni, 1979), economic changes analyses according to the sources of irrigation on the basis of case studies.

Krishnaswami (1939), David Firman (1952), Unissa (1968), Chaturvedi (1968), Prasad (1968) and Shingarey (1968) have examined regional account of irrigation with one or all modes and methods of irrigation, their development and effects. Other important studies relating to different aspects of irrigation include those by Singh (1974), Shanmugham (1976) and Dayal (1977). In Maharashtra State, Pawar (1981) has studies impact of irrigation on land use in Krishna basin. More and Mustafa (1984) expressed the need for irrigation in Maharashtra in the context of average rainfall, cultivated area and rural population.

Indian Council of Agriculture Research, New Delhi, has published some monographs, such as irrigation structure (1970). Design and evolution of irrigation methods (1972), irrigation with saline water (1972) and water resources and their utilization in agriculture in India (1973). Walmi reports have also been referred for the present study.
DATA BASE AND METHODOLOGY

The data collected and used for the period 1975-2000 comes both from primary and secondary sources. The primary data is the raw data collected through different sources for which special questionnaire were designed, information collected through various official, farmers and information technology. The broad picture of present pattern of irrigation, land utilization of the district is prepared with the help of secondary data obtained from official statistics from Socio-Economic Review, District Statistical Abstract, District Census Handbooks, Gazetteers, Agricultural Epitomes, Irrigation Epitomes, periodical, Season and Crop Reports published by the Department of Agriculture, Department of Irrigation, Ground water Survey and Development Agency, Maharashtra State. The information is also obtained from the Bureau of Economic and Statistics, the Zilla Parishad, etc. certain data like yields per hectare, consumption of fertilizers, pesticides, insecticides, size of operational holdings and land tenure system, etc. are not available at Taluka Level. Information pertaining to these aspects has been collected through questionnaires, personal interviews, visits to district and Taluka headquarters in the study area. This study pertains to 9 Talukas comprising 1344 villages. It is considered necessary to supplement secondary information by in depth micro-studies at village level. For this purpose, one village from each agro-climatic zone has been chosen. A micro-level study includes plot to plot survey of the land, covering information of relevant aspects such as sources of irrigation and number of wells, their depth and water table, methods of irrigation, and problems pertaining to irrigation.
The data thus collected, through primary and secondary sources, were processed and represented by statistical and cartographic techniques, weightage method is applied for computing intensity of cropping, while index of diversification is used for studying the crop diversification; Weaver’s technique is applied for delimiting the crop combination zones in the region. The productivity of individual crop and overall productivity of agriculture is computed by crop concentration and yield index ranking co-efficient method. Spearman’s correlation technique is used for analyzing the relation between irrigated area and use of major inputs and crop productivity. The regression technique is also applied for showing the correlation between irrigated area and crop pattern yield.

PLAN OF THE STUDY

The study has been organized into Seven Chapters. The First Chapter deals with physical determinants of irrigation and comprises review of relief, climate, water resources and soils from the view point of their suitability for the development of irrigation and agriculture. This is followed by an analysis of relevant demographic factors.

The pattern of irrigation is the subject matter of Second Chapter and deals with the evolution, methods and sources of irrigation in the region. The association of irrigation with mechanical and bio-chemical inputs is analyzed in Chapter Three. The impact of irrigation, in association of other inputs on agriculture landuse has been delineated in Chapter Four. It comprises consideration of the impact of non-arable and arable land, and the cropping intensity. The Fifth Chapter analyses Irrigation and productivity. Case Studies at micro-level, which are incorporated in chapter Six. Finally, brief summary and
conclusion have been presented with meaningful and viable suggestion.

The finding and references are given at the end of each chapter.
REFERENCES


