CHAPTER I

INTRODUCTION

1.1 Importance of the Study

Irrigation has a very important role to play in the development of Indian agriculture. Intensive agriculture based on improved seeds and high levels of fertiliser application, which goes under the current strategy of 'Green Revolution', requires an assured supply of irrigation as a necessary precondition. However, about 75 per cent of India's cropped area depends exclusively upon rainfall, which is concentrated in a few months in the year, and moreover, about 70 per cent of the cropped area receives inadequate or uncertain rain even during the main crop season to allow intensive cultivation.

Irrigation is, therefore, an important pre-requisite for the spread and success of the green revolution - a symbol of agricultural development.

The Fifth Five Year Plan estimated that out of the total cultivable area of 175 million hectares in the country, ultimately about 107 million hectares, that is, only 61 per cent of the total cultivable area of the country can be irrigated by all the sources of irrigation.¹

Thus, it is apparent that irrigation is both a very important and scarce resource in India and its allocation as between uses and users will have significant welfare effects. For this reason irrigation projects are regarded as monuments to the country's economic development, and there is constant pressure on the administration to give high priority to them in the plans.

When the era of planning began in 1950-51, the total irrigation potential already developed was around 22.6 million hectares.\(^2\) Thereafter, additional irrigation potential of 30.9 million hectares has been developed by 1977-78,\(^3\) leaving a balance of 53.5 million hectares (50 per cent) to be developed in the future plan periods.

To create the balance of the irrigation facility in future, one may conceive of a number of alternative irrigation projects which promise to serve the same specific objective, i.e., increased agricultural production, and compete with each other for being selected. A faulty selection of the project will entail enormous loss to the economy where capital is a scarce factor. Though there are often admittedly important social and political factors involved in taking decision on an irrigation

\(^2\)Ibid.

\(^3\)Ibid.; and also see Government of India, Planning Commission, Draft Five Year Plan, 1978-83, New Delhi, 1978, pp. 135 and 137.
project, the economic criteria remain equally important.

For any irrigation project, the ultimate interest is with the productivity or total return to the society of all the resources devoted to it. This is a measure of the social benefit of the project. On the other hand, every one of the individual entities which participate in a project---farmers, organisations, co-operatives or whosoever---is concerned with the return to the resources it contributes. This is the financial return of the project.

Policy makers must be interested in knowing which among the alternative projects generate high social benefits, while participants are concerned about the return to the resources they contribute to the project. This is true whether the resources committed are being invested by the Government directly or by individuals within the economy. The project analysis techniques help in identifying the projects which render maximum return to the growth of the economy as well as to capital contributed by the participants. Of course, "any national investment decision must be a political act summing up the best judgement of those responsible. The function of project analysis is not to replace this judgement; rather it is to provide one more tool (a very effective one, we hope) by which judgement can be sharpened and the likelihood of error narrowed."4

In a country like India where water as well as capital resources are extremely scarce, the importance of economic evaluation of irrigation projects can hardly be over-emphasised.

1.2 The Problem

The problem dealt with in this study has two facets. The first deals with the development and application of a proper criterion for the study of social benefit-cost and the financial profitability of irrigation projects.

The criterion for the economic evaluation and choice of irrigation projects for investment by the Government underwent basic change in 1964. For almost a century prior to 1964, the traditional method of choice of public investment in irrigation projects in India was the possibility of a specified rate of return on capital invested. However, dissatisfaction with this criterion of selection had been frequently voiced in the past mainly on the ground that many indirect benefits to the country and the Government were unaccounted on the credit side making it too rigorous a test. A new alternative approach to the

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The economics of irrigation began with Gadgil's study on the economic benefits of the Godavari and Pravara Canal in the early 1940s. The first systematic attempt at spelling out social benefit-cost measure of a proposed irrigation project was the Hirakud study. This was followed by a series of five studies sponsored by the Research Programmes Committee of the Planning Commission. The results of these were summed up by the Committee of Direction of the R.P.C. which recommended the benefit-cost ratio criterion and the detailed method for this, which was subsequently officially accepted and adopted, and the financial productivity criterion of the past was finally abandoned. Besides these, a large number of studies have been made on this aspect by individual scholars, financial institutions and Government Departments, not all of which are published.

The recent discussions on this aspect and a review of this literature, which we undertake in Chapter II,

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bring out two important points: (1) The method of estimating the social benefits and costs, and consequently the procedure for calculating the benefit-cost ratios of the irrigation projects adopted in India, reveal certain inconsistencies and errors. (2) Moreover, the exclusive concern with social benefit-cost calculus has resulted in attention not being paid to the possibility of financial returns to the investment in the projects, the possibility of different types of farmers finding it possible to use water profitably, and their ability to bear the cost of irrigation. This has been noted and emphasised by the financial institutions which finance private (including co-operative) investment in irrigation, but it has been completely neglected in public irrigation projects.

In the present context, therefore, it should be of some general interest to review the current method of economic evaluation of irrigation projects in India and suggest improvements in the methodological framework adopted in estimating the benefit-cost ratios and financial profitability of proposed irrigation projects.

The second aspect of the study relates to the problems faced in the formulation and implementation of lift irrigation projects in the dry agricultural regions of Maharashtra, projects which we propose to study to apply the proper project evaluation techniques.

Maharashtra is one of the states with a
dry agricultural region, and with less irrigation potentiality than any other state. The Irrigation Commission (1972) pointed out that water resources over a large part of the State were extremely limited compared to the needs of irrigation and that it would be possible to bring under irrigation only 30 per cent of the net cultivated area after tapping all the surface as well as underground water resources, of which about 67 per cent is exclusively from surface irrigation. In view of these limitations it would be necessary to utilise all the surface water resources by installing lift irrigation schemes on rivers, rivulets, etc. In trying to make best use of the available sources of water at the quickest possible time, great emphasis has been put on lifting water from rivers and streams with the help of pumps to irrigate neighbouring lands. Large amount of public and private funds are currently tied up in such projects. The Land Development Bank, Agricultural Refinance Corporation, Commercial Banks, etc., are playing an important role in advancing funds to the lift irrigation schemes.

It is, however, felt that the execution and working

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of these projects have in many instances turned out to be highly unsatisfactory. Many schemes have remained incomplete inspite of the receipt of the necessary finance; in other instances, the full capacity of schemes which have been completed and are in operation have not been utilised. Some schemes have been locked up after the physical plants have been put up, while some others have been taken over by the State. Nevertheless, the suitability of lift irrigation projects in general for increasing agricultural production in the State cannot be questioned. The losses involved in such projects make the financing institutions and the State Government hesitate to promote these in still larger numbers. Under the circumstances, it is necessary to examine the possible economics of a few such schemes to highlight the problems faced by them.

1.3 The Objectives

To be precise, the major objectives of the thesis are two-fold: Firstly, to estimate social benefit-cost and the financial profitability of the lift irrigation schemes by improving upon the methodology followed by most of the studies in India so far, and secondly, to study the problems faced in the formulation and implementation of the lift irrigation schemes in Maharashtra State. The following will be particularly taken care of:

(a) To review the present method of economic evaluation of irrigation projects in India
and formulate a proper procedure to be adopted in this study.

(b) To assess the social benefit-cost and the financial profitability of the lift irrigation schemes, and

(c) to highlight the problems faced in execution of the lift irrigation schemes.

1.4 The Plan of Work

This study includes in all ten chapters. The second chapter is devoted to reviewing the current official method of economic evaluation of irrigation projects in India and simultaneously adopt a proper methodological framework for the procedure followed in this study. In the third chapter, we discuss the design of the survey, selection of the lift irrigation schemes and the beneficiaries and the collection of the farm data. In Chapter four, we present important aspects of the economy of the sample farms as revealed by the survey for the selected lift irrigation schemes. In Chapter five, we estimate the financial profitability of the lift irrigation schemes. An attempt is made in Chapter six to assess the designed repayment pattern of the loans of the schemes. In Chapter seven, we estimate the social returns and costs of the schemes and consequently calculate the respective benefit-cost ratios. In Chapter eight, we
examine the question whether the water used by the lift irrigation projects as designed is the best use of the water for irrigation from the social point of view.

In Chapter nine, we highlight the problems associated in the formulation and implementation of the lift irrigation schemes. The tenth is the concluding chapter.