

CHAPTER NO. 2

THEORETICAL BACKGROUND AND METHODOLOGY

2.1 Introduction

In this chapter in the **first Section** we briefly spell out the theoretical background about the economics of irrigation. In the **second Section** we outline briefly the methodology of study adopted in this work.

SECTION I

2.2 (| Successful agricultural production depends on a number of factors. However, nobody can deny the crucial importance of adequate and timely supply of water in agricultural production. Although land and water basically belong to the category of gifts of nature, we have to; remember that across regions quality and fertility of land differ significantly. Moreover, the natural availability of water, continuity of its supply as also adequacy and timeliness of water supply differ across regions and over period. However, it is fortunate for agriculture that irregularity, uncertainty and inadequacy of water supply can be reduced by human efforts to a great extent. This is where the factors of irrigation become very important. It is indeed beyond dispute that irrigation is the most important input in any

programme of agricultural development. Irrigation has the magic power of converting barren tracts into lavishly green and fertile area. In a sense irrigation plays the role of Midas touch in agriculture. According to Prof. Bharadwaj¹ irrigation improves agricultural productivity in three ways namely -

- (1) Irrigation makes it possible to adopt multiple cropping.
- (2) Irrigation increases yield per acre per unit cost.
- (3) Irrigation makes it possible to cultivate more lucrative crops.

It is also to be noted that the element of uncertainty in agricultural production is significantly reduced by the regular availability of irrigation water.

It has been highlighted by Professor Mellor² that investment in irrigation facilities may help in the removal of the economic barrier to profitable application of new technology to agriculture. In fact he pointed out that investment in irrigation coupled with new technology raises the returns to infrastructural facilities in agriculture and also provides the basis of reducing income inequalities in agriculture. Broadly speaking, investment in irrigation and other agricultural infrastructure has the potential of starting an all embracing and egalitarian process of economic

development.

The development of irrigation schemes, therefore, assumes great importance for multi-dimensional progress of agriculture. The importance of irrigation in the development of agriculture hardly needs emphasis. It is, indeed, the very lifebreath of agriculture. Irrigation facilities have decisive bearing on cropping pattern, cropping intensity, crop combinations, the yield per unit of area and to a certain extent the season of sowing and the harvesting period.

It is also observed that the adoption of improved agricultural practices, particularly the high yielding varieties of seeds and modern chemical fertilizers are significantly dependent on adequate irrigation facility. It is generally found that the efforts of Indian farmers of increasing agricultural productivity have failed mainly because of inadequacy or absence of irrigation facility.³ Similar view has been expressed by Prof. D.K. Desai.⁴ In fact some experts have accepted the extent of irrigation as an appropriate index of agricultural development.⁵

In the ultimate analysis the success of agriculture depends to a large extent on appropriate satisfaction of water requirement of various crops.⁵ It is also generally



seen that irrigation by increasing the yield per unit area induces farmers to increase the cropped land area. This will naturally generate greater employment opportunities in rural area. Similarly, increasing irrigation facilitates additional investment in cattle, farm equipment and as a result enables the farmers to adopt a more appropriate cropping pattern in which valuable commercial crops predominate.

Another important effect of irrigation is observed in the substantial increase in the land values. It also causes significant increase in the intensity of landuse.⁷)

It is because of these considerations that we decided to examine in detail the economics of Lift Irrigation schemes (LIS) which constitute the most widely used method of irrigation in Warana area.

2.3 The Objectives of the Present Study

In the study area, as has been revealed in the first chapter, lift irrigation schemes predominate although even now the role of well irrigation is not negligible. In the study area there are mainly four types of lift irrigation schemes, viz.,

- 1 Individually owned Lift Irrigation Schemes;
- 2 Partnership Lift Irrigation Schemes;

- 3 Cooperative Lift Irrigation Schemes;
- 4 Factory-sponsored or managed Lift Irrigation Schemes.

On this background we fixed the following objecties for the present study:

- 1 To make a comparison of investment cost of the four varieties;
- 2 To make a comparison of the operational cost of the four varaties;
- 3 To make a comparative study of the income and expenditure of these four varieties of lift irrigation schemes.

SECTION 2

2.4 Methodology of the Study

For the purpose of this study we adopted the following methodology:

- (1) As pointed out in the first chapter, there are 66 villages coming under Warana area. Out of these 66 villages, we selected 5 villages satisfying the condition that the village concerned has all the four types of lift irrigation schemes mentioned above. This constitutes 7.57 per cent of the villages in the Warana area.

(2) The selected villages are -

- 1 Pargaon,
- 2 Kini,
- 3 Ghunaki,
- 4 Kakhe,
- 5 Tandulweadi.

The villagewise distribution of total number of various types of LIS and the number of selected LIS as a proportion is given in Table No. 2.1 on the next page. It is seen that in the selected villages there are in all 134 individual LISs, 82 partnership LISs, 10 cooperative LISs and 18 factory-sponsored LISs. In other words, the proportion of the selected individual LISs is 3.73 per cent; in the case of partnership LIS 6.09 per cent, in the case of cooperative LIS 50 per cent and in the case of factory-sponsored LIS 33.33 per cent. In other words, the total number of LIS in the selected villages is 244, out of which we selected 21 LISs for the study. The sample of LIS as a proportion of total number of LISs in the selected villages comes to be 8.61 per cent. However, as a proportion of total number of LIS in the Warana area, the sample of selected LISs turns out to be 1.36 per cent. The overall information of the sample is given in Table No. 2.1.

TABLE NO. 2.1
Sample of selected villages and LIS.

1	Par. gaon			Kini			Ghunaki				
	2	3	4	5	6	7	8	9	10	11	12
I	P	C	F	I	P	C	F	I	P	C	F
1. 54	36	1	7	19	13	1	2	33	7	6	4
2. 1	1	1	1	1	1	1	1	1	1	1	1
3. 1.85	2.77	100	14.28	5.26	7.60	100	50	3.03	14.28	16.66	25

1	Kakhe			Tandulwadi				
	13	14	15	16	17	18	19	20
I	P	C	F	I	P	C	F	F
1. 21	20	1	2	2	7	6	1	3
2. 1	1	1	2	2	1	1	1	1
3. 4.76	5	100	50	14.28	16.66	100	33.33	

Notes: 1. Number of schemes.
2. Selected schemes.
3. 2 as percentage of 1.

I = Individual LIS
P = Partnership LIS
C = Cooperative LIS
F = Factory-sponsored or
managed LIS

This may appear to be a very small size of the sample but it is to be noted that the method of sampling is mainly purposive determination by two conditions -

- (1) Selection of that LIS from which it was convenient and easy to get recorded data;
- (2) The selection of the village only when it has all the four kinds of LIS working at the time of the field study. We, therefore, feel that the sample size though quantitatively very small, is qualitatively adequate and appropriate.

2.5 Collection of Data

Primary Data

For collecting primary data, we prepared detailed structured questionnaires after necessary pre-testing for each kind of LIS and they were canvassed with the secretaries of the factory-run and co-operative LIS, with the available partner in the case of individual LIS. The questionnaires were prepared in vernacular and their English versions are attached at the end as Appendix No. 1. The secondary data were collected from -

- (1) Irrigation Department of the Warana Sahakari Sakhar

Karkhana, Warananagar.

- (2) Office of the Deputy Registrar, Co-operative Societies Kolhapur District and Sangli District.
- (3) Office of the Executive Engineer, Irrigation Department, Kolhapur and Sangli districts.

So far as general data regarding socio-economic profile is concerned, the secondary data were collected from District Statistical Abstract of Kolhapur and Sangli Districts, for the year 1981. In the analysis of data we have used mainly the technique of ratio analysis.

NOTES AND REFERENCES

- 1 Bharadwaj, R. - Production Conditions in Indian Agriculture, A study based on Farm Management Survey, Cambridge University Press, 1974, p. 43.
- 2 Mellor, J.W. Report on Technological Advance in Indian Agriculture, IBRD Dec., 1969, p. 6.
- 3 Desai, D.K. - Technological Change and its Diffusion in Agriculture, Indian Journal of Agricultural Economics, Vol. XXI, No. 1., 1966; see also Sen, Sudhir, A Richer Harvest - New Horizons for Developing Countries, Tata McGraw Hill Publishing Co., Delhi, 1975, p. 209, and Arora, R.C. - Development of Agriculture and Allied Sectors - Command Area Approach, S. Chand

and Co., New Delhi, 1982, p. 20.

- 5 Kurulkar, R.P. - Agricultural Finance in Backward Region, Himalaya Publishing House, Bombay, 1983, pp. 16,17.
- 6 Arora, R.C. - Development of Agriculture and Allied Sectors, S. Chand and Co., New Delhi, 1976, pp. 17-36.
- 7 Gadgil (1945). Referred by Jadhav, M.G. Sugarcane cultivation - A regional survey, Himalaya Publishing House, Bombay, 1984, p. 29.