CHAPTER TWO

METHODOLOGY AND CHAPTER SCHEME

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CHAPTER TWO

METHODOLOGY AND CHAPTER SCHEME

This chapter attempts to present the methodological aspects and the analytical techniques used in respect of this study on the economics of water management for agriculture.

2.1 THE PROBLEM:

The development of modern agriculture heavily rests on the adequate availability of water and its appropriate management. In the transitional phase of agricultural development, the strategic input of water is not found at its best use. In view of the inadequacy and uncertainty of rainfall, waste of water resource is posing a serious but less realised problem for the development of agriculture. In this regard, this chapter deals with the objectives of the present study along with the methodological aspects of the presentation with the details of the chapter scheme.

2.2 OBJECTIVES:

(i) The first major objective of the study is to identify the nature and quantum of the availability of water resource in the country, nature of their utilisation and management.
The second major objective of the study is to examine the nature and extent of under-utilization of the created irrigation potential which is one of the major problems in the development and utilization of water resources. Besides, in this regard in respect of Gujarat the following aspects have been examined.

(a) What is the nature of the availability of water through rainfall in respect of Gujarat state?

(b) The irrigation potential created and its utilization in respect of major and medium projects

(c) The forces responsible for the under-utilization of irrigation.

The third major objective of the study is to deal with the need, scope and features of warabandhi system of water management.

Finally, to ensure the required increase in efficiency in the use of water resources, important policy implications have been traced, so as to evolve a well-planned use of irrigation water economically and carefully.
2.3 METHODOLOGY:

The different categories of data are collected and used for the analysis of the thesis.

Primary data:

To inquire into the working of the warabandhi system of water management at farm level, primary data are collected by conducting a field survey with a suitably designed questionnaire, which contained qualitative informations obtained in terms of attitudes and opinions of the farmers' views on the availability of canal facilities, the nature of water supply, its availability and the use thereof, the disputes in water distribution system, canal water rates etc, were also obtained. The informations so gathered were used to examine the need for the effective and efficient utilization of water through warabandhi system.

Secondary data:

In respect of different water management practices the necessary secondary data were also obtained from the various published sources viz., (i) various publications of the Bureau of Economics
and Statistics, Government of Gujarat, Gandhinagar, (ii) various micro level studies completed by the Research Cell of the Department of Economics, Vallabh-vidyanagar, (iii) various plan drafts of the Government of India, as well as of the Government of Gujarat, (iv) various publications of the Central Board of Irrigation and Power, New Delhi, etc.

Data on the irrigation development, irrigation potentiality and its utilisation are available for 1951 to 1984 for the Gujarat State, while for minor irrigation in the State the data are available for 1961 to 1983. For medium and major irrigation projects the analysis of districtwise irrigation potential and utilisation of the Gujarat State are based on the data related to 10 year period from 1973-74 to 1982-83. All these data are obtained from the various Government publications. Moreover, to study the impact of the working of the warabandhi system at farm level, the available data have been obtained from the Research Cell of the Department of Economics, Vallabh Vidyanagar. It may be mentioned here that the original data were manually processed in the Cell.

Besides, to obtain data and related information for some of the irrigation projects the various authorities of the different offices and circle offices

2.4 A MICRO-LEVEL STUDY, THE ORGANIZATION OF:

In respect of a micro-level study of water management, the discussion is divided in two parts. The first part discusses the impact of the working of the warabandhi system at farm level. It is based on the secondary data obtained from the Research Cell of the Department of Economics, Vallabhbh Vidyanagar for the period of 1983-84 and 1984-85. In this regard, it was found necessary to mention that during the summer season of the above mentioned years, the study area was personally visited along with the investigators of the Research Cell of the Department of Economics, Vallabh-Vidyanagar. During these visits necessary informations were collected through the discussion with the staff at various levels of the irrigation department engaged in the water distribution system and also with the sample farmers.
To study the impact of water management at farm level, it is necessary to make a comparative study of farm conditions in the water management area (WMA) with those of the non-water management area (NWMA). It may be mentioned here that the scope of the study undertaken by the Research Cell of the Department of Economics was fairly wide. It covered 250 sample household. The study year 1982-83 was the initial year of the introduction of water management in the project area. The households covered under the WMA were less in number and increased afterwards. Therefore, the number covered under WMA is not found to be constant throughout the study of four year period of 1982-86. In this context, therefore, to provide uniformity in the analysis we have tried to find out the households which were constantly under the WMA and also in NWMA for the two years 1983-84 and 1984-85. As in the original study of the Research Cell in the first year the number of households covered in the WMA was limited, 1982-83 was left out from this study. Thus the study is based on 116 sample farmers, 81 farmers constituted the sample of water management area and 35 farmers constituted the sample for the non-water management area. The sample of the study covers three villages viz., Morva, Gokalpura and Ujada representing both the segments of the two areas of WMA and NWMA. Of the three villages, Morva and Gokalpura are situated on the head reach of the Morva distributory while Ujada is on the middle reach. With the change introduced in the sample, the whole process of processing of data had to be repeated.
The first part of the micro-level study covers the period of two years. The details of the socio-demographic structure of the selected sample households pertain to the first year of the study (1983-84). This was done in order to avoid duplication in presentation. Moreover, one cannot expect a major change in these characteristics in a two year period. The details of irrigation practices pertain to the average of the two year period of the study.

Under the study the farm-holding groups were as below:

<table>
<thead>
<tr>
<th>Farming Groups</th>
<th>Size of operational Holding</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Marginal Farmers</td>
<td>Up to 1 hectare</td>
</tr>
<tr>
<td>2. Small Farmers</td>
<td>From 1.01 to 2.50 hectares</td>
</tr>
<tr>
<td>3. Medium Farmers</td>
<td>From 2.51 to 5.00 hectares</td>
</tr>
<tr>
<td>4. Big farmers</td>
<td>From 5.01 to 7.00 hectares</td>
</tr>
<tr>
<td>5. Large Farmers</td>
<td>From 7.01 hectares and above</td>
</tr>
</tbody>
</table>

The second part of the micro-level study presents the qualitative informations in terms of attitudes and opinions of the users of water at farm level. With the help of interviewing technique the necessary informations from the sample farmers were collected by preparing a detailed attitude and opinion schedule. In this regard the study covers the three villages viz., Morva, Gokalpura and Ujada. The warabandhi
water delivery system was put into practice in the rabi season of 1981-82 for the minors 5/R and 6/L. Under both these minors taken together the culturable command area (CCA) was of 145 hectares. This area was then extended to the minors 1/R, 2/R, 4/L, 5/R, 6/L, 7/R, 8/R and 9/L. All these minors cover the total CCA of 695 hectares.

It has been stated earlier that the village Morva and Gokalpura are at the head reach of the Morva distributary of the Panam irrigation project, while the village Ujada is at the middle reach of the Morva distributary. The farmers of the former that is the head reach villages have been benefitted with the warabandhi system since 1981, while the latter that is the farmers of the Ujada village, at the middle reach of the Morva distributary have been benefitted since 1983-84. The minors 4/L, 5/R, 6/L and part of 7/R are located at the head reach villages, viz. Morva and Gokalpura. The minor 9/L is located at the middle reach village Ujada. Thus, to study the performance of warabandhi system and its problems faced by the farmers in obtaining water, minors 4/L, 5/R, 6/L, part of 7/R and 9/L were selected. On the respective minors 19, 15 6, 18 and 9 outlet were respectively inquired.

At minor 4/L in all 316 farmers have been benefitted under the warabandhi system, while 259, 42 and 76 farmers were benefitted under warabandhi system respectively at
minors 5/R, 6/L and 9/L. If we take these figures village-wise, the number of benefitted farmers comes to 617 in the head reach villages viz., Morva and Gokalpura and 76 farmers in the middle reach village Ujada. For obtaining the necessary details the sample farmers were randomly picked up. In this regard, to study the impact of warabandhi system the size of the sample farmers was arbitrarily fixed at 120. This was then distributed as, 80 from the two head reach villages and 40 from the middle reach village. The distribution of sample farmers by reaches and villages was of the following nature:

<table>
<thead>
<tr>
<th>Villages</th>
<th>Reach</th>
<th>Number of Farmers selected</th>
</tr>
</thead>
<tbody>
<tr>
<td>MORVA</td>
<td>HEAD</td>
<td>35</td>
</tr>
<tr>
<td>GOKALPURA</td>
<td>HEAD</td>
<td>45</td>
</tr>
<tr>
<td>UJADA</td>
<td>MIDDLE</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>TOTAL</td>
<td>120</td>
</tr>
</tbody>
</table>

The informations in this regard were collected for the year 1988-89. The data relating to the year wise and season wise irrigation potential created and actual irrigated area of the Morva distributory were collected for 1981-82 to 1988-89. The functioning of the warabandhi system of water management, informal discussion was also held with
the engineers and other officers of the Irrigation Administration and with the farmers who were actually affected or likely to be affected by the different water management practices.

2.5 PRESENTATION OF ANALYSIS:

For the present study analysis is divided into six chapters, which are as under:

1. The first chapter titled "Water Resources and Water Management" gives the details about the importance of water, nature of the use of water, the concept of water management and the need for water management.

2. The second chapter on "Methodology and Chapter Scheme" deals with the methodological aspects of the presentation and the analytical techniques used for the study.

3. The third chapter title "Water Management Practices" tries to bring forth the different water management practices in India and in the other countries. Moreover, this chapter provides information regarding the scope and features of warabandhi system of water management, the management of warabandhi system and
its method for distribution of water. For the appropriate distribution and use of irrigation water, the need for the implementation of warabandhi system of water management which implies an orderly distribution and the use of water at farm level has been examined in the third chapter.

4. The fourth chapter "Water Resources in Gujarat, Nature of the Use", traces the development of water resources in Gujarat and the use thereof, the State irrigation potential and the utilisation, etc. It also deals with the problems of underutilisation of the created irrigation potential through different irrigation projects of the State.

5. The fifth chapter; "Water Management- A Micro-level Study" is divided into two parts. The first part deals with the impact of the working of the warabandhi system at farm level while the second part presents the qualitative informations in terms of attitudes and opinions of the users of water at farm level.

6. The sixth chapter on "Conclusion and Policy Implications" presents an overview emanating from the study. Moreover, the important policy implications are also laid down in this chapter.
NOTES AND REFERENCES


2. Original data were manually processed in the Research Cell, Department of Economics, Vallabh-Vidyanagar.

3. Data obtained from the office of the Panam Sub-Division, No.1, MORVA, District: Panchmahals.