

**SECTION 1**

**INTRODUCTORY**

## CHAPTER - I

### INTRODUCTION

#### **Background**

1.1.1 Institute for Resource Management and Economic Development, at the instance of Planning Commission, conducted a study on 'Status, Impact and Determinants of Farmers Participation in Irrigation Management in India'. The study was started in September 1997 and completed in January 1999. A Committee of Direction had been constituted to provide guidance and direction to the research team for conducting the study. The Committee included a representative from Command Area Division of the Planning Commission as one of its members. The Committee held three meetings in which it identified the states to be selected for detailed study, approved the methodology, finalised the questionnaires and examined the draft report.

1.1.2 It was initially decided that one state from each zone, east, west, north and south, where farmers participation in irrigation management had achieved good progress, would be selected for the study. Accordingly, Bihar in the eastern zone, Gujarat in the western zone, Tamilnadu in the southern zone were selected for the study. With regard to the northern zone, it was found that there was no state where farmers participation in irrigation management had made any worthwhile progress even though there were a few successful but isolated experiments like the much written about experiment of sukhomajari in Haryana. Hence, it was suggested by the Committee of Direction and approved by the Planning Commission that Maharashtra where farmers participation had made good stride be selected in lieu of a state in the northern zone. Accordingly, primary survey for the study was conducted in the states of Bihar, Gujarat, Maharashtra and Tamilnadu.

#### **1.2 Prevailing Irrigation Management**

1.2.1 Principal objective of irrigation development since Independence was to raise the agricultural productivity to meet the growing needs of increasing population. To some extent, this objective had been achieved, though not in commensurate with the resources invested in agriculture and more specifically in the irrigation sector. Though the data on irrigated agricultural productivity are hard to come by, it is generally accepted that the overall productivity is not even half of that achieved in other countries under similar conditions.

1.2.2 After independence, in order to extend irrigation facilities to a large area with a view to attain self sufficiency in food production, more emphasis was put on creation of irrigation potential through construction of major dams and canal distribution network as compared to that on proper maintenance of field channels and their efficient operation and management. As a result, utilisation of irrigation remained far below the potential created. The wide gap between the potential created and the actual utilisation had been the subject of investigation for many committees and commissions appointed by the State and Union Governments. Some of their recommendations were accepted but on implementation it was found that many more problems arose and the overall situation remained almost at the same level.

1.2.3 The present system of water management is more administrative and revenue oriented wherein individual farmers are expected to deal directly with the Irrigation Department. Except for some mutual cooperation in case of water distribution under warabandi system as for examples in Punjab and Haryana, there is practically no efforts on the part of farmers to maintain field channels constructed by the government, nor the sense of economic use of water generated among them. Moreover, under the present irrigation management system larger benefits are, by and large, derived by those having privileged position on account of their status in the community or location of their land in an outlet command or in head reaches of canal system at the cost of socially or economically weaker sections and tailenders. This disparity in water sharing system stems inter-alia from the fact that the water users are not properly organised and are not conscious of their water share.

1.2.4 The existing system of irrigation management wherein each farmer is expected to deal directly with the Irrigation Department (ID) puts tremendous pressure on the Department in maintaining the main system, planning of water distribution through the main canal branches and also for preparing the schedule for individual farmers. As a result, supplies, more often than not, are made arbitrarily, and objectives of optimum utilisation of irrigation potential created, equitable distribution at farm level and maximum increase in productivity can not be achieved on sustainable basis.

### **1.3 Case for PIM**

1.3.1 Hence thinkers and policy makers started realising the need for changing the system by involving farmers in the management of irrigation. It came to be recognised that the farmers

could not play a crucial role in the management of irrigation unless they were actively involved in the same. Several advantages were anticipated. It was hoped that farmers involvement would reduce water distribution cost and would ensure proper maintenance of irrigation system at micro level. The beneficiaries would also derive dual benefits. The understanding that they owned the system would motivate economic use of water, while reliability of assured supply of water would induce them to use appropriate inputs leading to higher productivity. They would also be required to pay irrigation charges at the main outlet level on volumetric basis which would be less than cropwise irrigation charges on acreage basis. The farmers organisations could also deal with the problems related to water scheduling, equitable distribution, better water use efficiency, conflict resolution at farm level, collection of irrigation dues and finally increased agricultural production. Farmers participation could also be useful in construction activities such as land levelling and land shaping and construction of field channels.

- 1.3.2 The National Water Policy brought out in 1987 underscored the need for PIM. According to it, "efforts should be made to involve farmers progressively in various aspects of management of irrigation system, particularly in water distribution and collection of water charges. Assistance of voluntary agencies should be enlisted in educating the farmers in efficient water management". The necessity of involving farmers in water management started engaging the attention of the planners too in recent years. The sixth plan, for example, had emphasized the need for involvement of farmers in the management of irrigation works by organising farmers associations. From the mid-1980s to the present, several conferences and seminars including national seminars organised by Ministry of Water Resources, Government of India were held at periodic intervals. The Committee on Pricing of Irrigation Water constituted by Planning Commission in its report submitted in 1992 also advocated "encouragement of user groups to take over maintenance, management of water allocations and collection of water rates". The Ministry of Water Resources, Government of India had been trying to help the process of PIM through its Command Area Development Programme. It had issued a series of guidelines as in 1985 and 1987 on formation and functioning WUAs, organised workshops and conferences and what is more important, it had been providing fund (Rs. 100/- per hectare for each of the first two years and Rs. 75/- for the third year) as management subsidy to WUAs. Funds were provided on matching basis by

state governments also. Through these pronouncements and activities, a message in favour of PIM was conveyed

## **1.4 Experience in Other Countries**

1.4.1 Some experiments in organising farmers and entrusting them responsibility of water management documented by FAO / Ford Foundation and others (Wijayaratna and Vermillion, 1994, Soenarno, 1995, Ratnayake 1995, Goriz et al, 1995, etc.) showed that through such experiments as in Philippines and Sri Lanka an effort was made to induct catalysts or organisers in the command areas. These organisers were qualified professionals and trained in irrigation management, irrigated farming, organising farmers and building confidence in them to take active part in planning, designing and execution of the system in the first phase and managing water delivery and maintenance of the system in the second phase. The organisers took the initiative which could be undertaken by groups of farmers by forming the Water Users Associations and formulating procedures for realisation of water charges. Experiments in other countries including the USA and Mexico had also shown that to ensure optimum return on irrigation investments, managements of irrigation system should be with the farmers / beneficiaries. In Mexico between 1990-1995, the government transferred management responsibilities, including financing, to WUAs covering 80 percent of the command areas in 80 irrigation districts. (IIM-IIMI report 1998). According to a recent review (Vermillion 1997) the impact of such transfers had been a mixed one.

## **1.5 Current Status of PIM**

1.5.1 Influenced by the experience of other countries and repeated pleas of central agencies, a few State Governments took administrative and / or legal measures during the period since mid eighties for the formation and functioning. of farmers associations in irrigation management. As a result, a few associations and cooperatives were formed in the states notably Maharashtra, Gujarat, Bihar, Andhra Pradesh, and Tamilnadu etc. State wise picture is presented in the next chapter.

## **1.6 Need for the Study**

1.6.1 The experience gained so far need to be analysed systematically so that appropriate

approaches may be evolved. Some studies for the country have no doubt been made in this area as can be seen from bibliography given at the end. Most of these are descriptive and deal with experience of one or two associations in a scattered manner. A more comprehensive study is "Farmers Participation in Irrigation Water Management" brought out in 1991 by the Command Area Development Division, Ministry of Water Resources, Government of India. This publication, however, is based mainly on the secondary information. It does not provide any assessment of the working of the farmers association including factors affecting formation and functioning of such associations. In October 1994, ISPAN (Irrigation Support Project for Asia and the Near East) brought out reports on Policy Options For Participatory Irrigation Management for five states of Bihar, Gujarat, H.P., Maharashtra, and Tamilnadu. This study was sponsored by USAID and was collaborated by a state level institution like WALMI in Bihar, Centre for Water Resources of Anna University in Tamilnadu. These reports concentrate mainly on administrative and procedural aspects. These do not provide any quantitative information on impact of water users associations in specific cases through a standard scientific methodology. In January 1997, the CAD wing of the Ministry of Water Resources, Government of India brought out a valuable publication entitled "Management of Irrigation - A New Paradigm : Participatory Irrigation Management" containing papers presented for the National Conference on Participatory Irrigation Management held in New Delhi from 20 to 22 January 1997. The publication contains a very useful paper by Shri L.K. Joshi on the then current status of the progress of PIM in different states. The focus in this publication is on historical, legal and administrative aspects. Information on impact in quantitative terms was thus grossly inadequate when this study was conceived and taken up. By the end of 1998, when a draft report of the present study was under preparation, it came to be known that a study on "Irrigation Management Transfer" in India was completed in August 1998 by IIM Ahmedabad in collaboration with IIMI Colombo. This study is quite comprehensive. It covers a number of states which include all the major states where PIM has been important. This study, however, concentrates more on process of formation and functioning of the associations and less on their impact. The analysis is mainly qualitative rather than quantitative. There are parts where this study overlaps with the present study where there are others while the two supplement each other.

1.6.2 In view of the above, a need was realised to make a comprehensive fact finding as well as analytical study of the farmers participation in irrigation projects in the country. Such a study should cover the range of approaches being used, constraints in implementation and the impact on performance of irrigation system. It was also needed to assess (i) what supporting policy or regulatory requirements were necessary, (ii) the need and potential for bureaucratic reorientation, and (iii) suitability of different models of farmers participation processes in different environments..

## **1.7 Objectives**

1.7.1 An initial difficulty that was faced related to inadequacy of information regarding the specific irrigation projects where farmers participation in irrigation management was taking place. The first objective, therefore, was to obtain information on location of such experiments in the country. Another issue related to information on the outcome of these experiments in terms of success or failure. This information was even more scarce. An attempt, was therefore, made in this study to examine the impact of these experiments on important indicators of performance such as changes in the extent of utilisation of the irrigation works and crop area under irrigation, cropping pattern, crop yield, value of produce, etc. along with other factors such as collection of water charges, equitable distribution, water use efficiency, physical sustainability of the irrigation system, environmental impact, replicability, etc. It was equally important to know the reasons for success, failure, or differential impact of the experiments so that an appropriate strategy for promoting them may be evolved. Certain other factors e.g. (i) extent of interface between the farmers' participation and official machinery in relation to Irrigation Acts and administrative practices, (ii) socio economic homogeneity of the farmers, (iii) size of groups in terms of water users, (iv) extent of involvement in planning, management and appraisal of the projects, (v) provision of suitable training to farmers for improving their managerial capability, (vi) availability of suitable organisational framework for farmers' participation, and (vii) more favourable official machinery, etc. would have their impact on the success or failure of the experiments. Revamping of Panchayati Raj in the wake of the recent Constitution 73rd Amendment Act and consequent decentralisation of powers of development and administration upto the village panchayat level might also help in the farmers involvement in the management of irrigation projects.

1.7.2 In view of the above, the objectives of the research study are as under :-

- i) To identify and prepare comprehensive information on experiments in farmers' participation in management of irrigation projects (large, medium and minor) in the country.
- ii) To study the functioning of farmers associations in different parts of the country and examine the socio - economic impact of such participation.
- iii) To study the interface between the farmer's participation and official machinery and to examine the changes in view of the implementation of Panchayati Raj.
- iv) To identify factors responsible for variations in performance of such experiments, and
- v) To offer suggestions for promoting and strengthening such participation for better management of irrigation projects.

1.7.3 It may be mentioned that all the objectives are not of equal importance. The most important one is the second objective since very little information was available on performance and specially impact. Accordingly maximum space in this report has been given to this objective. The third objective is allied to the second objective while the third and fourth objectives flow from the second and the third. As regards, the first objective, the purpose behind it was to provide the background information for the study and to give information for selection of a sample for detailed study related to other objectives.

## **1.8 Hypotheses**

1.8.1 Being comprehensive, the research study has several hypotheses of which a few are mentioned here as illustrations e.g. the farmers participation in irrigation results in (i) efficient, regulated and equitable distribution of water, (ii) judicious use of available water, (iii) construction and maintenance of field channels and other on farm development, (iv) resolution of conflicts of water users, (v) favourable interface between the water users and official machinery, and (vi) as a result, success of farmers' association is a direct outcome of (a) their socioeconomic homogeneity, (b) their involvement in planning and operations, (c) provision of suitable training to them resulting in improvement in their managerial capability and (d) more favourable official machinery, etc.



## **1.9 Sampling Design**

### **Selection of Projects :**

- 1.9.1 Information regarding names of irrigation projects (major, medium and minor) and their location where farmers participation in irrigation management had been in operation, were sought from different states. On the basis of information received from the different states as well as papers presented at the National Conference on Participatory Irrigation Management held in January 1997 by Ministry of Water Resources the states having sufficient information for the study were first identified and then the states of Bihar, Gujarat, Maharashtra and Tamilnadu were selected for study as per criteria already provided. Thereafter three projects from each of the above mentioned four states having PIM were selected for detailed study. Of these, one was major, one medium and one minor so as to provide a wide range of experience. From the above, such associations which had been in operation for atleast 3-4 years and were located in different agro-climatic regions in the states as far as possible were selected. Some modifications took place during the course of field survey. These are as below.
- 1.9.2 In Gujarat, Mohini Society in Ukai - Kakrapar Project (Major) was additionally selected at the instance of the Planning Commission, since this was a major project having considerable experience of PIM.
- 1.9.3 In Maharashtra, it was perceived that in Girija Medium Irrigation Project in Aurangbad district initially selected for the study where farmers association was formed in September 1994, water was released in 1994-95. Since 1995-96 there was acute shortage of water in the catchment area of the dam due to severe drought. As a result, for the next three years, no water could be released from the dam and the association remained inoperative. It was also reported that no medium irrigation project in this area was in good running condition due to extensive drought during the last 3/4 years and hence no purpose would be served by selecting any such project in substitution of Girija project. Selection of any other medium project in this agro-climatic region was not possible for want of relevant data at the time of field work. Therefore, a minor irrigation project (Loni) where irrigation took place during the last 3/4 years was selected in place of Girija project in consultation with Irrigation Department officials at the district level.

1.9.4 In Tamilnadu, one of the initially selected projects, Pathinettupatti project (medium) in Tanjaur District was not in operation. Hence in its place another minor project Anaikuppam Irrigation project in Thiruvarur district was selected in consultation with the Director of Irrigation Management Training Institute, Tiruchy, and Chief Engineer of Tiruchy Irrigation Division. The projects which got selected in the light of the considerations mentioned above were the following.

States	Projects selected
i) Bihar	<ol style="list-style-type: none"> <li>1) Paliganj Distributary in Patna district, Sone Canal Project (Major)</li> <li>2) Kiul - Badua Chandan Project in Bhagalpur district, Asarganj Distributary (Medium)</li> <li>3) Tubewell Management in Vaishali district by Vaishali Area Small Farmers Association (VASFA) (Minor)</li> </ol>
ii) Gujarat	<ol style="list-style-type: none"> <li>1) Ukai - Kakrapar Project in Surat district (Major)</li> <li>2) Karjan Project in Narbada district (Major)</li> <li>3) Baldeva Project in Bharuch district (Medium)</li> <li>4) Lakhigam Irrigation scheme in Surat district (Minor)</li> </ol>
iii) Maharashtra	<ol style="list-style-type: none"> <li>1) Upper Godavari Palkhed Project in Nasik district (Major)</li> <li>2) Loni Tank Project, Aurangabad district (Minor)</li> <li>3) Parunde Project, in Pune District (Minor)</li> </ol>

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|-----|------------|----|---|
| iv) | Tamil Nadu | 1) | Thindal Distributary, Lower Bhawani Project in Erode district (Major)                           |
|     |            | 2) | North Kodai Melazhahian Channel Thambraparni Irrigation System in Tirunelveli district (Medium) |
|     |            | 3) | Valappar Anaikuppam Voikkal Project in Tiruvroor district (Minor)                               |

1.9.5. One association of water users from each of the above mentioned irrigation projects was selected for a detailed study in consultation with local level beneficiaries. From each of the selected association, 40 farmers on an average (preferably more from large ones and less from small ones) were selected as respondents. The selection of farmers was done by the method of stratified sampling so as to include in the sampling big, medium, small and marginal farmers proportionately. This provided representation to all categories of farmers within the project area under study. To get feedback from farmers from different locations of the command area equal number of farmers were selected at random as far as possible from head, middle and tail end of the distributary channels.

1.9.6 Information was also obtained from nearby farmers of each of the study areas who were having irrigation but were not members of any water users association. For this purpose, from the control area of each selected project 15 farmers on an average (number varying from major to minor project) were selected.

1.9.7 The size of samples generated for each selected state were as under :

- |      |   |                                   |
|------|---|-----------------------------------|
| i)   | No. of Projects                           | 3 ( 4 for Gujarat)                |
| ii)  | No. of beneficiary farmer respondents     | - 3 x 40 = 120 ( 170 for Gujarat) |
| iii) | No. of control areas                      | - 3                               |
| iv)  | No. of non-beneficiary farmer respondents | - 3 x 15 = 45                     |

## **1.10 Methodology and Conceptual Framework**

- 1.10.1 In view of the constraints of both fund and time available for the study, it was decided to take up about 12 (increased subsequently to 13) projects for study and to select about 40 member and 15 non-member households per association for a detailed study. In view of the limited number of associations to be studied as well as need to examine motivational, organizational, functional and other qualitative aspects of WUAs, it was felt by the Committee of Direction of this study project that it would be useful to follow a case study method.
- 1.10.2 Information for each case study was obtained from both secondary as well as primary sources. State wise information was obtained mainly from secondary sources. In addition to published material, considerable information was also obtained from unpublished sources by the Project team contacting officers of Irrigation Department, WALMIs etc. Questionnaires cum schedules were used for collection of primary data from water users in both command and control areas. Besides, guide points for discussion with project authorities had also been prepared. Collection of field level information was handled by senior staff so as to gain an insight into the functioning of the associations.
- 1.10.3 A two stage stratified random sampling method was followed for selecting the sample in both the command and control areas. In the first stage, both the command and control areas were divided into head, middle and tail reaches and then farmers of different socio-economic groups were selected at random from each reach.
- 1.10.4 The terms 'farmers participation in irrigation management' and 'participatory' irrigation management as used in this report are interchangeable. These connote a situation where farmers are involved in one or more aspects of management (like water acquisition and distribution, repaired maintenance, resource mobilisation and conflict resolution) through a formal organisation established for the purpose whether registered under any Act or

otherwise. There is no rigid framework regarding functions performed, rights transferred, extent of control exercised and legal status.

- 1.10.5 Functioning of farmers' associations, as mentioned in the second objective of the study, has been analysed with respect to formation, working and composition of managing committee, mode of election, process of decision making, fixation and collection of water charges, maintenance of the water conveyance system, water distribution mechanism, training of farmers, maintenance of accounts etc. Rather than discussing each of these components in a routine manner for every experiment, an attempt has been made to highlight those aspects pertaining to a particular experiment which deserved to be highlighted.
- 1.10.6 The ultimate purpose of forming WUA from the point of view of a farmer is to raise their income. Impact assessment of the experiments, therefore, was made mainly in terms of, (i) Whether PIM resulted in more coverage of area under irrigation, (ii) Whether quality of irrigation in terms of adequacy and timeliness had improved as a result of close supervision of irrigation management by farmers' themselves, (iii) Whether there was a change in cropping pattern in favour of higher value crops, (iv) Whether the new experiment led to higher per hectare productivity, and (v) Whether there was an increase in value of crops grown by the farmers. Timeliness of availability of water was also supposed to provide an indicator of water availability. Impact was also assessed in qualitative terms with respect to distributional organisational and functional aspects. In the case of associations covering large areas like Paliganj in Bihar, distributional aspects of the impact in terms of head, middle and tail end beneficiaries was also taken into account.
- 1.10.7 Impact of water users association on agricultural economy of the concerned area was analysed through comparing the agricultural status of the sample farmers in terms of the above mentioned variables as prevailing before formation of the association with that after which was taken as the agricultural year immediately preceding the time of the survey viz. 1996-97 in some cases and 1997-98 in others. It was, however, realised that in some cases e.g when the gap between the two periods was quite long, the method might not give

very reliable result. Hence a 'with' and 'without' comparison was also made. This implied comparing the agro-economic situation in the area covered by WUA with the nearby homogeneous area having irrigation, but without WUA. The former was denoted as 'command area' and the latter as 'control area'. Data collected for both the areas was taken to be the latest agricultural year for which data were available at the time of the survey namely 1996-97 in some cases and 1997-98 others. In this case also, data related to important performance indicators like changes in area under irrigation, quality of irrigation, yield per hect. and value of the produce per respondent were compared and analysed. It may be mentioned that 'with' and 'without' approach was found more useful in Vaishali where there was no irrigation in the before period and also in Mohini and Melazhehian where the time gap between 'before' and 'after' was quite long.

1.10.8 Coverage of average area under irrigation was worked out per respondent and crop wise. Average increase in irrigated area per respondent between two points of time was computed on the basis of number reporting 'before' and 'after' periods. These numbers were not necessarily the same. Productivity of crops was, however, measured in terms of per hectare. Changes in productivity of crops per hect. were assessed for the crops grown under irrigated condition only. A farmer, however, gets produce from unirrigated areas also. Hence average value of produce per respondent included both irrigated and non-irrigated farming. Hence the number of respondents in this table would be different from the number reported under the tables dealing with coverage of area under irrigation. Value of each crop was determined on the basis of number reported growing that particular crop. To ward off temporal fluctuations in prices value of produce was computed at constant prices for which purpose latest year's prices at the time of field survey namely 1996-97 in some cases and 1997-98 in others were taken into account. Quality of irrigation was assessed in terms of number and percentage of respondents saying yes to questions related to adequacy and timeliness of irrigation.

1.10.9 The term small farmers used here covered farmers having operational land holding of 1 to

2 hectares while marginal farmers covered those having operational land holding of 0 to 1 hectare.

## **1.11 Collection and Analysis of Data**

1.11.1 Extensive field survey was carried out during 1998 for collection of primary as well as secondary data by employing well qualified and experienced Research Assistants, Supervisors, etc. Care was taken to include local language knowing staff in field teams for different states. Overseeing of the field work was done by the Project Director and the Headquarters' team. Primary data was collected with the help of household level schedule-cum-questionnaire. Processing of data was done manually as well as mechanically. Computer services were employed mainly for tabulation of primary data, while processing and tabulation of secondary data and qualitative information was done manually.

## **1.12 Plan of the Report**

1.12.1 Chapter II which follows next, provides a brief overview of the experiments in farmers participation in irrigation management made so far in different states of India. It covers the first objective of the study and as based on secondary sources of information. Chapters III, IV, V and VI deal with experiences of WUAs studied in detail by this Institute in states of Bihar, Gujarat, Maharashtra and Tamilnadu respectively. Each of these chapters covers 2nd, 3rd and 4th objectives of the study. The data and information for these was derived from our field surveys. Chapters VII to XI provide an overview of the experience in 13 experiments in 4 states studied in detail. Chapter also draws attention to a few important macro implications of WUA, as arising out of the findings of the study. Chapter XI gives suggestions for accelerating the growth of WUAs. These chapters cover all the objectives of the study.