REPORT
ON
PARTICIPATORY IRRIGATION MANAGEMENT

इनसिड - INCID

INDIAN NATIONAL COMMITTEE ON IRRIGATION AND DRAINAGE
भारतीय राष्ट्रीय सिंचाई एवं जल निकास समिति

NEW DELHI
JUNE, 2003

FOREWORD

Over the past many years, efforts to promote and support formation of Water Users' Associations and handing over irrigation systems to the farmers for operation, maintenance and management have not yielded the desired results even though pilot projects sponsored by international funding organizations and some NGOs were also undertaken. There have been various problems/constraints leading to this situation. Therefore, as one of the activities, INCID sponsored a study to provide updated information in respect of various aspects involved and to suggest some steps for speedy implementation of the recommendations.

To accomplish this task Dr K.V. Raju, Social Scientist and Associate Professor, Institute for Social and Economic Change, Nagarbhavi, Bangalore, by virtue of his long association with this topic particularly through Water Resources Management and Training Project (WRM&T) of Government of India, was chosen to prepare a draft report based on the data available with him. This report needed further inputs from various organizations both Central as well as States with a view to making it more comprehensive and useful. Accordingly INCID pursued this matter with the various organisations for obtaining their expert views on the draft prepared by Dr Raju. The comments/suggestions received were compiled into a compendium and circulated to the participants for dissemination to enable their active participation in the National Workshop organized by INCID during April 1996.

Following the presentation of a revised report by Dr Raju and detailed deliberations in the Workshop, it was decided to set up a small Working Group under the Chairmanship of Chief Engineer (IMO), Central Water Commission and two members and a Convenor from INCID to modify, update and finalize the draft report based on latest information available in the Ministry of Water Resources, Central Water Commission, and in line with the policies of Government of India.

The group after prolonged deliberations over various aspects in several meetings, discussed and finalized the report. This document is the culmination of the efforts made by them and subsequent updating in INCID Secretariat.

I do feel this will serve as a reference document for Irrigation Engineers, Administrators, Policy Makers, Farmers and all others engaged in irrigated agriculture.

I am grateful to Dr K.V. Raju for preparing the basic document, and to the experts and Working Group members for their inputs in preparing this Report. The efforts put in by the INCID Secretariat in updating and bringing out this publication, particularly of Shri S.C. Sud, Consultant are appreciated. Shri Vimal Kumar Gaur, Data Entry Operator, INCID who diligently computerised the entire report deserves to be complimented. Special thanks are due to Shri P.L. Diwan, Chairman and Managing Director, Water and Power Consultancy Services (India) Limited (WAPCOS) for his support and for providing needful infrastructural facilities to INCID, to bring out this publication.

(R. JEYASEELAN)
Chairman, INCID &
Central Water Commission

WORKING GROUP CONSTITUTED TO MODIFY, UPDATE AND FINALISE THE STATUS REPORT ON PARTICIPATORY IRRIGATION MANAGEMENT

1.	**Shri C.D. Khoche** Chief Engineer (IMO) Central Water Commission	Chairman
2.	**Shri D.D. Sahu** Joint Commissioner (CADA) Ministry of Water Resources	Member
3.	**Shri N.K. Dikshit** Former Member Narmada Control Authority	Member
4.	**Shri P.D. Goel** Consultant, INCID	Convenor

ABBREVIATIONS

AED	-	Agricultural Engineering Department
AKRSP	-	Agha Khan Rural Support Programme
ATP	-	Accelerated Transfer Programme
AWB	-	Area Water Board
CAD	-	Command Area Development
CADA	-	Command Area Development Authority
CADAM	-	Command Area Development and Management
CASAD	-	Centre for Applied System Analysis and Development
CBP	-	Columbia Basin Project
CCA	-	Culturable Command Area
CNA	-	Commicion Nacional del Agua (National Water Commission)
CO	-	Community Organiser
CWC	-	Central Water Commission
CWMP	-	Command Water Management Project
CWR	-	Centre for Water Resources
CWRDM	-	Centre for Water Resources Development and Management
DoWR	-	Department of Water Resources
DSI	-	Devlet Su Isleri (General Directorate of State Hydraulic Works)
EDI	-	Economic Development Institute
FA	-	Farmers' Association
FAO	-	Food and Agricultural Organisation
FC	-	Farmers' Council
FLIA	-	Farm Land Irrigation Authority
FO	-	Farmers' Organisation
FOT	-	Farmers' Organisation Turnover
GDRS	-	General Directorate of Rural Services
GoM	-	Government of Maharashtra
ha	-	Hectare
HID	-	Haryana Irrigation Department
HIRMI	-	Haryana Irrigation Research and Management Institute
HNG	-	Hung Nong Gae (A type of Association in South Korea)
HW	-	Hot Weather
HWRCP	-	Haryana Water Resources Consolidation Project
IA	-	Irrigators' Association
IG	-	Irrigation Group
ICO	-	Irrigation Community Organiser
ICOP	-	Irrigation Community Organising Programme
IIM	-	Indian Institute of Management
IIMI	-	International Irrigation Management Institute
ILI	-	Indian Law Institute
IMC	-	Irrigation Management Company
IMTI	-	Irrigation Management Training Institute
India NPIM	-	Indian Network on Participatory Irrigation Management
INPIM	-	International Network of Participatory Irrigation Management

IP	-	Irrigation Panchayat
IRMA	-	Institution of Rural Management, Anand
ISF	-	Irrigation Service Fees
IT	-	Irrigators' Team
KTIS	-	Kattiampandal Tank Irrigation Society
LBP	-	Lower Bhawani Project
LID	-	Land Improvement District
MOU	-	Memorandum of Understanding
MARD	-	Ministry of Agriculture and Rural Development
Mha	-	Million Hectares
MOU	-	Memorandum of Understanding
MoWR	-	Ministry of Water Resources
NABARD	-	National Bank for Agriculture and Rural Development
NGOs	-	Non-Governmental Organisations
NIA	-	National Irrigation Authority
NIS	-	National Irrigation System
NISIP	-	National irrigation Systems Improvement Programme
NWP	-	National Water Policy
O&M	-	Operation and Management
OFD	-	On Farm Development
OWRCP	-	Orissa Water Resources Consolidation Project
PAP	-	Participatory Approach Programme
PIDA	-	Provincial Irrigation and Drainage Authority
PIM	-	Participatory Irrigation Management
PWD	-	Public Works Department
RSP	-	Rural Support Programme
RWS	-	Rotational Water Supply
SIFT	-	System Improvement and Farmers' Turnover
SOPPECOM	-	Society for Promotion of Participatory Eco-System Management
STIs	-	State Training Institutes
SWF	-	Surface Water Flume
Th.ha	-	Thousand hectares
TNWRCP	-	Tamil Nadu Water Resources Consolidation Project
UNDP	-	United Nations Development Programme
USAID	-	United States Agency for International Development
USBR	-	United States Bureau of Reclamation
WALMI	-	Water and Land Management Institute
WAPCOS	-	Water and Power Consultancy Services (India) Limited
WG	-	Working Group
WRCP	-	Water Resources Consolidation Project
WRM&T	-	Water Resources Management and Training
WRO	-	Water Resources Organisation
WUAs	-	Water Users' Associations
WUO	-	Water Users' Organisation
WUG	-	Water Users' Group

PARTICIPATORY IRRIGATION MANAGEMENT IN INDIA

CONTENTS

	Foreword	(i)
	Members of the Working Group	(ii)
	Abbreviations	(iii)
1.	**Farmers' Participation - Indian Experience**	1
	1.1 Introduction	1
	1.2 Irrigation Development Before Independence	2
	1.3 Irrigation Development After Independence	4
2.	**Farmers' Participation - International Experience**	7
	2.1 China	7
	2.2 Columbia	8
	2.3 Egypt	8
	2.4 Indonesia	8
	2.5 Japan	10
	2.6 Mexico	10
	2.7 Nepal	12
	2.8 Pakistan	12
	2.9 Philippines	14
	2.10 South Korea	14
	2.11 Sri Lanka	15
	2.12 Thailand	16
	2.13 Turkey	16
	2.14 United States Of America	18
	2.15 Vietnam	18
	2.16 Other Countries	19
3.	**Participatory Irrigation Management - Suggested Approach**	21
	3.1 Objectives	21
	3.2 Need for Involvement	21
	3.3 The Process	25
4.	**Awareness, Motivation and Incentives to Farmers**	27
	4.1 Background	27
	4.2 Steps Taken	28
	4.3 Role of Various Agencies	28
	4.4 Incentives to Farmers	29
5.	**Participatory Irrigation Management - Present Status**	31
	5.1 Statewise Status	31
	5.2 Common Features and Variations	37

6.	**Water Users' Associations - Some Profiles**		**39**
	6.1	Datta Cooperative Society, Mula Project, Maharashtra	39
	6.2	CADA Model, Kerala	41
	6.3	Sinchai Panchayat Model, Mahanadi Command Area Raipur Distt., Chattisgarh	44
	6.4	CADA Model, Lower Bhavani System, Tamil Nadu	47
	6.5	Kattiampandal Tank Irrigation Scheme, Tamil Nadu	50
	6.6	Aga Khan Rural Support Programme Model, Bharuch Distt. Gujarat	52
7.	**Participatory Irrigation Management - Suggested Roles**		**59**
	7.1	Role of Farmers	59
	7.2	Role of NGOs	59
	7.3	Role of WUAs	60
	7.4	Role of Government Agencies	61
	7.5	Role of WALMIs	62
8.	**Rehabilitation and Modernisation**		**65**
	8.1	Existing Practice	65
	8.2	Works Involved	65
	8.3	Linkage with Turnover	66
	8.4	Promotion of Concept in Some of the Ongoing Schemes	66
9.	**Legal Support**		**73**
	9.1	Background	73
	9.2	Rights of the States	73
	9.3	Users' Water Rights	74
	9.4	Water Supply	74
	9.5	Water Rates	75
	9.6	Maintenance of Distribution System	76
	9.7	Limitations of Irrigation Acts	77
	9.8	Maintenance and Repairs	77
	9.9	Collection of Revenue	78
	9.10	Dispute Settlement	78
	9.11	Overview	79
	9.12	Future Approach	81
	9.13	Necessary Provisions for Legal Back-up	82
	9.14	The Transfer Agreement	89
	9.15	Bye-Laws of WUAs	89
	9.16	Conclusions	89
10.	**Summary and Recommendations of National and Regional/State Conferences on PIM**		**91**
	10.1	Introduction	91
	10.2	National and State Action Plans for PIM	91
	10.3	Regional and State Level Conferences	93

11. Action Research and Training **97**
11.1 Introduction 97
11.2 Definition 97
11.3 Training in Action Research 98
11.4 Action Research Project Sites (Statewise) 98
11.5 Status of Work Done 99
11.6 Constraints Faced and Lessons Learnt 104
11.7 General Findings 108

12. Future Perspective - Programme/Goals - Recommendations **111**
12.1 Introduction 111
12.2 Problems 111
12.3 Future Perspective - Programme - Goals 112
12.4 Recommendations 114

Annexure

1. Statewise Status Regarding Water Users' Associations (WUAs) 121

2. Water Rates for Principal Crops in various States and Year of Revision 122

3. State-wise and Year-wise Percentage Recovery of Working Expenses Through Gross Receipts in Irrigation and Multipurpose River Valley Projects 123

4. Ministry of Water Resources (CAD) Guidelines for Involving Farmers in Water Management of Irrigation Systems (1987) 124

5. Ministry of Water Resources Guidelines for Formation of Farmers' Association (WUA), 1995 134

6. Suggested Memorandum of Understanding Between Water Users' Associations (WUAs) and The Irrigation Department / Agency 144

7. Format for Monitoring of Participatory Irrigation Management Programme 147

References 149

CHAPTER - 1

FARMERS' PARTICIPATION - INDIAN EXPERIENCE

1.1 INTRODUCTION

Management of Irrigation is a complicated and challenging task. It demands a real and meaningful involvement of all the major partners viz. irrigation engineer or manager from the irrigation and agricultural departments, non-government organizations (NGOs) and the farmers. Participatory Irrigation Management (PIM) is a concept that is not new to India. Farmer managed irrigation systems are recorded as far back as the third century B.C. However, over the last 100 years or so, during the British rule and then after independence, management of the large irrigation systems became so centralized and one sided that there was a near exclusion of farmers from the management of irrigation system.

However, keeping in view the multifarious problems confronting irrigation sector management viz. the stagnant growth rate, decline and deterioration of the infrastructure, growing resource constraints including severe financial crunch for proper upkeep and maintenance, social inequality and non-optional utilization of water, the importance and need for improved O&M practices was felt by incorporating enhanced scope for the farmers' participation and their active involvement in irrigation management. Farmers, who are the main stakeholders and beneficiaries of irrigation system, are found to have stronger inclination to manage water more efficiently.

Till the early 80s, case studies regarding involvement of farmers in management of irrigation systems were few and covered only the familiar locations. The concept of PIM received due importance after the Water Resources Management and Training (WRM&T) project of Government of India supported by United States Agency for International Development (USAID) was initiated. Water Users' Associations (WUAs) was an essential feature of action research taken up by Water and Land Management Training Institutes (WALMIs) in eleven States. The National Water Policy adopted in 1987 stressed this concept by stating that efforts should be made to involve farmers progressively in various aspects of management of irrigation system, particularly in water distribution and collection of water rates. The publication of the Ministry of Water Resources, namely, "Farmers' Participation in Irrigation Water Management" in August 1991, gave the status then existing about the WUAs. Though it included some non-functioning WUAs in its list, the book facilitated much needed compilation and updated the knowledge on WUAs, particularly the efforts of the Command Area Development Authority (CADA). The profiles of fourteen WUAs carried out under the USAID supported WRM&T project, though not described in detail, provide a quick understanding on some of the hitherto unknown WUAs. Meanwhile, a number of other case studies have been published providing better understanding on PIM.

Over the last two decades, several efforts have been made to introduce PIM. But many of these efforts have been half hearted, with no real seriousness on the part of the various State Governments to transfer responsibilities to farmers' organizations. Sporadic efforts from NGOs remained localized with a few WUAs formed below the minor outlets in some of the canal systems. Due to financial constraints and for sustainable development and proper management of irrigation systems, virtually all States in India are considering transfer of irrigation management to WUAs, specifically after seeing the results of the irrigation reforms in some of the projects.

Conditionalities attached with World Bank loan agreements are also to some extent responsible for involvement of farmers by Irrigation Departments in Irrigation Management in some states. But care needs to be taken that these reforms do not merely remain on paper and the message of participatory management for improved agricultural production and long term sustainability of irrigation systems through transfer of management to the users and other experiences, be shared with all concerned with the water resources management.

During the last two decades, a number of Conferences, Workshops, Seminars, Training Courses have been organized to create awareness and to share the knowledge and experience gained to promote WUAs and PIM in India for efficient water management and to realize the objectives of irrigation. All these activities were supported by Government agencies, local and external NGOs and funding agencies. The deliberations at these forums emphasized on field experiences and after providing a historical perspective, discussed the present status. The discussions highlighted the necessity and feasibility of PIM for increased agricultural production and efficient irrigation management. International experience all over the world has also shown that farmers' organizations tend to have a better sense of ownership, enhanced farmers' satisfaction, increased cost recovery of O&M charges, reduced disputes, and better production.

PIMhas been found to be effective in many irrigation commands in the world and in some projects in India. However, there are several constraints in implementation of PIM, which need to be tackled with determination by Central and State Governments and farmers together. Also for the success of the programme, regular and effective monitoring and evaluation of PIM should be conducted for identification of constraints and taking remedial measures. There is a need for a mass movement in favour of PIM and accordingly it is the duty of all water professionals to educate the people, the elites and common man alike as well as those in the Government and farmers, about the merits, problems and solutions and modalities involved in introducing and implementing PIM. There is also a need to lobby and orient the policy makers, Government functionaries, politicians, farmers, educators and researchers in the water sector through mass media, about the benefits of PIM.

1.2 IRRIGATION DEVELOPMENT BEFORE INDEPENDENCE

1.2.1 During Pre-historic Times

Irrigation in India has ancient roots. There are passages in some of the ancient texts elaborating the responsibilities of the rulers and beneficiaries apart from providing incentives, taxes to be levied etc. for irrigating lands. There are also documents on irrigation structures constructed in the days bygone indicating the extent of people's participation in the construction and maintenance of irrigation systems.

Amongst those developments for which some historical records exist is the Grand Anicut in present-day Tamil Nadu, which was constructed in the second century A.D. with its basic design still intact. Some tanks in use in southern India can trace their history to even before the 10th century. Construction of some of the Yamuna canals in Haryana began in the 14th century.

During the 2nd Century AD, the Chola King Karikala built a diversion dam across river Cauvery in Tamil Nadu, known as the Grand Anicut. The scope of the project was gradually extended to supply water to many parts of the Chola Empire. Prior to the advent of the British rule, certain parts of the irrigation systems were maintained by the government and were called `Sarkari'. The lower parts of distribution system were maintained by farmers and the system was known as 'Kudimaramat' (farmer maintenance). The farmers also contributed labour for maintenance and for

protection from flood. Thousands of small irrigation tanks were built in those days in Tamil Nadu, Andhra Pradesh and Karnataka, in which the ownership and operation and maintenance rested entirely with the farmers. These systems are even now managed by either formal or informal groups of farmers.

According to the Arthashastra (4th Century) written by Chanakya, the great policy adviser of ancient India, the King should provide assistance to the farmers, who come forward to construct irrigation tanks, and diversion works by supplying construction materials like timber, stones; lime etc. He also advised the rulers to compel people to participate in the construction of dams and diversion weirs. The recalcitrant populace should be coerced by punitive action to participate. It has been indicated therein that incentives were offered through remissions of water fees for 2 to 5 years to the farmers, who would construct, rehabilitate or undertake repairs of irrigation structures. The irrigation tax was related to the gross produce and maximum tax levied was up to one third of the produce, from those who were taking water from the government channels. The rates were reduced to one fifth of the produce for those who used water from their own wells or through mechanical appliances like water wheels.

In Vijayanagar Empire, (13-16th Century) the rulers of the once mighty empire in Southern India (now situated in Karnataka) had built a series of diversion weirs and canals on Tungabhadra river for supplying water for irrigation in which people participated voluntarily for building anicuts and water distribution systems. Resolution of conflicts as well as routine maintenance was achieved through voluntary participation during this period.

In Himachal Pradesh, an ancient system called Kuhls existed in which the systems of irrigation were managed by the community. In Uttar Pradesh also there were traditional farmer managed diversion schemes in the Himalayan region. The `Phad' system in Dhule and Nashik districts of Maharashtra is well known. This system consists of a diversion weir and a canal supplying water to the area of a village, divided into parts called phads, wholly managed and maintained by the Pani Panchayat, a representative body of the beneficiaries. The system dates back to 16th century A.D. The government framed guidelines for implementation by the beneficiaries and maintenance of accounts.

1.2.2 During the British Rule

During the British period, irrigation was dominated by the civil engineering profession because of certain historical reasons. When the British wanted to utilize Himalayan waters for irrigating the plains of the north-west, they brought in Dutch engineers, as there were few British irrigation engineers. They also used military engineers. The projects were conceived, executed, and managed as top-down engineering projects. In South India, when the tanks were taken over by the administration and a large number were going into disuse, the Government of the then Madras Presidency appointed engineers to look into the reasons. Subsequently in 1819, a separate department was formed for this purpose, which later evolved into the Public Works Department (PWD). Although the construction of irrigation works was taken over by the Public Works Department in the States, some irrigation works like weirs, tanks in southern and western India were continued to be maintained and operated by local communities like Panchayats and other local bodies. The Government departments in many cases helped in desilting of tanks with financial assistance, which also encouraged local bodies to continue to maintain the same.

The concept of management through private agencies has of-late not been emphasised at various levels and the whole system of private management which was already there in the past has to be revived and activated for efficient use of irrigation water.

As the existing canal systems on the Cauvery River fell into disrepair, the government appointed engineering bodies to look after them. During the period starting from the first half of the 19th century, irrigation developed through renovation and improvement of existing works and later with new investments. After the great famine of 1876-78, special emphasis was given to irrigation development. By 1900 the irrigated area in undivided India was about 13.4 million hectares (Mha) of which 56 per cent was under public schemes and the rest private, mainly wells and tanks. The concept of farmers' management of the irrigation systems was revived in the report of Irrigation Enquiry Committee appointed by the then Government of Bombay under the Chairmanship of Sir M.Vishweshwariah (1938). The Committee was of the view that the Operation and Maintenance below minors should be turned over to farmers' co-operative societies and water should be supplied on volumetric basis. In 1947, Government of Bombay (now Maharashtra) set up Canal Advisory Committees and Water Panchayats to facilitate farmers' participation. The role of the Committees was to advise the Department of Irrigation on Scheduling of Water.

The irrigation system in ancient and medieval times were largely self managed. The systems were generally small and the State did not intrude in the areas of day-to-day management of water and resolution of conflict and routine maintenance, were achieved through voluntary effort. These cannot be cited as traditions for PIM, because irrigation work of the present times did not exist before the last quarter of the 19th century.

1.3 IRRIGATION DEVELOPMENT AFTER INDEPENDENCE

Before the advent of the Plan era, (i.e.1951), an area of 22.6 Mha was under irrigation. Since then, successive five-year plans have made large investments in the irrigation sector aimed at expansion of irrigated area averaging to about 1.5 Mha a year. The irrigated agriculture has increased by nearly four times by 1996-97 with the gross irrigated area being about 73 Mha. It has made a tremendous impact on agricultural production by increasing the production of food grains from 51 million tonnes in 1951 to about 200 million tonnes in 1999-2000.

While there has been significant development in the creation of irrigation potential since independence, certain problems as mentioned below also had cropped up in the management system.

(i) Out of the irrigation potential of 93 Mha which has been created upto 1997-98, about 89% viz. 83 Mha could only be utilised. About 10 Mha of potential created has remained unutilised.

(ii) While new systems are being added, the infrastructure has not been strengthened to meet the present need. Also over the years, maintenance and repair works of irrigation structures have been affected owing to increase in working expenses and low water rates. Moreover out of the meagre amount provided for O&M a major portion is utilised to meet the establishment cost, leaving negligible amount for works.

(iii) Inspite of the dynamic transformation of agricultural technology, public administration of the irrigation sector remains rooted in a governmental structure, which has not kept pace with the changing character and complexities of irrigated agricuture.

(iv) It has not been possible to ensure reliable supply to farmers. Several evaluation studies under Command Area Development Programme have shown that the water available at the outlet is different from the design quantum. This may be generally due to silting up of both reservoirs and canals and inadequate O&M in some projects.

(v) The farmers at the head of the canal generally tend to take disproportionately large share of water even at the cost of exposing their lands to waterlogging, while denying water to tailenders.

(vi) Due to lack of communication between the farmers and the officials of the Department of Irrigation, timely and assured water supplies are not available to farmers.

(vii) Due to inadequate sector planning and financial management on the one hand, and inadequate water management and maintenance on the other, the performance of the Irrigation sector is not upto the mark. The growing deterioration of country's existing irrigation infrastructure and its management, therefore, requires that we take a hard look at the above issues and initiate policy changes and measures such as farmers' participation and private sector involvement for the overall improvement of the irrigation sector.

This issue has been engaging the attention of the authorities concerned since the last few decades. In 1972, the Irrigation Commission expressed concern about less than optimal use of water in irrigation commands and the gap between the potential created and utilised. A Command Area Development (CAD) Programme was started in 1974 in order to ensure that water below the outlet should reach all the fields in the command area and the management of water should become more efficient. The planned and systematic effort by the Government on farmers' participation in the irrigation management started for the first time in India, under the centrally sponsored CAD programme during 1985. The Union Ministry of Water Resources (MoWR) requested the State Governments participating in the programme to take up farmers' participation on pilot basis on atleast one minor (comprising about 1000-2000 hectare of area) in each CAD project to involve farmers in water management and maintenance of water courses/field channels with the objective that eventually the minor level systems could be handed over to the WUAs for management and maintenance purposes. The concept of "Participation of farmers" was also incorporated in the National Water Policy adopted in September, 1987. The Policy states that "efforts should be made to involve farmers progressively in various aspects of management of irrigation systems, particularly in water distribution and collection of water rates". In order to provide incentive for promoting farmers' participation in irrigation management, provision of management subsidy at the rate of Rs.100/- per ha for the first two years and Rs.75/- per ha for the third year on a matching basis by Central and State Governments for WUAs formed at minor level, was made under the centrally sponsored CAD programme in the VIIth Five Year Plan. This has now been changed as one time grant of Rs.500/- per hectare to the WUAs. Simultaneously, efforts were also made during the same period (i.e. 1985 onwards) to promote farmers' participation in irrigation water management under some of the externally aided projects and under Action Research Programmes (in some cases) by own initiatives.

A review of the progress achieved in promoting PIM in India during the last 15 years indicates that inspite of the various efforts made by the Union and the State Governments under Centrally sponsored CAD programme and under various other externally aided projects by way of providing management subsidy, creating awareness through workshops, seminars, symposia, trainings and involving NGOs, etc., the progress achieved in this area is not adequate, as only about less than 1% of the created potential could be brought under PIM.

For formulation of IXth Plan (1997-2002), a separate Working Group (WG) was set up for PIM. The Working Group had recommended that at least 10% of the irrigated area may be brought under PIM in the IXth Plan. Taking up of 2000 pilot projects during the IXth Plan period was also recommended, by the Working Group alongwith several other recommendations for development of PIM in the Country.

For the formulation of Xth Five Year Plan (2002-2007) also a separate WG for "Private Sector and Beneficiaries Participation in the Irrigation Sector" was set up by the Government. While reviewing the progress about PIM in IXth Plan, Working Group has observed that while progress regarding setting up of pilot projects was far below targetted figures, the overall progress regarding removal of legal bottlenecks in formation of WUAs and introducing certain policy measures for promoting PIM has been significant. Statewise status regarding WUAs is given in Annexure-1.

The WG has made several suggestions for accelerating PIM programme. It has suggested for initiation of a new programme "Command Area Development and Management (CADAM)", which should cover both command area development and management aspects of irrigation for any existing irrigation project with CCA of 500 ha or more. The CADAM programme should cover all the irrigation projects and be funded jointly by the Government of India, State Government and Farmers' Organisations (FOs). Setting up of WUAs; providing legal support through specially enacted legislations to WUAs; transfer and sale of water to WUAs on volumetric basis; provision of management subsidy; revision of water rates by mobilising political will to achieve financial self sufficiency; involvement of NGOs for promoting, facilitating and sustaining PIM; imparting training to the farmers and officials and evolving suitable systems for monitoring and evaluation of PIM to ensure speedy progress and timely rectification of deficiencies are some of the important recommendations of the WG.

Demonstration of Border method of irrigation to farmers (Maharashtra)

CHAPTER - 2

FARMERS' PARTICIPATION - INTERNATIONAL EXPERIENCE

Beneficiaries' participation in one form or the other is in vogue in many countries and efforts to transfer the management from Government control to the WUAs have taken place in many countries. Since 1980 there have been a spate of experiments world over. The important efforts and information pertaining to PIM in various countries are briefly described below:

2.1 CHINA

There are about 5,500 big and small irrigation projects in China with an average of 9,000 ha each. The total irrigated area is 50,000,000 ha. A Council or Management Committee comprising representatives of government departments, special management institutions, collective organisations and water users is responsible for management of irrigated areas. Management bureau, management divisions or management stations, according to the scale of the project are set up for maintenance of projects, water allocation, O&M of the system and collection of water charges. Projects of tributary canals and below are managed by collectives or water users. However, the contribution of water users in the management of the system is negligible and they show little concern over the maintenance of key projects. In addition, the water rates in irrigated areas are too low, and revenue recovery being poor, generally the O&M of the system has been quite unsatisfactory.

During the late 1980s, a series of reforms were introduced in the management of irrigation systems called contract responsibility system. Some of the important aspects of the reforms are:

(i) transfer of responsibility for financing irrigation from communes or provincial governments to financial autonomous irrigation districts,
(ii) volumetric and area water fees and compulsory maintenance labour,
(iii) introduction of incentive system based on performance monitoring.

According to a proclamation issued in 1985, all costs needed for operation and maintenance including renovations and rehabilitation had to be borne by water users and each farmer had to contribute 20 day's labour for maintenance. In the early 1990s, a system of farmer stock shareholding arrangement had begun, due to which farmers acquired ownership of the system's infrastructure on the basis of shares. 'Stockholding' method was adopted to construct new projects or to reorganise the existing management systems in some provinces. In some provinces, water supply companies were established to supply water to users including for irrigation.

Pilot projects are being taken up to experiment with the turnover of management of canals and on-farm works to Farmers' Management Committees. The members of the Committees include Governors of townships, village heads and elected farmers. The Committee is not a legal body, but it is financially independent. Users' Representative Congress has also been proposed to be established in all irrigation projects to discuss and decide major issues relevant to team management of irrigation. The Congress will consist of the representatives of farmers, staff of the local government and staff of the local irrigation agency.

The Association of Water Users is a legal entity and is financially autonomous. It takes active interest in the rehabilitation of 'outdated' systems and to enact suitable legislation for reforms in irrigation sector. Some of the prominent features of the Association are as follows:

(i) The Association is not established according to administrative divisions, but by water boundaries, thus encouraging the unified development and utilisation of water resources;
(ii) These are non-governmental organisations;
(iii) The Associations follow democratic processes in electing their representatives and in deciding their affairs. The convention of representatives of water users is the main body of the Association, water user group is the policy making body and the Secretariat work is entrusted to the executive committee;
(iv) The Association is a non-profit making organisation;
(v) It ensures participation of water users in management, financial inputs and policy making;
(vi) The Association performs O&M functions and is responsible for the collection of water charges;
(vii) Its internal disputes are settled by the government;

2.2 COLUMBIA

Columbia declared a policy for transfer of management of irrigation to farmers during 1980. In order to determine the unit cost of O&M, a national standard accounting procedure was set up. A system level budget based on actual cost of management was worked out for the first time and the information was conveyed to Farmers' Associations (FAs). The farmers decided that they could do the work of management more cost effectively than the Government. The Government made considerable emphasis on training of farmers and farmers' leaders in technical, financial and other managerial aspects of irrigation. Another important step taken in implementing PIM was legislation of a new irrigation law in 1993, which stipulated that future investment in irrigation could be made only if the beneficiaries demanded it. The beneficiaries had to make a commitment to form WUAs and to put in their own resources for on-farm development works. This model was applied to new projects where beneficiaries could be involved from the planning stage of project itself.

2.3 EGYPT

Egypt is a semi-arid, Nile dependent country with 3.3 per cent of its area under cultivation, which is 7.8 Mha. Water is scarce in Egypt. Its population increased from 22 million in 1947 to 66 million in 1996. Government of Egypt has been making efforts to introduce PIM and irrigation improvement projects are being initiated to develop tertiary system. The drainage system is also being improved by constructing open drains, pumping stations and sub-surface drainage. The farmers pay the cost of implementation of schemes in 20 years. The system of sub-surface drainage is transferred to Farmers' Organisation (FOs) for its operation and maintenance. The problem in transferring the system to farmers is that traditionally water has been supplied free of cost to farmers in Egypt and farmers do not like the idea of paying for it. Further, due to the irrigation system being in a very poor condition necessitating high repair costs, the farmers are reluctant to take over these systems.

2.4 INDONESIA

Indonesia has traversed a long distance in water resources development and through that, successfully raised the financial status of their peasantry to a remarkable extent. The cultural heritage played a dominant role in their endeavor. Central Java and Bali Islands are the major areas of significant water resources development, largely due to the fact that intensive agriculture is practised here since long.

The 'Subak System' of Hindu farmers in Bali like `temples' is the centre of social and cultural activities in a village. Subak is the net result of centuries old traditions. It is a community endeavor for well being and benefit of village society as a whole. It is a traditional association of 200 to 300 farmer families headed by an acceptable farmer leader for a duration of five years. A Subak is located at a central place of the village with a well kept community house, painted wall map of the fields and water channels, well-equipped place for worship and social gatherings, and food storage facility for keeping the seeds to prepare seedlings for transplantation of rice. Subak is a living example of community life and time immemorial philosophy of co-existence. It fulfills the social, economical and psychological needs of the resident members of that village. Fee, more often in kind which is proportionally paid by the members, is used for social/ religious ceremonies and O&M purpose based on the needs.

The Subak System's main components comprise; sharing of labour, participation of society in good and bad days, no selling of land even of those family members who have left the village and its awareness to the issues of social mix, integrated approach towards agriculture, fine art and handicrafts and even environmental aspects. The farmers originally built and managed most of the small irrigation systems. Over the years, various programmes were taken up to assist these systems particularly during 1970s and early 1980s, when Indonesia obtained abundant income from high oil prices. A policy statement for O&M of small-scale irrigation systems (500 ha or less) was prepared by the Government of Indonesia in 1987, wherein the policy of turnover of small-scale irrigation schemes to WUAs was enunciated. It took two years for an in-depth analysis of the issues and to device criteria for turnover. It was in 1989 that actual implementation began. The important factors in turnover process are

(i) The system should be in good condition before turn over;
(ii) the farmers have to be ready;
(iii) before being handed over, the systems needing some repair and rehabilitation be improved by carrying out such works;
(iv) WUA should be established accordingly.

The WUA is registered at the district office. The decision about the turnover of the scheme is taken by the Governor of each province and its implementation is done by the Chief of District Government. The WUA has a Board of Organisation elected by water users. The source of income of WUAs is the fees from its members. A painstaking and detailed process of preparation of WUA profiles prior to turnover is the main feature of the Indonesian experiment. By the middle of 1994 the Indonesian Ministry of Public Works had transferred almost 1500 small irrigation systems irrigating more than 115000 ha to WUAs in 10 provinces.

The salient features of Indonesian Water Resources Management could be summarized as follows :-

(i) The Institutions and arrangements like Water Masters, collection of Irrigation Service Fees (ISF) by Ministry of Home Affairs, retaining of 7% of the Irrigation Fees by each of WUA to meet the exigencies, "Ulu Ulu" (Water Manager), who is a technical person available at grass-root level, are some of the peculiar administrative aspects of Water Resources Management in Indonesia.

(ii) There has been perceptible change in the capacity of farmers, self-sustenance of WUAs and upgradation of the O&M of water channels. The net result of all these positive developments is evident in the dramatic increase of per hectare crop (predominantly rice) production.

(iii) The turning over process, both through government managed or assisted WUAs and through traditional FAs, strengthened O&M aspects largely due to financial sustainability by way of ISF.

(iv) The upgraded water management system by Government and beneficiaries together have increased the cropping intensity and productivity.

Indonesian scenario, somehow, gives a picture of 'Government presence' everywhere and every time, in one-way or another, directly or indirectly.

2.5 JAPAN

Japan has had a long historical tradition of PIM. In Edo era, irrigation associations were established to implement irrigation projects. After Meiji restoration in 1868, irrigation and land consolidation associations were formed of which the landowners not tenant farmers, were the members. In 1945, as a result of land reforms, tenant farmers were made the landowner farmers. In 1949 legal framework for implementing and managing irrigation and drainage projects was enacted. In order to implement a project, it is necessary that at least 15 farmers in the area must apply for implementation of the project. Only the persons who are actual cultivators can participate in the project. These persons can organise a Land Improvement District (LID) within which the project has to be implemented with the permission of the Governor of the Prefecture.

The LIDs are organisations for constructing and managing irrigation and drainage facilities. The members of the organisation are cultivators. Cultivators have compulsorily to join the organisation and share costs. They determine the area of the LID and notify publicly the outline of its activities and its bye-laws. It is the responsibility of these initial proposers to obtain the agreement of two thirds of the farmers in the area for the LID. In practice, agreement of ninety per cent cultivators is obtained to make it effective. The plan of the project and bye-laws are then finalised by a process of public consultation. Thereafter, an application is made to the Prefectural Governor for establishing of LID. Projects with beneficial area of more than 3000 ha, 200 ha to 3000 ha and 20 ha to 200 ha are considered as National, Prefectural and LID Projects and are entitled to national subsidies of 2/3rd, 50% and 40% respectively. It is thus possible to implement the project effectively.

2.6 MEXICO

In 1989, Commicion Nacioanl del Agua (CNA) (National Water Commission) was created by Federal Government by a Presidential Decree which stated the main tasks of the Commission as under:

(i) to administer national waters,
(ii) to transfer O&M responsibilities of irrigation districts to WUAs,
(iii) to increase Users' contribution to O&M and investment costs, and
(iv) to promote more efficient use of water.

The National Development Plan (1989-94) gave high priority to the transfer programme and practically stopped the expansion of new irrigation schemes. The transfer programme was backed by a National Water Act of 1992, which provided for total transfer of 3.3 Mha of public irrigation districts to private organisations. The first irrigation district was transferred for management by WUAs in 1990 and in the next 5 years, 3.2 Mha had been transferred to WUAs. The size of

Associations is vast, the largest comprising 40,000 ha with about 10,000 members. Some employees of the government agency lost their jobs while the competent officials were employed by the WUAs.

Although it seemed that the transfer process in Mexico was very swift, yet it was preceded by intensive preparation. A large number of meetings with users were needed to convince them of the necessity and benefits of users' associations. Training was an important aspect of the programme, which is largely responsible for its success. Assistance of professional private organisations was taken for intensive training of farmers before the turnover

Political factors also played important part in the process of transfer. In the Aptazingan Irrigation District in the state of Michoacan, the farmers were not agreeing to enhancement of irrigation fees, which was necessary for meeting the costs of O&M. Majority (95 percent) of farmers were small (5 ha land holding) farmers in public sector, i.e. those to whom land had been allotted by government, called 'ejidatarios'. It required negotiations with local farmers' unions, after which the issue was settled and transfer could be affected in December, 1994.

Financial self-sufficiency of the Water Users' Organisation (WUO) was pre-requisite for transfer, so that they could meet the cost of normal O&M and the administrative expenses of the new body. As a result water fees normally increased from 2 to 5 times, but in some cases by as much as 10 times of what they were before transfer. As has been described above, convincing the farmers about the need to increase water fees was the most difficult task before CNA. Some progressive farmers assisted CNA in this task.

The irrigation sub-system, which formed the basis for WUO was called module. The organisation is known as Associations Civile, which is a legal entity. On an average a module is about 5000 to 10,000 ha in size with about 1,000 users in WUO. In Los Mochis area the average size of the module is about 18,000 ha. The WUOs in an irrigation district are expected to form a Sociedad de Responsabilidad Limitada e Interes Publico (Society of Limited Responsibility and Public Interest). This would be responsible for the O&M of the main system. The necessary legal framework for transfer was provided by the Title of Concession. The Title of Concession gives a detailed list of infrastructure transferred to WUO. It also lists the rights and obligations of WUO. The Title of Concession includes a detailed map of the irrigation district, a list of water users and detailed instructions for O&M. It also illustrates how the water fee has to be calculated. The role of the CNA does not end with the transfer of the module to WUO. It ceases to be incharge of direct management, but it continues to monitor the activities of WUO and provide back up support. The responsibility for the headworks also remains with CNA. The WUO has to prepare (a) a cropping plan giving details of crops to be planted, area covered by each crop and their water requirement and (b) a maintenance plan every season. It is CNA's responsibility to ensure that these are implemented. Each WUO has an elected Executive Council and a General Assembly of users' representatives. There is an Oversight Committee also. The WUOs are required to file annual financial reports.

The farmers pay water fees in advance before the season begins. The fee is deposited in the bank by the farmers on the basis of calculation slips provided by the WUO, which state the share of WUO, the society (3rd stage) and the CNA.
Important lessons from Mexican experience are:

(i) Political will and administrative determination led to the success of Mexican experiment.
(ii) A proper legal framework is a prerequisite for the success of PIM.

(iii) Proper communication creating awareness and training are essential features for implementation of PIM Programme.

2.7 NEPAL

In Nepal, the Government announced irrigation policy in 1992, which is based on the principle of participatory approach for management of irrigation. The basic guiding principles are:

(i) Increase in farmers' involvement in the management of irrigation and transfer of the system to FO with the attendant responsibility for O&M; and
(ii) To create the feeling of ownership among the farmers.

While minor irrigation systems are entirely transferred to the farmers, the larger systems are jointly managed by the WUAs and irrigation agency. The participatory approach adopted by Nepal embraces the principle to involve users at all stages of development and management; project identification, preparation, planning, design, construction, operation and maintenance. The major activities of Department of Irrigation related to the participatory approach are assistance to Farmer Management Irrigation Systems, which includes rehabilitation, improvement of physical systems or other technical or institutional support. The assistance is provided on the formal request of the users on a cost-sharing basis.

2.8 PAKISTAN

Out of the total cultivated area of 21.60 Mha, 17.20 Mha (79.63 per cent) is irrigated in Pakistan. Due to poor drainage, waterlogging is a major problem in Pakistan. In 1970 Water and Power Development Authority of Pakistan found that there were huge conveyance losses in the watercourses in the fields. It was found that about 40-50 per cent of water reaching the outlet was lost in the watercourses. Experts came to the conclusion that these losses can only be minimised with the active involvement of farmers. The cost of improvement of watercourses through the usual system of contracts was found to be double the cost with farmers' participation. A pilot project under the auspices of USAID was started for the improvement of watercourses. This On-farm Water Management Project was implemented through the Department of Agriculture. 5 Pilot Projects were taken up in five different districts of Punjab. These projects were completed during 1980-81 after the watercourses were improved. However, after this there was no further work for these WUAs and their activities gradually declined and they became redundant. It shows that WUAs which involve themselves in activities for the benefit of their members and build up their financial position, often become viable for undertaking sustained development. The WUAs in Pakistan disintegrated, because they were organised without thorough initial preparation and emphasis was laid on civil works and not on strengthening WUAs.

In 1981, a WUA Ordinance was promulgated to make WUAs legal entities. Drainage Beneficiary Groups were also organised on the lines of WUAs to fight the problem of waterlogging and soil salinity. FOs were formed to whom public tubewells were handed over. In 1985 Command Water Management Project (CWMP) was started, which like CAD Programme in India, integrated all the functions of irrigation and agriculture at the field level. Water Users' Federation were formed under this programme.

A WUA in Pakistan is organized around the watercourse. Generally, there is one WUA per watercourse and the farmers along this watercourse share a common concern-obtaining more water. Consequently, the prospect of improving and maintaining the common resource (i.e., the water

course) in order to increase the amount of irrigation water available to each farmer generally provides most, if not all farmers with an attractive incentive to organize themselves into a WUA. Further, although most farmers may not realize it at first, the existence of a WUA on each watercourse along a distributary provides an organizational basis on which to develop higher-level organizational forms (e.g., a distributary federation of WUAs). In turn, the existence of a federation of WUAs on each distributary along a canal provides the organizational basis on which to develop a canal federation of WUAs.

The Pakistan Government has unveiled plans to introduce PIM into the world's largest contiguous irrigation system. According to a policy decision announced in September, 1995, the major canal commands of the Indus system will be managed by Area Water Boards (AWBs) controlled by a board of water users and Government representatives. These AWBs would distribute water to the user associations within that command. At the provincial level irrigation departments will be reconstituted as Provincial Irrigation and Drainage Authorities (PIDA) providing technical support and guidance to the AWBs. The average command area of the AWBs would be about 0.6 Mha.

Participants to the Second National Seminar on PIM, held in Bhurban, Pakistan from October 1-4, 1995, discussed the implications of the new policy for introducing PIM at the local level. One of the recommendations of the seminar was that irrigation water users (farmers) be fully represented on the managerial boards of the PIDAs and the AWBs. Arrangements for such representation should be made at the initial establishment of the PIDAs and AWBs.

The creation of autonomous PIDAs with independent revenue and spending authority and financially self-accounting AWBs, would provide a healthy context for the effective involvement of the water users in all levels of irrigation management. In order that the institutional arrangements of the PIDAs and AWBs be consistent with the aims of PIM, the following recommendations have been made:

(i) WUAs at the chak level, representing all water users (including women and tenants) should be formed. In many instances, these can be based upon the WUAs created under the On-Farm Water Management Programme, but in other instances, these will need to be created afresh.

(ii) WUOs at the distributory or minor level, representing all WUAs, should be formed. These Organisations would collect water fees and enter into a contractual arrangement with the concerned Area Water Board for the provision of water and other irrigation support services.

(iii) The heads of all WUOs would be represented on the Area Water Board, either directly (if only a few WUOs), or through an elected sub-group of WUO heads. Eventually the WUO representatives should form a majority on the Area Water Boards. During the transition period, while the WUOs are still being established, representatives of the Water Users would be nominated or elected.

(iv) At the provincial level, one farmer representative from each canal command area (Area Water Board level), would serve on an oversight committee that would monitor the management of the PIDAs and AWBs and suggest improvements.

2.9 PHILIPPINES

The Government of Philippines created National Irrigation Authority (NIA) in 1964 for development of irrigation. However, with the increase in the area of irrigation and poor collection of Irrigation Service Fees, the irrigation system started deteriorating. Faced with such challenge, the NIA turned towards the new management scheme of farmers' participation in the management of irrigation. The farmers in the National Irrigation System (NIS) serving 1000 ha or above, were organised into Irrigation Authorities mainly at the turnout level unit with an area of about 50 ha. These Irrigation Authorities were given the responsibility of O&M at the turnout level and could be federated into higher level organisations for their involvement in O&M of higher portions of the system. This did not succeed for want of incentives and formalisation of Irrigation Authorities' responsibilities.

In 1974, Presidential Decree No.552 mandated NIA that part of the cost of construction and improvement should be recovered from farmers, who should organise themselves into Irrigators' Associations (IAs). In 1975 NIA coordinated with Farm Systems Development Corporation, now extinct, to organise farmers into IAs. In 1976, Participatory Approach Programme (PAP) was started by NIA, in which IAs were involved from the earliest stage of development of projects. In 1983, it became a policy that all NIA-assisted projects would be implemented through the PAP.

In early 1980s, under National Irrigation Systems Improvement Programme (NISIP), Irrigation Community Organising Programme (ICOP) was initiated. This helped in organising IAs in a unit covering 500-750 ha area. These IAs were then given formal responsibilities in the O&M of the system by formal contracts. Incentives were also provided for both maintenance and collection of fees.

Confederation of IAs at provincial and regional levels is now being organised. These Confederations are involved not only in irrigation activities but also in other agricultural assistance programmes. A National Level Confederation of IAs has also been now planned. The head of this Confederation will also be a Director in the NIA.

The Community Organiser (CO) has been the cornerstone of the Philippine's strategy of PIM. College graduates in social sciences who had experience of working with rural and urban poor were trained by NIA in the methods of organising communities and operation of irrigation systems. They were hired on temporary basis as COs. They lived with farming communities to establish rapport and worked as an interface between the communities and NIA. At the same time they motivated the farmers to form IAs. The IAs are registered with securities and Exchange Commission. Elaborate manuals have also been prepared for guidance of officials and farmers.

2.10 SOUTH KOREA

Ruth Meinzen-Dick et al have mentioned three types of associations in South Korea: Farm Land Improvement Associations (FLIA), Hungnong Gae (HNG) and WUAs. The FLIA is the legal public enterprise responsible for large and medium scale irrigation schemes. The leader of FLIA is appointed by the Government. HNG is a farmers' club, which promotes improved variety of irrigated paddy. The leader of HNG is recommended by the village chief to the members and should be elected by a unanimous vote. The leader of WUAs is elected by members.

2.11 SRI LANKA

Sri Lanka has a land area of 65,610 Sq Km.. It is predominantly an agricultural country with 80 per cent of its population of 17.6 million engaged in agriculture. Sri Lanka is divided into two climatic zones: A Wet Zone, which receives about 2500 mm rainfall every year and a Dry Zone with 1500 mm/year rainfall. Agriculture in the Wet Zone is largely rain-fed and to a small extent serviced by minor irrigation works (small anicut schemes). Agriculture in Dry Zone is both irrigated and rainfed. The Dry Zone has major and medium scale irrigation projects as well as village based small tanks. Paddy is the main food crop of Sri Lanka and historically, therefore, irrigated agriculture is associated with paddy cultivation.

There is a long tradition of irrigated agriculture in Sri Lanka. Major storage reservoirs are linked with village tanks and other micro-irrigation systems. One of the traditions developed in Sri Lanka is called 'Mahasammatha' (Great Tradition), which was based on construction of small village-based irrigation schemes and the other one is called 'Chaulasammatha' (lesser tradition) based on construction of major reservoirs. Small tanks were constructed in the Dry Zone and subsequently in the Wet Zone for purposes of irrigation and maintaining ground water level. Later these tanks were joined with each other in cascade and with larger tanks. These systems fell into decline in course of time. However, steps were initiated during the British Colonial period to revive the system.

During the course of centuries, a system of distribution of water called 'Bethma' was evolved in the small-scale sector. It is a traditional mechanism for distribution and allocation of water. The water share for each field is agreed upon by the Community. Traditionally, the main paddy fields in the command of a village tank belonged to the entire village. On the basis of the information about the water level in the tank, the fields were divided into upper, middle and lower portions and each village family held land in each portion. The community decided the portion of the village field to be irrigated, if sufficient water was not available for the entire field. Each family received its share of water proportionate to the land area under its possession.

When large irrigation works were taken up, they were beyond the means of farmers. These were constructed by the State and bureaucracy came into existence to maintain these. Also, an intricate decentralised irrigation management system was evolved for the management of large works.

Since large systems were joined to minor tanks, it resulted in the development of a cohesive agricultural community, necessitating development of an ethoes for the management of irrigation and irrigation structures. Such socially evolved rules seem to have bred systems of equitable distribution of the benefits of water resources, including the distribution of water quantities, distribution of fish and other aquatic resources, the allocation of land as well as allocation of produce served by irrigation water. These mechanisms have been assailed by State intervention, which has led to farmers' dependence on the State and Irrigation Agency.

The policy issues of Sri Lanka concern revival of the traditional system and re-establishment of 'greater' and 'lesser' traditions. Revival of inter-linkage between 'lesser tradition' and tanks is also contemplated. Steps have been initiated for physical revival through restoration and rehabilitation by PIM techniques. The main plank of policy is systematically to reduce the role of the Government in the management of irrigation and limit it to high technology areas. The role of farmers is being enhanced to make the system completely farmer managed. The cost recovery will be through FAs. The concept of participation is being broadened to include production planning, credit making etc.

The irrigated area of Sri Lanka has more than doubled to above 0.55 Mha since Independence. About 65 percent of this area is under major irrigation schemes i.e. the schemes irrigating more than 80 ha. Since early 1980s, as the Accelerated Mahaweli Development Program was completed, irrigation investments have shifted from new construction to rehabilitation and modernization of existing systems. Experiments have shown that economic returns have increased on those rehabilitation projects, which are accompanied by management improvements, whereas returns on new construction have declined.

In Sri Lanka, the Government declared the concept of PIM as an official policy in 1988. The processes in developing FOs are based on tiered representation system approach with informal user group (approximately 25 ha - 25 farmers) organised on the basis of field canals tertiary system. The representative of this group comes into the distributary canal organisation, which is the formal organisation registered under provisions of the law. Representative of distributatary organisation in turn sits on the apex level FO and also in the Project Management Committee, comprising line agency staff and representatives of the farmers. Enabling legislation to the irrigation ordinance in March, 1994 has institutionalised the Project Management Committee chaired by a Project Manager of the relevant agency or by a representative of the farmers. The whole organisation and mobilisation process is facilitated by using the services of institutional facilitators or catalysts, who help to mobilise the farmers to form groups and provide training opportunities to the farmers. Four key financial aspects of turnover policy of Sri Lanka are:

(i) Exempting farmers from paying water charges to the Government.
(ii) Having farmers pay fees to water user groups.
(iii) Granting O&M contracts to farmers.
(iv) Involving farmers in rehabilitation contracts.

2.12 THAILAND

There is no water fee for irrigation in Thailand. The Government, therefore, follows the policy of beneficiary participation in the O&M responsibilities of the irrigation systems. Water Users' Groups (WUGs) are formed at the outlet level. The members of WUGs select a 'chak leader', who is responsible for equitable allocation of water among the members of the Group. He also acts as Group's spokesperson. The WUG is responsible for maintenance of the micro-system. The work of motivation of farmers is done by government officials. They elect a group leader. The WUG prepares the water rotation plan, looks after O&M activities, tries to resolve the conflicts and supervises the collection of water fees. About 6 chak groups are joined into a main ditch group and its leader is elected. These are further joined together in main canal groups. The main shortcoming of the approach is that the need for such groups has not been fully appreciated and neither the farmers nor the officials of the irrigation agency fully understand its rationale.

2.13 TURKEY

Surface irrigation command has been developed through a variety of mechanisms in Turkey. These include :

(i) private development by individual farmers or informal group of farmers;
(ii) General Directorate of Rural Services (GDRS); and
(iii) General Directorate of State Hydraulic Works (Devlet Su Isleri or DSI). GDRs look after schemes in minor irrigation sector.

Net irrigated area is about 3.95 Mha. About 92 per cent of the area is presently covered under WUAs. The country's irrigation laws promote transfer of completed Irrigation systems to a variety of municipal, village and farmer-based organisations. Although Turkey had legal provisions since 1954 for transfer of management responsibility of publicly constructed irrigation schemes to local control, yet the programme proceeded very modestly till 1993, when Accelerated Transfer Programme (ATP) was started. This resulted in bringing under WUAs about 10,000 ha. compared to 6200 ha then covered under WUAs.

The ATP in Turkey has been founded on a downward reaching link between DSI and local administrations, rather than on the formation of participatory local-level associations of farmers. While there are regional variations in the nature and extent of farmers' involvement in the operation and management of schemes, transfer in Turkey is basically a devolution of certain responsibilities of operation and maintenance to local administrations and consortia of local administrations.

If the transfer is proposed within a village, the responsibility is given to Irrigation Groups (IGs). Under this programme village headmen (Muhtars) or mayors of municipalities, designated as heads of IGs, enter into contractual arrangement with DSI to take administrative responsibility for submitting demands of farmers for water to DSI, managing distribution of water below a certain hydraulic level, maintenance of system and collection of water fees. In return DSI gives a discount of 20 to 40 percent on irrigation dues. This is used for O&M expenditure. The weakness of IG Programme is that there is no involvement of farmers. However, according to a study by the Economic Development Institutue of the World Bank, the presence of IGs has provided an important foundation for Turkey's irrigation management transfer process.

When ATP began in 1993, the transfer of responsibilities for management devolved on one of the following four organisations: Cooperatives, villages, municipalities and Irrigation Associations. Cooperative approach was adopted mostly in the minor irrigation schemes developed by GDRS. DSI has transferred the management either to local administration as mentioned above or to Irrigation Associations. Where the irrigation scheme serves only a single village or a single municipality, the transfer is made by DSI to Muhtar or the mayor. Irrigation Associations are formed, where the irrigation scheme covers more than one local administrative unit. In this case a new institution is created under municipal law. The general assembly of the Irrigation Association is made up of Muhtars and Mayors of participating villages and municipalities and some additional members. Selection procedure for additional members differs from one region to the other. They can be selected by Muhtars or Mayors or directly elected by farmers. The average size of an irrigation unit managed by an Irrigation Association is approximately 6,500 hectare.

The following five basic steps in the process of transfer are followed:

(i) **Initiation**
The first step is to motivate the local administration and farmers to participate in the process of transfer. DSI takes the initiative in informing the representatives of local administration and farmers about the need for and possible benefits from participating in transfer.

(ii) **Transfer agreement**
This document sets out the rights and responsibilities of the DSI and IA.

(iii) **Transfer protocol**
After finalising the transfer agreement, the transfer protocol is entered into between DSI

and Irrigation Association. This describes all the characteristics and facilities in the unit being transferred and includes a map of all irrigable lands.

(iv) **Preparation of O&M plans**
Once the transfer agreement is cleared and the transfer protocol is signed, DSI staff and Irrigation Associations representatives jointly prepare O&M plans and budgets for the first post-transfer irrigation season.

(v) **Implementation**
Responsibility for management of water is then carried out by IAs

2.14 UNITED STATES OF AMERICA (U.S.A.)

The United States Bureau of Reclamation (USBR) constructed the Columbia Basin Project (CBP) to irrigate 2,25,626 ha in Washington State in USA. Irrigation began in 1953. In 1969 the management for the main system and downwards was transferred to WUAs in three irrigation districts. Each district has 2000 to 2500 water users and elects a Board of Directors to oversee policy and guide district manager. Water is distributed on daily requests of farmers subject to the constraints of supply and individual entitlements or willingness to pay excess water charges. Water deliveries to farmers' fields are cut off for non-payment of fees and landholdings sold to recover dues. According to a study, the important factors in the success of irrigation management turnover in the CBP were strong legal institutions, clear system of water rights, training to farmers and strategic process of negotiation, research and legal analysis.

It is impressive that the management of irrigation in CBP for more than 2 lakhs ha with approximately 7000 landholders is being handled successfully by three local irrigator organisations. Indeed, it is a recurring pattern throughout American West even on larger scale. IA of King's river near Frenso, California successfully services an area more than twice as large as the CBP.

2.15 VIETNAM

About 7.3 Mha of land in Vietnam is used for agriculture out of which 6.2 Mha is irrigated. The Ministry of Agriculture and Rural Development (MARD) is responsible for construction of irrigation systems. At provincial level, provincial Agriculture and Rural Development Service exists for controlling minor irrigation and drainage systems. Irrigation Management Companies (IMCs) are responsible for operation and maintenance of the existing systems. Some IMCs are responsible for the whole system from headworks to the tertiary level. In other cases Subsidiary or District Companies are responsible for the O&M of the secondary systems and supply of water to Agricultural Co-operatives. The Commune Authority and Cooperative Authority pay irrigation fees to Irrigation Company which through District Sub-Company delivers water to Cooperative Farms through O&M sub-stations. This is mediated through the Irrigation Team of Commune Authority. At the farm level management had been given to a group of farmers called Irrigators Team (IT) in the 1980s. This was selected by the Cooperatives. It was responsible for O&M of waterways and collection of water charges to be paid to IMC. If one canal fed one commune, there was no conflict. However, conflicts arose, if one canal fed more than one commune. Problems also arose between IMC and cooperatives, when the latter used water rates collected from farmers for building farm roads, other improvements instead of paying to IMC. After 1988, farmlands were handed over to farmers, and many cooperatives collapsed. As a result IMCs found it difficult to sign contracts for water supply with any single body. Signing contracts with individual farmers would be difficult. As a result, the concept of Service Cooperatives of farmers took root. These cooperatives, in many

places, provide agricultural services including irrigation and drainage. The cooperative has many teams, which are responsible for water management. The cooperatives recover charges for water and maintenance of field channels. If two or more communes share one canal, a new Water Users' Agency is set up for these communes.

2.16 OTHER COUNTRIES

Implementation of PIM has been initiated in Jordan, Morocco, Sudan, Senegal and Tanzania also. Tanzania's action plan places, a great deal of emphasis on gender equity in transfer process. In the wake of political restructuring, PIM has been adopted as a policy in irrigation sector in Romania, Albania and Macedonia.

Broadly, the following could be considered as the important factors for the success of PIM world over:

(i) Political and Administrative will to introduce the new concept
(ii) Intensive and prior consultation with the farmers and officials of the irrigation agency about the details of the policy and its implications.
(iii) Involvement of farmers from the planning stage of the project in case of new projects and their involvement in rehabilitation of the system in case of existing projects
(v) Legal changes to facilitate registration of societies, resting them with legally enforceable rights, enunciation of clear water rights and clear definition of rights and obligations of the WUAs and the irrigation agency.
(vi) Training of farmers and officials is important in sustaining the associations.
(vii) Sound financial basis of the WUAs ensures its sustainability.
(viii) The tasks delegated to the WUAs are of continuous nature, because lack of activity can lead to atrophy.

Internal Water Distribution by Farmers-Mahi R. B. Canal (Gujarat)

CHAPTER - 3

PARTICIPATORY IRRIGATION MANAGEMENT - SUGGESTED APPROACH

3.1 OBJECTIVES

Participation of all stakeholders in Irrigation Management is crucial for conserving the resource and its optimal utilisation, since it presumes a dialogue between the service providers and users, where the wishes and problems (perceived and real ones) can be scrutinised and sorted out. The participants have to be aware of what role they are supposed to play and how best they can do that. If they are to be actively involved in preparing and executing management plans, it is particularly important to have clear and stringent rules about how, when and to what extent they could be involved. In short, participation should not be seen as "Window dressing". The objectives of PIM could, therefore, be set out as one or more of the following:

a. to improve the service through better operation and maintenance;
b. to achieve the optimum utilization of available resources through improved systems of delivery of water, matching to the extent possible the needs of the crops;
c. to achieve equity in the distribution of water;
d. to increase production per unit of water or per unit of land as the case may be;
e. to make the optimum use of natural precipitation as ground water in conjunction with flow irrigation;
f. to help the farmers to have a greater choice of crop sequence and timing of water supply, period of supply and frequency of supply, depending on soils, climate and other infrastructure facilities available in the command such as roads, markets, cold storages, etc., so as to maximize the income and returns;
g. to inculcate a sense of ownership and responsibility among the farmers and to ensure the collection of water charges from the members;
h. to develop professional relationship between the personnel of the agency of irrigation and the farmers;
i. to promote economy in the use of water;
j. to mobilize local resources in cash, kind or labour towards capital cost and/or O&M charges;
k. to branch out into activities other than the distribution of water for the purpose of raising resources, so long as they are consistent with the basic responsibilities of the WUA. (For example, the FAs in Mexico have set up highly profitable agro-industries);
l. to resolve differences on conflicts regarding water distribution and any other related issue.

3.2 NEED FOR INVOLVEMENT

The Report of the Committee on Pricing of Irrigation Water (1992) has pointed out that reforms in irrigation management, including turnover of the systems to farmers, is imperative, not just for financial reasons alone, but for realizing the full potential of irrigated agriculture. The need for involvement of beneficiaries in water management is well recognised due to the following:

(i) To overcome the accumulating problems in the irrigation sector, an increasing role for water users has been recognised as a solution. Efforts to form WUAs in India have been influenced by similar farmers' groups working in different forms in various parts of India and in Southeast Asian countries. Pilot projects supported by funding agencies through various NGOs and state training institutes like WALMIs have also helped promote formation of WUAs.

(ii) Over a period of time, both Central Government and various State Governments have evolved policies and guidelines to promote WUAs at various levels in minor, medium, and major irrigation projects. However, irrigation being a State subject, suitable policies, enabling irrigation acts, properly oriented manpower, and accountability are required to move in the right direction. While a few States are attempting to bring about changes, majority of the States have resorted to piece-meal approaches.

(iii) WUAs are a major means to turnover and self-management of irrigation systems. Forming WUAs by rule or by an act itself does not ensure self-management of irrigation systems. Promotion, development, and support of WUAs is likely to be the most effective short-term and long-term solution for affecting farmers' participation and control of irrigation schemes. Users' participation in system operations and maintenance is necessary for keeping the existing systems functioning. The advantage of users' participation are a) removal of some of the burden of management from government, b) improvement in system performance, micro-network maintenance, and equity in water distribution, and c) increase in water fee collection.

(iv) The Irrigation Department of the Government of Maharashtra has issued guidelines in October 1992 and updated these in August 1994 regarding forming of cooperative WUAs. It has been brought out in these guidelines that farmers' participation in irrigation management is necessary due to the following:

a) entrust irrigation water management to the actual users,
b) enable the beneficiaries to decide the crops to be taken and the quality of water to be supplied to the crop,
c) achieve equity in water distribution as a consequence of community management,
d) instill in the minds of the beneficiaries the urge to use water economically,
e) create an amicable and cordial relationship amongst the beneficiaries themselves as well as between beneficiaries and the government officials, and
f) achieve optimum utilization of the available resources.

The draft policy resolution of the Government of Gujarat (1994) also brings out that such Users' Associations benefit farmers, Irrigation Department, and the State. Many countries in Asia, Africa and Latin America are either implementing or considering implementing irrigation management turnover programmes. It was argued that this interest is largely because of :

a) Government's financial constraints,
b) a perception of poor management performance by Government Departments and
c) an expectation that non-government organizations such as WUAs will manage irrigation at least as effectively as Government agencies.

In addition, WUA-managed systems have a consumer orientation. They are likely to provide better services and improve users' willingness to pay. There are early signs of significant progress in using WUAs, especially in small-to-medium-sized systems. Even large WUAs, such as those in Medoza (Argentina) and in Coello (Colombia) have proved effective. Involvement of WUAs in ownership and management of canal networks through "water bonds" or other mechanisms to transfer ownership could be considered by the Government for reforming the irrigation sector.

Financial Constraints

During pre-independence period, only productive irrigation projects viz. those yielding profits to the Government and were, commercially viable were taken up for implementation. They were yielding

benefits even after meeting the O&M expenses and interest on the capital. However, after independence, especially since the beginning of planned era of development from 1951, there was a change in approach and irrigation projects were viewed as instruments of developments. Hence instead of the financial criterion, benefit cost ratio criterion was followed for sanction of irrigation projects. Though the objective was socially beneficial, this resulted in losses on irrigation projects since benefits were less than the working expenses. This resulted in lack of maintenance and the deterioration of systems.

In India irrigation charges are presently very low and are area based depending on crops and seasons and sometimes based on the reliability of supplies. A statement showing 'Water rates for principal crops in various States and years of last revision in the country' is given at Annexure-2. Generally it amounts to two to three percent of the crop harvest value. The cost of irrigation water on the basis of investment works out to Rs. 0.91 per thousand litres against which the prevailing water charges are Rs. 0.02 for rice and Rs. 0.11 for sugarcane. Most of the States have revised their water rates in the recent past. However, the charges collected do not cover even working expenses of a project. There is thus an urgent need to bring about a substantial increase in water rates and replace the existing practice of charging for water on area crop basis by volumetric basis to check wastage of water. The water rates should be such as to convey the scarcity value of the resource to the users and to foster the motivation for economy in water use. They should be adequate to cover the annual maintenance and operation charges and a part of fixed costs.

Apart from low water rates, the revenue collection has also declined over the years. For the period 1976 to 1992, on all India basis against the working expenses of Rs.1032/- per ha (including interest on capital) the gross receipt was only Rs.82 per ha during 1991-92. The main reasons for such low revenue receipts are very low water rates, high establishment charges and inefficiency in revenue collection. Data on yearwise percentage recovery of working expenses through gross receipts in irrigation and multi-purpose projects from 1974-75 to 1998-99 show that irrigation revenue recovery has substantially declined since 1974-75 (Annexure 3). Also all- India average of revenue recovery as percentage of working expenses declined from 64 in 1974-75 to a mere 7 in 1998-99. This has further aggravated owing to rising expenditure of establishment employed on irrigation projects. Recently a study was made in the Planning Commission to analyse the pattern of actual O&M costs in some regions in the Country and to suggest ways to revise water rates, which the farmers or beneficiaries could afford and would be adequate to cover full O&M costs. The study carried out for four states, viz. Andhra Pradesh, Assam, Gujarat and Haryana indicated that there is a need to limit the establishment costs under O&M to certain prescribed ceiling and to work out the O&M costs based on a representative sample in the system for the revision of water rates. The formation of WUAs would help in better revenue realisation and reduce the establishment charges.

State Governments' Compulsions

The data available from the study, as mentioned in above para, for the 4 states indicated that (a) while O&M expenditure was increasing every year, the water rates charged remained more or less constant during the period of study viz. 92-93 to 98-99; (b) major part of the expenditure incurred on O&M in the States was utilised on staff expenditure and amount made available for actual works was only a token amount. In 1998-99 out of total expenditure on O&M, the expenditure on works were 0.8% in Assam, 6.9% in Haryana, 13.4% in Andhra Pradesh and 44.6% in Gujarat (major projects) (c) The revenue realised from farmers has been very small percentage of O&M expenditure. For the year 1998-99 this was as low as 0.07% in Assam, 26.5% in Haryana, 28.2% in Gujarat to 73% in Andhra Pradesh.

From the above and problems arising out of over staffing, it is seen that low water rates and low revenue realisation are common for almost all the States. In view of this, the Water Resources Departments or Irrigation Departments in many States are increasingly realizing the need for forming WUAs, not necessarily to enhance users' participation, but to meet the need for efficient use of water. This will also help in improving financial and organizational performances of the projects.

The State Finance Commission of the Government of Gujarat has clearly favoured privatization through formation of water distribution cooperatives/companies/users' associations. It has also suggested "private sector participation for the construction, maintenance and management of water resource systems on a selective basis. Existing systems could be considered for privatization. The resources generated from this process can be utilized to upgrade the existing irrigation facilities in order to realize their full potential". Even in the case of minor irrigation works, owing to steep increase in establishment costs, the Commission has recommended that "the Government must hand over the management of these works to the users cooperatives. If the users cooperatives do not come forward, the Government should transfer these works to the highest bidder."

Central Initiatives

Since 1985, MoWR has been encouraging farmers' participation in water distribution and management of tertiary system in the projects covered under the centrally sponsored CAD Programme. In 1987, the CAD Wing of the MoWR requested the State Governments to set up FAs in the CAD projects and issued guidelines for involving farmers in water management of irrigation systems (Annexure 4). Under the CAD program, a management subsidy at the rate of 275 per ha, to be paid in three years, had been given to encourage the formation and functioning of FAs. It has now been increased to Rs.500/- per ha as one time functional grant to be shared by Centre, State and farmers at the rate of Rs.225/- per ha, Rs.225/- per ha and Rs.50/- per ha respectively. Union Cabinet while approving continuation of CAD programme during the 8th Plan, had stipulated that no new project should be included in the CAD programme unless States give an undertaking to form FAs and committed to hand over the work of operation and management of irrigation system upto tertiary level and recovery of water charges to the Associations.

The MoWR adopted the National Water Policy (NWP) in 1987, wherein it is stated "as the country prepares itself to enter the 21st century, efforts to develop, conserve, utilize and manage this important resource have to be guided by national perspectives. The need for a PIM is thus abundantly clear." Since 1987, a number of issues and challenges have emerged in the development and management of water resources. Therefore, in 2002, NWP was reviewed and updated in April, 2002. Item 12 on page 11 dealing with Participatory approach to Water Resource Management reads as under:

'Management of the water resources for diverse uses should incorporate a participatory approach; by involving not only the various governmental agencies but also the users and other stakeholders, in an effective and decisive manner, in various aspects of planning, design, development and management of the water resources schemes. Necessary legal and institutional changes should be made at various levels for the purpose, duly ensuring appropriate role for women. WUAs and the local bodies such as municipalities and gram panchayats should particularly be involved in the operation, maintenance and management of water infrastructures/ facilities at appropriate levels progressively, with a view to eventually transfer the management of such facilities to the user groups/local bodies'.

The National Irrigation Management Policy formulated in 1995 also states that unless farmers are actually involved in the O&M and maintenance of Irrigation system, the objective of increased utilisation and production from irrigated command area is difficult to realise. It recommends that efforts be made to involve farmers in various aspects of management of irrigation system particularly in water utilisation and collection of water rates. It suggests supplies of bulk irrigation water to each association at distributory head and authorising the association itself to collect the revenue from individual farmers using this water.

The guidelines for formation of FAs/WUAs have been issued by Ministry of Water Resources in 1995 to all concerned. These are given at Annexure-5.

The Central Government is creating awareness about PIM among farmers/officials through Conferences/Seminars/Newsletters/Workshops/Films/ visits etc. It is assisting State Governments in generating funds through external financial assistance to projects. It is also assisting States in preparing manuals on PIM in regional languages and disseminating information on PIM. MOWR has requested the State Governments that a High Level Working Group should be constituted to frame policies for implementation of PIM. Ministry of Water Resources had engaged an NGO as Consultant to study changes needed to be introduced in the existing State Irrigation Acts, which could be recommended to states for incorporation in their Acts to facilitate and establish PIM. Main features proposed for amendments in the State Acts are:

- There would be a MOU between the Government and WUA specifying terms and conditions of water deliveries, water rates etc.
- WUAs may raise their own financial resources.
- Government to restore/rehabilitate the system before transfer to WUA for management.
- Water allowance would be notified and incorporated in MOU.
- Water would be supplied on volumetric basis and water rates may be related to quantities used and not on crop area basis. Measuring devices would be installed by the Government Department.
- WUA would have freedom for adoption of cropping pattern depending on the available water.
- WUAs would be empowered to decide water charges for their members and non-members.
- There would be joint inspection of system before handing over to WUA.
- A Federation of WUAs at distributory and branch levels and Apex body at the Project level to be provided for in the Act.

The Act would empower the Government to declare specific areas for handing over to the WUA for management and distribution.

3.3 THE PROCESS

The first requirement in initiation of PIM is motivation of farmers. Farmers need to be explained about PIM, its advantages and how the PIM would benefit them individually and collectively. The discussion with the farmers should be as detailed as possible, so that everyone knows what it costs and what one would get. This task should be preferably entrusted to a community organiser or a catalytic agent employed either by voluntary or government agencies. This effort is needed to assure that the PIM process takes off in the right direction.

Participation of farmers in the realm of irrigation water management implies an active role of beneficiaries in all the facets of irrigation water management and its attendant linkages with the main system management in agricultural/agronomic activities. This role is very different from the traditional passive role of farmers to look to the department for irrigation, for water supply and its distribution. The timing of farmers' involvement is crucial. Farmers' participation is most effective, when it takes place from initial stages of project planning, including the stage of project formulation. Such involvement forms part of ideal conditions for a partnership between farmers and government.

The concern for involvement of farmers has existed in Government of India since mid-seventies. When the CAD Programme was started, it was recognized that farmers' participation would be necessary to run the micro-systems. Once the farmers start managing water within their areas and the process of working together in planning crops, utilizing surface water equitably, exploiting groundwater and conjunctive use by all the farmers for increasing irrigation efficiency is set in motion, the WUAs would be able to widen their vision and think of other aspects of irrigated agriculture. At this time, the indirect incentives to the WUAs would be very much appreciated, which could be an expert advice or consultancy on crop planning/calendering and marketing the produce through WUAs after proper grading, direct transport to major markets, processing of agriculture produce to increase the incomes of the growers by the concerned Government Departments. Further, expert advice for export promotion, linking up with foreign markets can also be organized for increasing the returns.

WUA is to be basically a social organization. It will be successful and sustainable only when ayacutdars have the initiative to form WUA at different levels and agree on a code of conduct, of their own free will. The work it undertakes, is to be based on the problems faced and its efforts to solve or minimize the effect. Different levels of WUAs should be built on their own membership strength, which would require good leadership. Membership strength of organisations for large irrigation systems vary considerably, but all these organizations to be sustainable must have their own income, and should not solely depend upon state assistance and subsidies. For this, they may get involved in agro-based industries, wherever feasible.

Women group on tour to irrigation project areas (Kerala)

CHAPTER - 4

AWARENESS, MOTIVATION AND INCENTIVES TO FARMERS

4.1 BACKGROUND

In the present system of irrigation, the government departments have full control on distribution of water upto the outlet. This attitude has created a "No Concern" feeling in the user and he limits himself with the use whenever or whatever he gets beyond the outlet. Since the irrigation system management is an activity involving planning and managing allocation of water, system maintenance, conflict resolution, collection of charges, optimum utilisation of water, crop planning, environmental management etc., these aspects call for collective action on the part of departmental agencies as well as farmers. Hence an inter-disciplinary approach is called for on the part of government agencies alongwith active participation of users.

An, awareness in this regard is necessary for all the entities involved so as to achieve efficient irrigation management, coupled with socio-economic development, which in short is the ultimate goal of the water resources development activities. Further it is estimated by the National Commission for Intregrated Water Resources Development Plan (1999) that by 2050, food production has to be raised to around 494 million tonnes to meet the growing demand of increasing population, which is expected to touch 1581 million mark by then. The need for hydro and thermal power generation as well as for drinking needs of the people and livestock have also to be met with. Requirement for industrial use too is on the increase. Thus the water, which is already a scarce resource, is becoming scarcer day-by-day. This calls for utmost efficiency in water utilisation for which again, public awareness is necessary to bring home the importance of its conservation and judicious use. Closer interaction between government agencies and the users for operation and maintenance of projects is required to achieve this objective. Once FOs or WUAs are formed, activities like liaising with various government and other agencies distribution of water, O&M of the system, revenue collection etc. can be entrusted to them. In the present day parlance, this approach is also called "PIM".

Participatory approach implies the basic concept of ensuring full participation of the beneficiaries in planning, construction and finally take over of operation and maintenance of the complete system. The main objective of this process is to imbibe the feeling amongst the farmers that the system belongs to them after its commissioning. A "walk through" programme alongwith beneficiary farmers and government officials, along the entire system right from the source to the end of the physical system to see if the system actually functions as per design, will generate further confidence in the farmers and encourage/ motivate them to form WUAs.

The important practical benefits that are expected from PIM are as follows:

(a) equitable distribution of water;
(b) collection of water charges;
(c) maintenance of physical structures;
(d) protection of environment;
(e) increase in water use efficiency;
(f) Increase in agricultural production; and
(g) conflict resolution.

Given the range of practical benefits that can be realised through participatory management, there has been surprisingly not much progress in turnover of operation and maintenance to user associations. Many departmental staff as well as most farmers are still not aware that there is a NWP formulated by the Government of India in 1987 and revised in 2002, which strongly endorses the concept of farmers' participation in irrigation management. Further all the water users, rich or poor, have to understand that water has an economic value, although water, received as rainfall, is the nature's gift. Developing the source of water and conveying the same to the consumers require huge investments. Since operation and maintenance of a water supply system costs money, every water user must recognise that water has a cost and it is his duty to pay for the water he uses. However, when once a user pays for the water, he would expect better reliability of service. This can be best achieved when the distribution of water is done by an Association of Farmers.

4.2 STEPS TAKEN

Various steps have been taken to bring about this awareness. To mention a few, Water Resources Day is being observed all over the country every year during March-April to create public awareness about water conservation and various aspects of Water Resources Development. The WALMIs and Irrigation Management Training Institutes (IMTIs) set up in various States by the Government of India under its WRM&T project are also engaged in creating requisite awareness and education to farmers as well as to the in-service officials of the government departments, through training programmes. Besides this, dissemination of information through Television/All India Radio programmes as well as printing and distribution of pamphlets in regional / local languages is also being done by some WALMIs. Though some success has already been achieved throughout the country, it is not adequate. This has to be a continuous process - to keep abreast of the latest technologies.

4.3 ROLE OF VARIOUS AGENCIES

The best way to motivate farmers to go in for WUA is to demonstrate its usefulness/benefits to them. This is being best achieved through action research programmes undertaken by the WALMIs or IMTIs set up in various States, wherein an actual ongoing scheme is selected for carrying out a demonstration on its tertiary system. Very encouraging results have been obtained in some States through this process, as a result of which, more and more farmers have been encouraged to form WUAs.

Mass media like newspaper, television and radio have also a very responsible role to play in water management in the country. They have to keep the public well-informed and present a balanced view of the government policy and programmes, particularly in the area of water in which every human being is a stake holder. Mass media should give large coverage to water related issues.

Voluntary organisations have been playing an important role in bringing about basic changes in the management of some of the irrigation systems in the country. Their role has been of a catalyst. Some NGOs have contributed significantly towards setting up WUAs in irrigation commands. Voluntary organisations can effectively motivate the farmers in forming WUAs for better water management. They can also motivate the farmers in adopting better irrigation practices for improving water use efficiency and can act as intermediaries between government departments and local people engaged in the programmes.

Under the centrally sponsored CAD programme, management grant is being arranged which is to be shared between Centre, State and farmers and to be deposited as a fixed account of the WUA. The

annual interest accrued on it could be utilised by the Association. Under the above programme all the State Governments have been requested way back in 1985, to take up farmers' participation on pilot basis at tertiary level for initiating the process of farmers' involvement in water management and maintenance of field channels.

The CWC in their report on "Approach to Organisational & Procedural Changes in Irrigation Sector" (1992) have also suggested that irrigation departments should promote effective interaction between CADA and WUAs. Also inter-active training should be imparted to sensitize these groups and their respective roles, rights and obligations. One of the reasons why the government officials are not very enthusiastic about encouraging formation of WUAs is perhaps their apprehension that if the FOs are involved with the management of the irrigation systems, they will lose their authority and their strength may get reduced. Further they will have to provide an assured supply of water, which may require extra efforts on their part. Hence it is very necessary to bring about an attitudinal change among the government staff in water resources sector for achieving better water management.

NGOs, Professional Societies and FOs can play an important role in formulating policies in water sector and government must encourage professional societies in drafting new policy formulations or in reviewing the draft policy documents prepared by government agencies/departments. It would be necessary to impress upon the field officials that the participation of farmers is sought for not just to hand over responsibility of water distribution and managing the system, but for involving them in the entire functioning and working as partners to improve the irrigation efficiency and production from irrigated agriculture.

4.4 INCENTIVES TO FARMERS

Though many incentives for farmers to form an association have been covered in the text above, the important considerations which would attract farmers to go in for forming association and taking over the system could be broadly summarised as under :

(a) assurance regarding reliable water supply from the Department and equitable distribution of water supplies;
(b) freedom in deciding the cropping pattern depending on the available water;
(c) assurance regarding retention of extra revenue collected over and above the revenue collected through departmental water rates;
(d) increase in production and thus per capita income;
(e) increase in revenue and earnings through engagement in other agro-based industries;
(f) pride in ownership of the system and involvement in water resources development;
(g) availability of a forum/agency for quickly resolving the disputes over water distribution.

Volumetric Supply of Water to WUAs (Maharashtra)

CHAPTER - 5

PARTICIPATORY IRRIGATION MANAGEMENT - PRESENT STATUS

5.1 STATEWISE STATUS

Efforts have been made in several States to make a beginning in the direction of farmers' participation in the management of irrigation. In some States, Irrigation Departments are taking initiatives to promote and support WUA. In other CADAs are promoting and supporting the WUAs. In several States, WALMIs under Action Research Programme have been instrumental in promoting WUAs. Statewise number of WUAs and areas covered are given in Annexure-1. A brief review of State-wise status regarding PIM/WUAs is given below:

5.1.1 Andhra Pradesh

Government of Andhra Pradesh has laid down a policy for PIM in July, 1995 providing for formation of WUAs based on hydraulic units as minors covering a command area of 750 ha. or more. The State has taken up three pilot projects at distributary level in the commands of Sriramasagar Project and Srisailam Right Bank Canal Project for assessing their workability. An action plan has also been enunciated to involve farmers in all irrigation commands. In addition to the seven major command areas of Sriramsagar Project, Nagarjunasagar Project, Krishna Delta, Pennar Delta and Godavari Delta systems have been selected and Consultants appointed on a full time basis to evolve a framework for WUAs in these projects. The Chief Minister of Andhra Pradesh has also addressed all field officers to give a thrust to the promotion of PIM.

To provide legal status to WUAs, the State Government has enacted the "Andhra Pradesh Farmers' Management for Irrigation System Act, 1997", which provides for creation of WUAs. Under this Act 10,292 WUAs have already been formed covering an area of about 48,00,000 ha under major, medium and minor irrigation schemes. Election of office bearers for these WUAs have also been held and they have already started functioning. Distributory level Committees have also been constituted in case of major and medium irrigation schemes. As a matter of policy, the Government is getting the development works executed through WUAs. In order to assess the performance of WUAs and to create awareness among all concerned including officials and farmers, the Government held a State level Conference during October, 1995 and one Project level conference during February, 1997. Subsequently, State level, National level and International level conferences were also organised in the State.

5.1.2 Arunachal Pradesh

Government of Arunachal Pradesh has initiated more action to form WUAs. Two WUAs covering an area of 1470 ha have been formed in the State.

5.1.3 Assam

Government of Assam has prepared the programme to form WUAs and hand over O&M to them. A High Level Working Group under the Chairmanship of Chief Secretary has been set up for implementing the PIM. A Regional level Conference was held on PIM at Guwahati for Assam and other North Eastern States during February, 1996. So far 37 WUAs have been formed covering an area of 24,090 ha. State Government's policy is to make the system functional before handing over to WUAs. Enactment of "Assam Irrigation Water Users Act" is under consideration of the State Government.

5.1.4 Bihar

Government of Bihar has announced their Irrigation Policy, 1993 on the lines of National Water Policy, 1987 emphasizing the need for FAs to take over the management of irrigation system. The State has circulated a Draft Legislation, Bihar Command Area Development Bill, 1996, which provides for setting up of FAs to operationalise the PIM. It has so far prepared and approved Model Bye-Laws for WUAs and draft MOU between Irrigation Department and WUAs. It has been decided by the Government to hand over the management of deep tubewells and lift irrigation schemes to FAs. About 248 small and medium and 677 large public tubewells have been handed over to local village authorities for O&M. An action research programme in Paliganj Distributary in Sone Command with a command area of 12200 ha involving 75 villages has been completed by WALMI, Patna. Accordingly the Government has taken a decision in June, 1996 to hand over the system irrigating 12,200 ha to the WUAs for operation and management. In order to create mass awareness, a State level Conference on PIM was held at Patna in January, 1996 and six project level conferences were held during 1996-97. So far 37 FOs covering an area of 1,05,800 ha have been formed at distributary and sub-distributary level and are functioning in 34 distributary systems spread all over Bihar.

5.1.5 Goa

Government of Goa have enacted "The Goa Government Command Area Development Act, 1997" to implement PIM in the State. In the commands of Anjunam and Salauli Irrigation Projects, which are covered under centrally sponsored CAD Programme, 42 Water Users' Cooperative Societies have been formed covering an area of 5,000 ha for distributing water and resolving disputes. The main problem is that land holdings are very small in Goa.

5.1.6 Gujarat

In Gujarat, Mohini Co-operative Distributary Society was formed in 1979 in Ukai-Kakarapur irrigation scheme. The Society has been carrying on irrigation management since March, 1979 in the CCA of 475 ha lying in the command of Bhestan minor of Ukai-Kakarapur Project of Gujarat. The area under sugarcane has increased from 18 percent to 90 percent.

Government of Gujarat has given high priority to PIM and have been systematically promoting it by facilitating through Government resolutions from time to time since 1980s. A project in the Kavitha sub-minor of Mahi Kadana Project was initiated by the Institute of Rural Management, Anand (IRMA) at the instance of WALMI, Gujarat in 1988. There has been an improvement in the system through construction of field channels, as a result of which water has become available in the tail reaches. A number of measures were taken to improve the utilisation of water for the benefit of the farmers. It has been noticed that the area under banana increased by almost 3.5 times. Farmers utilised canal water for banana and received substantial additional income by utilising ground water also. Farmers adhered to rotational water supply and thus irrigation efficiency increased from 16 percent to 30 percent.

The action for formation of WUAs started under the Action Research Programme in 1984-85 as a part of USAID programme under WRM&T project. Mahi Project was selected for Action Research after detailed study of 5 projects viz. Sabarmati, Hathimati, Fatewadi, Meshwo and Mahi. The project is representative of many large irrigation systems of the State and has large potential for improvements. The specific area selected for the Programme covers 12000 ha under Adas and Ankleshwar distributaries of Borsad branch, which is at tailend of overall command

A High Level Working Group under the Chairmanship of Chief Secretary was set up in March, 1994 to consider the policy issues relating to PIM. The Government has adopted the principle of

PIM by an order issued on 1st June, 1995. Currently, 13 pilot projects have been taken up by the Government. The State has also involved Non-Governmental Organisations in the implementation of the programme.

State Government also adopted a policy to give priority to the schemes for rehabilitation where farmers were ready to form Associations and share part of costs. For Sardar Sarovar Command Areas as a matter of policy, it has been decided to supply water only to WUAs. WUAs are being formed with minor as the basic unit in an area of 17 lakh ha. Water will be supplied at the head of minor by Department and WUAs would be responsible for construction and O&M of system serving village Service Areas. Government has taken a policy decision to distribute water on volumetric basis to WUAs at the Minor level in Sardar Sarovar Project. About 526 WUAs have already been formed covering an area of 96,680 ha. The State organised a Workshop on Farmer-Government Partnership in Irrigation Development and Management in February, 1993. A Regional level Conference on PIM was held at Anand, Gujarat, Daman, Diu, Dadra and Nagar Haveli during February, 1996. State Government is also contemplating to revise the Irrigation Act, making specific provisions for PIM.

5.1.7 Haryana

In Haryana, the old well-developed 'warabandi' distribution system is being operated for past many years. As CAD was not operative, PIM did not get due priority. However, the Government of Haryana had agreed to implement PIM in the commands of projects included under Water Resources Consolidation Project, which was being implemented with the assistance of World Bank. A Regional level conference on PIM was held at Chandigarh for Haryana and Himachal Pradesh in January, 1996 to create awareness about PIM. Three project level conferences during 1996-97 and one project level conference during 1997-98 were held to create mass awareness at grass root level. So far about 2575 WUAs have been formed at the outlet level in Bhakra and Western Yamuna Canal Command areas serving 200,000 ha.

5.1.8 Himachal Pradesh

A High Level Working Group under the Chairmanship of Chief Secretary was constituted for effective implementation of PIM. About 875 Kuhl Societies are reportedly in existence covering an area of 35000 ha. Some FAs had been formed during the implementation of USAID assistance programme for minor irrigation works.

5.1.9 Jammu and Kashmir

No significant progress has been achieved in J&K for the formation of WUAs for water management. Only one WUA covering an area of 1000 ha has been formed.

5.1.10 Karnataka

Government of Karnataka have constituted a High Level Working Group under the Chairmanship of Additional Chief Secretary to consider policy issues for successful implementation of PIM in 1996. An Expert Committee set up under the Chairmanship of Chief Secretary recommended a number of changes in the existing laws and rules and the same were considered by the State Government. An ordinance was issued in the year 2000, which provided legal framework for PIM. Provisions of the new Act have come into effect from 14th June, 2000. Under the centrally sponsored CAD Programme, 2 Action Research Programmes on PIM were successfully completed. The State Government also conducted two State level conferences and two projects level conferences on PIM during the period March, 1996 to February, 1998 to create awareness among officials and farmers. So far, 934 FAs have been formed benefiting an area of 4,13,550 ha.

5.1.11 Kerala

Kerala Command Area Development Act 1986 provides for three tier WUAs i.e. Beneficiary Farmers' Association at the outlet level, Canal Committees and Project Level Committees. A High Level Working Group under the Chairmanship of Chief Secretary has been set up to consider policy issues on PIM. A State level conference on Participatory Irrigation Management was held in February, 1996. 3 Project level conferences have been held during 1997-98 to create awareness on PIM at grass root levels. So far 3930 Beneficiary FAs, 99 Central Canal Committees and 9 Project Level Committees have been constituted covering an area of 1,48,480 ha.

5.1.12 Madhya Pradesh

Government of Madhya Pradesh have initiated action to form FAs at minor canal level with a maximum discharge of 15 cusecs and a maximum command of 2000 ha on the basis of hydraulic units. Sixty-five Farmers' Associations were formed covering an area of 26,800 ha. In 1999 State Government passed "MP Sinchan Prabandhan Main Krishakon Ki Bhagidari Act" similar to A.P. Act. It envisages transfer of power to WUAs to manage the system under their jurisdiction, delineation of areas of operation on hydraulic unit basis freedom to raise resources, etc. The Act is effective from September, 1999 and election of office bearers for WUAs have also been held. . A State level conference was held in February, 1996 and five Project Level Conferences were held during 1997-98 to create awareness regarding PIM, among officials and farmers. So far, 1470 WUAs covering an area of 14,95,000 ha have been formed

5.1.13 Maharashtra

Government of Maharashtra had successfully conducted two Action Research Programmes to organize farmers at the minor level of major irrigation projects to evolve methodology, strategy and approach with the assistance of NGOs. One such programme was taken up on a minor irrigation tank through WALMI, Aurangabad. Based on these experiments the Government have issued detailed guidelines on PIM, simplified the procedure for registration of WUAs under Maharashtra Cooperative Societies Registration Act, finalised model bye-laws of WUAs and prepared a model draft of MOU between Government and WUA. The model evolved requires supply of water on volumetric basis with water allocation to each WUA as per command area, which is to be supplied in each season as provided in the MOU. The WUAs distribute water to the farmers, maintain minor/field channels, recover water fees and remit them to the Government according to the prescribed rates. Incentives such as reduced rates for bulk supply, rebates for timely payment of WUAs and choice of crops are also offered by Government.

Another instance of successful experimentation is Shri Datta Co-operative Water Management Society on Minor No.7, Mula Command, Maharashtra. This society has 200 farmers, covering an area of 361 ha. in minor no. 7. Center for Applied System Analysis and Development, Pune (CASAD) now renamed as Society for Promotion of Participatory Eco-System Management (SOPPECOM) in February, 1987 took up Action Research Programme with the active support of the Department of irrigation, for a minor on the Right Bank Canal of Mula Irrigation System. In a series of meetings and individual discussions held in 1987, CASAD explained the benefits that are likely to accrue to the irrigators by taking over management below the minor. As a consequence to these efforts, Shri Datta Society was registered under the Cooperative Act in February, 1989. MOU between the Department of irrigation and the Society, defining various duties and rights, was signed in June, 1989. It was found that the success of the PIM lies in ensuring regulated flow in the minor and equity in the distribution of water to individual farmers and certain minimum maintenance of the system. The measures including technical and institutional aspects resulted in an increase in irrigated area from 56 percent to 90 percent in two years.

Another notable example is the Ozar experiment taken up by Samaj Parivartan Kendra, Nasik. The project was launched in June, 1990 covering a CCA of 1151 ha on the Right Bank Canal of Waghad Dam, a part of Upper Godavari System. Three other societies namely Banganga, Mahatma Phule and Jaiyogeshwar were also organised on minors and Waghad Project having CCAs of 216 ha, 314 ha and 595 ha respectively. The societies were registered in March, 1991 and MOU with Irrigation Department was signed in November, 1991. From 1990-91 to 1993-94, the area under irrigation has increased considerably for a number of crops. Many other farmers were encouraged to form societies in the area by emulating this experiment because they could see the advantages of participation. By now 80 WUAs have been registered and systems turned over to them for full O&M. There are 15 WUAs, which have been registered and agreements between them and the Department of Irrigation signed, but turnover has not yet been affected. There are 84 WUAs, which have been registered, but agreements have still to be executed. There are 122 WUAs, which are in the process of registration.

In addition an Action Research Programme is being conducted through an NGO to encourage PIM at the distributary level. WUAs at the minor level are being federated at the distributary level to assume full O&M responsibilities below distributary having an area of nearly 6000 ha.

Under the USAID funded Maharashtra Minor Irrigation Project, 90 minor irrigation schemes were taken up for renovation. Formation of chak committees as well as joint management of these schemes are also envisaged under this Project.

Maharashtra is the first State to come up in 1994 with a clear set of guidelines (both in Marathi and English language) for formation of WUAs. The Government has also revised water rates and these include provision of concessional volumetric supply to WUAs, which undertake maintenance of minors.

The Non-Governmental Organisations are actively cooperating with the Government in the implementation of this programme. A number of training courses for both officers and farmers for encouraging PIM have been held. A State level workshop was organised in February, 1994 followed by a Regional conference on PIM held at Aurangabad by the State Governments of Maharashtra and Goa, sponsored by the Ministry of Water Resources in December, 1995. A National level seminar on PIM was also held at Aurangabad in June, 1994. 4 project level conferences have been held during 1997-98 to create mass awareness. A Steering Committee under the Chairmanship of Secretary, Command Area Development Department has been constituted to oversee the implementation of PIM. So far 1168 WUAs covering an area of 375,000 ha have been established.

The State Irrigation Act is proposed to be amended suitably for the PIM. The State Government has decided to supply water to WUAs on volumetric basis and to take up the work of rehabilitation of systems before handing over to WUAs. Also priority is given for completion of those works, where WUAs have already been formed.

5.1.14 Manipur

62 FAs have been formed, covering an area of 49,270 ha.

5.1.15 Nagaland

Only 1 WUA covering an area of 290 ha has been established.

5.1.16 Orissa

A High Level Working Group under the Chairmanship of Chief Secretary was set up to consider and formulate the policy options for implementation of PIM. Under the World Bank assisted Water Resources Consolidation Project (WRCP) covering a Culturable Command Area (CCA) of 265,400 ha taken up in 1996 the Government is taking action to involve farmers in the management process. Initially 4 Projects covering about 27,600 ha of CCA were taken up. 53 WUAs based on hydraulic units were registered in the projects covered under the CAD Programme. The State Government had conducted a State level conference on PIM in December, 1995 to give thrust to the programme. During 1997-98 the State had conducted 3 project level conferences to create awareness on Participatory Irrigation Management at the grass root level. In February 1999, it was decided to take up PIM and turnover programme in all projects under WRCP. State Government has also decided to introduce PIM in all canal commands of 16 lakhs ha under major, medium and minor projects under the Scheme "Pani-Panchayat". The "Orissa Farmers' Irrigation System Management Act" for implementation of PIM through the State is under consideration of State legislature. Out of 164 WUAs formed so far covering an area of 73,750 ha, 57 WUAs have already signed agreement and taken over the work of O&M of the canal systems.

5.1.17 Punjab

Punjab has a strong tradition of Warabandi (Rotational Water Supply). The distribution of water below the outlet is managed by the farmers. Besides, they also maintain the field channels and field drains below the outlet. 957 WUAs covering an area of 1,16,950 ha have been formed.

5.1.18 Rajasthan

Under the Centrally sponsored CAD Programme, 3483 Outlet Committees have been formed in Indira Gandhi Nahar Project. In Chambal Project 35 FAs have already been registered serving an area of 15,930 ha and 33 are under process of registration. The Government has constituted a High Level Working Group under the Chairmanship of Additional Chief Secretary for promoting PIM and a Sub-Group under the Chairmanship of Secretary, Department of Command Area Development and Water Utilisation to go into various aspects of PIM and make necessary recommendations to the Working Group. 3 separate Working Groups to deal with separate schemes on PIM were constituted by the State to make recommendations about policies and strategies to be followed in its implementations during the IX Five Year Plan. 425 WUAs covering an area of 2,19,650 ha have been established. A Steering Committee for the implementation of PIM has also been constituted, preceded by the State level conference in October, 1995 at Jaipur. Government has conducted 3 Project level conferences during 1997-98 to give impetus to the programme of implementing PIM in the State. The State has recently passed "Rajasthan Farmers' Participation in Irrigation Management Act 2000" to give legal support to PIM programme. The Act came into force from 8th July, 2000. The State Government has taken up a number of pilot projects with a view to improve the physical condition of canal systems and formation of WUAs both in areas covered under CAD programme and non CAD areas. 8 projects have also been handed over to WUAs.

5.1.19 Tamil Nadu

The State Water Policy enunciated in 1994 provides for participation of the beneficiaries in the water use sector. Under the recently launched World Bank WRCP in the State, System Improvement and Organising Farmers and Turnover (SIFT) Programme has been taken up through operation and maintenance wing of Water Resources Organisation of the State. Irrigation IMTI, Trichy, had carried out Action Research Programme on PIM and has lent support to the programme in the State. The Government have constituted a High level Working Group under the Chairmanship of Chief Secretary for the implementation of PIM in the State. The State had

conducted a State level conference at Chennai in October, 1995 to give impetus to the programme. The State had also conducted 2 project level conferences in 1997 and 1998 to create awareness at grass root level. A bill called "Tamil Nadu Farmers' Management of Irrigation System Bill 1999" has been passed. PIM is an important component of the ongoing World Bank assisted WRCP covering many schemes in Tamil Nadu. It has also been decided to extend PIM to all the commands under major, medium, minor and lift irrigation schemes. 7725 WUAs have been formed through voluntary efforts of farmers covering an area of 4,74,280 ha.

5.1.20 Uttar Pradesh

Uttar Pradesh Area Development Act, 1976 provides for formation of FAs at the outlet level to be called Chak Sabha. A pilot project Basarahiya Water Cooperative Society was attempted in the command of Sharda Sahayak. A High level Working Group under the Chairmanship of Chief Secretary has been constituted to formulate policy issues and guidelines for the implementation of PIM in the State. The State had conducted a State level conference during February, 1996 at Lucknow to give thrust to the participatory programme. During 1997-98 five project level conferences have been conducted to create awareness among officials as well as farmers at grass root levels. So far, 24 WUAs covering an area of 10550 ha have been formed.

5.1.21 West Bengal

Government of West Bengal has successfully introduced PIM in tubewell irrigation schemes by handing over the installations to the Panchayats for their management. The State also held a State level conference at Burdwan in December, 1995 to create awareness on PIM among officials and farmers of the State. Panchayats were allowed liberty to fix and realise water charges. The Panchayats, thereafter, organised Beneficiary Committees and gave them the responsibilities for operation and maintenance of the system. 'These schemes are being successfully managed through 10000 Beneficiary Committees set up for the purpose covering an area of 37000 ha. FOs have not been formed in major and medium irrigation schemes.

5.2 COMMON FEATURES AND VARIATIONS

A Study by International Irrigation Management Institute (IIMI), Sri Lanka, and Indian Institute of Management (IIM), Ahmedabad, of the policy relating to transfer of management of irrigation in Bihar, Haryana, Gujarat, Maharashtra, Kerala and Tamil Nadu has pointed out some common features and some variations, which are briefly given below:

5.2.1 Common features

a. All six States envisage transfer of responsibilities of management of irrigation to the WUAs organised on hydraulic unit basis.

b. All envisage the retention of the ownership of the main system under major and medium irrigation projects by the State.

5.2.2 Variations

a. WUAs are envisaged at different levels such as outlet level, and minor/distributary level.

b. Different water allocation and distribution systems are followed.

c. Varying levels of responsibility for the maintenance of the system and collection of water rates have been envisaged.

Participating officers interacting with the experts and resource persons, Imphal (Manipur)

CHAPTER - 6

WATER USERS' ASSOCIATIONS - SOME PROFILES

6.1 DATTA COOPERATIVE SOCIETY, MULA PROJECT, MAHARASHTRA

6.1.1 Organization: The Shri Datta Co-operative Water Management Society is on Minor Canal No.7 of the Mula Command. It is a registered "service" cooperative of 200 farmers having a CCA of 361 ha.

6.1.2 Purpose: Single purpose-irrigation management from one minor canal.

6.1.3 Tiers: No tiers. There are 13 outlets, but farmers decided that Outlet Committees would be too small and ineffective.

6.1.4 Sponsor: CASAD now known as SOPPECOM, Pune, which has assumed the role of helping set up WUAs, helped in organising the society. CADA then facilitated making a contract between the Society and the Irrigation Department.

6.1.5 Group Organizers: Spontaneous interest, but with the NGO and CADA help.

6.1.6 Origins: The Society started functioning in 1987, with a general meeting in which SOPPECOM explained possible advantages of a Society. Farmers said they wanted to avoid trouble of always having to beg the Irrigation Department to give them water. The President of the Society struggled hard to form it and had to make six trips to Bombay to talk to and persuade the Secretary of Irrigation Department. Finally with the assistance of SOPPECOM and CADA, a Memorandum of Understanding (MOU) was signed between the Government of Maharashtra and the Society. This allowed the Society to collect the water fees from the farmers, pay the Irrigation Department on a volumetric basis, and undertake routine maintenance of the minor. The Irrigation Department agreed to a quota of water supply by season and relaxation of controls on crop selection.

6.1.7 Organization and Leaders: Bye-laws of the Society are according to the Department of Cooperatives format. Several general meetings a year are called to resolve special issues. The President is a capable person whose sincere efforts have helped this Society achieve success. The Society was registered because it was already known. No problem was expected from the Department of Cooperatives in the State, but in fact the lower officials tried to insist on registering it as a "Lift Society" and wanted many copies of papers. These problems could be sorted out only after appealing to the Commissioner of Cooperative Societies. Lower level officials are not familiar with WUAs. SOPPECOM has recommended that the Irrigation Department itself should create means of registering such societies.

6.1.8 Social Categories: Average farm size is slightly more than 1 ha. Most farmers are Marathas. There are also some Muslims (Sek), Hindu Maharas, and Malis.

6.1.9 Irrigation and Crops: Before the Society came into being, farmers would make individual applications for water before each season giving details of the crops. Now they tell the Society about their water needs, and the Society informs the Irrigation Department of the volume required (hours of flow at a given level). Water flows during all the three seasons, four times a season, for a period of about four days each. Irrigation Department informs the Society when water is to come,

and the Society prepares a schedule of rotation. The Patwari and the Patkari (Canal inspector now employed by the Society) together open the gate, and the Patkari turns the water into the fields for about 4 hours per acre.

Crops are now more diverse, including irrigated jawar, sunflower, and hot-weather groundnuts. Some of these require collective action, such as for isolation or pest control, which the Society enables. Most farmers take the water for 2 or 3 seasons. Government agreed to relax ban on sugarcane, but those who grow it must pump additional groundwater. By agreement the Society must stop such pumping, if groundwater falls to less than 3 m.

6.1.10 **Water Rates:** Before the Society was formed, many farmers did not pay their water fees, supposed to be paid through Irrigation Department officers, but they would give them a gratuity to get their water again the next year. In nearby villages half the water fees are still not paid. Now the Society collects the water fees, in advance. Farmers willingly pay per ha Rs.50 for Kharif, Rs.75 for Rabi, and Rs.150 for hot weather, plus a Society service charge of Rs.25 per ha. There are no over dues. This is still far cheaper than groundwater. The Irrigation Department has negotiated with the Society rates for kharif at Rs.10 per 1000 cu.m, for rabi Rs.15, and hot weather Rs.37.50 Water quota from Rabi carried over to hot weather costs 30 percent less, and water stored by the Society is paid for by rates of the season in which it is used.

6.1.11 **Maintenance:** The Irrigation Department and the Society jointly inspected the minor and determined balance of renovation to be done, and after completion it was handed over to the Society. The Department gives the Society Rs.10,000/- a year to maintain the minor (the Society says about Rs.15,000/- is needed). Earlier, the Department was spending much more than this amount to maintain this minor, though it is only 2 km. long. It appears that before the Society was formed, part of the maintenance money was not properly utilized. Now there is less cost to the State, and workloads of the Patkari and Junior Engineer are reduced. The Assistant and two watchmen are paid by the Society from its own income. There is no donated labour (Shramdan) for maintenance, but the Society contracts out maintenance of the minor. Field channels are maintained by farmers.

6.1.12 **Income to the Society:** The Society collects a flat Rs.25 per ha above the official water rates, regardless of the crop, which covers its personnel and office expenses. CADA policy and the MOU provide for government subsidy to the Society for 3 years as reimbursement for certain administration costs at the rate of Rs.100 in the first year, Rs.100 for the second year, and Rs.75 for third year. CASAD recommends that the subsidy may be less, but it should be extended for five years after which the Society can be stable. The Society is planning to plant trees along the minor for additional income.

6.1.13 **Advantages**

a) The Government saves on maintenance and duties of engineers and field functionaries.
b) The Government gets water dues on time.
c) Inefficient old procedure of recording applications of water by farmers season-wise and crop-wise is avoided.
d) Since water is paid for in proportion used, it is not wasted and more land is irrigated. Threat of waterlogging has subsided.
e) Water comes more or less in specified times, so agricultural activities can be properly planned.

f) Cropping intensity and crop varieties have increased and specialized crops requiring cooperation can be grown.
g) Farmers save wages of posting a man in field to watch when water might come.
h) The Society controls Patwaris and Guards, who must now work in the interest of the farmers, Hence they are flexible in giving water by turns, if necessary.
i) Conflicts have been resolved amicably.
j) Environment has improved through plantation of trees.

This is one of the most successful FOs so far. It has most of the idealized features and advantages.

6.1.14 **Possible Problems and Replicability:** Sustainability of the Society is yet to be proved and CASAD is still a stabilizing factor. The Irrigation Department has not always been able to adhere to its promised quota of water and time of supply. Linkage with the Department of Cooperatives remains cumbersome and the Society is seeking alternative possibilities of legal status.

6.1.15 **Recommended Changes:** A Workshop on FOs held in the WALMI, Aurangabad, during September, 1990 concluded with a number of recommendations, based on experiences of CADA and development organizations in Maharashtra. The workshop recommended that the Irrigation Department should itself have a system of recognizing and registering FOs for volumetric supply, which would avoid the trouble of dealing with the Department of Cooperatives. The Irrigation Department could also have a second list of stable FOs eligible for making agreements for maintenance, repair, or construction.

6.2 CADA MODEL, KERALA

6.2.1 **Organization:** There are 10 irrigation projects under the CADA, Kerala. As per policy, owners of farmland in all commands are to be organized according to the CAD Act of Kerala. About 2000 societies have been registered, covering nearly all outlets on these canals. Registration is as a society (not under Cooperative Act).

6.2.2 **Purpose:** The main purpose of the primary associations is to distribute water and maintain water-courses below the outlet. CADA encourages associations to be multipurpose. Kerala Government is promoting group farming, because farms are so minuscule and many farmers have other jobs. Group farming includes common provision of seeds, nurseries, manure, night watch, plant protection, soil conservation, transportation, training classes, and credit, but not marketing. There is convergence of purpose and objectives between WUAs and group farming. Where group farming exists, it is brought under the CADA system, and where the CADA system exists, no other group farming is necessary.

6.2.3 **Tiers:** This is a 3-tier system. First level is the Outlet Group, which is registered as a society. An outlet usually has 15 to 25 farmers. Farmers of one or more outlets may also form an informal association having 30 to 130 farmers on 10 ha to 40 ha. Second level is the Canal Committee (1000 ha or so), comprising of Presidents of the Associations plus Assistant Engineer and Officers of the Irrigation Department and Agriculture Department. It meets once in two months. Third level is Project Committee, convened by the Executive Engineer. It includes one member from each Canal Committee, besides members of other Government Departments and MLAs. The Government has ordered that all irrigation projects should have such committees, which are now getting organized. These committees of elected representatives will replace the earlier system of appointed Advisory Committees, which the farmers say mostly did not represent them. Such joint responsibility may

have clear advantages. For example, if an association has a common rice seedling nursery, the Executive Engineer can order water in the right time through the outlet above that nursery.

6.2.4 **Sponsor:** Kerala CADA is implementing this system in all of its 10 projects. In Kerala, the Chief Engineer can hold two posts, in the Irrigation Department and as well as Chief of CADA. So he or his staff engineers are also represented in the Canal Committees. CADA has cooperative, agricultural, and engineering wings. The engineering wing makes watercourses with 75 percent grant to the farmers and 25 percent loan. The agriculture wing conducts training and holds seminars. There are also CADA development officers. CADA claims the right to examine the books and records of any such Association.

6.2.5 **Group Organizers:** The CADA Cooperative wing has officers seconded from the Department of Cooperatives, who form the FOs and get them registered- not as cooperatives, but as societies. But these officers being limited in numbers, most associations have to be formed with only very few visits. A system of training of key farmers is under way, which should enable training of some members of each of the 2000 FOs.

6.2.6 **Origins:** The Irrigation Department of Kerala realized that the huge investment in irrigation was not creating the expected productivity. But several studies showed that where group farming and better management was practised, productivity went up. So it was decided to form associations of all farmers in the 10 canal projects, which come under the Kerala CADA.

6.2.7 **Organization and Leadership:** Registration is under the Scientific and Charitable Societies Act of Kerala (based on the original Societies Act of 1860), which is found to be more flexible than the Cooperatives Act. Registration requires a minimum of 7 members. There is a standard MOU, which all the Societies seem to adopt. They then register with the Registrar of Societies for a fee of Rs.25. A general meeting, always to be held in March, requires a quorum of two-third of members, and elects a governing body and officers such as president, vice president, secretary, joint secretary, and treasurer. Election is often by nomination and acclamation by clapping. The governing body prepares and administers the budget, oversees all irrigation and related matters, and appoints a waterman. Monthly meetings are to be held on a fixed day of the month. About 30 per cent of the associations so far have become active.

6.2.8 **Social Categories:** Many farmers have high school education, and most are socially and politically highly aware. But many are part-time farmers with very tiny plots. So in Kerala group farming is uniquely advantageous. Most landowners, even of very small plots, do not work in the fields themselves. They hire labourers, who demand high wages. But unless they have land, they are not members of the FOs.

6.2.9 **Irrigation and Crops:** The Irrigation Department still controls the canals but CADA and the FOs will increasingly have a say in their management through the Project Committees. FOs expect now to have control over their water from the source down. A waterman employed by the Association opens the gates (formerly opened by an employee of the Irrigation Department), thereby reducing the conflict of farmers with the Irrigation Department. Water runs in the canal for 4, 5, or 7 days, or continually, depending on the situation, and flow is modified according to rainfall and irrigation need. Rotation under the outlet is by a skeleton warabandi plan, which should not be changed within the year.

In Kerala one-third of irrigation command area is under rice and two-thirds planted with trees and gardens. Some farmers say that they do not really need irrigation water, which affects sustainability of associations. But others say that irrigation water may be needed to supplement the two monsoons, and may be for growing a third crop in summer. Where the CADA FOs have been operating for a couple years, yields have gone up on an average from 2000 kg. per ha to 2200 or 2300 kg. per ha. Agronomists expect the rice yield to double, if assured water supply is made available. In the Gangotri Project, yield has been as much as 6000 kg. per ha.

The agricultural wing of CADA conducts half-day training programme, one-day camps, and district-level seminars for FOs. It has conducted adaptive trials through 40 FOs in the Neyyar Project and 13 FOs in Palghat and Trissur Districts. This has increased planting of HYV paddy to 60-70 per cent of the first crop, 40-50 per cent of the second crop, and 70-80 per cent of the third crop.

6.2.10 **Water Rates:** Water rates are about Rs.41/- an acre, based on area and not crop. Until now there has been no pressure to conserve water. CADA leaders say the intention is to collect fees in future on the basis of volumetric supply, by measuring depth of flow. Water fees will then be paid not to the Revenue Department, but to the Irrigation Department. But so far this has not been tried.

6.2.11 **Maintenance:** CADA provides some funds for construction and maintenance, such as building concrete field channels. Societies are expected to raise more funds and undertake maintenance. Each society has to work out its own maintenance method and funding.

6.2.12 **Income to the Associations:** Farmers pay a fee of Rs.5/- upon joining their association. The associations can collect other fees and gifts, but this is not much clarified in the instructions. Not much thought has been given yet to financial viability of the Associations, expenses, and farmers' contributions, which is so far a weak spot in the system. The FOs are counting on receiving government management subsidy for the first three years, from which they will pay their waterman. A few FOs have bank savings.

6.2.13 **Advantages:** Preliminary studies show that water is used more efficiently and crop yields have increased about 10 per cent in one association on the Neyyar Project and in Gangotri, it has tripled. This three-tier plan implies responsibilities for government officials, and is yielding efficient water management, especially in the canal areas. The combination of group farming and multi-purpose WUAs in Kerala is unique and could be very advantageous. An evaluation would be required. The decision in principle to introduce volumetric water rates, if implemented, will have impact on efficiency in future and to reduce waterlogging.

6.2.14 **Possible Problems:** Bureaucratic order for creation of people's groups (as cooperatives, panchayats, etc.) may fail, as it tends to be top-down. There is danger in trying to organize 2000 people's associations all at once by order-- even though it is urgent that such FOs be formed.

It is reported that the decision to form such associations, and their proposed type, were made without detailed discussions with farmers, just on the advice of irrigation officials, and mostly with the original objective to undertake maintenance. Engineers are said to feel superior to farmers and also to agriculture officers. This is particularly resented by farmers in Kerala. So unless technical officials' attitude toward farmers is compatible, it may be difficult for associations to take deep roots. Many farmers in Kerala do not urgently need irrigation water, as they say they can get two rice crops without it, which affects commitment to the Association. Paddy production in Kerala

remains far below expectations, because landowners may have other interests. Even on the smallest plots, farm owners in Kerala avoid working themselves, and pay high daily wages for labourers.

Sources of income (not just subsidy) and financial viability of the Associations need to receive much more consideration, if they are to be viable. Political activities are endemic in Kerala and tend to invade all such organizations and destroy their purpose. Water logging is increasing. The canals are not lined, but wind around hillsides and leak. The Associations should take up this environmental issue, and also engage in dewatering in low lands, where there is too much standing water. Farmers report that bribing of officials is common and expected. Without a climate of mutual respect between officials and farmers, the new system may not work smoothly.

6.2.15 **Replicability:** The model has already been replicated at least on paper in most of the outlets on CADA projects and its effectiveness is to be seen. Much depends on the training of organizers (so far, cooperative officials) and more so, on training of FOs presidents and key farmers, which is just getting under way. If training material in Malayalam are prepared by CWRDM, possibility of success would be enhanced. Other states may find it impossible to follow this model, because the farmers in Kerala have more education and awareness and Kerala is unique in group-farming efforts. But the concept of multipurpose FOs built on group farming principle deserves wider experimental application.

6.3 SINCHAI PANCHAYAT MODEL, MAHANADI COMMAND AREA, RAIPUR DISTT., MADHYA PRADESH (NOW CHATTISGARH)

6.3.1 **Organization:** In Madhya Pradesh formation of Irrigation Panchayats (IPs) is compulsory under the MP Irrigation Act, 1931, modified in 1974. IPs have been functioning for 50-60 years on both major and medium canal systems, mainly in the rice-growing Chattisgarh region. They mostly coincide with villages. In 1990, in the Mahanadi Command area there were 736 IPs, with an irrigated area of 183,000 ha. Each IP has a small Panchayat (Committee) which serves on an average 250 ha., though the Act stipulates an area of 405 ha or more for each IP.

6.3.2 **Purpose:** The officially stated purposes are : a) Distribution of water; b) Collection of irrigation fees and remittance to the Treasury; c) Assisting officials in resolving disputes; d) Repair and maintenance of water courses; e) Punishing the offenders of irrigation water.

6.3.3 **Tiers:** None. But WALMI in Bhopal conducted a Workshop on FOs in February 1991 and discussed irrigation panchayats in detail. Recognizing weaknesses in the system, the workshop made the following recommendations: a) IPs should have Outlet Samitis (first tier), b) There should be an Apex Committee at project level (third tier), c) CADA should develop IPs, and should hire a cadre of trained persons having interest to deal with social issues and to form FOs, d) WALMI should be the nodal institution for a system for training key IP members, e) IP affairs should be under the Irrigation Department and not under the Collector, f) IPs should get commission on water fee collection : for collection of 50 percent of the assessment, 10 per cent; for collection of 50 to 75 per cent, 12 per cent; for collection of 75 to 100 per cent, 15 per cent, g) IPs may collect administration charges of Rs.3 per ha. per year, h) IPs should look beyond water management to agriculture productivity and environmental management.

6.3.4 **Sponsor:** The Irrigation Department makes a five-year agreement with each cultivator, who then becomes an IP member. The Department plays a vital role in formation of the IPs by guidance and monitoring. The District Collector oversees IP elections.

6.3.5 **Group Organizers:** The Sub-Divisional Officer ensures that the IPs are formed and function properly. This is partly done through the Amin, the local functionary, employed to manage water for 5-6 villages.

6.3.6 **Origins:** The Mahanadi Canal Project began supplying water in 1915, and the project was completed in 1923. The command area now is 3.7 lakh ha, but water reaches not more than 2.1 lakh ha. In the Raipur region, local self-government has had a long history. There were Janapada Sabhas at tahsil level, panchayats at village level or for a group of villages, nyaya panchayats for judicial matters, and then the 3-tier system under Panchayati Raj. So the panchayat idea was spontaneously applied for distribution of canal water at the local level. The original Act made it legal and compulsory, along the lines of other local bodies.

6.3.7 **Organization and Leadership:** In accordance with the Act, IPs are established for every village. The number of outlets may vary, but the system was designed to try to supply for villages as units. A group of villages may also be formed into an IP at the discretion of the Collector.

The IP consists of a Sarpanch and two or more members, elected by the holders or permanent cultivators of the land for a 3-year term. Elections are to be approved by the Collector, who also has the power to nominate one member to each IP and to dismiss any member for reasons to be recorded in writing. He may also dissolve the IP, and an appeal to the decision can be made to the Commissioner. The Sarpanch and IP members meet the cultivators at the beginning of the kharif season to decide about water distribution. The IP meets frequently informally to discuss or resolve disputes and together or individually to supervise water distribution.

The Sarpanch is generally expected to be honest and service minded. Some Sarpanches have held their position for more than 20 years. In most cases, if a Sarpanch abuses his position, he will not be re-elected, or the people will have him thrown out by appealing to the Collector. If the irrigated area is more than say 200 acres, the IP employees a Banihar (Waterman) on daily wages, which is less than official minimum wages, or they may pay him for the season, say Rs.500/-.

6.3.8 **Social Categories:** Any permanent owner or cultivator in the IP area has to participate and cooperate in its activities, regardless of social status or landholding size.

6.3.9 **Irrigation and Crops:** Chhattisgarh is dominantly a rice growing area and now depends on canal water for assured irrigation. Irrigation is field-to-field, except where channels are now being made. The irrigation system is kharif-oriented, but a few farmers request water for rabi wheat, pulses, and fodder. The IP, on the basis of requests of farmers, submits a seasonal request to the Irrigation Department for water based on crop and area.

The Amin employed by the Irrigation Department manages canal distribution, and Paniharis manage village-level distribution. But water supply is much less than designed because of low discharge and seepage loss in the unlined canals. Paddy cultivation has been by broadcast, though in recent years transplantation has been introduced, requiring adjustment in water supply. Groundwater is not used because the aquifers are 250 feet down under rocky formations, and recharge is low.

6.3.10 **Water Rates:** Water rates for paddy per acre per season is Rs.32, of which Rs.10 is betterment levy. For land not under agreement but receiving supply, an additional Rs.2 is charged. The IPs must collect and remit the money between January 15 and March 31.

6.3.11 **Maintenance:** IPs usually maintain the watercourses, for which they pay to the labourers. In a few villages IPs organize voluntary 'Shramdan' in which one person per family provides labour for a day or two to clean field channels before the season.

6.3.12 **Income to the Irrigation Panchayats:** The Act provides for income as follows: a) commission on water fees collected at 3 percent for the first 1000 rupees and thereafter 2 percent for the rest of the amount, b) an additional 9 paise per acre irrigated for administration of fee collection, c) part of the penalty charges. The whole fee is remitted to the treasury, and after about six months time, the commission is returned to the Irrigation Department. This income is divided among the elected panchayat members, with a double share going to the Sarpanch. Their income from this is a few hundred rupees a year.

IPs may separately collect money from farmers according to landholding for the wages of the Banihar, and for any costs for cleaning and maintenance. The Act provides authority to the IP to accept an amount not exceeding Rs.250 in each case for "composition" (adjudication) of irrigation offences.

Advantages to the farmers are several: a) farmers get their water without contacting the Irrigation Department, b) it is easy to get the water (though sometimes not enough) and there is little problem in arranging distribution, c) farmers have easy access to the IP, which controls distribution and solves disputes, d) farmers can appoint or dismiss the Sarpanch, IP members, and Banahari, e) farmers can unitedly voice their opinions through the IP to the Irrigation Department.

Advantages to the Irrigation Department are : a) IP takes part of the burden of water distribution, b) collects the fees and c) resolves conflicts. There is very little chance for corruption derived from illegal outlets or untimely release of water, because farmers can keep the Amin under control. The Sarpanch and IP members, being locals, cannot easily be rude or very corrupt. As income from this responsibility is modest, the posts are usually held by medium rather than by very large landowners. Since the rules are specified in the Act, there is less chance of manipulation.

6.3.13 **Possible Problems:** Responsibilities of the IP members are not matched with delegated powers and there is low incentive to seek election to IP. Collection of water fees has declined much (in one sub division it declined from Rs.14,600 in 1986 to under Rs.2000 in 1990). This is because of assurances by political parties that the state will waive fee arrears as well as loans. The IP members are not willing to take stern action against defaulting fellow villagers. The decline in fees means that the IP members get little incentive (in one case as low as Rs.12 for the year), which in some cases is causing breakdown of the whole system.

There is also no incentive to the Irrigation Department staff to collect arrears. (In one sub-division when there was a temporary incentive collection was Rs.17 lakhs and when the incentive was given for limited period, collection fell to Rs.6 lakhs). Timely and adequate water is not available, which affects farmers' interest in involvement.

There is no way provided in the Act for IPs to raise money for maintenance except by direct collection from farmers. If the water rates were high enough to allow a much higher percentage returned to IPs, they could use it for proper maintenance. IPs have no authority to get water courses lined, either with funds from the Irrigation Department, or by a loan which farmers might

repay in instalments. IPs would work better if they could take up some other activities to facilitate agriculture, such as supply of seeds, fertilizers, and pesticides.

6.3.14 **Replicability:** Since this system has been in vogue for more than 50 years, it is well accepted and reasonably successful in Chhattisgarh. But replication in other parts of the state, where rice is not grown will take time. This would be facilitated by stricter measures and incentives to collect the fees, and marginal increases in the commission earned by the IP members. But even now, the IP system would work better if channels are lined, seepage reduced and there is some land shaping below the outlet so that tail-enders get water evenly, as an incentive. But this may not be cost-effective on a wide scale. It could not be replicated in other States unless there is a comparable Act.

6.4 CADA MODEL, LOWER BHAVANI SYSTEM, TAMIL NADU

6.4.1 **Organization:** FOs are formed as part of the on-farm development of the Department of Agricultural Engineering, which in Tamil Nadu manages CADA activities. Outlet Associations are formed having roughly 50 farmers each. These are not legally registered, and mostly do not have written bye-laws. Second-tier organizations are registered under the Societies Act (not as cooperatives). So far 470 associations have been formed and they cover 12,000 ha. Ultimately, tiers of FOs will enable farmers to participate in management of water from the source.

6.4.2 **Purpose:** The main purpose is water distribution and maintenance.

6.4.3 **Tiers:** There are four tiers: First is the Association, consisting of 30 to 70 farmers, formed under a sluice. If it has a discharge of more than 1 cusec, the Association consists of 2 or more blocks, but these have only an informal leader each. Second is a Committee of Leaders of Associations, at branch level. It represents may be 20 associations, each with 2 or more representatives, depending on size. This level was recently formed because of evident need to work with PWD management of the branches. Third is the Council (Sangam), at canal level. It consists of leaders or representative leaders of about 60 or 100 Associations. So far three councils have been formed, and others are in process. Fourth is the Federation, an advisory body at project level. This is yet to be formed. It will consist of 38 Councils covering the Lower Bhavani Project.

6.4.4 **Sponsor:** Department of Agriculture Engineering, which is responsible for implementing the CADA programme in Tamil Nadu

6.4.5 **Group Organizers:** About 50 unemployed diploma engineers were hired as Irrigation Community Organizers (ICOs). They are given some supplementary training in social organization work. It is felt that this gives these engineers at least temporary employment, and also avoids potential conflict between engineers and social scientists. It is the job of the ICOs to catalyse farmers for group action, identify local leaders, and train the farmers.

6.4.6 **Origins:** Earlier, the farmers had been taking water directly from the field channel, whenever they wished. The tail-end farmers in the system had not been getting water for years, yet they had been paying water fees in the hope that some year water would come, as otherwise their land might be de-notified.

Arumai Singh, Superintending Engineer in this project in the mid-80s had been to Philippines and Indonesia and had seen how the farmers there had organized for irrigation. He initiated the system in the interest of equity. He found it difficult to convince the farmers to organize. Now the momentum has picked up. However, there is an existing old association of water-user farmers, mostly larger farmers. Almost all of them belong to the Kavundar caste, which has active leaders. At the time of this visit, there was an evening meeting of 300 of these farmers who arrived on many motorcycles to discuss water supply in the system. Following many speeches, the meeting adopted six resolutions. This shows the capacity of the farmers to organize and take initiative to manage water. But the relation between this old organization and the new CADA system is not clear; the potential rivalry has not yet destroyed either of them.

6.4.7 **Organization and Leadership:** Primary Associations have Committees of five members, elected by consensus for three years. Most of them do not have bye-laws, but minutes of meetings are recorded. The Committees (second tier) consisting of representatives from the Associations are also informal. The Council, consisting of representatives from the Associations, is the level legally registered under the Societies Act. It has bye-laws and holds regular meetings.

6.4.8 **Social Categories:** Most landholding farmers here are of the Kavundar caste. They are traditional landed farmers, mostly well organized, industrious and productive, who work on their lands. Members of other castes of course also participate, according to their landholding.

6.4.9 **Irrigation and Crops:** Water is distributed by strict warabandi. For the rice crop, the canal runs half full continuously for 30 days for irrigation of nurseries. Then water is released for two months, eight days on and four days off. Flow is continuous, and outlets are ungated. The flow into a watercourse should not be more than one farmer can manage. For example one sluice irrigating 70 ha has a flow of 2.8 cusecs, which farmers say one farmer cannot manage. So under the sluice there is a division box with four shutters, and separate lined channels each with a flow of .7 cusecs going to the four blocks. Each block here gets water for 48 hours. Farmers open these shutters when their turn comes.

The Warabandi schedule is prepared by the officer of the soil conservation wing of the Department of Agricultural Engineering, in consultation with farmers. The list is then stamped by the Assistant Engineer. All farmers know their turns. Most of them have watches, but even if not, they know exactly when their water turn comes, and wait for it. Night turns are acceptable, and mostly there is no rotating day-night schedule.

The warabandi schedule is written on a board against the farmers' names, erected in some blocks. The running times are written on the board in chalk before each season, as the times are different for the rice crop and the dry-season crop. Farmers can exchange times within the block.

For the rice crop water flows within the block field-to-field. But for the second crop, say peanuts, field channels must be prepared anew every year. The engineers wanted farmers to make permanent field channels for the second crop, but farmers prefer to cultivate all the land for rice and make dirt channels a new for the dry-season crop. Irrigation of coconuts is forbidden to stop rice land being converted to coconuts, but there is no other control on crops.

6.4.10 **Water Rates:** Water rates are about Rs.60 per acre for rice and Rs.40 for dry-season crops. Additionally, land tax revenue is only Rs.8 or so an acre.

6.4.11 Maintenance: Below the outlet maintenance is organized by the Association, which pays for the labour. The Department of Agriculture Engineering is helping line channels from the boxes up to the blocks. Farmers pay Rs.320 per ha. for that, and after two years grace period this is to be repaid over five years. Farmers are making these payments. Maintenance in the branches will gradually be taken over by the Councils.

6.4.12 Income to the Society: The Associations have income from member fees of Rs.10 per year per acre. The Councils are building up a trust fund. This is from the administration subsidy of Rs.100/- per ha for the first two years and Rs.75 per ha. for the third year received from the Government of India through CADA. It has been clarified that such subsidy is not limited to the cooperative form of organization. However, the Councils do not spend this money, but put it in a savings account. Moreover, each member farmer is expected to voluntarily contribute a matching amount for those three years, and most of them do. The interest on the above amount is for future maintenance and improvements. A Waterman (Nirkatti), records flow from each outlet daily, from a "stage level recorder" or marked flume. He gets Rs.18 a day, uptill now paid by the Department, but in future to be paid by the Councils.

6.4.13 Advantages: The system works quite well. Since farmers participate increasingly in management right up to the source of the water, equitable distribution of water is made and tail-enders get water. The use of the CADA subsidy to build up a trust fund rather than for current spending is an excellent idea. It avoids reliance on outside money, and assures that in future the FOs can be viable and system will be maintained. The farmers through their system of four tiers feel they have, or will have, a part in management of the system up to the source of the water.

6.4.14 Possible Problems: The main problem is reliability of water in the canal, because Tamil Nadu has very little available water and that too erratic. The cost of installing a "stage level recorder" is about Rs.10,000/- which is prohibitive for most outlets, so flumes have to be used for recording flow. There is no effort to provide volumetric supply-- perhaps the most important technical aspect of water management to be introduced. This should now be tried on an experimental basis to stretch the water supply and to prevent over-irrigation.

There is a potential problem of competition between the old water-users society of active Kavundar farmers, and the new set-up. So far both sides say they are willing to help the other, but in future this competition could break open. The whole system is still totally under the control of the Irrigation Department, which is not multidisciplinary. The suspicion and distrust that formerly existed may not be completely rectified until the irrigation system is fully responsive to social, local institutional and agronomic interests.

6.4.15 Replicability: This system so far covers 12,000 ha. out of 83,770 ha. of the Lower Bhavani Project, and will be extended to the whole project command. Farmers seem to be interested and extending it. A similar system has already been set up by CADA in the Periyar -Vaigai Command. It is on a smaller scale, but said to be working satisfactorily. The system is also being set up in Tanjavur district, the first implementation on the Kaveri Command Area. There seems to be no reason, why it cannot be expanded to cover the State. Some arrangements may be necessary to work out overlap or differences between the WALMI Kudimarat model on the Kaveri command, and this CADA system, as both seem to have potential for replicability. However, this model should preferably be spread by contacts among farmers rather than by order.

6.5 KATTIAMPANDAL TANK IRRIGATION SCHEME, TAMIL NADU

6.5.1 **Organization:** The Centre for Water Resources (CWR) of Anna University, funded by The Ford Foundation, has taken up an experiment to develop alternative approaches to tank rehabilitation and management. The Kattiampandal Tank Irrigation Society (KTIS) is the result of this effort. KTIS was registered in 1989 under the Tamil Nadu Societies Registration Act of 1975.

KTIS manages a hydraulic system comprising two tanks connected by a regulator, and a channel length of 1165 m, serving 143 ha. It has undertaken physical improvement works under an agreement with the Public Works Department, which till 1991 was done entirely by PWD.

6.5.2 **Purpose:** a) To execute repairs and improvement of the tank and supply channels. b) To distribute water equitably. c) To prepare schemes for improvement of agricultural productivity and related development. d) To improve the financial position of the Society by collection of annual subscriptions, and raising of trees and fish culture. A revolving fund is being created. e) To improve the income and living standard of the farmers of the village.

6.5.3 **Tiers:** None

6.5.4 **Sponsor:** The Centre for Water Resources, Anna University, funded by the Ford Foundation.

6.5.5 **Group Organizers:** In the beginning an institutional organizer was posted in the village by the project for two years. His work is being taken over by local organizers selected by consensus from each 'pangu' (share of land). CWR has employed an irrigation sociologist to oversee this work.

6.5.6 **Origin:** The tanks with their traditional system of FO are probably centuries old. The KTIS management model emerged from the original system, plus efforts of CWR through action research programmes in different parts of Tamil Nadu, lessons picked up from the experience of the National Irrigation Administration of the Philippines, and the Ford Foundation funding and experience.

6.5.7 **Organization and Leadership:** KTIS grew out of the earlier traditional type organization, which was re-organized formally in 1988, and registered the following year. All landowners and actual cultivators who are above 18 can be members of the KTIS. The admission fee is Rs.5/-. The general body of the KTIS has 215 members. It selects an executive committee of 21 members. Representation is according to the pangu system by which lands and landholders are grouped, and it also has 7 co-opted members drawn from various government agencies. The executive committee in turn elects office bearers and leaders of three task force committees: a) Water Distribution and Management Committee, b) Maintenance Committee, and c) Development Committee. The task force committees meet twice a month to discuss problems and work allocation.

6.5.8 **Social Categories:** Kattiampandal village consists some 60 percent of the population which belong to several Harijan castes, and 40 percent are Mudaliars. Because of skewed land ownership, the executive committee has three Harijans and 18 Mudaliars. However, a Harijan member was unanimously elected as leader of one of the task force committees.

6.5.9 **Irrigation and Crops:** In ancient times there were two types of water distribution arrangements, known here as : a) Open system in which the water flowed continuously, and b) 'Orumadai Paichal' system, which was rotational. Both these had deficiencies, so another traditional system, viz. Pangu (Share) system was evolved.

There were six pangus, and each pangu consisted of 16 kanis (7 ha). In all it covered 42 ha. Water turns were determined by drawing lots. As for water charges, one pangu was considered as one rupee or 192 tambadis (formerly the smallest coin, 192 to the rupee). For each tambadi pangu, one farmer could irrigate his field for 3.75 minutes. Only pangu- holding farmers were eligible to use the water during times of scarcity, others would not get water. But some priority irrigation rights were given even in times of water scarcity to certain influential families in the village. The privileged farmers had to pay a special tax called 'Paichal Vari' (irrigation tax). In addition they had to bear the expenses for village festivals. Pangu holders could sell water rights to other farmers.

The farmers would collectively appoint a waterman (Nirkatti or Kambukaran) to look after allocation and distribution. The pangu system was modified by the farmers at a meeting in December 1988. The important changes now are : a) The 6 pangus have been increased to 10. b) The entire command area of 143 ha. and adjoining lands, which were getting irrigation through tank water have all been included in the 'pangu' system. So the area of the 10 pangus is now about 163 ha. c) Like-minded people or kin who own lands in a command area are now grouped in one pangu. d) Each pangu, which covers about 16 ha, gets 12 hours of irrigation. e) Night irrigation is now arranged. f) KTIS now appoints the Nirkatti, who gets one bundle of paddy per acre. g) The task force committee is responsible for the water from the community well, which it is planning to dig under the tank, and to distribute it to cultivators according to need and availability.

The Kattiampandal tank has a registered gross command of 143 ha, including 84 ha under single cropping and 59 ha under double cropping. High yield varieties of paddy are extensively grown in the first season, followed by a second crop of paddy, if there is water in the tank. If there is not enough water, farmers who have wells try to grow groundnut, rabi pulses, and some vegetables. Sugarcane is grown only by farmers having wells with good water supply. If any cattle damages a crop and is caught by other members, the cattle owner has to pay a fine as decided by the Committee.

6.5.10 **Water Rates:** Water fees paid to the government are included in land cess under the command. Land cess is Rs.30 per acre. Groundwater is sometimes pumped and sold by farmers. They charge Rs.20 per hour for a 3 HP motor.

6.5.11 **Maintenance:** Since the formation of KTIS, the whole system has been maintained by the Executive Committee with the support of the Task Force Committee for maintenance. All the members together take decisions on sluice opening, sluice closing, water distribution and other activities when there is water in the tank. KTIS through its task forces takes up annual repair and desilting of the supply channel and branch channels. For all repair works one or two labourers are sent by each family, according to the decision of the Committee.

Improvement to the physical structure of the tank has been undertaken by KTIS under contract with the Public Works Department, which was an innovation. KTIS is able to carry out works on a relatively large scale (worth say Rs.20 lakh) and on a smaller scale (lining of field channels), with the active participation of the members' labourers. KTIS feels the quality of the work and durability is much better than with work done by Government agencies. The contracts for physical

improvements also provide labour opportunity to the villagers, which is not always so, when contracts are given to outside contractors.

6.5.12 **Income to KTIS:** Income accrues from the following sources : a) Annual subscription fee. b) Admission of new members. c) One kg of paddy per acre to meet the cost of protecting the crop from cattle, ant, theft etc. d) Income from leasing of fishing rights, trees, and grassy areas. e) Fines collected from cattle owners, when their cattle are found damping the crop.

6.5.13 **Advantages:** KTIS controls the tank and its water, its distribution, and routine maintenance without any expenditure from PWD. A precedent has now been set in that PWD has made contracts with KTIS for maintenance and repair. PWD feels that this solves most of the water-related problems. Since the reorganization of KTIS water-related disputes have been eliminated completely.

6.5.14 **Possible Problems:** Under the pangu system, lands are grouped not according to whether they are contiguous, but based on the owners being like minded and kin. So conflicts may be less, but water may not meet the needs of the crops. The design of water supply is time-based rather than need-based. Even after completion of the tank modernization work, sufficient water may not be available because de-silting is necessary. This is a big job, which is not part of the project. So the tail-enders may still have some supply problem. There may be problems in leadership. Both the president and secretary are aged, and second-line leadership is not given due importance.

6.5.15 **Replicability:** There is already demand from neighboring villages for formation of similar societies. They could also be successful, provided: a) There is funding for tank modernization. b) Community organizers are trained and available in the required numbers. c) CWR or a similar sponsoring agency can coordinate them on the desired scale. d) PWD is prepared to hand over physical structures and make contracts for improvements. This may require attitude changes, which may come about provided the officers see for themselves that this can be effective.

6.6 AGA KHAN RURAL SUPPORT PROGRAMME MODEL, BHARUCH DISTT.,GUJARAT

6.6.1 **Organization:** There are seven Lift Irrigation Societies (one each in seven tribal villages) sponsored by the Aga Khan Rural Support Programme (AKRSP). Water sources are rivers, and their command areas vary from 70 to 164 ha. Membership ranges from 50 to 120. The Societies are registered cooperatives. The farmers are all Bhils, who have had little experience with irrigated agriculture. The farmers pay nearly what the water actually costs.

6.6.2 **Purpose:** The purpose of the Societies is to improve the economic condition of farmers through irrigation, as there is no other way to raise their income. The lifted water is distributed to village lands, and also to kitchen garden plots so that women can be involved in irrigating food crops. The Societies also undertake activities such as input supply and marketing.

6.6.3 **Tiers:** None

6.6.4 **Sponsor:** The Societies are sponsored by the AKRSP, which is funded by the Aga Khan Foundation and other donor agencies. It tries to promote sustainable and equitable village institutions and improve income levels of the beneficiaries.

6.6.5 **Group Organizers:** The Societies were catalysed by the field staff of AKRSP.

6.6.6 **Origin:** The district is a tribal belt. The topography is characterized by undulations and perennial rivers, which makes lifting an ideal means of irrigation. Prior to AKRSP's intervention, the State Irrigation Department had built lift schemes in some villages. Most of these fell into disuse because of technical defects, low participation, and mismanagement. AKRSP intervened in a few of these villages by setting up new schemes which were technically sound. Cooperative Societies were formed to group the participants and to avail of the CADA management subsidy. The members were involved in all stages-- from construction to day-to-day operation of the schemes. Later on, requests for lift schemes came from other villagers.

6.6.7 **Organization and Leadership:** A Cooperative Society has a Chairman and a Management Committee to oversee its affairs. The officers are elected by consensus during the annual general body meeting, and serve for three years each. The Secretary, who gets special training from AKRSP, looks after day-to-day affairs. The Secretary, water distributor, and pump operator are employees of the Society. AKRSP has appointed an internal auditor to check the accounts of all the societies.

6.6.8 **Social Categories:** Bhils are the dominant ethnic group. They are divided into castes such as Rathod, Buriya, and Kamal. The management committees of the cooperatives represent different Bhil and scheduled castes.

6.6.9 **Irrigation and Crops:** Each Society has an electric motor of 35 to 80 HP and a standby diesel engine. Water is collected from a well in the streambed, pumped into a jack well located in a high place of the undulating command area and distributed through closed plastic pipes. At first, water was provided to just one acre per family. Now the Society decides before each season the area to be irrigated. There has been significant increase in the irrigated area. The increase in irrigated area for some of the villages in Bharuch District from 1986 to 1988 is as follows:

Village	Irrigated Area (ha)		
	1986	1987	1988
Sejpur	70	160	174
Dhavliver	94	174	158
Samadhiyala	10	28	303

There was a change in cropping patterns, from long duration crops such as cotton and pigeon pea, to short duration crops such as wheat, sorghum, and gram. The cropping intensity has increased to 194. Yields of kharif sorghum have increased 113 percent, Rabi sorghum 26 percent, arhar 183 percent and cotton 28 percent. Farmers are beginning to adopt horticulture. Landless labourers now also use the water for their kitchen gardens, and agriculture extension facilities are provided to them.

6.6.10 **Water Rates:** Water rates are decided during the annual general body meeting. They are calculated on the basis of expense to be incurred, utilization over past years, and projections for the current year. The average rate during 1989-90 was: Rs.120 per acre per watering for support irrigation and Rs.80 per acre per watering for rabi or summer crop. Payment is by both credit and cash. In some cases interest is levied, if water is given on credit.

6.6.11 **Maintenance:** The Society generally looks after the maintenance of the machinery. Each Society employs one pump operator, one water-distributor, and one part-time watchman. AKRSP helps the Society identify technical help, when repairs have to be undertaken. At the start of the season, the members around a chamber help in cleaning operations and in other works required.

6.6.12 **Income to the Society:** The capital costs were provided by AKRSP, averaging Rs.3045 per ha. Of this, 65 percent came from the government, 25 percent from the Tribal Development Corporation, and 10 percent from AKRSP and the Agha Khan Foundation. The Societies have to maintain and run the systems. Now 6 of the 7 Societies meet their operational and maintenance expenses, mainly by water charges, which are Rs.100 per acre per watering. The Societies earn additional income through the distribution of kits, marketing, and hiring out threshers. Most of them have been able to build up some reserve funds.

6.6.13 **Advantages:** Out of the 7 lift projects, 6 are self-sustaining. The villages contributed as much as 301,000 mandays (up to March 1990). Capital costs of about Rs.3000 per ha appear extremely attractive compared to canal system costs of over Rs.30,000 per ha. It is demonstrated here that water charges of Rs.100 an acre per watering are viable (Rs.400 to 600 per crop). Users pay most of the actual cost of the water, in comparison with government canal systems, whose costs are mostly subsidised. Farmers' income has increased as intended both through irrigation and other linkages. Most farmers increased their crops by 2 to 3 times a year. Other benefits include reduced seasonal out-migration of labour, more children in school, repayment of old loans, and purchase of numerous manufactured goods.

6.6.14 **Possible Problems:** In a few Societies, there have been problems regarding recovery from some members and repayment of loan for construction of schemes. Electricity is erratic, though a fixed charge has to be paid based on horsepower. The cost of diesel comes to Rs.100 per acre per watering, which is prohibitive. It is sometimes difficult to find members to take active part in the affairs of the Society. The Societies are dependent on the sponsoring agency for organizational and technical help, even after they have become economically viable.

6.6.15 **Replicability:** This model is in principle replicable because the costs are sustainable by water-users. Outside assistance is needed to donate capital to install such systems, at least for poor tribals, which may inhibit replication over a wide area. The Government agency responsible for collaborative work (Gujarat Land Development Corporation) seldom reaches the actual isolated farmers, and only with difficulty. Organizations such as AKRSP having the dedication and zeal of AKRSP are rare. Where lift irrigation is new, it takes a lot of effort from some such agency to persuade the farmers first.

A comparison of the profiles of above mentioned WUAs is given in Tables 1 to 3.

Table-1 COMPARISON OF PROFILES OF WUAs: Type, Sponsor, and Legal Form

Type	Irrigation Project	State	Place	Sponsor	Legal Form
Canal	i) Mula	Maharashtra	Chanda, Ahmednagar Distt	CASAD	Coop Act.
	ii) 10 Projects	Kerala	All over	CADA	Societies Act
	iii) Mahanadi	Madhya Pradesh	Raipur Distt.	Irrigation Department	Irrigation Department
	iv) Lower Bhawani	Tamil Nadu	Erode Distt.	CADA (Agr.Engg)	Societies Act
Tank	i) 2 Tanks	Tamil Nadu	Kattiampandal, Chingelpet Distt.	Anna University	Societies Act
Lift	ii) 7 Sites	Gujarat	Bharuch Distt.	AKRSP	*RSP Coop Act

* RSP : Rural Support Programme

Table 2 : **COMPARISON OF PROFILES OF WUAs :** Purpose, Size, Structure, and Leadership

S. No.	System & Model	Purpose	Size	Structure	Leadership
	Canal System				
i)	Mula Project Coop. Society	Management on minor canal & distribution	200 farmers, one Coop Society, 361 ha.	Cooperative Society	Elected Members & President
ii)	Kerala, CADA	Distribute and maintain water courses	2000 societies of 15 to 25 farmers each at outlet level registered covering 10-40 ha each	Project Committee Canal Committee 1000 ha (Presidental & E.E), ID officials	Governing Body & President
iii)	Mahanadi I.P	-Water distribution -Collection of water fees	736 IPs, each IP has 3 members & 251 ha	Under Act Village level with Sarpanch & Elected Members	Sarpanch+Members
iv)	Lower Bhavani	Water distribution	50 Farmers' Associations, 470 Associates, 12,000 ha	-Outlet-Association - Branch-Committee - Canal-Council -Project-Federation	Informal leader, 2 representatives each from outlet level
v)	Regd. Society, Kattiampandal	-Equitable water distribution -Repairs & improvement work of tank and channels -Improve agricultural productivity -Improve financial position of society	215 farmers, one society, 143 ha.	-Regd. Society -Elected 21members & 7 Co-opted members - 3 Task Forces	Executive Committee & 3 Task Forces
vi)	**Lift Irrigation** Coop Society, AKRSP	-Lift & distribute water -Improve economic condition of farmers	Society of 50-120 farmers, 7 Societies, 70-160 ha. each	Chairman, Management Committee (elected)	Management Committee & AKRSP field staff

Table 3 : COMPARISON OF PROFILES OF WUAs: Advantages, Problems & Replicability

Particulars/FP	Advantages	Problems	Replicability
.Mula Project Co-op Society	-Procedural delays avoided -Proportional water fees -Reduced water wastage -Cropping intensity and diversity -Society controls through Patkaries -Less conflicts	-Sustainability -Depends on one local leader -Inadequate supply of water and timelines	-High possibility -Registration with ID instead of Department Cooperatives
Kerala CADA	-Efficiency in water use -Better crop yields -Combination of Group farming & WUA is unique -Volumetric water use & rates	-Organising 2000 people's Associations at one time not feasible -Discussions with farmers not held -Political intereference	-Possibility on a wider scale within Kerala
MP, Irrigation Panchayats	-Easy water distribution -Resolves conflicts -Less procedural delays -Easy for ID to coordinate	-Responsibilities not matched with powers -Inadequate & untimely water -No control over physical system	-High possibility -Need similar Act -Improve physical system
Lower- Bhawani, CADA Model	-Equity -Farmers' Participation -Job opportunities	-Reliability in canal flow -High cost of stage reorder -Volumetric supply needed	-High possibility both within and in other CADA -Spread by contact among farmers
Registered Societies, Kattiampandal	-Controls tank & water distribution -Society undertakes contract for repair & maintenance -Less disputes	-In Pangu system lands grouped are contiguous -Desilting of tank not done -Time based supply -Second line leadership	-High possibility, with ready demand -funding required for modernization -trained Community Orgnizers available -attitude change of PWD
AKRSP Lift System Cooperative Societies	-Coop Societies are self-sustaining -More employment -Low capital cost/ha. -Increase in income levels	-Repayment of loan -Erratic power supply -Depend on sponsoring agency	-Easily replicable as costs are sustainable -Funds/Assistance needed for installation of systems.

Lining being carried out on Water Course of Bathinda Distributary (Punjab)

CHAPTER - 7

PARTICIPATORY IRRIGATION MANAGEMENT - THE SUGGESTED ROLES

7.1 ROLE OF FARMERS

The farmers are the real production managers of all the agricultural products and hence need the whole-hearted support of all the suppliers of various inputs required for increased agricultural production. The farmers in turn should function as real production managers making effective use of all the resource inputs.

Their prime role as far as the PIM is concerned is as below:

a. All the registered landowners in an irrigation command should join together, establish associations, interact with the Government and involve themselves in effective participation from the planning stage itself in the process of irrigation management.

b. The registered association as a legal entity should enter into an agreement through a mutually agreed MOU and bye-laws and assist the Government agencies in finalization of the rehabilitation and modernization of the irrigation systems, testing the hydraulic performance of the distribution systems after improvement and taking over complete responsibility of O&M tasks at distributary/minor levels having a command area ranging from 200 to 500 ha.

c. Monitor the water deliveries at the heads of distributary/minor, pipe outlets within the command area under the jurisdiction/control of the FAs and water distribution among the ayacutdars maintaining equity.

d. Resolve the conflicts arising among the users in respect of water distribution ensuring equity and participation in maintenance activities.

e. Coordinate and assist the members of the executive committees of different levels of FAs for effectively discharging their O&M responsibilities of the distribution system turned over by the Government.

7.2 ROLE OF NGOs

NGOs can play a very important catalytic role by acting in close association with the Government. The NGOs can act as facilitators in setting up WUAs, take up Action Research Programmes, provide expert assistance in organizing farmers, drafting of manuals for PIM, drafting of MOUs, training of farmers and monitoring and evaluation of pilot projects.

The services of the representatives like Institutional Advisors and Social Organizers from the NGOs are required to take care of the liaison work between the government agencies and the farmers and to provide effective support to various tasks related to PIM implementation. Their services are not only required during the initial stages of implementation of PIM programmes, but also to sustain these subsequently.

The NGOs are doing yeomen service in formation and sustenance of WUAs in the States of Gujarat, Maharashtra, Andhra Pradesh and Tamil Nadu. They have proved to be an important link between the Irrigation Departments and the beneficiaries in developing the PIM. They have helped in arriving at and signing of the MOUs in this regard, and they continue to play an important role in development of PIM in the country. Their role has been well recognised and there is growing awareness for their increased role and assistance in furthering the PIM programme in the country. Increase in the number of NGOs working or interested in PIM/WUAs is also very necessary.

7.2.1 Indian Network on Participatory Irrigation Management (India NPIM)

IndiaNPIM is a premier National Level NGO working towards Irrigation Sector Reforms in India, efforts outside the Government, but working closely with the Government and influencing and supporting the appropriate policy decisions. One of its main objectives is to promote the concept of PIM, not only in the installed large irrigation systems but also in minor and medium irrigation systems as well as tank and groundwater irrigation systems.

IndiaNPIM approach has been to promote PIM in India through the strengthening and promotion of FOs for better management of irrigation systems and by helping to bring about the appropriate policy changes.

The objectives of the organisation are

- To facilitate and promote PIM in India.
- To network between the various actors in the irrigation sector in India for better water management.
- To advocate and lobby for enabling policy reforms and initiatives for a sustainable pro-poor water policy.
- To act as a Think Tank on PIM.

The main activities of IndiaNPIM are in the areas of policy advocacy, training, research, seminars and workshops, documentation and information dissemination.

7.3 ROLE OF WUAs

It is believed that genuine WUAs cannot be formed just by an administrative order and that for its survival, attitude of the irrigation agency must be supportive. As a principle, NGOs will not organise WUA as an extended arm of the Irrigation Department for maintaining the irrigation network or for distributing the water among its members or for removing the obstruction from the irrigation system etc., but will motivate and inculcate in them the habit of finding the constraints. Once this is achieved, farmers are likely to take up the above tasks, if and when they find that these are in their interest. The role of NGOs and Irrigation Department is thus to catalyze their awareness decision and to form an organization. Irrigation authorities should respect farmers' experience and intelligence, forget the bureaucratic attitude and allow WUAs to set their own task.

It can be expected that through formal and informal training, preparing teaching material in local language to explain the use of structures of the system, farmers can improve on their own and a right type of understanding between users and suppliers can be developed for implementing PIM. Further, with the supportive role of Irrigation Department and the NGOs advising and guiding WUA to abide by the terms of the MOU, the system management will improve. But for making it a sustainable institution for managing the affairs from distributary level, maintaining the entire network down to farmers field on its own and play an effective role in policy decision, Government has to announce its policy and intention of considering farmers as equal partners. Government will need to make corresponding changes in budget and personnel allocation, identifying clearly the sharing of power, responsibility and the distribution of funds between FOs and the irrigation authorities and adhere to it.

This being the objective, it takes time for WUA to be built up as a sustainable institution. Forming or registering WUA is not enough. To gain momentum for sustainability, beneficiaries of the system need time to trust their leaders, trust other WUAs, the system itself, the attitude of the authorities and to find out if the actions taken by all WUAs working in the project, are in their common interest and are profitable to them.

Keeping all this in mind, it is to be realized that management of the entire system is to be participatory and distribution of water below the distributary is to be tackled by the Farmers' Organizations, if irrigation efficiency is to be improved and potential created is to be fully utilized. To achieve this the first step is to understand the physical structure which provides facilities that can control the water being applied to fields right from the head of the project to the tail end of the distribution system, and then based on the same, an appropriate organization of farmers for participatory management of the system can be established through their active involvement, through continuous dialogue and wining their trust.

7.3.1 Structure and Levels of WUAs

Hydraulic unit has generally been accepted as the basis for formation of WUAs.. At outlet level having about 40 ha. CCA, WUA is considered to be too small to be effective. But WUAs at minor level having CCA between 500-750 ha. are considered to be ideal as basic units. Irrigation schemes having CCA upto 1000 ha. should have a single tier. But for medium and major projects there should be multi-tiered WUAs ranging between 2-4 depending upon the size. While the WUAs and associations at different levels have the right to institute their own administrative and financial structures and establishment and adopt their own bye-laws, equitable development can only be effective in the entire irrigation system and sustainability achieved, if the following general principles are adhered to:

a. Sensible water allocation policy under entire system, depending on seasonal condition;
b. Friendly environment for development and use of ground water;
c. Measures to combat corruption, and unlawful tapping of water.

This depends on how fast NGOs can create among all irrigators a respect for the democratically taken decisions especially with regard to water allocation policy taken up by their association, based on water availability in the reservoir. This in turn requires reliable information not only about the irrigation network and its efficiency but also different flows in the system, depending on inflows in the reservoir and the policy of releases. Adequate transparency in Government policies, financial accountability, involvement of FAs at different levels in irrigation management, entrusting the repair work to FOs with financial support, will create confidence to take up work and strengthen the economic position of WUAs.

Irrigation Department should, therefore make it its objective to hand over irrigation system to its users' association and make sure that Government policies assist these associations to operate efficiently. Similarly, each WUA should be held accountable to its members, in absence of which these associations will be liable to be taken over by vested interest groups.

7.4 ROLE OF GOVERNMENT AGENCIES

7.4.1 Centre

Under the Constitution of India, water is a State subject. Union Government plays the role of facilitator and provides guidance, while actual implementation of PIM has to be done by States. In the Centre, the following strategy is being followed:

a. Creating awareness among Farmers/Officials through Conferences/Seminars/Workshops/ newsletters, films, visits, etc.
b. Assisting States in generating funds (Externally Assisted Projects)
c. Providing financial assistance under CAD programme (management assistance, action research, training).

d. Assisting states in preparing manuals on PIM in regional languages.
e. Preparing a model bill for amendment to State irrigation laws.
f. Disseminating information on PIM
g. Carrying out other related activities for promotion of PIM (setting up of IndiaNPIM, Central Sector scheme, appropriate organisation).

7.4.2 States

In the States the following strategy is being followed :

a. Declaring intent to pursue PIM as a policy objective
b. Setting up of high level working group on PIM to decide policy matters
c. Amending irrigation acts and making necessary rules.
d. Taking up pilot schemes
e. Financing formation of WUAs
f. Transferring small irrigation schemes to farmers
g. Giving incentives to farmers and officers for promotion of PIM
h. Preparing action plans
i. Evaluation and monitoring the performance and bringing necessary improvements
j Engaging NGOs for implementation process.

It should be realized that the contemplated institutional and organizational changes have to be sponsored and implemented by the States, as the subject of irrigation is entirely within the State's jurisdiction. Yet it is possible to influence their decisions in the desired direction by imposing conditionalities. This does not in any away encroach on the jurisdiction of the States. In fact, many of the World Bank loans to the various States do contain such conditionalities and are being accepted readily by the States. A bold step in this direction was taken by the then Minister for Water Resources in 1995, when it advised the States that no funds would be available from the Centre, if FOs are not set up and CAD Boards revamped to provide for dominant representations to the farmers. However, since this decision was reversed later, it would augur well, if a long-term policy in this regard is formed and implemented.

7.5 ROLE OF WALMIs

The irrigation development task in India in terms of complexity, size, variability and significance has no equal. There are different types of systems located in different states depending on agro-climatic conditions of that region and hence training needs are varied, and is required at different levels to suit these conditions. There has to be training of (i) Trainers (ii) Personnel from Irrigation/Agriculture Departments and (iii) Farmers and others etc. Keeping these requirements in view WALMIs and IMTIs have been set up in several States, Prominent States being Andhra Pradesh, Assam, Bihar, Gujarat, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Rajasthan, Tamil Nadu & Uttar Pradesh.

The main objectives of these institutes are :-

a. To train the relevant professionals at various levels of Government Departments in Water & Land Management & Development.
b. To undertake research & conduct experiments in various aspects of Irrigation Management & land development and to collaborate with other similar organisations for research & development.
c. To provide consultancy services to Government, local bodies and other organisations in irrigation management and land development for irrigation & agriculture.

d. To promote active participation by farmers in irrigation management for optimal utilization & production through social organisations.

e. Publication of literature and its dissemination for transfer of technology to farmers and all concerned with irrigated agriculture.

Most of these institutes are functioning as autonomous bodies with governing board and State Technical Councils. All the important policy decisions are taken by Governing Council of the bodies comprising senior officials of the relevant concerned State Government Departments and representative from Central Water Commission. The nature of training imparted is multidisciplinary in nature with faculties drawn from Agriculture, Irrigation Engineering, Science and Social Science branches. In these efforts, two Agricultural Universities and three Engineering Universities are also involved, which work in association with WALMIs/IMTIs. These are M.L. Sukhadia University, Udaipur and Mahatma Phule Agricultural, University, Rahuri and three Engineering Universities namely M.S.University - Baroda; Anna University - Madras; and Bihar College of Engineering - Patna.

As mentioned above, these WALMIs/IMTIs interalia train farmers in operation, maintenance and management of irrigation system under their Action Research Programmes with focus on taking over the system for self management by farmers at least at tertiary level. The field demonstrations carried out during such training sessions have provided sufficient incentive to the farmers to take over system management by themselves on some projects and the message of success achieved has prompted other farmers also to take over part of the system for management.

Channel maintenance work by a group of farmers (Kudimaramat) at Salipperi village in Cauvery Delta (Tamil Nadu)

CHAPTER - 8

REHABILITATION AND MODERNISATION

8.1 EXISTING PRACTICE

So far the irrigation systems are operated and maintained fully (upto outlet level) by the Irrigation or Water Resources Departments. Under the centrally sponsored CAD programme, field channels are constructed by the CADA with an understanding that the farmers would maintain the same. Due to paucity of maintenance and repairs, Irrigation Departments find it impossible to maintain these canal systems in up-to-date condition. The piloting work in PIM done so far indicates that the farmers are not generally ready to assume the new responsibility of undertaking O&M, unless the systems are brought back to designed conditions or at least they are satisfied that the water reaches all outlets and further to all the fields in the command. The rehabilitation of channels to bring them in reasonably good shape before these are transferred to the farmers seems to be necessary to motivate farmers to form associations and undertake the responsibility of O&M, after the turnover. This will reduce perpetual maintenance responsibility and costs on secondary and tertiary systems.

8.2 WORKS INVOLVED

Rehabilitation is not modernisation and should include only items and costs necessary to restore the systems to originally designed standards with some consideration for improved controlling and regulating functions and precise measuring devices to facilitate the WUAs in distributing water on equity consideration, in time and space.

The original construction of minors, water-courses and even field channels have not necessarily been done in consultation with the farmers' groups. Hence, inadvertently some errors in judgement of micro specific situations of omissions in understanding and inconvenience of the users might have happened. These items are generally locations of outlets, structures, etc. The rehabilitation envisaged before handing over should address rectification of such errors in consultation with the WUAs.

The most common items which need to be considered in restoration works are:

- Cleaning the channels for desilting, deweeding;
- Raising banks in embankments or dressing side slopes to design standards and removing undercuts in hard strata;
- Strengthening banks in filling sections;
- Regrading minors to designed standards, where bed gradients are not properly attended;
- Replacement and painting of metal parts in gates, hoists;

The regulating/controlling arrangements, including provision and fixation of measuring devices to facilitate better distribution of water may include:

- Additional regulating structures such as Cross Regulators, Duck-Bell Weirs, construction of Surface Water flumes (SWFs) at heads of minors and Parshall flumes or Cut-Throat flumes below outlets.
- Repairs to Drops or constructing additional Drop structures where erosion is observed or the Drops are bye passed.

The other general items, which could be included in the rehabilitation works are:

- Re-sectioning the canals as per original design.
- Raising banks where the full supply depths are encroaching the free boards or strengthening banks where slips occur;
- Repair to all types of structures, cross-drainage works, head/cross regulators, outlets, drops, division boxes, aqueducts, syphons and repair/replacement of gates, hoists, hoist platforms, including locking arrangement;
- Changing positions of outlets, where the command is not receiving water properly;
- Changing location of turnouts;
- Repairs or replacement of energy dissipation arrangement downstream of head regulators/ outlets drops;
- Smoothening entries of syphons, aqueducts cross/head regulators bridges to reduce afflux.
- Strengthening the banks revetment, pitching for earthwork, upstream slopes and downstream of structures for smooth working sections, entries/exits and also to serve as preventive repairs to avoid frequent overtopping branches;
- Additional road, foot-bridges, where severe inconvenience is felt by the community;
- Providing catch water drains to avoid silting in canals;
- Repairs to service roads/inspection paths;
- Fixing boundaries of canals by stones, trench cuts;
- Fixing canal bed stones.

8.3 LINKAGE WITH TURNOVER

Some rehabilitation and modernisation to bring the system in reasonably good shape need to be integrated with the participatory management programmes, particularly, for the works to be carried out on channels intended to be transferred to a WUAS. Rehabilitation provides strong incentives for farmers to come together in an association. At the same time, through the association, farmers can make important contributions to the rehabilitation process. Because of the mutually supportive nature of rehabilitation and participatory management programme, the two components viz. participation and rehabilitation work best, when implemented simultaneously.

8.4 PROMOTION OF CONCEPT IN SOME OF THE ONGOING SCHEMES

8.4.1 Water Resources Consolidation Projects

The World Bank assisted Water Resources Consolidation Projects (WRCP) are under implementation in three States namely: Haryana, Orissa and Tamil Nadu. The main objectives of WRCP are: (i) Improvement in agricultural productivity through rehabilitation and completion of irrigation schemes and farmers' participation; (ii) Water resources planning by river basin across all uses of water; (iii) Assured sustainability of infrastructure and the environment; (iv) Improving institutional and technical capability of managing the State's Water Resources.

To achieve the above objectives, thrust areas, inter-alia, under the project include completion of the scheme, system improvement, farmers' participation, on-farm development works, enhanced O&M of the systems, water planning, research, environment, management etc.

8.4.2 Orissa Water Resources Consolidation Project (OWRCP)

The OWRCP is to be implemented in a time slice of 7 years by the Government of Orissa. About 265,400 ha of CCA in 25 existing irrigation schemes has been included in the System Improvement and Farmers' turnover component of the project.

The farmers' organisation and turnover component is an integral part of the overall project. Three important features of the WRCP approach to water user participation are:

(a) The implementation of organising efforts are closely integrated with physical improvements to be funded under the project. Organisational efforts will precede implementation of minor-level rehabilitation works to ensure that farmers are committed to maintaining the improvements.

(b) The focus of organising activities is at the minor or small distributary level. A single WUAs will be formed to manage the entire minor, or in case of larger command areas, several WUAs may be formed. The size of WUAs will range from 300 ha to 600 ha. Turnover of O&M responsibilities at this level will result is significant cost reduction to Department of Water Resources (DOWR) and improved water management.

(c) The terms and conditions of turnover will be specified in a written contract (Memorandum of Understanding) between DOWR as well as the newly created distributary or minor level association.

Implementation Strategy

Because Orissa has no experience in WUAs, a phased introduction of PIM was proposed. The initial phase of PIM was confined to an area of 15,519 ha or about 10 percent of the area that will eventually come under the PIM programme during the life of the WRCP. Phase-I was started in 1996 and it continued for about two years. During this period 50 WUAs were formed in 4 "Pilot Projects" each association catering to an area of 300-600 ha. The experience of the programme is being intensively monitored and evaluated. The analysis of Phase-I was used for the approach to be taken in Phase-II. A similar methodology was employed for Phase-II and Phase-III.

Implementation of PIM Programme

The implementation process has been sub-divided into four phases; preparation, assessment, organisation and joint management, leading to turnover.

(a) **Preparation Phase** (Variable duration): Two dimensions of preparation are (a) institutional strengthening of the organisations responsible for implementing the PIM programme, and (b) attitudinal change on the part of DOWR. A series of training activities have been planned to help address both dimensions. Consultants have been engaged who advise on programme implementation and work with state WALMI in conducting appreciation workshops.

(b) **Assessment Phase** (about three months): During this phase, the JEs and SOs of DOWR will initiate discussions with farmers about the WRCP improvements, management needs and the potential for establishing WUAs. The JEs will be responsible for an area of 2000-3000 ha. Their initial activity will be to arrange participatory walk-through of each distributary, alongwith DOWR project staff and farmers, to begin a dialogue about priority improvements. Other tasks during this phase include compiling a list of actual farmers and the land holders, a detailed map of the official and actual command area (including unauthorised/authorised water use), and a rough assessment of the organisational capacity of farmers in each distributary area, including information on any existing formal or informal organisations.

(c) **Organising Phase** (4-6 months): The process of organising farmers will precede any construction activities at the distributary level or below. This is to ensure that farmers are committed to maintaining any improvements that will come under their O&M responsibility. The JEs, with assistance from the social organisers, will begin a long series of informal meetings with farmers throughout the command to discuss the turnover concept. A listing of the proposed improvements will form part of the provisional MOU to be drawn up jointly by the DOWR and farmers, with the help of the PIM team. A provisional MOU will be drawn as a reference for discussing the details of the WUAs eventual rights and responsibilities.

(d) **Joint Management Phase** (2-6 months): During this phase, the WUAs will learn how to manage the distributary. Farmers will work closely with DOWR field staff to understand how to read water levels, how to adjust gates (if needed in the particular distributary), and how to maintain the new improvements. Prior to formal turnover, a test of water flows will be conducted to ensure that physical facilities are in order.

Financing Arrangements

Under the WRCP, farmers are being asked to share a larger proportion of the total management burden than earlier. Most of the increased burden is in kind, and is through participation in the activities of management (attending meetings, keeping records, monitoring water levels, resolving disputes etc.). To ensure a minimal level of O&M funding for the minor/distributary commands under their control, WUAs are required to establish an O&M fund prior to management transfer.

During the phase-I of the PIM programme, a fee of Rs.250/ha. (Rs.100/acre) from each member of WUAs was collected and held in interest bearing fixed deposit account. The annual yield of roughly Rs.30/ha. would be supplemented by additional collections from the members, if O&M costs exceed the interest payment.

Incentives, in the form of rebates, are provided to the farmers, to enter into high cost management arrangements. The first type of rebate accrues to WUAs that agree to collect irrigation fees on behalf of the DOWR. The second type of rebate comprises of a reduced fee structure for farmers in those minors/distributaries where the WUAs have formally assumed management, thereby replacing some of DOWR functions.

Participatory Irrigation Management (PIM) and Farmers' Organisation Turnover (FOT)

In February, 1999 a decision was taken by State Government to implement FOT programme in all the 33 projects covering an area of 3,32,079 ha included under the Orissa, WRCP in two phases. In Phase-I, it has been implemented in 4 pilot projects namely Ghodahado, Aunli, Derjang and Rushikulya Distributary No.11, covering on area of 20,670 ha and out of 50 WUAs handing over is completed in 48 WUAs. Balance 3,11,409 ha will be taken up in Phase-II, in which 676 WUAs in 29 projects will be formed in three spells. The progress ending December, 2001 is given below:

Organisation	No. of Projects	Total Payment	Pani Panchayat (WUAs)	
			Target	Achievement
WALMI	16	1,47,279	326	133
CADA	5	79,979	165	-
NCCDS	2	11,957	26	-
NGOs	6	72,194	159	-
Total	29	3,11,409	676	133

The whole process of registration and handing over is expected to be completed by March, 2003.

A Pani Panchayat bulletin under the name Pani Panchayat Samachar is being published and distributed. WALMI, Orissa is also conducting training program for Government staff and farmers. Government of Orissa has prepared draft bill called "Orissa Pani Panchayat Bill" which is yet to be approved. Agriculture intensification programme is implemented in these projects as a part of PIM programme.

8.4.3 Tamil Nadu Water Resources Consolidation Project (TNWRCP)

The TNWRCP is a seven-year Project (1995-96 to 2001-02). The project is now extended upto March, 2003. The total project costs US $491 million. Under the TNWRCP, the need for rehabilitation is being addressed not only to meet the original design standards, but also to modernise and reorient the system to meet the new demands of agricultural production. The project seeks to improve system performance through three important elements:

(a) Infrastructural improvements in the system from the head of the main canal to the sluices including structural repairs, changes in regulatory structures, and works for the restoration of design canal capacity in line with: (i) an operation plan prepared in association with farmers; and (ii) system of water control designed to deliver water in proportion to the command area below the structured level.

(b) Enhancement of staff skills of specialised O&M units within a reorganised WRO in the formulation and implementation of operational plans and in the formulation of a maintenance programme aided by the introduction of a number of modern technologies and management system.

(c) A new type of public private partnership through intensive farmer participation in planning the above infrastructural improvements and through decentralised management of the irrigation system with FOs taking full operational and financial responsibility for O&M of the system, typically below the distributary or minor, covering about 500 ha.

The TNWRCP integrates these three demands as mutually reinforcing components, as it has been observed in the past that rehabilitation investments without adequate attention to system management or farmers' participation have resulted in the construction of civil works without financial and institutional sustainability. Under the WRCP, the rehabilitation and modernisation of the system is contingent on farmers' interest and agreement to turnover O&M responsibilities below the structured level to FOs.

System Improvement and Farmer Turnover

The TNWRCP's largest expenditure item and field effort is in the rehabilitation and modernisation of existing irrigation, drainage and bulk water facilities. This would be integrally associated with beneficiary participation in the scheme for investment and management decisions and turnover of water management and maintenance of distributaries to farmers.

The system improvement component would cover about 660,000 ha constituting 50% of the State's surface water irrigated area. It comprises focussed low investment improvement to enable more equitable and reliable delivery of water in all sections of the irrigation system and at the heads of each distributary, minor and sluice off takes, based on a detailed command diagnostic (crops, yields, hydrology, current performance and problems) followed by preparation of a "Plan of Operation and Maintenance" and identification and design of the infrastructural improvements to make this work.

Under Stage-I, priority design changes and structural improvements are being carried out in association with farmers in about 5,08,000 ha to ensure reliable irrigation to tail end sections in 10 major and medium commands and about 40 minor schemes (98,000 ha). The central feature of the design change is the structuring of the system, usually at the distributary and sometimes at the minor level. Below this level, control structures are being provided at all offtake canals to distribute water in the desired proportion without manual control. The costs of the rehabilitation and modernisation works under stage-I average to Rs.5300/ha (US $166) at 1994 prices.

Under Stage-II, a second round of investment to further improve performance and conveyance efficiency especially at distributary level, has been undertaken for commands successful during stage-I. In the WRCP period, this is expected to be primarily on the ex-NWMP commands (153,000 ha). Stage-II improvements are primarily for the construction of regulatory structures and selective upgradation of canal lining, with an average cost of Rs.7900/ha.

Farmers' Organisation and Turnover

The participation of water users would be closely tied to the physical improvements. The centerpiece of the participation programme is a progressively increased involvement of farmers, moving from consultation to active management of O&M below the structured level. A 3-tier structure of WUAs is being developed as part of the public-private sector partnership between farmers and WRO. At the lowest level (about 40-50 ha), there is an outlet level organisation ("Sluice Committee"), federating into a "Farmers' Council" at the distributary level (about 500-700 ha) where most of the formal negotiations with the WRO initially occur. Councils would further federate into an "Apex Committee" at the scheme level for consultations and agreements on overall water management and on inter-distributary issues. During Stage-I, WUAs are formally established as registered societies and they enter into an MOU with WRO. The Councils would also collect from their members Rs.250/ha and these collections would be deposited in their bank accounts. Interest earned would substantially pay for the Council's annual cash costs (the rest being farmer supplied labour) for maintenance below the distributary/minor head, which is their responsibility. Formal turnover of O&M responsibilities to WUAs is accompanied by intensive training and also involves an interim period (typically 6-9 months) of "joint management".

Distributary level improvements (Stage-II) would be contingent upon the formation of WUAs: their participation and agreement on the nature of the works; and their acceptance of O&M responsibilities, including financing, after the investments are completed. Canal lining, the most expensive item of stage-II works; would be taken up selectively and only when it is part of a jointly set priority improvement and when farmers collect 20% of the cost of the lining.

152 FOT teams comprising of the AEs/JEs, Work Inspectors and Lascars have been formed and trained. To assist these FOT teams, 17 NGOs have been engaged. For 6,00,000 ha covered under System Improvement and Farmer Turnover (SIFT) schemes, it is planned to form 1288 Farmers' Councils (FCs) at distributary level. So far 1284 FCs have been formed and systems have been turned over to 1236 FCs covering an area of 5,28,164 ha. All the systems are proposed to be turned over to FCs by 31.03.2003. The bill for "The Tamil Nadu Farmer Management of Irrigation System (TNFMIS) Act" has received President's assent. Necessary draft rules have been prepared and actions are being taken accordingly.

On Farm Development (OFD) Works

Farmers' participation is proposed to be extended to "OFD" works as well. Previously constructed by the Agricultural Engineering Department (AED), OFD (sluice drains) provide the important link between the irrigation system and farmers' fields, but needs to involve farmers and a lower cost

approach, if the investment is to be affordable and sustained. Under the WRCP, WUAs would decide on the need for OFD, and assistance to OFD would be extended only in outlets, where higher level WUAs are organised and the sluice has an active Sluice Committee. The WRO would construct the alignment structures and the watercourses and field channels would be constructed by farmers themselves. WRO costs would be about Rs.720/ha compared with Rs.3500/ha as per present practices with government taking full responsibility. About 425,000 ha area is targetted for OFD works under WRCP.

8.4.4 Haryana Water Resources Consolidation Project

Haryana Water Resources Consolidation Project (HWRCP) was earlier a World Bank assisted programme for six years (1994-2000) aiming at improved water management, institution building and planned water use for productive activities at full cost recovery in an economically viable, environmentally sustainable and socially equitable manner. The World Bank had extended the project by one year upto 31.12.2001 after restructuring the project by including those activities, which would be completed within the extended period i.e. upto 31st December, 2001.

The project emphasizes upon turnover of Operation and Maintenance to beneficiaries, which will help substantially in achieving the project objectives. The Haryana Irrigation Department (HID) has been mainly responsible for the O&M of canals, distributaries and lined watercourses (which is the lowest common channel serving an area of 100-300 ha). According to the existing Haryana Canal and Drainage Act of 1974 (which is based on the Northern India Act of 1873), the maintenance and repair of the watercourses is the responsibility of the farmers. Alternatively, the Act provides for the Department to operate and maintain the system and charge farmers sufficiently to cover the cost. The farmers are maintaining the Katcha (unlined) water courses, either individually in the lengths passing through their fields or through informal group actions, where some leading farmers take the initiative to organise other farmers to clear the channels, but over the time HID has de facto taken over the maintenance of lined watercourses (without adequate compensation). It is the policy of the Government of Haryana to reduce HID's involvement in system O&M, and pass this responsibility to beneficiaries, either operationally or financially.

Need for FAs

The above underlines the need for formation of FAs'. The Associations would be responsible for the timely upkeep, repairs and maintenance of the entire watercourses, to keep vigil on tampering, intentional damages and recover the associated costs.

Turnover Approach

The turnover approach will be progressive and voluntary, assuming that the present system of operation is working satisfactorily and should not be disturbed. Farmers are given the option of assuming full responsibility for maintenance of water courses or higher level channels in exchange for relative reductions in water charges, given that the water charges are expected to rise overall for irrigation services. While it may be desirable in the long run to turn over O&M of distributaries and minors to the farmers, this may have adverse impact on the prevailing RWS and warabandi allocation and right of water of the individual farmers and is thereby likely to reduce irrigation efficiencies, impact the equitable distribution and affect production negatively. The farmers of Haryana are not very familiar with cooperatives and community activities and in the absence of any experience or piloting sudden changes would be untimely. Turnover of system maintenance should, therefore, be implemented at the watercourses level, initially on a pilot basis and extended horizontally over more area or vertically to higher levels, based on the response of farmers.

The Haryana State has amended its Irrigation acts, making provisions for formation of WUAs and turning over O&M responsibility to them. The State plans to introduce PIM, in a stepped manner and WUAs for watercourses have been formed. Haryana Irrigation Research and Management Institute (HIRMI) has been conducting professional training courses for irrigation engineers, agriculture officers and farmers. Training to 4431 engineers/revenue staff/agriculture officers and 3350 farmers have been imparted upto December, 2001. Government of Haryana has also increased the water rates under various categories in December, 1994, May, 1996, September, 1998 and July, 2000 with an overall increase of about 50% over the whole period. However, Bank had suggested major increase in the rate by about 300% to meet the 100% cost recovery.

Interaction of trainees and faculty members with the farmers (Tripura)

CHAPTER - 9

LEGAL SUPPORT

9.1 BACKGROUND

Traditionally, water was not considered to be a subject matter of property or property right (Indian Law Institute (ILI), 1991, p.23). There were no special profits to be gained. It was only a matter of gaining certain conveniences. People had their customary right to use water. However, with economic and technological development the issues such as management of water resources, productivity, and efficiency as well as justice, equity, and fairness have gained importance. These issues led to Government intervention in the development and use of water resources in the country. Being sovereign in character, the state holds water resources as a trustee.

Water resources in British India were initially managed and maintained by village community. The Government made conscious efforts to make use of their knowledge and skills in water harvesting, protection, and maintenance of irrigation works (ILI, 1992, p.46). The role of the village panchayats were recognized in matters of settling disputes relating to land and water. However, the village panchayats were ad hoc bodies and had no constitutional power. There were also problems associated with the zamindari and ryotwari systems of management and maintenance of water resources. In response to these problems, the Government passed the Indian Easement Act in 1882 to protect its own right over water resources. The Act is protected even today.

The introduction of WUA requires necessary legal support for its effective implementation. Legal support is needed for the following:

a. Legal recognition for WUA.
b. Legal authorisation to manage distribution of water, collection of fees and other responsibilities given to WUAs; and
c. Conflict resolution

The surveys of existing Irrigation Laws of the States show that there is no explicit, much less comprehensive, provision for farmers' participation in the management of irrigation. Some of the States have provided for farmers' participation in minor community systems of irrigation. Thus a serious legislative gap exists in most of the States.

9.2 RIGHTS OF THE STATES

Under the present constitutional provisions, primary responsibility for the development of water resources rests with the States. Ownership in water is one of the rights to use. This right can be exercised by an individual, a group of individuals, or a legal entity. The rights exercised by the State over water are not proprietary in nature, but sovereign in character. From this flows the inherent right of the State to administer or regulate the waters flowing within its territories, subject to the right of a riparian to get the customary quantity of water.

As part of the process of decentralization of power, the Constitution was amended (73rd amendment) in 1993 to include the provision for Panchayati Raj. Rural local governments have now been vested with independent power and resources. The States are given legislative competence regarding irrigation matters and are vested with some responsibilities on the panchayats. This empowerment of panchayat raj to control all natural resources may even lead to controlling the functioning of WUAs within the village or block. The elected leaders of panchayat raj may overrule the decisions of WUAs, particularly in the case of tanks.

In the following paragraphs some critical parameters are discussed wherein the State plays a supreme role and users have little or no role and control. Hence, these parameters, which are significant to move towards irrigation management turnover, have remained the bone of contention between users and the Irrigation Agency.

9.3 USERS' WATER RIGHTS

The irrigator is entitled to customary or accustomed supply of water subject to its availability. The power of the State to interfere with the customary supply of water to irrigators should also consider the accustomed user.

Though the Government's right to regulate irrigation in natural waters is paramount and sovereign in character, the Government's right is subject to the riparian getting the same quantity, to which a user is entitled by custom. In so far as MOU between Government and the WUA is concerned, it may be specified that quantity allocated to WUA is subject to availability.

9.4 WATER SUPPLY

Supply of water in the distribution system and distribution of water below the outlet are two crucial elements for irrigation management transfer. Supply of water for irrigation should abide by three counts: a) timeliness, b) quantity, and c) quality. In Indian irrigation systems, generally, water quality for irrigation is less of a problem. There are some emerging exceptions owing to trade effluents discharged into river streams and excess use of pesticides and fertilizers in some places. They are, however, so far on a low scale.

The major problem lies in irrigation water supply on time and in adequate quantity. The State Irrigation Acts and the Model Irrigation Bill of 1976, are far from dealing with these aspects. The Acts and the Bill have presumed that timeliness and quantity have been taken care of by the implementing officers, or considered not significant. They at length describe: a) general provisions for supply of water, b) procedures to be followed, c) powers of officials in water supply and in stopping it and d) rights of the Government.

There are a few exceptions. In Gujarat, water can be supplied to farmers' groups or associations. In Kerala, the Irrigation Bill of 1994 does not elaborate as in other State Acts, on procedures and provisions of water supply. The Kerala Bill says; *"the distribution of water from irrigation works constructed or maintained at the cost of a local authority shall be subject to such regulations as may be made by that authority, with the previous approval of the government*".

Some stumbling blocks in the process of transfer are as follows: a) there is no rule or binding on the Government to inform users on availability of water and its supply dates in different parts of the command area, so as to enable farmers to prepare land operations; b) there is no clear agreement between the Government and users, that the Government will abide by its scheduled dates of supply and quantity; c) if the agreement as in b) is violated, there is provision for the canal officer to punish the farmer, but not vice versa, and d) the agreement and/or rules are considered as one-sided.

The ultimate user, for whom the water deliveries have to be made, has no role in deciding the schedules of supply and its quantity. Nor there is a provision for a consultation process with the users. The issue is accentuated, owing to mismatch between the crops grown by farmers and timeliness and quantity of water supplied. Agricultural conditions have changed over a period of time, but the system operation rules have more or less remained unchanged. Across the States, uniformity is lacking regarding irrigation laws of water supply. However, different laws and practices appear to be justified by the special circumstances of various states (Jacob and Singh, 1972, p.20).

Users have a genuine reason in asking "let us get a control on water first, before taking over the operation and maintenance of the system." Unfortunately, neither the recent water policies (National Water Policy, 1987 and its updated version of 2002; Kerala Water Policy, 1994; and Water Policy of Tamil Nadu, 1994) nor guidelines issued under the Water Resources Consolidation Project in Tamil Nadu for FOs and turnover component consider users' complaints. A good exception is the guidelines issued by Maharashtra to promote WUAs. The guidelines say: *"There will be guarantee to get the sanctioned quota of water at predetermined intervals as per the legal agreement entered with the government"*.

This kind of guarantee is essential to move towards irrigation management transfer. However, it lacks accountability from the Irrigation Department. In case users do not get the agreed quota of water, what steps they can take is not clear, even in the Maharashtra guidelines. As sanctioned quantity of water would not be available always, particularly in drought year, it could be specified in guidelines and agreement that in case of reduced availability there would be proportionate reduction in quota of supplies. However, the Andhra Pradesh, Madhya Pradesh, Rajasthan, Orissa and Assam, Acts recently enacted provide for guarantee for scheduled supplies to be provided in the MOU and also for penalty clause in case WUAs do not get agreed quantity of water.

9.5 WATER RATES

Main Features of Existing Water Rates

Except in Assam and the North-Eastern States, which do not levy irrigation rates all States charge directly or indirectly for the use of irrigation water from public sources.

In some States (notably Andhra Pradesh and Tamil Nadu), there is no separate water rate for areas under the old systems (including minor surface irrigation systems). Lands irrigated by these systems are classified as wetlands for purposes of land revenue. Being more productive, wetlands are charged at a much higher rate than dry land. Within wetlands, there is further differentiation by quality of soil and irrigation source. The difference between dry and wet assessment can be construed as a 'water charge' determined on the basis of productivity impact, as assessed at the time of the revenue settlement. However, in respect of the second/third crop raised on wetlands using public irrigation sources, both States charge a separate water levy called Irrigation Cess.

In all other States lands irrigated by public systems are charged separate water rates based on actual area irrigated. They are invariably differentiated by season and crops. In many States, the rates are further differentiated by categories of irrigation projects to allow for differences in the quality of irrigation as reflected in the quantum, duration, and assurance of water supplies.

There are notable variations in some States. Orissa charges a basic water rate on all lands within the culturable command of a project for the supply of water, whether used or not for the staple kharif cereal crop of the area (generally paddy), and individual water rates for non-staple crops. Bihar makes a distinction between long lease, seasonal lease, and single watering. Some States (Maharashtra, Madhya Pradesh) make a distinction between demand rate and agreement rate.

Crop-wise rates, in general, are highest for perennial cash crops like sugarcane and banana, and lowest for irrigated dry seasonal; paddy is charged at a higher rate than irrigated dry crops. In several states the rates for paddy differ according to season. In general, rates vary according to season, the rates for the hot weather season being considerably higher than those during the monsoon season. In Maharashtra, the rates are differentiated primarily by season, but hybrid seed crops and hot weather cash crops are charged at a substantially higher rate than others. However, the rates are generally uniform within a State for a given class of irrigation work.

Besides water rates, a few States levy general or special purpose cess on irrigated areas/crops. The most prominent is Maharashtra, which collects a local cess of 20 paise per rupee of water rate; an education cess on selected irrigated crops on a per ha basis, and an employment guarantee cess per ha of agricultural land. Andhra Pradesh and Kerala also collect irrigation cess at a less rate.

On the other hand, WUAs do not have authority to charge over and above the Government rates. However, at present some WUAs are charging or planning to charge in different ways: volumetric basis; crop area basis; and differential rates consisting two parts: i) a flat rate for all holdings in the command area; ii) based on field irrigation, since it varies among head, middle, and tail reaches of the command and of the distributory or minor. WUAs find difficulties in levying additional charges to defaulters, late payers, free riders, and to cover any expenditure of the organization owing to lack of authority.

9.6 MAINTENANCE OF DISTRIBUTION SYSTEM

The Irrigation Acts, across the States, classify the distribution system mainly into canals, field channels, watercourses, and drainage works. Separate sections in these Acts deal with each one of them. But there is hardly a section, which focuses entirely on the distribution system as a whole.

9.6.1 Canals: Above the outlet, the water distribution network is popularly known as canals. Irrigation Acts of some States classify canal works under irrigation works, while field channels and watercourses are separately categorized. The authorities have bestowed all powers on the Canal Officer to design and execute the canal work. There is no clause, even in the Model Irrigation Bill of 1976, to consult the users or to elicit suggestions from them on location and design of canals. This may not be feasible, in all levels of canals, owing to their technical design requirements. However, across many projects in the country, the poor performance of irrigation is attributed to poor design and in many places wrong location of middle and lower level canals.

9.6.2 Field Channels: Field channels are defined differently by the Irrigation Acts of different States Some States specify field channels by water carrying capacity (e.g. not exceeding one cubic feet per second in Karnataka), irrigated area size (e.g. more than ten ha but less than 100 ha), and who should construct it. The Acts generally assume that construction of field channels will be done by landholders and they also maintain it. Some Acts specifically mention that it should be by landholders. However, there is a consensus on the definition of field channels as conveyors from the system distribution network to individual plots of farmers.

A Government official, either from the Revenue Department or the Water Resources Department or from CADA, determines the location of field channels. In the whole process of notification for land acquisition, execution, and compensation payment, Governments' role is supreme.

To reduce the differences across the States and to simplify the laws regarding the field channel construction and maintenance, the Model Irrigation Bill (1976, p.5) has defined field channel as *"a channel constructed by owners or occupiers or constructed by the State Government on their behalf and at their cost to serve the various fields within a block of 40 hectares or as may be prescribed and maintained by such owners or occupiers and includes existing water courses constructed or maintained by the owners or occupiers*". In the absence of any role of users in field channel design, location, and construction, the channels require frequent repairs. Water flow into these field channels is also uncontrollable. Hence, users demand a role in control of field channels.

9.6.3 Water Course

The Model Irrigation Bill (1976, p8) defines water course length of a channel between an outlet and a field channel, built at the cost of the State Government and maintained by the owners or occupiers to carry water from an outlet to any block of land or as may be prescribed. The Bill makes it clear as in the case of the Gujarat Irrigation and Drainage Ordinance of 1989, and the Kerala Irrigation Bill of 1994, that a) construction of watercourse is at Government's cost, and field channel at users' cost, and b) maintenance of both watercourse and field channel is to be done by users. The Bill was circulated to all State Governments in 1976.

9.7 LIMITATIONS OF IRRIGATION ACTS

Some of the lacunae in the irrigation management process are: a) neither the existing Irrigation Acts and rules of various States nor the Model Irrigation Bill have considered the importance of involving users in designing and location of field channels; b) the Acts and the Bill are silent on giving field channels and water course construction contract to local WUAs. In recent years, only the Tamil Nadu Government has shown interest in awarding physical contract work (up to Rs.2 million in the case of Kattiampandal tank) to users' associations, particularly in tank areas; c) they are not focused on the size of area to be irrigated and carrying capacity. For example, the Model Irrigation Bill of 1976 and the Kerala Irrigation Bill of 1994 have mentioned the area, while the Karnataka Irrigation Act of 1965, mentions carrying capacity. Hence, a mismatch exists between field channel size and area to be irrigated in the field channels within the village or within the command area of a minor or a distributory; d) the Acts and the Bill have not insisted upon the completion of field channel construction as a pre-requirement before starting irrigation.

9.8 MAINTENANCE AND REPAIRS

Proper maintenance and repairs is crucial for system operation. None of the Irrigation Acts and the Model Bill of 1976 stipulates users' role and control over maintenance and repairs grants and its execution. Over a period of time, only limited physical works were done due to growing financial crunch in the Government. This has further worsened maintenance and repair works. Still many States are not keen in transferring maintenance and repair responsibilities to WUAs.

At present, two States- Maharashtra and Kerala- give prominence to WUAs in maintenance and repairs. Maharashra has a) empowered and supported users in maintaining field channels and field drains, and b) actively involved users in joint survey and certification of repair work and in maintenance of minors, sub-minors, and distributories. All this has boosted users' confidence in their activities, decreased Agency's responsibilities, and increased revenue collection. Kerala has gone a step ahead to entrust the construction and maintenance of any irrigation work to any local authority, cooperative society, or other society of farmers.

In the Lower Bhavani Project (LBP) of Tamil Nadu, a large number of WUAs have been put together into a three-tier structure. Still, formal involvement of users in repairs and maintenance of lower level distribution work is absent. In recent months, the LBP farmers' federation is increasingly demanding to get involved in maintenance and repairs. They are willing even to take up maintenance and repair work at project level, in a formal manner. But, the Government response is wanting in this regard.

In the Paliganj distributory of the Sone command area in Bihar, the WUA carried out repairs work of Rs 40,000, owing to lack of response from the Government for two years (Srivastava and Brewer, 1994).

The Irrigation Acts should enable movement from the present full control of Government to joint control up to certain levels, and full control by users in most of the places. Full control by users can be affected over a period of time. Partial handling of the system poses a constraint for water sharing across the canals. Otherwise, the Agency should ensure an agreed quota of water supply at the distribution head of all canals of the system.

9.9 COLLECTION OF REVENUE

Irrigation revenue consists of mainly two parts: charges for supply of canal water and penalties. Across the States, irrigation revenue includes several items: water charges, occasional water charges (including charges for unauthorized use, water wastage), charges for benefit by percolation and leakage from canals, betterment tax, dues in arrears, and penalties. Across the States, however, there is a variation in water charges for supply of canal water. The Irrigation Acts of all States and the Model Irrigation Bill empower State Governments to determine water charges for supply of canal water.

The Kerala Irrigation Bill of 1994 empowers the Government to levy an annual water cess on all lands. Government may increase the rate, provided the aggregate shall not exceed fifty percent of such rate. Arrears shall bear interest at the rate of nine per cent per annum. Water cess is levied for indirect benefits like a) water from any irrigation work, b) by direct flow or percolation or c) indirect flow, percolation or drainage from or through adjoining land under cultivation, or d) flows of reservoir. All these rates shall be equal to canal water rates. A local authority can levy water cess with the previous sanction of the Government; it can also levy an annual water cess in lands benefited by petty irrigation works and minor irrigation works executed by it.

The Gujarat Ordinance of 1989 does not specify any fixed interest rate on arrears; instead the State Government decides the rate. The ordinance assigns supply of water and maintenance responsibilities to groups or associations. But in the case of water fee collection, groups or associations have no role. However, in practice, the Anklav WUA in the Mahi project, and the Mohini WUA in the Ukai-Kakrapar project collect water fees on behalf of the Government.

According to the North Indian Canal and Drainage Act of 1873, Government has full control over the fixing of water rates and collection of fees. This Act and other similar legislations do not assign any role for WUAs in collection of fees and levying additional charges.

In the Andhra Pradesh legislation rules, even though decision on water charges vests with the Government, WUAs have been given powers to levy fees for facilities provided or for specific services and for building asset base. However, no WUA has levied any fee on the members. Also, making available the collected water charge to FOs has not yet been implemented. The assessment and collection of water charges is still with Revenue Department.

Significantly, the Irrigation Acts have not empowered the State Governments or groups or associations to stop water supply to water fee defaulters. Owing to this lacuna, irrigators continue to get supplies. In Shejpali areas, particularly in the Mahi project, irrigators circumvent this by filling Ekrarnama. The ratio of filling and non-filling applications for water supply is 40:60.

9.10 DISPUTE SETTLEMENT

One of the major hurdles faced by irrigators, individuals or a group/association, is dispute settlement. Disputes may arise between: a) two individuals, b) among two or more irrigators, c) between head, middle, and tail reach irrigators, and d) between irrigator/s and Agency. Disputes are

mainly related to: a) water supply from Agency to irrigators, its distribution among irrigators during this supply and distribution process, meeting time and adequacy requirments of individual irrigators and or group; b) improper condition of physical structures, and on-farm development which result in problems in smooth flow of water, water seepage, waterlogging, low/excess water supply, damages to land quality and its productivity; c) changing cropping pattern below outlet, irrigators growing different crops in a single crop season, water supply schedules not in tune with changed cropwater requirements, more of water consuming crops than what has been originally designed in the project plan, and unseasonal demand for water.

Many Irrigation Acts have very little or no provision to settle the kind of disputes mentioned above. This lacuna on one hand continues to haunt command area authorities and, on the other, has become a source of rent seeking. The Model Irrigation Bill of 1976 has provisions for settlement of disputes. The Canal Officer orders the use or distribution of water and settles differences between two or more persons in regard to their mutual rights and responsibilities. If the Irrigation Agency officials fail to settle the dispute, irrigators can go to a civil court.

In the case of cropping pattern, the Model Irrigation Bill of 1976 suggested irrigation authorities to have control over it. But hardly any State has followed it up. Even Irrigation Bills of recent years do not adhere to the Model Irrigation Bill. A good exception is the guidelines issued by the Government of Maharashtra to form WUAs giving freedom of crop choice to WUAs while limiting annual water supply.

On the other hand, existing laws and guidelines are not clear about a) how coordination and integration need to be carried out, b) how to resolve the various issues like water delivery, quantity, and timeliness among intra-WUAs and inter-WUAs, c) what role does the state or and WUAs have to play when conflict arises between WUAs and other uses of water like domestic and industrial needs.

9.11 OVERVIEW

For the purpose of analysis the States can be divided into four homogenous regions:

North: Uttar Pradesh, Punjab, Haryana, Himachal Pradesh, Rajasthan, Delhi, Jammu and Kashmir
East : Bihar, West Bengal, Orissa & Assam
West : Gujarat, Maharashtra, Madhya Pradesh & Goa
South: Kerala, Tamil Nadu, Karnataka, Andhra Pradesh

In the Northern Region, the Northern India Canal and Drainage Act, 1873, as amended from time to time by different States, is applicable. The Bombay Irrigation Act, 1879, predominantly governs the Western Region. In the Eastern Region, the Bengal Irrigation Act, 1876, regulates irrigation practices. The system of irrigation management prevalent in the Southern States is predominantly controlled by the Mysore Irrigation Act, 1965.

Table 1 presents a summary of the responsibilities of individuals/groups/Govt. etc. in carrying out the various activities related to irrigation in some of the States in the country. In all four regions, the Government has power to acquire land for irrigation works and the land owner has right to receive compensation from the Government. Through contractual arrangements, irrigation water is supplied to the individuals or shareholders in the Northern and Southern Regions, and to groups or associations in the Eastern and Western Regions of the country.

Table 1 : Irrigation Responsibilities Across States

States	Water Supply	Water distribution	Field channel construction	Field channel maintenance	Revenue collection	Dispute settlement
NORTH						
Uttar Pradesh	1	5	3	3	6	7
Punjab	1	5	3	3	6	7
Haryana	1	5	3	3	6	7
Delhi	1	5	1	1	6	7
Rajasthan	1	5	1	1	6	7
Jammu & Kashmir	1	5	1	1	6	7
EAST						
Bihar	2	5	3	3	5	7
West Bengal	2	5	3	3	5	7
Orissa	1	5	1	1	5	7
WEST						
Gujarat	2	5	1	1	5	7
Maharashtra	2	2	2	2	2	7
Madhya Pradesh	1	5	1	1	3	3
SOUTH						
Andhra Pradesh	1	5	1	1	5	7
Karnataka	1	5	1	1	5	7
Kerala	1	3	1	1	5	7
Tamil Nadu	1	5	1	1	5	7

Note: 1.Indivdual or Shareholder, 2.Group or Association, 3.Panchayat, 4. Coop Societies, 5.Government(DCO), 6.Lambardar or Sarpanch, 7.Civil Court.

In the Northern and Eastern Regions, the task of constructing and maintaining watercourses is assigned to the village panchayats except in the States of Rajasthan, Jammu and Kashmir, and Orissa, where the responsibilities lie with individuals or shareholders. In the Western Region the task is assigned to any one individual, groups, or village panchayat - while, in the South, the Government constructs and maintains watercourses.

The construction and maintenance of field channels are assigned to village panchayat in the Northern and Eastern Regions except in Rajasthan, Jammu and Kashmir, and Orissa, where the task is completed by the individual or shareholder. In the Western and Southern Regions the construction and maintenance is the responsibility of the beneficiary, except in Maharashtra, where a group or association constructs and maintains field channels.

Water is distributed to beneficiaries by the Government in all States according to the contractual arrangements made with beneficiaries except in Maharashtra and Kerala where water is distributed by Associations and village panchayats respectively. Water dues are collected by the Lambardar or Sarpanch of the village in the Northern Region. In other Regions, irrigation revenues are collected by the Government Revenue Department, except in Maharashtra and Madhya Pradesh where they are collected through Associations or village panchayats. In all States the beneficiaries have the right to seek the help of civil courts in matters related to irrigation disputes, but in Madhya Pradesh panchayats are bestowed with the powers of dispute settlement.

9.12 FUTURE APPROACH

In the National Conference on PIM held in June, 1995, a National Action Plan was suggested. One of the actions included in this Plan related to modifications in the State Irrigation Acts for enabling implementation of PIM. As a follow up action MOWR had entrusted the work of suggesting amendments to the existing Irrigation Acts of States for PIM to a Consultant. Some of the features proposed to be made in the amended Act by the Consultant are given below:

The Act would empower the Government to declare specific areas for handing over the management and distribution to WUAs. The act would also recognise that WUAs would be voluntary bodies of users and registered under Co-operative Act or Societies Registration Act.

There would be a MOU between Government and WUA specifying terms and conditions of water deliveries and water rates etc. WUAs being autonomous organisations, would raise their own financial resources. Water allowance and/or quotas would be notified and incorporated in MOU. Water would be supplied on volumetric basis and water rates would be related to quantities used and not on crop-area basis. Whenever WUAs would be formed, it would be binding on the Department to install measuring devices. WUAs would have complete freedom for following the cropping pattern. WUAs would be vested with the powers of Canal Officer. WUAs would decide water charge for members and non-members. There would be a joint inspection of the system before handover. Act provides for the hierarchical structure for PIM i.e. a federation of WUAs at distributary and branch level and Apex body at the Project level.

A suggested MOU between WUAs and Irrigation/Water Resources Department/Agency is given at Annexure-6. Ministry of Water Resources, have also addressed the States to amend their Irrigation Acts suitably to facilitate implementation of PIM. Some of the States have already enacted separate legislations for promoting PIM. Andhra Pradesh have enacted comprehensive legislation to facilitate PIM. Few more States like Tamil Nadu, Madhya Pradesh, Rajasthan, Assam and Orissa have either passed a legislation for PIM or are in process of doing so. The Government of Karnataka, instead of separate legislation has amended existing Irrigation Act to facilitiate PIM.

9.13 NECESSARY PROVISIONS FOR LEGAL BACK-UP.

Participatory Irrigation Management refers to involvement of irrigation users in all aspects of irrigation management, and at all levels. All aspects include the initial planning and design of new irrigation projects or improvements, as well as the construction, supervision, financing, decision making rules, operation, maintenance, monitoring and evaluation of the system. "All levels" refer to the full physical limits of the irrigation system i.e. outlet, minor, distributary, branch, main system, project and basin. The irrigation system in the country, which is largest in the world, has so far been constructed and managed by Government. Hardly has there been any involvement of farmers in the same. So introducing PIM requires new paradigm in irrigation management. The Government should have a clear-cut policy for PIM with legal backup for the PIM. There are variety of legal necessities for PIM as follows:

1. Legal entity for WUAs
2. Enabling provisions (for PIM)
3. Empowerment of WUAs
4. Rights and obligations of WUAs as well as of Agency
5. Principles/Rules for water allocation to WUAs
6. Conflict resolution
7. Resource Mobilisation by WUAs.
8. Relation of WUAs with other Agencies and local authorities
9. Incentives and disincentives to WUAs as well as to Agency.

9.13.1 Legal Entity

The WUA should have legal entity. A group of persons simply coming together cannot be called a legal body unless they are recognised by Law. In absence of such recognition, the members of the WUAs are not directly liable for any action or inaction making it difficult for WUA to function. For suing or to be sued they all have to be parties instead of being singly addressed in the name of the Association. Any liability has to be shared by all. For taking a decision all have to be involved. To overcome these disabilities/inconvenience, the WUA is to be registered as a body under any of the existing laws, like:

i. Societies Registration Act, 1860 (as applicable to the State)
ii. Co-operative Societies Act of the State concerned.
iii. Indian Companies Act, 1956.
iv. Any other Act as provided by the State.

The Societies Registration Act is simple for registration but it requires the society to be a non-profit making one. Registration under the Co-operative Societies Act is little bit stringent considering that the society has to be enterprising one and it is required to submit number of returns including that for income tax. Registration under Companies Act for WUAs would also not be advisable as it is complex in nature. So far, no society has been registered under Companies Act in the country. In order to facilitate registration, the State Government may thus have to provide a separate Act or make provisions under existing Irrigation Acts through amendment, as may be necessary.

9.13.2 Enabling Provisions

Enabling provisions for WUAs should be available in the Act so that the Agencies can enforce it. Similarly the farmers could form WUAs and force the Agency for registration.

(i) **Structure and levels**

Legal provision should be there for farmers to form WUAs specifying the form or structure of WUAs and levels. It needs to specify the hydraulic levels (outlet/minor/ distributary/branch/ project) where farmers can form Associations. Further, reference is to be made regarding, whether it is to be formal/informal, functional/advisory Association/Federation of Associations depending upon the size of the project. In case it has to be related to administrative units like Village/Panchayat/Block, the same needs to be mentioned.

(ii) **Membership Requirement**

It is to be specified with what percent of members the Association can be formed. It may be 51 per cent of members or members having 51 percent of command or both. Further, it needs to define a member. He or she may be owner or tenant or leaseholder or simply an occupier.

(iii) **Act for Registration**

Reference to the Acts as mentioned under Para 9.13.1 under which WUAs/Federation/ Apex can be registered needs to be given. It is observed that while the WUAs, in Maharashtra, Gujarat, Karnataka are registered under respective Cooperative Societies Acts, the WUAs in Tamil Nadu, Kerala and Orissa are registered under Societies Registration Act. The recently formed WUAs in Andhra Pradesh have not been separately registered, as the Act recognises them as legal bodies.

(iv) **Procedure/Approach for registration**

The Act should provide how the farmers should proceed for registration. The Agency to whom they are to approach should be specified. The Irrigation Department or any other Department, who is incharge of the system, being the nodal Agency, should assist the farmers to form the Association. To the extent, the role it should play, should be mentioned.

(v) **Objectives and Purpose**

The objectives and purpose of forming the Societies should be mentioned in the Act. Moreover, objectives and purpose vary at different levels of FAs.

(vi) **Binding Provisions**

Depending upon the suitability of commands of irrigation projects the agency should be able to declare certain areas for delivering water to WUAs only. In these areas, it will be mandatory for farmers to form WUAs to receive water and distribute among members. If required, they are to maintain the system to be handed over to them. Similarly, it should be binding upon the Agency for delivering water to WUAs, if farmers through Association ask for the same. They may even ask for taking over the system to manage under certain conditions, if legal provisions permit.

(vii) **Nature of Works to be handed over**

There is a variety of works, which can be handed over to WUAs under PIM. It may not be same because of nature of work, locality, environment and constraints, etc. The works may be such like: construction, repair, maintenance, management, distribution of water, collection of water fees, etc. Necessary guidelines should be available under the legal framework. In case of Joint Management of some of the items, the classification of works between the Agency and the WUAs needs to be mentioned.

9.13.3 Empowerment

In the Agency managed irrigation system, all the powers are vested in the Agency. But alongwith the transfer of certain works/ responsibilities to WUAs, necessary powers need to be handed over to the WUAs. They have to be empowered to handle the responsibilities entrusted to them. While the basic provisions for transfer of power/authority need be provided in the Main Act, detailed Rules and Regulations are to be prepared to supplement the provisions depending upon the situation. These powers should be transferred to WUAs through a Transfer Agreement generally called MOU, which are to be exercised over the area handed over. These powers may be as follows:

i. Powers of Canal Officer.
ii. Authority to collect water fees from members as well as non members even at higher rate.
iii. Authority to resolve conflicts/disputes.
iv. Authority to recycle seepage or drainage water and also to exploit groundwater.
v. Powers to access to information/data (held by the Agency).
vi. Authority to have a say in the decision-making (related to management of the system).
vii. Power to take up any other agricultural activities as could be permitted.
viii. Authority to prepare rules for distribution of water among members.

9.13.4 Rights and Obligations

Alongwith rights of the WUAs there should be some responsibilities or obligations and these have to be defined through Memorandum of Association. Similarly, the Agency should have some rights and responsibilities.

Rights and Responsibilities of WUAs are as follows:

Rights of WUAs

- Receiving water.
- Collection of water charges.
- Receiving maintenance grant/assistance/incentives.
- Getting information about
  * availability of water
  * operation particulars
  * developmental activities.
  * change in policy matters/rules/regulations.
- To take up related activities like conjunctive use of surfacewater and groundwater; construction of check dam/storage tank etc.
- Receiving technical advice.
- Representing in higher bodies like Federation of WUAs/CAD Board/Apex Committee etc.

Responsibilities of WUAs

- Maintenance/upkeep of the system (Physical).
- Operation of the system.
- Requisition for water year/season-wise.
- Receiving water and distributing among members (and non-members).
- Collection of water fees and remission of the same to Department/Agency.
- Maintenance of the equipment/machinery.
- Conducting the business of the Society.
- Maintenance of Record for:
  * Administrative matters;
  * Accounts;

* Technical Records like;
* Water received/distribution;
* Hydro-meteorological data;
* Groundwater Table;
* Cropping pattern;
* Productivity/produce;

- Furnishing prescribed information to Agency.
- Co-operation for monitoring of the performance of WUA by the Agency.
- To abide by MOU.
- Sustaining the environment (without any deterioration)

Rights and Responsibilities of Agencies are as follows:

Rights of Agencies

- Receiving water fees.
- Receiving information from WUAs as desired.
- Monitoring the performance of WUAs.
- Suggesting directly improvements in the administration of WUAs, if found not to be functioning as desired.
- Ownership of the systems.

Responsibilities of Agencies

- Maintenance of Head-works and Main Conveyance System.
- Supplying water as agreed upon.
- Supplying information relating to water availability, operational particulars etc. to WUAs.
- Rendering technical advice/training to WUAs.
- Rehabilitation/modernisation of the system as agreed upon.
- Releasing maintenance grant, financial incentives as agreed upon from time to time.
- Making Rules and guidelines as required under Legal Frame Work & Transfer Agreement.
- Environmental protection.
- Any other, as agreed upon.

9.13.5 Principles of Water Sharing by WUAs

Water is required for various uses viz. domestic industry, hydropower and irrigation. Source being common, many a time allocation of water for various purposes needs to be done depending upon the priority. Again demand by WUAs for irrigation water may fall short of available water for irrigation. Between WUAs water demand also may vary. The situation may worsen in a deficit year. Considering all these aspects certain principles/ rules should be laid down for sharing water on the following basis:

- Availability and demand

  The demand may not match always with the water available. When demand is more, it may be required to restrict the supply, based on some agreed rules. If available water is in excess over demand, it may not pose any problem. But distribution of excess water should be made as per prescribed norms.

- Equity

  The principles of equity must be maintained.

- Priority Areas
  Water for specific purpose may have priority and as such cannot be simply reduced proportionately in deficit year.

- Members and Non-Members
  There may be some categories of non-members, who do not have outright provision for allocation of water in a deficit year while members may have the right all the time.

- Environmental Safeguard
  To prevent waterlogging or salinity there may be restriction in water supply. Similarly over exploitation of ground water may be harmful.

- Mutual sharing/understanding
  Farmers may come forward to mutually share the water and in that case the request for the same may be acceded to.

- Carrying capacity of the system.
  During process of modernisation/rehabilitation the normal supply may be disrupted; besides, carrying capacity of the system may restrict the peak demand.

- Provisions in transfer agreement
  The condition laid down in the agreement may entail restriction in water supply.

Mechanism/Agency for forming principles

- Mutual understanding compromise
  If principles can be mutually agreed upon then it is probably the best solution. But it seldom happens due to conflicting demands by various users.

- Power vested in WUA
  WUA can impose allocation of water based on rules. This must be accepted by Members.

- Local government
  Local governments like Panchayats/Municipal Corporation may be vested with the power to allocate water for various purposes and among various users.

- Arbitration/existing judicial system
  Under existing judicial system the matter may be resolved. In case parties agree, matter may be referred to arbitration for settlement of issues before resorting to judicial system.

9.13.6 Conflict Resolution

Conflict may arise between parties involved under PIM and the same need to be resolved quickly and amicably.

Nature and Parties to conflict:
The parties to the conflict may be:

i. WUAs
ii. WUA and Agency
iii. WUA and an outsider
iv. Members of WUA/Federation
v. Member/Non Member and WUA

The nature of conflicts may be on any of the following issues.

i. Supply and sharing of water
ii. Collection of Water fees
iii. Liability/Compensation for damage/injury
iv. Imposition of Punishment/Penalty
v. Cropping pattern
vi. O&M of the system
vii. Rehabilitation/modernisation of the system
viii. Environmental issues (waterlogging/salinity, over exploitation of groundwater, excessive use of pesticide/fertilizers).

Provisions for resolution of conflicts

Under Multi-tier FAs (WUA/Federation/Project) the conflict involving certain Associations at lower levels should be resolved by next higher Association unless a conflict is internal one. When the issue is internal, it is to be resolved by the Association. There may be provision for review/appeal against any decision.

To deal with conflicts between any WUA/Federation and the Agency there could be provision for Standing Committee representing both sides or arbitration mechanism to resolve the conflict. In the case of conflict between a WUA and an outsider on whom the Agency has jurisdiction, the Agency may be the appropriate authority to resolve the conflict.

9.13.7 Resource Mobilisation

The FAs should be financially autonomous. It should not depend upon outsiders for its sustainability. Naturally, it should be free to mobilise resources. The sources for raising funds could be -

- Water fees
- Maintenance grant
- Contribution by Members (Cash/kind/labour)
- Loan
- Rent/Returns out of Capital/Assets/Equipment
- Service charges
- Fines/Penalty

In order to tap the above sources, the WUAs/Federation may need recognition/authority and assistance as follows:

- Authority to collect Water Fees, impose fines/penalty etc.
- Recognition for obtaining loans/grants/aid etc. from financial as well as other institutions.
- Security to be provided by the Agency for obtaining loan/advance payment etc.
- Assistance/Co-operation from related agencies for raising fund/resource mobilisation.

9.13.8 Relation of WUAs with other Agencies/Local Authorities

The FA will be new entity, which will be dealing with a number of agencies as well as local authorities (Panchayats/Municipal Corporations) directly or indirectly. It has to maintain cordial relations with these organisations without affecting their functions and side by side enjoying authority in related matters. To achieve these objectives, the following would be required

- Recognition of its authority/participation in related activities.
- There may be a good number of activities in which farmers are directly or indirectly involved. As these schemes/activities are meant for community welfare, the FA should have a say in it.

- Introduction to other agencies:
  The WUAs/Federations may be introduced by Irrigation Agency to concerned agencies/ institutes, which could help these Associations in carrying out their business.
- Cordial relation with local governments:
  There is a hierarchy of Panchayati Raj Institutions i.e. at village, block and district levels. The FAs also are to function at different levels i.e., Minor/Distributary/Branch/Project. These two type of organisations can not be completely separated and there has to be some interactions. Hence the relations between these two organisations should be defined to avoid any conflict and also to ensure cordial relation.

9.13.9 Incentives and Disincentives

PIM requires mainly involvement of Agency and farmers. NGOs may be required to play the role of facilitator/organiser. PIM being a new concept for the management of irrigation system, it requires much efforts on the part of those involved to make it a success. Incentives are required to be given to promote PIM. It may be in the form of recognition, reward/award, benefits and authority to all those involved. Unless, these incentives are identified through legal means, it may not be possible to provide these incentives to those concerned.

Incentives to WUAs (farmers)

PIM involves transfer of power/authority as well as responsibilities from Agencies to FAs. Farmers may decline to shoulder new responsibilities, unless they are properly motivated and convinced regarding the benefits to them. Naturally, it requires some incentives to be given to WUAs i.e. to farmers to attract them to share new responsibilities. Incentives may be as follows:

* Rehabilitation/Modernisation of the system.
* Grants/Loan to bring up WUAs and foster these Associations in the initial years.
* Rights in allocation of water
* Authority/Power to the self-management of the Systems.
* Freedom in cropping pattern (subject to certain limitation like water data, cropping capacity of the conveyance system)
* Collection of water fees.
* Providing technical assistance/training/study tours.
* Conflict resolution by WUAs.

Incentives to Agency

* Better recovery of Water charges.
* Maintenance of tertiary system by farmers leading to more attention to main system by the Agency.
* Reduction in conflicts.
* Incentives to Agency Staff.
  - Recognition of service.
  - Cash award/reward
  - Choice of posting.

Incentives to NGOs

* Award (fulfilling their own objectives).
* Remuneration for service.
* Training/study tours.

Disincentives

PIM involves also disincentives like shouldering responsibilities by WUAs, contribution by farmers for sustaining WUAs, extra efforts by farmers, loss of power/authority by Agency, reduction in agency staff, voluntary efforts by NGOs etc. PIM also involves a factor of risk for all as there is no guarantee for success or win-win position for all.

9.14 THE TRANSFER AGREEMENT

Following provisions should be made under MOU:

(a) Objectives of Agreement
(b) Area to be transferred.
(c) Irrigation system particulars (alongwith inventories)
(d) Water allocation (volumetric/percentage)
(e) Rights and responsibilities of WUAs.
(f) Rights and responsibilities of Agency.
(g) Recovery of water charges including provision of rebate for timely payment.
(h) Maintenance grant (percentage of water charge/lumpsum grant)
(i) Conflict resolution (procedural aspects)
(j) Incentives (rehabilitation/functional grant/management subsidy)
(k) Transfer of Authority (empowerment)
(l) Access to information (transparency)
(m) Termination of agreement

9.15 BYE-LAWS OF WUAs

Main provisions:

(a) Particulars of the Association (name, address, area etc., Act under which registered)
(b) Objectives
(c) Membership criteria
(d) Structural Organisation and Internal Management
    * General Body
    * Executive Body
(e) Operation and Maintenance of the System
(f) Fees and Dues (Water Fees)
(g) Rights and Responsibilities of Members.
(h) Interpreting and Amending byelaws.
(i) Conflict Resolution.
(j) Resource Mobilisation
(k) Liquidation

9.16 CONCLUSIONS

It is felt that with the availability of recommendations/suggestions for amendment to Irrigation Acts of various States for PIM, each State would be in a position to amend their Irrigation Acts and frame rules/regulations for the purpose of PIM. As already stated earlier, some of the States i.e., Andhra Pradesh, Madhya Pradesh and Rajasthan have already enacted exclusive legislations for PIM and other States are in the process of doing so shortly. This would provide the essential legal support and backup for effective implementation of PIM throughout the country.

Lining of Water Course, Malaut Distributary (Punjab)

CHAPTER - 10

SUMMARY AND RECOMMENDATIONS OF NATIONAL AND REGIONAL/STATE CONFERENCES ON PARTICIPATORY IRRIGATION MANAGEMENT

10.1 INTRODUCTION

In the last two decades many National and State level seminars have been held in various parts of the country to share and exchange the knowledge and experience on PIM. One of the most important National Workshop attended by high level State and Central officers was held at Indian Administrative College at Hyderabad in July-August, 1987. This was supported by International Irrigation Management Institute (IIMI), Sri Lanka. After the event, participants were taken on study tour to Indonesia and Philippines also, the countries where PIM has been quite successful. Ministry of Water Resources, Government of India with World Bank Assistance created awareness among farmers and officials of various State Irrigation Departments by sponsoring conferences, seminars, workshops and through newsletters, films and field visits. India NPIM, a premier National Level NGO, is now working towards irrigation sector reforms in India. India NPIM approach has been to promote PIM in India through the strengthening and promotion of FOs and has conducted a number of seminars and workshops on PIM. These seminars have helped in bringing out the requisite awareness and built up the tempo throughout the country for the development of PIM. Some of the conferences in which important decisions to promote PIM were taken have been described in the subsequent paras.

10.2 NATIONAL & STATE ACTION PLANS FOR PIM

A National Conference on PIM was held at New Delhi from 19-23 June, 1995 with the following objectives:

(a) To prepare a National Level Action Plan for PIM.
(b) To prepare State specific Action Plans for States
(c) To identify training needs.

The Conference was sponsored by the Ministry of Water Resources in collaboration with Economic Development Institute (EDI) of World Bank, Washington, National Bank for Agriculture and Rural Development (NABARD) and Rashtriya Pariyojana Nirman Nigam (NPCC). The Conference was attended by over 150 delegates from Union and State Governments in India, representatives from Economic Development Institute (EDI) of the World Bank Office, New Delhi, a representative each from Pakistan and Nepal, seven representatives of NGOs and participants from WAPCOS (India) Limited. At this Seminar, National and State Action Plans to support PIM were evolved.

Subsequently, a National Level Conference was held at Vigyan Bhawan, New Delhi on January, 20-21, 1997 to discuss various issues related to PIM in India. The Conference was attended by delegates from Union and State Government in India, Water and Land Management Institutes, representatives from EDI of the World Bank Office (New Delhi), Ford Foundation, United Nations Development Programme (UNDP), European Union, NABARD, NGOs and Farmers' representatives. The important actions needed to support PIM at National and State Level recommended during these Conferences are briefly given below:

10.2.1 Actions at Central Level

- Issue policy guidelines for establishing PIM as a national objective and specifying the basic structure and functions of WUAs in irrigation management
- To provide the capacity for acting on the policy, one of the existing wings in the Ministry of Water Resources (MOWR) to be designated as the nodal wing at the national level to promote, facilitate, guide and coordinate PIM in the country. This wing would link with counterpart units at the State level to ensure maximum communication and sharing of experience.
- Launch a PIM awareness campaign across the country through print and electronic media and also through a series of seminars, to reach farmers, irrigation agency staff, and policy makers.
- Suggest suitable modifications in State Irrigation Acts to promote PIM.
- Assess the training needs for implementing PIM in the States and develop a capacity-building programme for WALMIs, farmers and other governmental and non-governmental institutes/ agencies.
- Advise the states to establish high level working groups of senior officers, interested NGOs and academicians giving impetus to PIM through appropriate policy, planning, review, and procedural initiatives and sorting out inter-departmental issues.
- Undertake process documentation, study of critical issues, and systematic monitoring and evaluation of PIM activities in the country, suggest possible improvements.
- Facilitate exchange of experience, research results, and information on PIM among the States.
- Create databank for reports and other documents relating to PIM in India and abroad.
- Issue guidelines for involving NGOs in PIM programmes and develop a scheme for providing financial support to NGOs on a pilot basis.
- Link the release of central assistance under the centrally sponsored CAD programme with the formation of WUAs in the irrigation schemes covered under the programme.
- The ongoing centrally - sponsored CAD programme should be used as an effective instrument for promoting PIM in the irrigation schemes covered under the programme in a phased and time-bound manner. Therefore, the States would be directed to set up CAD Boards having majority of its members as farmers, in place of existing CADAs, and place CAD funds at the disposal of the CAD Boards.
- Make budgetary allocation under central sector in the annual plan of the MOWR to promote PIM in irrigation schemes not covered under any of the centrally sponsored or externally aided projects.
- Issue policy guidelines requiring that WUAs be established at least informally as a condition to rehabilitation activities as a part of PIM, and suggest procedures for entrusting certain types of construction activities to WUAs/NGOs.

10.2.2 Actions at State Level

- There is an urgent need for setting up of high level Working Groups in the States under the chairmanship of the Secretary (Irrigation) to provide policy guidelines as well as help in drafting the State Government's resolution for adoption of PIM as a policy instrument.
- There should be Steering Committee at the State level to coordinate the implementation of the programme of PIM.
- For better implementation of the programme of PIM, there is a need to induct other disciplines such as Social Science and Economics at appropriate places in the hierarchy of Irrigation Agency.
- There is an urgent need to create awareness among the farmers and the officials of the Union and State Governments about PIM. This can be done by using various media and techniques of mass awareness by the Union Government and the State Governments. The Irrigation Agencies, WALMIs and other institutions concerned with the development of water resources could be used for this purpose.
- Rehabilitation is an important aspect of implementation of the programme of PIM. It is suggested that the rehabilitation should be such that system should be reasonably good and in running situation. Rehabilitation need not be a pre-condition for transfer of the system to WUAs but there should be an assurance that it would be taken up within a reasonable period. The cost of rehabilitation should be shared by the Government of India, the State Governments and the WUAs.
- There should be amendments in the State Irrigation Act to give legal status to WUAs.
- The NGOs can be vehicles for organising and mobilising the farmers. It should be done in the spirit of mutual trust and respect between the NGOs and the Irrigation Agencies. NGOs could also train the departmental staff for mobilisation and organisation of farmers.
- Training is a key input for implementation of the idea of programme of PIM. Training has to be imparted to the officials of the Irrigation Agency, farmers, functionaries of WUAs and NGOs. There is need to build up capacity of and for strengthening the existing training institutions such as WALMIs for training in PIM programme.
- Monitoring and evaluation are necessary to take corrective steps during the implementation of the programme and suitable mechanism for qualitative and quantitative monitoring should be evolved.
- It is felt that no programme of social transformation can succeed without the involvement of women. It is, therefore, necessary that women should be involved in this programme.

10.3 REGIONAL AND STATE LEVEL CONFERENCES

To promote the concept of PIM and to create awareness, MoWR, Government of India, organised Regional/State Level Conferences. During the conferences, the States recognised the need and utility of WUAs for sustainable irrigation development and management. The following issues pertaining to PIM were discussed in detail during these conferences :

Administrative Management
Agricultural Aspects
Legal and Organisational Issues
Social and Economic Aspects
Monitoring and Evaluation

The main recommendations as emerged from these conferences are as follows:

(a) For Irrigation Management the farmer should be involved at the Minor Canal level, for which WUAs of the farmers' should be framed for irrigated areas of about 200 to 500 ha.

(b) The WUA should be given the work of water management, distribution, collection of revenue and maintenance upto Minor Canal and other related works.

(c) The power delegated to Irrigation Department regarding distribution of water and revenue collection should be suitably transferred to WUA as per the Irrigation Act.

(d) The WUA can generate financial resources from other miscellaneous works also. However, for providing more encouragement to WUAs for irrigation management, the Government should give grant and rebate etc. as may be decided.

(e) The training programme of Water Resources and Ayacut Department, members of the WUA and NGOs must be held before the Agriculture season.

(f) For monitoring of the functioning of the WUA, a three-tier Committee should be formed with membership from Water Resources and Agriculture Department.

(g) If the irrigation system is damaged due to some natural calamity, the responsibility of its rehabilitation should be that of the Water Resources Department. However, the farmers may also help and WUA may also carry out the repair works.

(h) The NGOs, which help in forming the WUAs of farmers should be provided with financial assistance by the Government on per hectare basis.

(i) For proper co-ordination between WUAs and Government, a Coordination Committee must be framed. The Committee should hold the meeting before the start of cropping season and later on as per requirement so that cordial relations between WUA and Government are maintained.

(j) PIM programme may be implemented outside the CAD area also and the grants similar to those being given under CAD should be given for these also.

(k) To promote PIM suitable amendment may be carried out in the Irrigation Act of the State.

(l) The WUAs will perform the duty of sorting out the differences amongst members. However, in case of deadlock, the decision of the Executive Engineer, of the Water Resources Department should be binding

(m) WUAs may be formally registered under Irrigation Act, Co-operatives Act or Societies Act and for the purpose of registration representation of more than 51% of members of affected area may be made necessary.

(n) WUAs may be constituted by the farmers themselves. However, if some voluntary organisations or NGOs are working in the area, their assistance may be sought for, for the constitution of WUAs and such organisation may be treated as Coordinating Committee, which may be provided with financial assistance on hectare basis by the Government.

(o) The WUA shall be in mutual contact with the Government in order to avail facilities/ assistance such as technical assistance required by members from time to time, proper maintenance and operation of canals, arrangements of agriculture inputs and training to its members etc. from the Government.

(p) Various Government Departments such as Agriculture, Water Resources, CAD etc. should jointly chalk-out an action plan.

(q) The minor may be modified, repaired suitably by the Government, before handing it over to the WUA.

(r) The WUA will make arrangement for buying water on volumetric basis from Water Resources Department and its distribution.

(s) In the first phase, farmers' participation in the irrigation management at different levels e.g. outlet, minor level, distributary level, may be ensured. Later on this may be extended in a phased manner at branch canal, main canal and project level.

(t) The responsibility of motivating farmers to form WUAs may be given to WALMIs, Water Resources Deptt., local NGOs.

(u) Various financial assistance, Government grants and other funds under different project schemes, to be provided to WUAs may be made available well in time.

(v) Performance of WUAs may be evaluated by Government agencies, from time to time.

(w) Water rates may be determined as per Government rules in vogue. Revenue for water rates may be collected by the WUAs. Prescribed format of MOU may be included in the pilot project being implemented to get experience.

(x) Wherever WUAs are being formed at the minor level, the irrigation panchayat should be abolished and all the rights and responsibilities must be transferred to the WUAs for which suitable amendment may be made in the Irrigation Act.

(y) Maintenance/repairs of irrigation distributary system may be done by the WUA. For technical assistance, the concerned Junior Engineer also should be nominated as a member of WUA.

CHAPTER - 11

ACTION RESEARCH AND TRAINING

11.1 INTRODUCTION

Indian economy is by and large dependent on agricultural production and about 80% of the Indian population is engaged on agriculture. Water is prime input for agricultural production; however, it is well known that even after meeting this need, the desired level of agricultural production per unit of area is low as compared to some other countries. The main reason could be attributed to improper management of water right from the source upto the farm level. This calls for undertaking some kind of field oriented research on existing projects with a view to assessing their performance efficiency vis-a-vis conceptual design, construction, present physical status, agronomic conditions in the command, socio- economic level of the beneficiary farmers, identifying constraints that impede efficient agricultural production and to undertake interventions for improvement. As per present thinking, this concept has been termed as "Action Research" which has been taken-up in 11 States namely, Andhra Pradesh, Bihar, Gujarat, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Rajasthan, Tamil Nadu and Uttar Pradesh.

11.2 DEFINITION

Action Research is a relatively new concept in the realm of Irrigation sector and involves professionals from various disciplines like Irrigation, agronomy, agricultural engineering, social and economic sciences, etc. Attempts have been made from time to time to evolve an appropriate definition of this term to avoid any confusion and to maintain uniformity of approach throughout the country. While the term "Research" implies systematic enquiry to develop a new understanding, "Action Research" connotes field study of the effect of a change in the irrigation system due to an innovative intervention on all aspects of the system.

These changes may be as a result of research effort or a Government programme for system improvement. The example of the former could be studies on say effect of farmers' participation in the management of water beyond a certain point in a distribution system, while in the latter case it could be introduction of Rotational Water Supply (RWS)/Warabandi.

"Action Research" studies in brief include the following procedure:

(a) Selection of suitable site in consultation with the State's Irrigation Department.
(b) Bench mark survey.
(c) Diagnostic analysis.
(d) Identifying interventions and prioritising the solutions on the basis of cost and time considerations.
(e) Implementation of prioritised recommendations.
(f) Monitoring and evaluation.

11.2.1 Expected Benefits

The common benefits that could be expected from this programme are:

(a) Thorough and comprehensive understanding of real life Irrigation problems faced by the persons involved in the study.

(b) Benefit to farmers near the study area due to system improvement directly and indirectly through exposure to new technology through training programmes.

(c) Identification of successful interventions that could be replicated on other systems in the country.

(d) Use of study sites for imparting training to field professionals, farmers, on-site demonstrations, workshops, etc. for technology transfer.

11.3 TRAINING IN ACTION RESEARCH

One of the functions of Action Research is to provide a living laboratory for the in-service trainees. This helps them in better understanding of actual field conditions, the process of implementing improvements, and to understand the system from the farmers' point of view.

The State Training Institutes (STIs) like WALMIs/IMTIs are discharging this role quite amicably to:

(a) provide a means by which trainees and faculty can obtain "hands on experience" in different aspects of Land and Water Management in order to enhance the development of professional competence.

(b) increase STIs staff's understanding of the dynamics of Irrigation Management and to provide information vital to the development of relevant curricula in land and water management.

(c) provide case studies that can be used in the WALMIs teaching programmes.

11.4 ACTION RESEARCH PROJECT SITES (STATEWISE)

The list below gives the names of irrigation projects, statewise, in which action research activity is being or has been conducted.

State	Action Research Site
Andhra Pradesh (WALAMTARI)	1. Sriramsagar - Kakatiya Canal 2. Shameerpet Project.
Bihar	1. Sone Canal System - Paliganj Dy. 2. Gandak Project - Jamunia Branch
Gujarat	1. Mahi Rt. Bank Canal - Borsad Branch
Karnataka	1. Malaprabha Project - Right Bank & Left Bank Canals
Kerala	1. Kuttiadi Project. 2. Gayatri Project.
Madhya Pradesh	1. Samrat Ashok Sagar Project 2. Gorapachhar Medium Irrigation Project
Maharashtra	1. Pus Medium Irrigation Project 2. Nazare Project.
Orissa	1. Mahanadi Delta Irrigation Project - Atala & Delang Minors 2. Kuanria Medium

Rajasthan	1. Guda Medium Irrigation Project
Tamil Nadu	1. Cauvery Delta Irrigation System - A Class Channel
Uttar Pradesh	1. Agra Canal System - Jait Minor 2. Sarda Sahayak Project

11.5 STATUS OF WORK DONE

The status of work done with regard to the above activities in some states is briefly as under:

11.5.1 Andhra Pradesh

A pilot program was taken up covering a minor, with a command area of about 500 ha under Sriramsagar Project. This was followed up with a large scale pilot programme covering a command area of about 20,000 ha under six different distributaries in the Sriramsagar Project during 1995 to 1997 through two NGOs. The terms of reference for the NGOs were:

- Identify a model for creating WUAs
- Evaluate the present system of water supply and suggest modifications
- Suggest methodology for optimizing the use of waters by farmers
- Identify gaps in the existing dissemination of information to the farmers
- Train the farmers
- Identify incentives for effective functioning of WUAs

Farmers in the command area were helped to form the WUA and to take up minimum maintenance works that were feasible to them for ensuring free flow of water up to the tail reaches in the system, organize water distribution in the entire system, resolve disputes, if any, internally; and adopt their own crop planning. The net result of this experiment was that the awareness amongst the farmers increased. There was an increase in the irrigated area from a pre-project level of about 50 percent to around 80 percent with the same quantity of water as was supplied in the earlier years and without any substantial investment on rehabilitation or repairs of the system.

11.5.2 Bihar

Bihar has taken up action research in four areas (a) Paliganj Distributary (Sone) (b) Jamunia Branch Canal (Gandak) (c) Gara Chaubey Branch (Sone Canal) & (d) Asarganj Distributary (Badua Research Project).

Sizeable progress on action research has been reported on Paliganj Distributary of Sone Canal System (12000 ha command). Efforts have mainly centred around formation of WUAs covering the entire length of Distributary. WUAs have been established through WALMI's efforts. Presently, the Association is composed of a Distributary or a Minor Committee consisting of representatives of 20 villages out of 76, which are scattered throughout the length of the command. They have implemented an operation plan for the Distributary and more villages are expected to join. An Inter-Village Council has been created to solve operational problems. This is reported to have proved successful.

Action Research Programme in the command of Dhawahi Sub-distributary ex-Jamunia branch canal of Gandak Project was taken up in 1990 and some initial findings indicate that though the water reaches the tail end of the sub-distributary, it does not reach the lower reach of water courses (about 5 cusec channels). Also, the micro channel development works below the outlet head do not

function well and there is inequitable distribution of water, resulting in soil deterioration and low productivity.

11.5.3 Gujarat

The work on Action Research was initiated in 1984-85 in an area of 1200 ha. under Adas and Anklav distributaries of Borsad branch which is at the tail end of Mahi Right Bank Canal. For detailed on farm development and intensive study including farmers' participation, an area of 2400 ha was selected under the command of Anklav sub-minor of Adas distributary. Significant amount of extension work has been carried out under action research activities and a number of booklets on irrigation and crop technologies were published. It is reported that water is now reaching tail areas, which had not previously been irrigated. Irrigation intensity over the entire project and particularly action research area have increased. Thus, agricultural production in this area has shown improvement. Considerable success is also achieved at Anand in the area of FOs. The WALMI is presently assisting the farmers to form a Water Cooperative and is expanding its activities to other distributaries. These activities have led the State Government to take a decision that water will be supplied henceforth only to FOs on volumetric basis.

11.5.4 Kerala

Action Research activity was initiated by CWRDM during 1990 in the command areas of Narath and Ichannur distributaries of Kakodi Branch canal of Kuttiadi Irrigation Project. Out of the total Project command of 14,000 ha, 557 comes under action research study. Initial work on bench work survey and diagnostic analysis has been done. Efforts are being made to institutionalise the responsibilities for maintaining productivity and water management directly through Irrigation Department, Agricultural Department, etc. As a part of these efforts two committees have been formed on action research - an action research working group responsible for field activities and an action co-ordination committee for supervising and monitoring the activities of action research working group.

Action research working group consists of 5 A.Es for Kuttiadi Irrigation project, a representative each from 5 Krishi Bhawans in the area and technical advisors when needed from CWRDM staff. The action coordination committee consists of S.E. from Kuttiadi Project as Chairman, Joint Director of Agriculture, Joint Registrar of Cooperatives and a Member Secretary from CWRDM.

Action research activities are concentrated, on Ichannur distributary. The 2 Km length of this distributary is being maintained by farmers' groups who are paid Rs.500/Km i.e. Rs.1000/- for two Km length distributary by the Irrigation Department and another Rs.1200 by CWRDM to maintain this portion called field bothi. The tail end is being maintained by Irrigation Department as the farmers feel that it is the responsibility of Irrigation Department.

Group farming has been introduced in 10 ha blocks. This activity is coordinated by Agricultural Department. Normal subsidy programme provides Rs.30/ha for group farming. Outlet Committees receive additional subsidies for seeds, pesticides etc. from Cooperative Department. However, the main issue faced by CWRDM is how to sustain this cooperative effort.

11.5.5 Karnataka

Action Research activities have been initiated on Malaprabha Irrigation Project during September, 1991 and almost 2/3rd of the system is covered. Reservoir capacity is reached only once in 5 years and therefore there is water shortage in most of the years.

Two sites have been selected for action research - one on the right bank and another on the left bank. A reconnaissance survey and diagnostic analysis indicates the following deficiencies in general:

(a) Poor maintenance below outlets.
(b) Poorly designed field channels.
(c) Unlevelled field.
(d) Water not reaching tail outlets.
(e) Some limited areas under waterlogging.

The University of Agricultural Sciences, Dharwad Research Station, which is located in the command of right bank is conducting water management studies on wheat, cotton, hybrid maize, jowar, sunflower, chilli, etc. Due to this, the agriculture on the right-bank appears to be good. The main system management on this long system (130-160 km) however appears difficult mainly because it passes through very different rainfall zones.

Regarding formation of WUAs, it is reported by WALMI that the head reach farmers see little benefit in organisation, because they receive fully the water they need. It remains to be seen whether WUAs can sustain without Government support.

The pre-action research position, interventions etc. have not been documented as yet, though the interventions have been identified and implemented. WALMI, Irrigation Department and CADA are involved and it is proposed to evaluate the interventions made through the consultants. Thereafter only, the impact of the action research activity will be discernible.

11.5.6 Madhya Pradesh

Under the action research activities taken up by Madhya Pradesh, the main emphasis is on developing FOs, which can take up irrigation management responsibilities. Action research activities have been conducted on 2 sites:

1. Distributary No.2 of Right Bank Canal of Samrat Ashok Sagar Irrigation Project.
2. Ghorapachhar Minor Irrigation Project.

On these sites, action research activities have been taken up since 1987. Diagnostic analysis, socio-economic and benchmark survey have been completed. Several farmers' training programmes have been conducted to create awareness about water management practices and FOs.

An NGO namely Bhumi Jal Sampada, Bhopal has been involved to develop Outlet Committees and making them functional in 2 selected outlets i.e. direct outlet Nos.1 and 2 in Gorapachhar Project. This NGO is also to implement Warabandi Programme through Outlet Committees.

It has been further decided to develop distributary No.2 as a model farmers managed irrigation system covering the aspects of drainage, recycling of water, conjunctive use, methods of cultivation, crop management, seed and fertilizers package. It is planned to turn over distributary No.2 to the WUA after it is formed and registered under society/suitable act.

11.5.7 Maharashtra

Four minors of Pus medium Irrigation Project has been studied under the Maharashtra action research programme. These are in different soil types and in different reaches of the canal as given below:

Bhojala Shiv Minor - Head reach of Right Bank Canal.
Pokhari Minor - Tail reach of Right Bank Canal.

Itawa Minor	- Head reach of Left Bank Canal.
Hudi (2) Minor	- Tail reach of Left Bank Canal.

The diagnostic analysis has revealed that the following main actions are called for

(a) Rehabilitation and improvement of Irrigation delivery system.
(b) Introduction of RWS
(c) Reviving defunct outlets and minor level Irrigation Committee.

Some of the problems noted during the diagnostic analysis both on the main canal system and the selected minors are: siltation of canals, no continuous service road along the canals or minors, no cross regulators and escapes on the canals, leakages from some structures, vegetation growth in the minors resulting in reduction of discharge, lack of measuring devices, turnouts, village road bridges, lack of field drains etc.

WALMI Maharashtra in consultation with the Action Research staff decided to study only two interventions relating to physical and cropping system. Itawa and Bhojala Shiv Minors were selected for the purpose because improvements/modifications alongwith OFD works had been completed by the Irrigation Department and changes in cropping system were also introduced in the command. Physical improvements on both then minors/OFD works were completed and RWS introduced from Rabi 1987-88 and changes in cropping system were also introduced in the command. Constant efforts were also made by Action Research Unit to persuade farmers to adopt scientific methods of inter cropping and to form WUAs.

11.5.8 Orissa

Action research activity has been initiated on two sites, namely, Kuanria Medium Irrigation Project and Atala minor of Mahanadi Delta Project. Kuanria Project reservoir has a command of 3600 ha whereas Atala Minor has a command of 1500 ha and is part of Mahanadi Barrage system. Documentation of the activities with respect to interventions made, their impact etc. has not been done so far. However some of the results of diagnostic analysis as available are given below:

i. Head regulator at Atala minor damaged.
ii. Regulators on sub-minors are damaged.
iii. Breaches in canal banks in some reaches.
iv. Canal design different from actual
v. No.of unauthorised outlets at different places at Atala minor.
vi. OFD works done by CADA from outlets downward have been damaged and have no proper channel section.
vii. Absence of measuring devices.

70% of rice growing area is low lying and in ill-drained condition. Hence farmers are forced to grow rice only. There is lack of operational efficiency and hence improper control on flow. Farmers are never aware of exact date of water supply in all the three seasons - Kharif, Rabi and Summer. Regarding quantity of water supplied, it is reported that 40% are getting adequate water whereas 52% are getting excess water than required. During drought, disputes arise in water distribution and there is no organisation to solve the disputes. About 50% of the beneficiaries want FOs and Government organisations to come up for solving their disputes and 70% of the farmers do not know whom to contact. Waterlogging, dearth of improved inputs like seeds, fertilizers, ignorance about improved methods of cultivation etc., are the main reasons for low productivity.

As per the guidance from the Action Research Cell of WALMI, the Irrigation Department have carried out the following improvements:

i. Canal sections restored to original design.
ii. Shutter for Atala minor fixed.
iii. Damaged masonry structures of 3 sub-minors repaired.
iv. No. of Parshall Flumes have been installed on Atala Minor and three Cut-Throat Flumes, one on each sub-minor i.e. Bhimpur, Rudrapur and Jaipur have been constructed for discharge measurement.
v. Efforts were made to involve farmers in system irrigation by persuation and WUAs formed.

11.5.9 Rajasthan

In Rajasthan, Guda Medium Irrigation Project has been selected for action research studies. This is located at about 60 km from Kota in Bundi Distt. The following two minors with a total CCA of 1000 ha. have been chosen for action research activities :

a. Minor No.2 of Left main canal with 160 farmers in 5 villages.
b. Minor No.3 of Right main canal with 205 farmers in 2 villages.

The diagnostic analysis indicates the following deficiencies in general:

a) Insufficient system capacity to carry water to tail end
b) Excessive seepage losses
c) Non-existence of measuring devices and other structures, village road bridges etc.
d) Unauthorized and bigger outlets installed including wrong positioning with respect to field level.

Necessary action for resectioning, desilting, lining the vulnerable reaches of the canal etc. has been taken. Control structures like falls, village road bridges etc., have been constructed. After proper studies, measuring structures have been constructed.

11.5.10 Tamil Nadu

The action research programme was started in Tamil Nadu in 1985 at the Cauvery Delta with the objective of serving as a field laboratory for inservice as well as farmer trainees and to intervene in a sample command and to study the impact as to the replicability in other parts of the command.

In action research 6-A class channels with a command area of 4000 acres have been taken up for study. These are (a) Sethiapuram (b) Kangalanchery (c) Annaikuppam (d) Pathiniapuram (e) Pidagai and (f) Mahilanchary. Preliminary surveys consisting of diagnostic analysis, socio-economic survey, soil survey, groundwater survey including water quality analysis have been done, which revealed the following deficiencies:

a) Canal roads were not constructed.
b) Canal lining was not done and measuring structures not constructed.
c) Poor field drainage and alarming drainage congestion.
d) Field to field irrigation was practiced and rotation of canals not done.
e) Poor knowledge on improved methods in agricultural water management.
f) Crop diversification was not popular.
g) WUAs were not formed.

For removing the above deficiencies roads have been laid on one side of A-class channels, lining of channels serving upto 25 acres has been done and Ventury flumes and Parshal Flumes constructed for measurement of flow. Additional channels were provided under CAD programme and two

drainage carriers desilted. Training was imparted to farmers and women farmers and village level WUAs formed with farmers' contribution of Rs.100/- per acre with matching grants.

11.5.11 Uttar Pradesh

1. WALMI, Uttar Pradesh is conducting action research at two minors of Shergarh distributary of Agra Canal system for the last few years. These are - Chanderi minor on head reach and Jait Minor at tail reach. Voluminous data on system infrastructure, its operation, cropping pattern etc. have been collected. Training courses have been conducted for officers at WALMI from time to time. Field investigations related to physical performance and socio-economic studies have been carried out and sufficient data on water distribution and socio-economic conditions have been collected. However, the data is yet to be analysed and documented. Only then it will be possible to identify the interventions. Implementation of the intervention and their impact will be studied later.

2. Another ongoing scheme is Basrahia Cooperative Irrigation Society created in October, 1988 on Amethi Gosainganj distributary of Sarda Sahayak feeder channel. The Society takes water from the Irrigation Department on volumetric basis while it collects water charges from the cultivators on area basis. The study has revealed that there is unauthorised use of water in the command resulting in loss of revenue. Remedial measures are being studied to check this activity.

3. Another proposal under study is to turnover Kazikhera minor of Sarda Sahayak Project to farmers. This activity is in a very preliminary state. The general feeling now developed is that the water users should be directly involved in irrigation management from a point where water can be supplied with an accepted degree of certainty.

11.6 CONSTRAINTS FACED AND LESSONS LEARNT

11.6.1 Andhra Pradesh

Based on the diagnostic analysis of the different distributaries in Sriramsagar Project, the following main issues were identified:

i) The physical condition of the distributaries was not satisfactory.
ii) Many of the structures on the minors and shutters at the outlets were either broken or dislodged over the years.
iii) 24 percent of the outlets did not get any supply.
iv) In about 30 to 32 percent of the outlets the flows were very poor.

To have effective involvement of farmers in PIM, a three-tier set up was developed at the level of the outlet, minor and distributary.

Lessons Learnt

Farmers in general are interested in self-management through the formation of WUAs and Distributary Committee not withstanding a few vested interests and lack of local funds It is seen that within the various limitations in the system, working closely with farmers and their organizations can help in improving irrigation utilization.

11.6.2 Bihar

In Bihar, based on the experience gained on Paliganj distributary of Sone and Jamunia Branch Canal of Gandak, the following findings are reported:

1. The existing organisation and working procedure for management of Irrigation system is a major constraint in better performance of irrigation system.
2. Head-end farmers are still putting illegal chak-dams, which they of course remove afterwards permitting water to reach tail ends.
3. Physical condition of canals in general is depressing. In channels, siltation, unauthorised cuttings, frequent breaches in banks and encroachment on channel embankments is a common sight. This is mainly attributed to callous attitude of farmers, lack of community feeling, resources etc.

Lessons Learnt

1. WALMI's experience is that organisational effort on larger distributary or minor level can effect real changes in water delivery procedures as against smaller sub-distributary or outlet committee.
2. Farmers are willing for participation ranging from O&M to complete takeover of system. Many farmers are in favour of collecting water revenue and using it for system management, provided the system is improved to deliver acceptable quantity of water.

11.6.3 Gujarat

Gujarat has carried out action research on Adas and Anklav distributaries of Borsad Branch of Mahi Right Bank Canal. The following main constraints have been faced.:

1. Inadequate carrying capacity of the distributaries and other canals.
2. Heavy seepage losses in some vulnerable reaches.
3. Water not reaching tail end due to absence of RWS.
4. Inadequate control structures and measuring devices.
5. Poor maintenance of field channels and structures.
6. Lack of extension activities of the Agriculture Department.

Lessons Learnt

The extension staff of the action research unit have encouraged farmers to form a WUAs. The farmers now understand that in order to get assured water supply from the Department the best way is to be represented collectively. This will also help in solving other problems related to irrigation and agriculture.

11.6.4 Kerala

Action research activity has been started on Narath and Ichannur distributaries of Kakodi Branch canal of Kuttiadi Irrigation Project and the following are the main findings.

1. There is large loss of water from the 3 under tunnel drains. These structures were lined using plastic sheeting provided by CWRDM and installed by the farmers themselves.
2. There are heavy seepage losses from the raised portion of distributary where it crosses some low lying land. These portions are being lined by farmers with funds from CADA. But there are still some problems of water reaching tail end due to early closing of distributary by influential farmers to save their low-lying land.

Lessons Learnt

The cooperative efforts between farmer groups, State Irrigation Department, and CWRDM is sustaining due to subsidy provided by Irrigation Department as well as CWRDM. However, this effort will need to be institutionalised for sustenance after the subsidy is withdrawn.

11.6.5 Karnataka

Action research activities commenced on two sites-one on the right bank and another on the left bank of Malaprabha Project, reveal the following problems:

1. At present there is no communication between the main system irrigation management activities of Irrigation Department and the University of Agricultural Sciences as a result of which the research station does not take into consideration, limitations as to when water is available in the reservoir and canals, and the research activities face a set back.
2. Poor design and maintenance below the outlets.
3. Tail end farmers not getting their share of water.

Lessons Learnt

Good communication with the various departments engaged in irrigated agriculture will go a long way in improving irrigation management practices and thereby resulting in increased agricultural productivity.

11.6.6 Madhya Pradesh

The action research activities have been conducted on two sites namely distributary no.2 of the right bank canal of Samrat Ashok Sagar Irrigation Project and Ghorapachhar minor irrigation project. The findings are as below:

1. On distributary 2, the design no.of outlets is 65 of which only 31 exist due to non-completion of structures and 26 nos. are unauthorised outlets. Thus out of 65 outlets about 46% are unauthorised.
2. Farmers have shifted the designed position of the outlets to other places to suit their own interest.
3. Location of some outlets is above the FSL of minors, so the farmers take water by putting an obstruction across the canal to irrigate small patches of land, which are otherwise outside the command.
4. Unauthorised direct pumping from canal between km 0 to 1.82 of distributary no.2 of right bank canal.
5. Poor physical condition of the system.
6. No measuring structures, turnouts, farm gates or village road bridges in the minor distribution system.
7. Waterlogging and salinity in some area due to absence of field drains.
8. Command is inaccessible during rainy season.
9. Low crop production due to low fertilizers inputs and improper water management.
10. No documentation has been done except only brief summaries of work done.

Lessons Learnt

The farmers could be persuaded to remove unauthorized outlets, construct field drains on their own and to form WUAs. The farmers now understand that in order to get assured water supply from the Department to solve other problems related to irrigation and agriculture, the best way is to be represented collectively.

11.6.7 Maharashtra

The following main problems have been identified in the main canal system and the selected minors as a result of diagnostic analysis.

1. Siltation of canals resulting in reduction of discharging capacity.
2. No continuous service road exists along the canals or minors.
3. No cross regulators and escapes on the canals.

4. Heavy leakage from some structures.
5. Lot of vegetation growth in the minor resulting in reduction in discharging capacity.
6. Sill level of outlets were higher than the bed level of minors. Outlets were in bad shape and not functioning properly.
7. Silted field channels, no division boxes, turnouts, or measuring devices on field channels.
8. Lack of field drains and field channels were not connected to natural drains.
9. Requirement of water at distributory head assumed in project planning was inadequate.
10. Transit losses assumed at 15% in Kharif and 20% in Hot Weather were low.
11. Cropping pattern adopted was different than the designed one.
12. Majority of farmers expressed that too many farmer families were attached to the grass root extension worker as a result of which advice rendered was untimely.
13. Farmers not aware of scientific methods of inter cropping.
14. Yield affected due to untimely and inadequate water supply.
15. Under utilisation of water due to undulating land, faulty location of gates, non-maintenance/absence of field channels.

Lessons Learnt

1. The major reason for under utilisation has been the development of new cropping pattern, which is different from the planned one. The new pattern got developed due to availability of canal water, climatic conditions and market demand etc. The cropping pattern needs certain changes for extensive irrigation, for which training and strengthening of Agriculture Extension staff to motivate the farmers to adopt the changes is required.
2. The farmers are ready to accept changes provided they get timely and assured water and technical guidance.

11.6.8 Orissa

Based on the experience gained from the Action Research studies on Kunaria Medium Irrigation Project and Atala Minor of Mahanadi Delta Project, the following main problems have been identified:

i) Poor physical condition of the system and a number of unauthorized outlets at different places.
ii) Low lying area with poor drainage and water logging problem
iii) Inequitable distribution of water and non-involvement of farmers in water distribution and management.

Lessons Learnt

From the past few years experience, WALMI, Orissa has learnt that NGOs have a greater role in promoting WUAs. In this direction, they have trained NGO nominees and unemployed youths from action research area to some extent to promote WUAs. Training on water measurement, management to ensure equity, etc. have also been provided and is planned to be continued in the coming years.

11.6.9 Rajasthan

In Rajasthan sufficient progress has been achieved on Guda Medium Irrigation Project. As a result of studies carried out, the main problems identified are: insufficient system capacity, inequitable water distribution, excessive seepage losses, non-existence of measuring devices and other structures etc. In regard to cropping system water intensive crops like sugarcane is being cultivated on a large scale resulting in waterlogging problems. There is lack of proper drainage as well. During the socio-economic survey, it was found that there is lack of farmers' involvement, lack of

coordination amongst agencies working in the area etc. Efforts have been made to take remedial interventions.

Lessons Learnt

By lining the vulnerable reaches of the minors, the seepage losses have been reduced and water logging problems decreased. Resection and desilting of channels has improved the water supply to tail-end farmers.

11.6.10 Tamil Nadu

Action Research studies have been carried out on Cauvery Delta System. On the basis of studies carried out the following findings have emerged.

1. Canal Roads absent
2. Lining of canal not done
3. structures for measuring canal discharges not there
4. Rotation of canals absent
5. Drainage congestion is alarming.

On the agricultural side, it is found that there is improper water distribution, inequity in water available to farmers lack of field drainage and knowledge on improved methods in agriculture is poor. WUAs have not been formed.

Lessons Learnt

1. Acceptance of new water management technologies by the farmers depends among other things on the adequacy and reliability of canal water. As it is hard to realise this condition in Cauvery Delta, acceptance by farmers is rather slow.
2. As far as farmers' participation is concerned, they are ready to cooperate with the Government in formulation of schemes with their profound knowledge about local field conditions. But they are reluctant to share the cost of development.

11.6.11 Uttar Pradesh

As brought out in Para 5, the main activity has proceeded on Jait Minor of Shergarh distributary of Agra Canal. The existing study has revealed that there is in general an unauthorised use of water in the command resulting in loss of revenue. Remedial measures are under study.

Lessons Learnt

The irrigation bureaucracy is now conceding that farmers as water users should be more directly involved in irrigation management from a point where water can be supplied with an acceptable degree of certainty.

11.7 GENERAL FINDINGS

The studies carried out by various institutes have revealed quite a few common problems under the various heads mentioned above. These are physical deficiencies of the system to provide the required quantity of water, seepage losses, lack of or total absence of measuring devices, existence of unauthorised outlets and their wrong locations, etc. Under the agricultural engineering the main problems identified are inequitable and improper water distribution, tailenders not receiving water, inadequate field drainage etc. Under agronomy/agriculture the common problems identified are - the existing cropping pattern being different from that planned, adoption of high water consuming crops like sugarcane, paddy, hot weather crops, groundnut being cultivated irrespective of soil

characteristics, leading to either water shortage or waterlogging. Also crop diversification has not picked up. Further introduction of sunflower has not picked up mainly because financially it is less remunerative as compared to sugarcane, paddy, groundnut etc.

Under sociology, the efforts made by some institutes to persuade farmers to form FOs have generally met with success. However, some groups have expressed reluctance mainly due to uncertainty of timely and adequate supply of water and for want of rehabilitation of systems. Some farmers have shown reluctance to share the cost unless water can be supplied with an accepted degree of certainty and timely guidance given regarding water scheduling and water management aspects. The experience of some of the Institutes is that NGOs as also extension staff of action research units have a positive role to play in promoting and encouraging WUAs and FOs.

CHAPTER - 12

FUTURE PERSPECTIVE - PROGRAMME/GOALS - RECOMMENDATIONS

12.1 INTRODUCTION

Historically, precedents of farmers' participation in the management of irrigation exist. Upto nineteenth century, all irrigation schemes, which were mostly small, were managed by farmers. During nineteenth century a number of modern irrigation schemes were taken up through Government agencies and management was totally taken over by the Government without any involvement of beneficiaries. In recent times efforts have been made, sporadically, to introduce participatory approach in irrigation. But it has had very little success so far.

Irrigation being a State subject, for PIM, Central Govt.'s role is that of a facilitator and actual implementation of PIM has to be done by States. The earlier financial support from Command Area Division of MoWR, on 50:50 basis to promote and support WUAs (Rs.100/- per ha for first two years and Rs.75/- for the third year) has repeatedly met with pleadings of financial constraints by State governments. This has since been increased to Rs.500/- per ha. Many States, facing financial crunch and emphasising on industrial economy as a result of and response to liberalisation, have given low importance to WUAs. Political and NGO's pressure has also not been adequate. Also there are not many NGOs (as in health, education, and forestry) working or interested in WUAs, particularly on a large scale.

Over the last 20 years, the efforts to promote and support the sustainable development of WUAs have not yielded encouraging results, even though pilot projects supported by funding organizations and some NGOs were also taken up. Government efforts are spread out too thin and also lacked clear guidelines and specific monitoring strategy. While the guidelines were generous to cover many things, they could not be transformed into practice, mainly because, adequate legal back up has not been there.

12.2 PROBLEMS

Some of the problems and constraints for PIM in India are as follows:

- **Resistance to Change**: Farmers in India are traditionally conservative. However, once convinced of the usefulness of change farmers are willing to adopt new practices in agriculture and irrigation as has been demonstrated by their flexibility in adopting hybrid seeds and new techniques, which ushered in the green revolution. It is also a fact that efforts made so far to motivate farmers to adopt participatory approach in the management of irrigation have not proved enough. They are not fully aware of its benefits and may even be apprehensive. The authorities managing the system of irrigation also need to be convinced of the usefulness of PIM. Due to this, the idea of WUA has not yet taken practical shape on a large scale.

- **Unrealistic Schedule and Lack of Flexibility:** The present system of delivery of water is pretty rigid and unrealistic. The farmers are, therefore, apprehensive that they would be saddled with the responsibility of managing the system without being able to make water deliveries flexible and realistic.

- **Social Impediments:** There is often a lack of homogeneity in the composition of farmers' groups. Differences of caste and class hinder the process of their coming together to form an association.

- **Location of Holdings:** Farmers who have their holdings at the head of the canal tend to appropriate more water than required, whereas the farmers at the tailend generally fail to get their apportioned share of water. Headenders, therefore, have a vested interest to continue the existing arrangement. The tailenders are not convinced that the situation will be materially altered, if the association is formed. The differences in perceptions of the farmers at the head and tail ends inhibit their coming together.

- **Lack of Extension Services and Interaction Between the Government and the Farmer:** Due to lack of interactive co-operation or even a dialogue between the irrigation bureaucracy and the farmers and due to the absence of effective facilities for irrigation extension, the farmers fail to perceive the benefits of better management of water.

- **Low Water and Power Rates:** At present the water rates are very low in most of the States and so are power tariffs. Therefore, cultivators feel disinclined to form associations for the fear that the charges would be hiked.

- **Absence of NGOs:** The NGOs understand the needs of farmers better than the Irrigation Authorities and are better able to communicate with the farmers. They carry more conviction also. At present there are very few NGOs working in this sector which makes it difficult to persuade and motivate the farmers to form associations.

- **Lack of Monitoring and Evaluation:** Owing to the near absence of proper mechanism for monitoring and evaluation so far, correct lessons have not been drawn from the existing associations and problems in their functioning have not been diagnosed to be able to apply remedial measures.

- **Lack of Support for PIM:** In the absence of any Centrally Sponsored Scheme under the Five Year Plan, means for propagation of idea of PIM are not available.

- **Deterioration of Infrastructure:** Because of lack of maintenance or inadequate operation in some of the projects, irrigation system infrastructure has deteriorated so much over the years that the irrigation potential has been substantially reduced. This is a major deterrent for the farmers to take over the system. If the credibility of the system is so low that there is no confidence in the ability to supply the designed or requisite quantum of flows at the distributary head, then there are likely to be no advantages to the farmers forming a users' association to distribute and manage the micro system. This has indeed been a basic inhibiting factor.

- **Lack of Institutional Support:** The present institutional arrangements for the management of systems of irrigation lack the capacity to introduce PIM. There are no properly oriented trained and motivated officials to implement this idea. The Irrigation Agency does not have any dedicated wing at any level for this purpose. There is a need to upgrade the skills of training and build institutional capabilities to impart necessary training to farmers and officials.

12.3 FUTURE PERSPECTIVE - PROGRAMME - GOALS

In recent past, many State Governments have taken initiatives to form high-level committees, generally chaired by Chief Secretary, to formulate guidelines and recommend to the State

Government on future action plans to promote PIM. Owing to the World Bank initiative through WRCP projects in three States (Haryana, Orissa, and Tamil Nadu), there is a lot of efforts to promote WUAs in these three States. The Water Resources Ministry of the Government of India has formed a body to regularly monitor and guide WUAs across the States. Besides, it has already formed an Advisory Council with representatives from NGOs to help implement the CAD guidelines. In India, the role of NGOs in WUAs is quite limited and that too only in a few States. Cumbersome procedures in funding, keeps NGOs at a distance. Wherever State Governments are interested and encouraging such activities, NGOs are playing a vital role.

Some well known NGOs are: SOPPECOM (earlier CASAD) in the Mula project of Maharashtra, AKRSP in South Gujarat, Sadguru Sewa Foundation for lift irrigation in Panchmahals of Gujarat, and IRDAS in the Sriramsagar Project of Andhra Pradesh, PRADAN for Lift irrigation in Bihar and small tanks in Madurai district of Tamil Nadu. Among the institutions: the Centre for Water Resources of Anna University in Madras has initiated farmers managed tank projects, and the WALMIs had taken up action research projects (funded by USAID) at minor/sub-minor level (in Gujarat, Madhya Pradesh, Maharashtra, Karnataka, Rajasthan, Tamil Nadu, Kerala, Uttar Pradesh, and Orissa) and at distributory level (in Bihar). In some States like Bihar, Gujarat, Maharashtra, and Tamil Nadu, WALMIs have taken a lead on pilot basis.

The Ford Foundation is considerably supporting efforts to promote awareness on WUAs among researchers, practitioners, and NGOs. It has funded workshops and seminars, and has facilitated the interested groups to gather and deliberate on the subject. Its collaboration efforts with Administrative Staff College of India, Hyderabad (workshop in 1992 and its recommendations) and with the Centre for Water Resources, Anna university, Madras in its efforts for farmers' participation in tank management, and support to Irrigation Management Transfer study of six States, conducted jointly by IIMI and Indian Institute of Management, Ahmedabad, during 1994-96, are noteworthy.

In connection with formulation of the X^{th} Five Year Plan, the Planning Commission had set up a separate WG on PIM Programme, with representations from Central and State Governments, various Institutes and NGOs active in the field. This WG had made wide-ranging recommendations covering the Legal, Institutional and financial aspects for implementation of PIM programme in the Country. The WG had recommended that an enlarged central scheme called "Command Area Development and Management (CADAM) Programme" with specific financial allocation should be available for any existing project with CCA 500 ha upwards for improving the performance efficiency of the country. It also recommended that a minimum provision of Rs.4800 crores be made in the Tenth Plan to support exclusively PIM related components of CADAM programme. Joint funding by Government of India, State Government and FOs; gradual transfer of O&M responsibilities to WUAs, bulk water distribution to WUAs, mobilising political will for raising water rates to achieve financial self sufficiency and operation efficiency, involvement of NGOs and reputed consultancy firms for training and capacity building, imparting training to farmers, officers and trainers and evolving suitable system for monitoring and evaluation of PIM programme have also been suggested by the WG. It is expected that the recommendations of the WG would provide the requisite impetus for development of the PIM programme in the Country in future.

INPIM was established in May, 1995 as a non-profit making organisation, registered in Washington D.C., with a mission to facilitate PIM through the exchange of people, ideas and training materials. The office of the INPIM Secretariat is currently located in the Division of Environment and Natural Resources (EDIEN) at the Economic Development Institute (EDI) of the World Bank. The counterpart of INPIM in India is India Network on Participatory Irrigation Management (India NPIM)

12.4 RECOMMENDATIONS

12.4.1 Size of Command area to be controlled by WUA

The FAs have to be formed at a certain hydraulic unit. The general consensus which has emerged during various workshops is that a minor is the most convenient, viable and sustainable unit. This would have a command of roughly 300 ha to 500 ha. The farmers could be organised at the minor level to begin with and given responsibility for O&M etc.

12.4.2 Categories of Schemes

PIM is desirable irrespective of the size of the scheme i.e. minor, medium or major irrigation scheme. It is equally desirable in case of lift as well as gravity flow schemes. There could be further distinction whether the schemes are covered under the centrally sponsored CAD or not. Broadly the following five categories can be envisaged;

(i) **Schemes under CAD Programme or World Bank aided Projects:** These schemes should be taken up first for introduction of PIM because the system is comparatively improved and the concept of PIM, has already been introduced.

(ii) **On-going Major and Medium Irrigation Projects:** In case of major and medium projects in which construction activity is going on and part of it has been commissioned, PIM can be introduced in the area where utilisation of potential has commenced. In addition WUAs can be set up in areas where planning, designing and construction of canal is in progress, so as to involve the farmers in the process and take their views into account.

(iii) **Major and Medium Irrigation Schemes neither covered under CAD Programme nor under Externally Aided Programmes:** It would require more effort than elsewhere to organise farmers in the schemes where traditional irrigation has already commenced. There are two distinct groups of farmers in such commands. One, who are getting plenty of water owing to locational advantages or political or economic influence. The other group is deprived of due share of water due to reverse reasons. As we have already discussed the privileged group of "haves" would have developed vested interests in the existing system and the deprived group of 'have nots' would have lost all hopes of redressal. Bringing these two groups with different perceptions in a homogeneous whole will be a testing task.

(iv) **Surface Minor Irrigation Schemes under Gravity Flow.**

(v) **Lift Irrigation Schemes viz.** ***lifts from rivers, canals, nalas and public tube-wells.***

12.4.3 Governing Considerations

FAs at Minor/Distributary Level

The FA could be a body corporate, registered under an appropriate Act. The primary units for WUAs shall be at minor or small distributary level as per the prevailing circumstances with operational area generally between 300 to 500 ha in major and medium irrigation schemes. However, the area of operation under each society could be governed by the following considerations:

(a) The area should be homogeneous as far as possible to ensure cohesion among the members in decision making.

(b) As far as possible the source of water for each WUA should be one single point such as full command area of minor or distributary. Small direct outlets on the distributary could be clubbed together with the adjoining minor of the same village.

(c) If the minor commands a large area, (say more than 500 ha) there may be more than one Association. However, this would depend on the farmers' choice.

(d) The area of operation generally should also not be very small (say less than 300 ha) because in smaller units the overhead costs of management tend to be higher. However, here also the final choice should be with farmers according to local conditions.

(e) Below the take off point of minor there should be formal WUAs and below minors at the outlet level, there could be informal sub committees or groups for (i) operation and maintenance of micro network comprising field channels & field drains (ii) for distribution of water below outlets according to the allocation made by the minor level WUAs and (iii) for recovery of water fees.

Federation of Societies at Distributary/Branch and Apex Levels

In view of the increasing technical complexities in O&M above the minor or distributary level, the O&M presently may continue with the Irrigation Agency. However, in an environment favourable to the introduction of PIM, the minor level WUAs could be federated at the distributary/branch/apex levels in the second phase. The federated societies could comprise all the minors, distributary or branch level societies, as the case may be under the distributary/branch/apex society as corporate members.

(i) The federal societies could assume the O&M responsibility for the network below the head regulator by receiving water in bulk on volumetric basis from the Department of Irrigation and distribute the same equitably on volumetric basis to the minor level societies, maintain the system and main drain in the command, recover the water rates from the member societies and remit the same at agreed rates to the Department of Irrigation.

(ii) The federal societies within their operational areas could be free to construct storage enroute, other water harvesting structures on streams and nalas, take up the work of recharge of ground water or recycle the water to augment the quantity of water. After practising equitable distribution of water, the federal societies can take up other services to the members such as providing inputs, crop production, processing of agricultural produce, marketing etc.

Minor Irrigation Schemes

Schemes with Culturable Command Areas (CCA) of less than 500 ha can normally have only one WUA. The WUA can operate in the entire area under surface irrigation as well as lift areas on the reservoir. Farmers in the minor schemes with CCA of less than 500 ha can be persuaded to have only one WUA for achieving financial viability. If due to any specific reasons, this is not possible, there can, however, be more than one society.

12.4.4 Form and Organisational Structure of WUAs

The form and organisational structure of WUAs may vary depending upon the size of the project. As is generally accepted, the associations should be based on the hydraulic boundaries. The mino

commanding an area between 500 to 1000 ha is generally accepted as the basic unit for such associations and as such, should be a legal entity. There may be informal outlet groups below the minor level. Above, there could be a federation of associations, which may be formal or informal depending upon the situation.

It is desirable that for a minor project the associations preferably should have only one tier. For major and medium projects, it may be multi-tiered. For a medium project having command of upto 5000 ha, two tiers of associations one at the minor level and another a federation of minor level associations at the project level, seem to be sufficient. For projects with command more than 5000 ha, three to four tiers of associations are suggested (minor/ distributary/branch and project).

The federation of associations could have the following responsibilities:

(a) Coordinate the activities of lower level organisations and groups;
(b) Monitor the distribution of water by the lower level organisations;
(c) Assist the Department of Irrigation in equitable distribution of water;
(d) Settle disputes, which cannot be settled at the lower level;
(e) Identify and prioritise the requirements of maintenance and repair of the system in consultation with the Department of Irrigation;
(f) Monitor the activities of the lower level organisations;
(g) Represent the grievances of the farmers/lower level organisations before the department of irrigation for redress;
(h) Coordinate the activities of lower level organisations and various Departments of Government concerned with irrigated agriculture.

12.4.5 Structure of Associations

(a) **Minor :** As the Association at minor level is considered to be basic or primary unit, all the landholders in its command are entitled to be its members. The Association should have an Executive Body, which may consist of a President, Secretary, Treasurer and a few members duly elected by the members of the Association. The term of office bearers may be three years. Bye-laws of the Association will regulate the terms and conditions of the office bearers in detail. Equal representation of head, middle and tail reach farmers should be ensured in the Executive Committee.

(b) **Outlet:** At the outlet level there may be an informal group consisting of all the landholders under the outlet. The main function of this group would be to distribute water among the landholders. A small governing body with a President, Secretary and two or three members may be elected to look after the affairs of the outlet group.

(c) **Branch/Distributary Level:** There will be a Federation of minor level Associations, at the branch or distributary canal level. All the office bearers of minor level Associations would constitute the assembly of representatives of the Federation. A governing body consisting of President, Vice-President, Secretary and a few members should be formed by the assembly for looking after the day-to-day affairs of the Federation. Any expenditure incurred by this Federation should be shared equally by the minor level Associations.

(d) **Apex Body:** The Apex Body should be constituted by the office bearers of the Federations at the distributary level. It should also have a governing body elected by the assembly of representatives. Being the highest body, it should be vested with sufficient authority by the lower organisations for looking after the management of the entire command.

12.4.6 Legal Aspects

a) WUAs should be formal organisations.

b) These should be registered under appropriate law.

c) Amendments should be made in the Irrigation Acts of States for PIM.

d) While legal support through specially enacted legislation is necessary alongwith comprehensive MOU, WUAs should not be deemed to come into existence just through enactment of legislation only.

12.4.7 Institutional Aspects

Based on the recommendations of the first and second National Conference on PIM held in June, 1995 and January, 1997, International Seminar on PIM held in May, 1997 and recommendations of the WGs on PIM for the IX and X Five Year Plans, which finalised their reports in April, 1997 and August, 2001 respectively, the State Governments should initiate the following measures:

(i) It is necessary that a High Level Committee or WG presided over by the Chief Secretary of the State should be set up to formulate policies for implementation of PIM. WG should work out plans for development of PIM. This Committee should include the representatives of the Departments of Irrigation, CAD, Agriculture and other concerned Departments and NGOs.

(ii) There should be a separate cell for PIM in the State Department of Irrigation CAD. An officer not below the rank of Joint Secretary should be exclusively in charge of PIM cell and should not be burdened with any other additional responsibilities. The cell should be a multi-disciplinary unit, which should include social scientists, agronomists, economists, engineers and persons from other concerned disciplines and should coordinate activities relating to PIM.

(iii) The State Government should decide upon the time table for PIM and declare in clear terms, their intention to withdraw from water distribution responsibility as per those target dates.

(iv) It will be useful to set up pilot projects in various areas of the State. With an arrangement to provide independent feed back on their operations, the WG can decide on corrective action through modification of existing regulations, procedures and instructions.

(v) A Monitoring Committee may also be set up under, Secretary, Department of Irrigation or CAD, which should include concerned Heads of Departments and representatives of NGOs. This Committee should meet at least once a month and take stock of the implementation of the decisions taken by the High Level Committee/WG. A well thought out plan for training will be required to upgrade the knowledge and skills of the staff of Irrigation Department, CAD and farmers. Excellent institutions for training and research exist in the form of WALMIs. These should be very actively involved in promoting PIM.

(vi) Spreading awareness about PIM and motivation of ID staff and farmers would require holding of seminars at district and block levels and employment of mass media. Experience has shown that study tours of successful projects are the best motivating factor for convincing the farmers as well as the staff of Irrigation Agency about the benefits of PIM.

(vii) Community organizers may be deployed for motivating the farmers and later working with them in setting up WUAs. Unemployed graduates can be employed as community organizers on payment of appropriate emoluments. This has already been tried in Tamil Nadu. Junior Engineers of Department of Irrigation and CAD with four to five years of service can also be tried as community organizers.

(viii) There would be definite need to provide incentives to farmers to motivate them to take over responsibilities hitherto reserved for public domain. Priority may be given to rehabilitation of the system to be transferred under PIM to FOs and also provide adequate financial assistance to FOs for discharging responsibility for O&M as well as for collection of water rate.

(ix) Amendment to Irrigation Acts of the States is also necessary to give legal status to FAs. The Government of Andhra Pradesh has already passed a new law to establish FAs. This could be considered as Guide.

(x) At the level of Government of India, MoWR also, there is a need to create a separate cell for PIM, which should be multi-disciplinary in composition and include among others social scientists also. The wing dealing with PIM should be headed by an officer of the rank of Joint Secretary and full complement of staff should be provided, which should be exclusively concerned with the promotion of PIM.

12.4.8 Training

Cells dealing with PIM both in Government of India and the State Governments should have team of officers, who have experience of imparting training in the field of water management etc. Monitoring and evaluation of the implementation of the programme also have to go on simultaneously. The PIM Cell should, therefore also have experts in monitoring and evaluation aspects of programme. Although the PIM Cell will not directly monitor and evaluate the implementation of the programme, yet the Cell has to prepare the necessary formats for this purpose and also the terms of reference for the NGOs and private consultants who would do the work of monitoring and evaluation.

12.4.9 Financing of the Programme

(a) As recommended by the WG for PIM for the X Five Year Plan, PIM should be taken up as a separate Central sector scheme and adequate funds for various participatory actions for implementations of the provisions of the PIM Act should be ensured. The following are the main recommendations of the WG:

i) The requirement of funds during the Tenth Plan for PIM related activities as projected by the States which responded to WG, exceeds Rs.6,000 crores. Evidently, the requirement of funds to cater to the needs of all the States are very high. It is recommended that a minimum provision of Rs. 4800 crores (Rs.4,000 crores for works + Rs. 800 crores for software items like management subsidy, motivation, capacity building, training, monitoring and evaluation etc.) be made in the Tenth Plan to support exclusively PIM related components of CADAM programme to cover an irrigation service area of about 10 mha.

ii) The CADAM programme should cover all the irrigation projects and be funded jointly by the Government of India, State Government and FOs for which suitable provisions should be made in the Central and State Plans. The share of each in this jointly funded programme would be approximately as under:

Central share	-	60%
State share	-	30%
Farmers' share	-	20%

iii) The excess of 10% contributed by FOs may be kept separately as WUA water fund, and the income from the same be used for maintenance and upgradation of the irrigation system.

iv) Some funds from the existing Irrigation programmes like the Accelerated Irrigation Benefit Programme (AIBP) or schemes of the Department of Rural Development which also presently fund several Minor Irrigation schemes, can be diverted to provide additional funds for CADAM.

v) With the gradual transfer of O&M responsibilities of the distribution system to WUAs, there should be reduction of staff component in the Irrigation Deptt. so that savings can be used for funding CADAM programme.

vi) The work charged staff engaged on the construction phase of a project should be transferred to another project and not to O&M after the construction is over.

vii) The existing practice of Government taking up the responsibility for construction of tertiary distribution system (below outlet) upto 5-8 ha block needs to be reconsidered, so that additional funds can be diverted for promotion of PIM and new projects.

viii) Besides external agencies, NABARD should also be requested to consider financing more schemes for rehabilitation through their RIDF or any other special programmes.

(b) Under the CAD Programme an initial management subsidy of Rs.275 per ha is available for FAs. This has now increased to Rs.500 per ha. This amount has to be put in the bank account of Associations for registration of the society and for stationery etc. The subsidy is proposed to be shared in the ratio of Rs.25:25:50 between the Union Government, State Government and the FAs. In the present financing pattern under CAD programme, the management subsidy is shown against works and should, therefore, not be included in the cost of establishment. However, it is necessary that this subsidy should be available to non-CAD areas also.

(c) The expenditure on training, workshops, seminars, publications, publicity in media, preparation of manuals in local languages on PIM, process documentation, creation of data bank, for NGOs should be fully borne by the Government.

12.4.10 Cost of Rehabilitation

In order to make a success of PIM, a reasonable level of rehabilitation would be necessary. The cost of rehabilitation should be shared in agreed ratio between Union Government, the State Governments and FAs respectively. In this regards, the following are the recommendations of the WG for Tenth Plan:

i) While it is desirable to carryout minimum rehabilitation before transfer/turnover of components of irrigation system to WUAs, for which adequate funds @ Rs.4,000 per ha of CCA shall have to be made available through CADAM funds provided under the Tenth Plan, it should not be a pre-condition for setting up of WUAs. Further more work should not be done before WUAs are actually formed and have been operational for some time.

ii) Funds should also be provided for overhead/management expenses and for "software" support (awareness programme/training, NGOs involvement, etc.). A provision for two subheads @ Rs.500/- per ha for management expenses and Rs.300/- per ha for "software" support should be made for this purpose in the Tenth Plan.

iii) While taking up of rehabilitation/restructuring programme efforts should be made to persuade the WUAs to bear a small proportion of the cost (10 to 20%) so that farmers develop a sense of ownership.

iv) The WUAs should be fully involved in prioritisation of the works to be done and should be encouraged to undertake actual construction with technical support of the Irrigation Department.

12.4.11 Monitoring and Evaluation

Regular monitoring and evaluation of the performance of the WUAs is necessary for development of the PIM Programme in the country. The success and failure of the WUAs at one place could provide the useful lessons and enable taking up of corrective steps in formation and sustainability of WUAs at other places. The performance has to be justified against the objectives, laid down and the financial viability. The broad general indicators which could be considered are :

a. Changes in quality in distribution of water.
b. Changes in reliability of supply of water.
c. Changes in sustainability of water use.
d. Changes in efficiency of use of water
e. Changes in area of irrigation
f. Changes in productivity, crop yield and production.

The MoWR has devised a Format for Monitoring the Implementation of PIM Programme. This is enclosed as Annexure-7.

Monitoring and evaluation may be preferably carried out by an independent agency. Setting up of a separate cell for the purpose by MoWR would be desirable. Recommendations of WG on "Private Sector and Beneficiaries Participation for the Formulation of 10th Five Year Plan 2002-2007" in this regard should be considered and implemented for development of PIM to improve water use efficiencies and irrigation services in the country.

Annexure-1
(Ref.: Para 1.3)

STATEWISE STATUS REGARDING WATER USERS' ASSOCIATIONS (WUAs)

Sl. No.	Name of the State	Achievement so far	
		No. of WUAs	Area Covered (th.ha)
1.	Andhra Pradesh	10,292	4800.00
2.	Arunachal Pradesh	2	1.47
3.	Assam	37	24.09
4.	Bihar	37	105.80
5.	Goa	42	5.00
6.	Gujarat	526	96.68
7.	Haryana	2575	200.00
8.	Himachal Pradesh	875	35.00
9.	Jammu and Kashmir	1	1.00
10.	Karnataka	934	413.55
11.	Kerala	3930	148.48
12.	Madhya Pradesh	1470	1495.00
13.	Maharashtra	1168	375.00
14.	Manipur	62	49.27
15.	Nagaland	1	0.29
16.	Orissa	164	73.75
17.	Punjab	957	116.95
18.	Rajasthan	425	219.65
19.	Tamil Nadu	7725	474.28
20.	Uttar Pradesh	24	10.55
21.	West Bengal	10,000	37.00
	Total	**41,247**	**8682.81**

NOTE : The WUAs in the States of Chattisgarh, Jharkhand and Uttaranchal are included in the respective States in which they were earlier geographically located. In the remaining States no progress on formation of WUAs is reported.

SOURCE : CADA, MOWR, Govt. of India, New Delhi

Annexure – 2
(Ref.: Para 3.2.1)

WATER RATES FOR PRINCIPAL CROPS IN VARIOUS STATES AND YEAR OF REVISION

Sl. No	Name of the State	Water Rates (Rs./ha)			Year in which rates were last revised	Remarks
		Rice	Wheat	Sugarcane		
		(Kharif)	(Rabi)			
1.	Andhra Pradesh	494.00	494.00	494.00	4.1997	w.e.f. 1.7.1996
2.	Arunachal Pradesh					No water rates levied
3.	Assam	140.62	281.25	111.00	3.1993	
4.	Bihar	175.00	150.00	370.00	11.1995	
5.	Goa	150.00	NA	300.00	1.2.1988	
6.	Gujarat	125.00	110.00	830.00	1981	
7.	Haryana	113.15	91.39	148.20	1998	
8.	Himachal Pradesh	24.30	14.60	41.09	1977	
9.	Jammu and Kashmir (Jammu)	20.10	10.80	20.07	1976	
	Srinagar	16.30	8.20	NA	1976	
10.	Karnataka	86.50	54.40	370.67	1985	
11.	Kerala	99.00	62.00	99.00	1974	
12.	Madhya Pradesh	197.69	247.11	741.33	1992	
13.	Meghalaya					No water rates levied
14.	Maharashtra	200.00	200.00	1750.00	1.7.1994	
		200.00	200.00	2625.00	1.7.1998	
		220.00	220.00	2890.00	1.7.1999	Declared the rates
		240.00	240.00	3175.00	1.7.2000	in advance
		265.00	265.00	3495.00	1.7.2001	
		295.00	295.00	3845.00	1.7.2002	
		320.00	320.00	4230.00	1.7.2003	
15.	Manipur	75.00*	37.50	NA	Dec., 1981	
16.	Mizoram					No water rates levied
17.	Nagaland					No water rates levied
18.	Orissa	100.00@	85.00	250.00	1998	
19.	Punjab					Water free of charge
20.	Rajasthan Pre-1962 works	56.80	51.90	123.56	1982	
	Post-1952 works	98.80	74.10	143.32	1982	
21.	Sikkim					No water rates levied
22.	Tamil Nadu	37.10	NA	49.42	1962	
23.	Tripura	30.00	30.00	NA		At present no water rates are being collected
24.	Uttar Pradesh	287.00	287.00	474.00	1995	
25.	West Bengal	37.10	49.40	370.66	1977 & 1984 for minor irrigation	
26.	A&N Islands					No water rates levied
27.	Chandigarh					Data not available
28.	D&N Haveli				1970, 71, 72, 73	For different schemes
29.	Daman & Diu				1980	
30.	Delhi				During IVth Plan	
31.	Lakshadweep					No water rates levied
32	Pondicherry				1979	

Source : Planning Commission

* Early Paddy Rs.73.00 ha Kharif 37.50 ha

@ Compulsory Kharif I Class irrigation work Rs.225/ha for Dalua

Annexure-3
(Ref.: Para 3.2.1)

STATEWISE & YEARWISE PERCENTAGE RECOVERY OF WORKING EXPENSES THROUGH GROSS RECEIPTS IN IRRIGATION & MULTIPURPOSE RIVER VALLEY PROJECTS

Sl N	Name of the State	74-75	75-76	76-77	77-78	78-79	79-80	80-81	81-82	82-83	83-84	84-85	85-86	86-87	87-88	88-89	89-90	90-91	91-92	92-93	93-94	94-95	95-96	96-97	97-98	98-99
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
1.	Andhra Pradesh	15.5	16.9	7.5	7.7	8.7	7.6	7.0	6.6	6.8	120.2	21.8	36.9	10.0	7.7	1.1	11.2	17.0	4.0	15.3	15.1	16.9	13.3	8.0	1.0	1.0
2.	Bihar	72.5	94.4	61.2	74.0	39.5	47.4	63.2	39.8	49.3	58.4	29.8	29.3	15.1	19.6	12.1	10.4	11.0	23.0	28.0	26.1	21.8	36.9	35.0	28.0	25.0
3.	Gujarat	71.1	94.3	84.1	90.6	71.3	70.6	34.4	16.0	30.8	35.7	35.4	25.8	44.6	6.5	5.7	4.8	6.0	6.0	6.1	6.0	7.4	5.1	4.0	9.0	10.0
4.	Haryana	55.3	77.9	86.6	68.4	66.2	55.2	64.4	57.5	43.5	42.9	37.7	46.8	57.0	9.1	16.6	11.7	16.0	11.0	10.7	11.5	4.4	9.5	5.0	11.0	23.0
5.	Jammu & Kashmir	6.0	2.0	3.2	4.1	3.1	2.2	1.8	1.5	1.9	0.6	5.8	8.0	13.7	4.9	7.1	4.4	3.0	3.0	4.6	2.8	4.7	14.0	6.0	5.0	3.0
6	Karnataka	97.6	129.0	83.4	76.4	95.5	85.9	7.6	77.3	33.2	50.9	29.7	6.8	38.7	10.1	10.3	10.5	10.0	15.0	7.4	5.3	4.4	4.9	9.0	10.0	20.0
7	Kerala	51.2	69.6	50.8	135.9	58.7	139.2	49.5	24.4	32.0	82.9	37.8	24.9	16.5	6.3	11.8	8.3	9.0	8.0	6.3	8.3	5.4	7.7	10.0	25.0	30.0
8	Madhya Pradesh	129.3	539.9	*	*	1401.8	*	45.5	30.7	39.8	44.8	30.2	41.8	33.3	31.8	35.1	21.2	22.0	24.0	24.4	7.1	29.3	21.3	25.0	15.0	14.0
9	Maharashtra	166.0	134.4	98.8	97.2	78.8	93.5	93.8	94.1	78.7	61.1	47.3	48.9	43.3	5.9	5.2	6.3	4.0	4.0	6.9	10.3	8.0	7.3	5.0	4.0	2.0
10	Orissa	30.7	86.4	71.9	75.7	60.9	46.3	46.8	69.8	79.3	95.0	64.3	134.9	209.0	45.8	46.2	28.6	22.0	2.0	42.6	16.2	11.6	24.7	13.0	12.0	19.0
11	Punjab	63.2	113.4	106.7	106.5	92.3	8.8	73.8	69.3	26.6	50.0	81.5	48.3	51.5	21.0	25.2	22.3	16.0	16.0	14.5	14.7	31.6	27.0	18.0	6.0	9.0
12	Rajasthan	49.6	104.9	105.7	57.0	65.5	66.0	55.9	46.5	51.2	43.7	43.6	19.3	16.1	11.3	9.7	12.3	11.0	12.0	8.9	7.1	7.1	6.4	7.0	6.0	4.0
13	Tamil Nadu	22.5	9.9	8.6	6.9	5.3	6.4	15.6	2.5	11.0	6.4	7.7	6.8	4.3	1.9	2.0	2.0	3.0	3.0	2.2	3.0	2.9	2.5	2.0	3.0	3.0
14	Uttar Pradesh	123.3	184.9	286.4	201.7	218.2	187.7	134.4	152.7	111.7	186.9	48.4	169.8	48.8	6.8	10.0	10.4	9.0	8.0	9.2	30.5	11.8	17.0	16.0	6.0	7.0
15	West Bengal	38.2	46.8	35.0	31.5	11.2	20.8	11.0	8.1	16.5	13.1	8.8	7.3	4.6	3.8	3.6	3.5	3.0	3.0	3.8	3.3	4.0	2.7	2.0	2.0	2.0
ALL INDIA		**64.2**	**91.1**	**92.9**	**76.2**	**69.6**	**71.7**	**45.8**	**45.3**	**49.3**	**60.3**	**38.8**	**46.0**	**34.1**	**9.9**	**7.8**	**9.3**	**9.0**	**8.0**	**10.2**	**12.9**	**10.2**	**10.4**	**8.3**	**6.2**	**6.7**

Source : 1. Combined Finance and Revenue Accounts of Union and State Governments of India
2. Central Water Commission (Statistics Directorate)

Remarks: 1* Due to more credits in irrigation Project (Non-Commercial) which resulted in negative working expenses, figures not given.
2 Working expenses for the year 1987-88 and onward are inclusive of interest on capital at the end of year.

Annexure-4
(Ref.: Para 3.2.3)

MINISTRY OF WATER RESOURCES (CAD) GUIDELINES FOR INVOLVING FARMERS IN WATER MANAGEMENT OF IRRIGATION SYSTEMS (1987)

1. Background

Irrigation facilities are created for supplying water to the farmers for raising crops so as to increase their agricultural production and cropping intensity through assured supply of water. The major and medium irrigation systems are planned, constructed, managed, maintained and operated by the Irrigation Departments, wherein certain procedures and rules are evolved and followed in respect of regulation of canals, frequency of supply and distribution of water amongst farmers.

The scheduling of irrigation, time of supply and the number of waterings to be given are hardly discussed with the users, except in some adhoc Committees set up at the Divisional or Sub-Divisional level. Until now the Irrigation Acts initiated during the British period are being followed, wherein each individual farmer is expected to deal directly with the Government except that some mutual cooperation is sought in case of water distribution under warabandi system being followed in the states of Punjab and Haryana.

The present system of water management does not provide for collective efforts in self-governance by the users. The result is that there is no effort in self-governance by the users. Thus there is neither any effort on the part of the farmers to maintain even the field channels, which are constructed in their field by the Government, nor the sense of economical use of water is generated among the users.

There is an increasing and pressing demand from the States, that the field channels constructed recently by the CADAs on behalf of the farmers should be maintained by the Departments or CADAs at the Government cost, as the farmers are not coming forward to maintain them. So far, we have constructed field channels in an area of about 9 million ha, but by the end of 7th Plan the total coverage under the field channels alone would be over 14 million ha. The position of maintaining the irrigation canal systems upto the outlets is also not satisfactory due to lack of funds and as such additional responsibility of maintaining the field channels and field drains would not improve the situation and the Departments would also not be able to cope with the additional burden and responsibilities.

Moreover the present system of management puts tremendous pressure on the Departments in maintaining the main system, planning of deliveries through the main canal/ branches and also preparing the schedules for individual farmers. The result is that the supplies are made arbitrarily, which neither benefits the farmers nor the crops.

2. Necessity of involving Farmers in the Management and Maintenance

The research in agriculture particularly in the field of agronomy in recent years has led to the evolution of hybrid and improved varieties having very high potential yields. However, these varieties are susceptible to water stress particularly at critical growth stages and therefore need very precise water management. Accurate information is now available about the soil plant-water relationship particularly when to irrigate, how much to irrigate and how to irrigate for better water use and application efficiency. Introduction of irrigation particularly in public delivery systems envisages changes in cropping pattern, cropping sequence and farming habits, so as to increase the irrigation as well as the cropping intensity by taking maximum advantage of the natural precipitation, irrigation and ground water.

Irrigation is a community subject and unless all the farmers in a given area adapt themselves to a certain common approach in selecting varieties of crops, sowing time and cropping sequence; the water deliveries would not match exactly with the crop water requirements for getting higher yields. The maintenance of field channels and field drains is also very important to get full quantity of water released from the outlets and also to remove excess water from the fields through drains, so as to maintain the health of the soils.

The present method of undertaking the responsibility of supplying water to individual farmers by the Irrigation Departments or by CADAs is not able to improve the water supplies or achieve economic as well as optimum utilisation of the irrigation potential. In this context, it is necessary to think some of alternative arrangements, which would improve the water deliveries for optimal production per unit volume of water.

The necessity of involving farmers in water management has been recognised by the planners over the past few years. This is based on the assumption that water distribution costs would get reduced, the maintenance of the irrigation systems at micro level would be achieved, the beneficiaries would have sense of owning the system, which would motivate economic use of the water and the effectiveness of the system would improve. Reliability of assured water supply made known to the beneficiaries would also motivate them to go for appropriate inputs leading to higher productivity. The distribution of water will be equitable and schedules of supply could be more effective. It is, therefore, felt that farmers' participation would ultimately give stability to the operation and maintenance of the irrigation system.

3. Experiences Abroad

Some studies have been carried out by FAO/Ford Foundation in organising the farmers and entrusting them with the task of water management and maintenance of the system. The promising ones are the experiments carried out in Philippines and Sri Lanka. In both these countries, an effort was made to induct `Catalysts' or `Organisers' in the command area. These `Catalysts were qualified professionals and had been trained in irrigation systems, irrigated farming, cooperation, organising farmers and building confidence in them to take up active part in planning, designing and execution of the systems in the first instance and managing the water delivery and maintenance of the system in the second phase. The Organisers started with simple tasks, which could be undertaken by groups of farmers through their organised actions, such as recruiting members for the associations, repairing the damaged structures, etc. The farmers' associations were then built up and water distribution procedures formulated. It came to the notice through these experiments that the farmers if approached in well-conceived manner with their interests clearly understood, they respond with resources and initiative. It was also noticed that promotion of improved water management would proceed better and provided better results if not focused only on water management exclusively, but rather, if associated with agriculture and other social activities, whenever the members desired so. Experience in other countries including U.S.A. and Mexico have also shown that for obtaining optimum returns from irrigation investments, the management of water should be with the farmers/ beneficiaries.

4. Experiences in India

In India, also, there are quite a large number of cases where farmers' associations, either formal or informal, have been successfully managing the irrigation systems and distributing waters to all the farmers in the respective commands. These associations have been able to economise the use of water, increase productivity and create a sense of reliability and assurance in all the farmers in getting the water on time and in adequate quantity for various crops. Some of these cases are described below.

4.1 **'PHAD' System:** 'Phad' system is the management of irrigation by a group of beneficiaries. For over 200 years such a system of irrigation management has been practised on small irrigation works in North-Western parts of Maharashtra. The irrigation system comprising of low diversion weir and distribution network is managed, operated and maintained by the beneficiaries themselves, through 'Phad' system. The Government only framed guidelines as to how the implementation by the beneficiaries was to be done and how accounts should be maintained.

4.2 **Mohini Water Cooperative Society**: With the conventional water distribution, the farmers at the tailends are the sufferers. On the other hand, the farmers in the head reaches use more water than required by the crop and thus not only waste the costly water, but also spoil their valuable lands in the long run. To find answer to this menace, the farmers of Kakrapar irrigation project in Gujarat have formed a water cooperative society named as Mohini Water Cooperative Society. The water is sold to the cooperatives in bulk and water rates are levied on basis of volume of water measured at the supply point. The responsibility of equitable and efficient distribution of the water amongst the farmers vests in the cooperative society.

4.3 **Sinchai Panchayats in Tawa Project (M.P.)** Sinchai Panchayats have been set up in a number of irrigation divisions in the command area of Tawa Project of M.P. These panchayats are entrusted with the responsibility of orderly management and distribution of irrigation water. Successful operation of the water distribution through warabandi/osrabandi is also a major responsibility entrusted to these panchayats. A detailed note on the working of these panchayats is given at Annexure-IV.

In addition, there are cases of irrigation cooperative societies in Kolhapur, Satara, Sangli and Ahmednagar districts of Maharashtra; informal farmers groups distributing water equitably in the delta areas of Tamilnadu and also farmers' groups distributing water in old Vijayanagaram canals in Karnataka.

The above examples indicate that the farmers in India have necessary skills, ability and capacity to manage irrigation economically for maximising the agricultural production from the available water resources. It is felt that if the farmers are trained in water measurement, water accounting and budgeting as well as modern on-farm water management practices, they would be able to manage the distribution in a more economic manner.

5. **Objectives of Farmers' Participation in Water Management**

1. To initiate participation of farmers (who are the users' of water supplied from the system) in water management, irrigation scheduling, distribution and maintenance of system at micro levels so as to -
   (a) Improve irrigation as well as water use efficiency for optimal production per unit volume of water;

   (b) Make best use of natural precipitation and ground water in conjunction with the canal water for increasing irrigation and cropping intensity in the commands.

2. Develop sense of economy in water use among the users.

3. Facilitate the users to have a choice in selecting crops, cropping sequence, timing of water supply and period as well as frequency depending upon the soils, climate and other infrastructure facilities available in the commands, such as roads, markets, cold storages etc., so as to maximise the incomes and profits.

4. Delineate responsibility in water distribution and maintenance of system between the users and the Departments for attaining high serviceable standards of the system.

5. Promote incentive to the farmers by way of less water charges to those, who use water efficiently.

6. Entrust collective and community responsibility on the farmers to collect water charges and payment to Governments.

7. Improve and sophisticate deliveries precisely as per crop needs by the Departments at the supply points of the minors and thus reduce operation losses.

8. Create healthy atmosphere between the Managers and users in the entire operation.

6. Area of Operation of Farmers' Associations and Methodology

The Associations will function efficiently, if the number of farmers is less, as this would have better cohesion and interaction amongst the farmers. The area of operation should also be continuous and connected for measuring the water deliveries and maintaining water accounts. However, large number of farmers can be accommodated under one Association, if the structure is built in two tiers viz. (i) Outlet Committees and (ii) Association at the minor level.

Every outlet should have a Committee of five members, out of which two should be from head reach, two members from tail reach and one from weaker section. One farmer should be selected as Outlet Leader who would be the Member of the managing committee of the Association at the minor level. It is necessary to form Association at the minor level and not at the village level, as the source of getting water being same in case of minors, there would be common interest developed amongst the members to act together. The Committee or Association at the village level would have vested interests and therefore may not be functional. The area of operation should be chosen in such a way that the managerial expenses in the long run would be less and with this point of view an area of 1000 ha appears to be reasonable, as the annual burden of managerial expenses would not be more than Rs.100 per ha.

6.1 Selection of Minor

The selection of a minor for pilot project in initiating the farmers' participation could be as under:

1. The command area is compact and where the construction of minor and the field channels and lining is completed. The condition of the micro system is reasonably, good though not very upto date.
2. There is a head regulator with gated control with measuring devices at least at the minor and preferably at the outlets.
3. The minor as a whole is receiving water without difficulty from the main system and the utilisation level is over 50%. Such prospective areas may be identified and the response from the farmers in initiating associations should be assessed by a fairly senior level officer through discussions with the farmers for final selection.

6.2 Methodology

Once the minor or group of minors are selected, the irrigation staff should be asked to conduct detailed survey regarding-

1. Discharging capacity of minor, area planned to be irrigated and actually irrigated.
2. Quantity of water release during past few years and the area irrigated per thousand cubic metre of water, seasonwise.

3. Actual seepage and transit losses in the minor as well as field channels, so as to work out the net water, which can be delivered to the farms vis-a-vis the water released from the head regulator of the minor.
4. Working out allocation of water for the selected minors in different seasons and also the water allocation per ha seasonwise.

The CAD or extension staff at the field level should visit the area and hold discussions with the individual farmers or the groups of farmers at the outlet level or in case of bigger outlets, group of farmers on branches of field channel separately and explain the management below the minor level. The staff should be apprised of the exact benefits. The farmers would get, in this process, by way of increase in irrigation, increase in production, saving in water charges, future prospects and thereby gains through organising inputs, transport, marketing and processing industries.

Once the farmers are appraised of the benefits in working together as well as taking over management; Outlet Committee should be formed and the election of the outlet Leaders should be carried out in the presence of representatives from the Departments, such as Patwaris or Canal Inspectors and the Extension Workers.

A meeting of all the Outlet Leaders/Members of the managing committees should then be organised and the collective and community advantages should be discussed with them by a senior level officer. The responsibilities and the duties of the Association in respect of water distribution and maintenance should be explained. The technical help that would be rendered by the Department, and the legal back up to Association should also be mentioned.

After the Committee resolves to form an Association, the same should be vetted by a general meeting involving all the farmers in the command and thereafter action may be taken to register the Association under the Registration of Cooperative Societies Act or under the Registered Societies Act.

Initially one Canal Inspector or Patwari may be deputed to the Association to work as Manager with one or two Assistants to be paid by the Association. The Canal Inspector or Patwari will later on be replaced by a Manager appointed by the Association.

Membership

The provisions under the Registered Societies Act or Registration of Cooperative Societies Act may be different in different States in order to cover the interests all the farmers in water management. Following minimum provisions need to be made in the model laws or bye-laws;

1. All the farmers in the command should be eligible to be members of the Outlet Committee and also the Association at the minor level. Every farmer will have only one vote in electing the Outlet Leader, passing resolutions in the general meetings of Outlet Committees or the Association.
2. If the 2/3rd of farmers become members of the Association, the rules in respect of water distribution/deliveries and management of water at the farm level as resolved by the Association should be binding on the farmers, who are not members. The non-members however shall not be deprived off getting water as per allocations and rules framed by the Association.

The Patwari or Canal Inspector may be ex-officio Member of the Outlet Committees and the Junior Engineer or equivalent CAD officer may be ex-officio Member of the Farmers' Association at the minor level. These ex-offcio members will not have voting right in electing the office bearers or the Chairman, etc. or in passing different resolutions, but may guide the Members of the Committee

regarding the allocation of water, general procedure for water distribution, provisions in the Irrigation Act or canal rules and other legal matters. They will provide information about the actual availability of water before each season and the approximate area that could be irrigated from the authorised or allocable water in the respective minor command.

The Managing Committee of the Farmers' Association will resolve disputes amongst members in respect of water distribution, water turns, allocate water to individuals; outlets, out of the allocable water for the minor as decided by the Department, undertake correspondence with the irrigation/CAD Departments in all connected matters, prepare water budget, decide the date of supply of water and the frequencies, doses etc., place indents and maintain water accounts as well as accounts for the expenditure on maintenance and repairs. The Committee also would be responsible for levying taxes for maintenance and repairs of the system.

The Managing Committee may elect one farmer to work as Chairman of the Association and one as Vice-Chairman and also may set-up different Working Committees for water distribution, maintenance and repairs, collection of water taxes, collection of contribution for maintenance of field channels and field drains, etc.

6.4 Duties and Responsibilities

The duties and responsibilities of the Farmers' Association could be worked out in stages, starting gradually from distribution of water as per the schedules prepared by the Department in the first season and for taking over the control of the entire minor in respect of operation, maintenance and supply of water on volumetric basis in three or four succeeding seasons.

6.4.1 First Season

a) Distribution of water as per schedules prepared for different rotations of water supply/warabandi by the Department.

b) Measuring discharge of water at minor and outlets and maintaining water account, i.e., total water delivered from the minor in the season. The water charges could be assessed as per the conventional area basis, but compared with the volumetric rates of supply, as agreed upon.

c) Demonstrate the practice of improved on farm water management methods for improving field application efficiency in the individual farmers' fields.

d) Maintain field channels and field drains through contributions from the members either in cash or by labour and maintain separate accounts of expenditure.

6.4.2 Second Season

(a) Prepare schedules for water supply for the outlets.

(b) Measure discharge of water at minor and outlets and maintain water accounts, i.e., water delivered at the head regulator of the minor and the outlet, work out area irrigated per thousand cubic metre of water and compare the water charges as per the areas irrigated with the volumetric rates as agreed upon.

(c) Convince the farmers regarding minimising operational, deep percolation losses, so as to reduce the cost of water.

(d) Prepare fields for receiving irrigation as per the improved methods, such as borders or furrows etc. Provide training and demonstrations for better application efficiency at the fields.

(e) Maintain field channels and field drains.

6.4.3 Third Season

(a) Prepare crop plans for the irrigation season giving crops and their area.

(b) Prepare layout of fields for adopting better on-farm water management.

(c) Prepare indents for water for the seasons and rotation.

(d) Maintain water accounts and prepare bills for the individual farmers based on area basis while remitting water charges to Government on volumetric basis as per agreement.

(e) Maintain and repair field channels and field drains including lining and earthwork of the minor.

6.4.4 Fourth Season

(a) Educate farmers about water rates on volumetric basis or supply in terms of hectare cm and billing the farmers on volumetric basis, as well as remittance of water charges to Government on volumetric basis.

(b) Maintain and repair the minor/distributary, structures from the maintenance grants to be received from State Government and maintain separate accounts.

(c) Maintain the entire on-farm development works, i.e., field channels and field drains including structures and collect contributions from the farmers either in cash or in labour.

(d) Prepare complete annual reports describing the water account, irrigation efficiency and water use efficiency, crops grown, production and value of crops.

6.4.5 Further Prospects

(a) Later on the Association may expand its activities further in respect of organising of inputs, i.e, seeds, fertilisers, pesticides needed for agricultural production and distributing the same to the individual farmers.

(b) The Association may also procure agricultural implements for the community and hire them to the individuals.

(c) Organise transport, storages and marketing of the agricultural produce, with a view to increase the profit margins of the growers.

(d) Once the Association members decide common and uniform crops in the area; agro based industries for processing the agriculture production can also be initiated, so as to avail more profits by the farmers.

7. Advantages to the Farmers

1. The farmers will have privilege of owning and managing system themselves.
2. Choice for selecting suitable frequencies of water deliveries and doses as needed by the crops, so as to enable them growing suitable crops which would given them increased production and profits within the allocable water from the project.
3. Security and reliability in getting water as per agreement with the Department.
4. Attaining a stable state of irrigation facilities as per agreement and thereby minimising the alterations or deterioration in the supply due to arbitrariness of the Irrigation/CAD staff. Incentive for economical use of water, as more the water saved, less would be the payment of water charges.
   (a) Possibility of increasing profits through organised transport, storage, marketing and processing.
   (b) Priority in getting irrigation water in case of shortage of water due to less replenishment in the system.

8. Duties and Responsibilities of the Department

1. The quantity of water allocable to the Association in normal years based on the area of the minor on pro-rata basis will have to be worked out and communicated to the farmers.

2. The discharge at the minor level will have to be maintained as per the indents placed by the Association of irrigation water.

3. Measuring the volume of water supplied to the Association and billing them in time.
4. Monitoring the working and performance of the Association through ex-officio Members in the Outlet Committees and Association, so as to ensure equitable distribution of water to all the farmers.
5. Intervening, in case the agreements are violated or the water rights of the weaker-sections are not protected, by the Association.
6. Accommodate choice of farmers in respect of water deliveries, period of flow, frequencies within general time schedules prepared for the project.
7. Maintain the system upto date and ensure supplies at full capacity in the main system.
8. To provide incentives to farmers like lining of minors, field channels, etc. for better supply of water.

8.1 **Advantages to the Department**

1. As the supply points are reduced, the time and energy in settling disputes of the individual members in sharing water amongst individual farmers would be reduced.
2. More attention can be given to programming and water scheduling at the minor level. This will however involve additional responsibility regarding effective supply precisely and punctually at the respective points, i.e., at the minor level.
3. As the sense of economy is built up in all the users, the irrigation efficiencies would be higher. Thus the problem of under utilisation will be reduced.
4. The role of irrigation staff and the status of the field functionaries in the society will improve, as in the new circumstances the irrigation staff would not be responsible for supplying water to the farmers but will have to work as judges or arbitrators in resolving conflicts and giving fair justice to all the farmers.

9. **Incentive to the Farmers for Future Development and Improvements**

There is no necessity of updating or sophisticating the system, i.e., lining of the minor or field channels before initiating the Association. If the system at present is workable and able to provide water to all the farmers with measuring devices at the minor and outlet level to work out the volume of water released it would be reasonably good for initiating such participation. The rates for volumetric supply can be worked out in the present circumstances in such a way that they are not more than the rates charged as per the area basis.

The Association can be assured that if they organise and take up the supply on volumetric basis and if their performance is good, the lining of minors and field channels would be taken up by the Department on priority, which will improve the availability of water further and also will reduce cost of water, as more water will be made available to the farms after lining. The Association can also be assured about the improvements in control structures by providing level control or automatic gates, which will further reduce the operation losses and ensure proper supply.

Such improvements be considered as points for negotiations or beginning with the Farmers' Associations and to provide incentive for better performance and economical use of water.

10. **Training**

The training of farmers, Members of the managing committee and the managerial staff of the Associations can be arranged in stages as follows;

1. Reading gauges at minor, flumes or V. Notches at the outlets, calculating discharge in litres/sec as per the readymade tables showing gauges versus discharges.
2. Calculating quantity of water by multiplying discharge in litres/sec. with secs, to get volume of water in thousand litres, units.

3. Cost of water per thousand litres or thousand cubic metres as per the annual cost of the project.
4. Water rates on volumetric or bulk supply water rates as per area basis as per the prevailing practices.
5. Crop water requirements with due adjustments at the field level, outlet level and minor level, depending upon the seepage losses in the system.
6. Irrigation layout for preparing fields to receive water, methods of irrigation, improvement in application efficiency by controlling stream size and cut-off time.
7. Calculation of water used for irrigation in ha/cm and total quantity of water required and used per season.

10.1 Measurement of Water and Water Management at Field Level and Maintenance

1. Cross-sections required for ensuring desired flows in the channels.
2. Relation of bed gradients and obstruction to flow due to structures, with the discharging capacities and thereby necessity of desilting and de-weeding.
3. Earthwork for the field channels, minors and field drains, maintaining bed level, top of banks, consolidation and compaction of earth work as well as maintaining adequate heights of banks and structures.
4. Energy dissipation at the falls and structures for maintenance of water cushion depths.
5. Maintenance of structures, i.e., cement pointing, plaster for masonry, pitching and lining, etc.
6. Maintenance of gates and other parts of the control structures.

10.2 Water Scheduling

1. Water allocation per ha in case of warabandi. supplies based on prorata basis as per roasters and holdings.
2. Water required for irrigating one ha with a given delta in ha/cm and thus calculating time of supply from the outlet for standard discharge of 228 litres per second at the outlet. Working out time required for flow through the outlets as per the actual irrigated area.
3. Roastering of rotation of outlets on minor depending upon the capacity of the minor.
4. Preparation of water schedules for individual farmers, outlets and minors.
5. Water budgeting for the season and water accounts at the end of the season.

10.3 Other Aspects

1. Rights, duties and responsibilities of every individual member of the Association.
2. Duties and responsibilities of the Outlet Leaders, Members of the managing committee, Chairman and Vice-Chairman as well as Professional Managers and staff employed by the Association.
3. Business rules for Executive Committee, Meetings for the general body of the Outlet Committee and general body of the Association. Recording proceedings of the meeting.
4. Points and subjects to be discussed during the meetings and procedure for passing resolutions and recommendations.
5. Mode of correspondence with the Department.
6. Presentation of water budget, water account regarding maintenance of accounts of expenditure.

11. Monitoring

The Farmers' Association is a new experiment and in order to build up the Associations on proper lines and establish good traditions, which will provide guidelines to other organisations likely to come up in future; timely and accurate monitoring by the Irrigation Department/CAD would be necessary. The monitoring of the Farmers' Associations should be done by the Junior Engineer or

equivalent officer and that of all the Outlet Committees should be done by the Patwaris or Canal Inspectors. The points for monitoring are:

1. Timely conducting meetings of Outlet Committee or Associations, i.e, one before each season for preparing crop plan, water budget, negotiations with the Departments, placing indents etc.
2. Accuracy and precision in measuring discharges and maintaining water accounts.
3. Maintenance of expenditure.
4. Ability of the Association for giving equal justice to all beneficiaries and their performance in this respect.
5. Billing the individual farmers for water taxes and collecting the dues from the members and remittance to the Government in time.
6. Preparation of annual reports regarding irrigation efficiency, water use efficiency, area of irrigation, production value of crops and economy in water use.
7. Higher level officers should pay visits to the Association offices and area during their normal visits and assess the working of the Association, its ability to function and capability of giving equal justice to all the members. More critical examination and close water need to be carried out to see that the Association is not used by a few influential farmers to exploit the water resource at the cost of the weaker sections.

Administration and higher-level officers should pay visits to these Associations and guide them in improving their performance/working, so as to achieve the objectives fully. It is also necessary to post capable and efficient officers in such areas so as to guide the farmers in building up Associations, explain them the benefits and establish good traditions. It also would be necessary to impress upon the field functionaries that the participation of the farmers is sought for not to hand over the responsibility of water distribution and water accounting etc., to the farmers but the main objective is to involve them in the entire functioning and working as partners and thus improve the irrigation efficiency and production from irrigated agriculture.

MINISTRY OF WATER RESOURCES GUIDELINES FOR FORMATION OF FARMERS' ASSOCIATION (WUA), 1995

COPY OF D.O.LETTER NO.7-1/95 CAD DATED 19.06.1995 FROM THE HON'BLE MINISTER FOR WATER RESOURCES AND PARLIAMENTARY AFFAIRS, GOVERNMENT OF INDIA.

Dear Janakibabu,

It is a matter of great concern that the irrigation potential created in the country so far has not yet been fully utilised. It is estimated that in India there is a yawning gap of 8.24 million hectare between potential created and utilised. The situation needs to be urgently remedied.

One of the major causes for this inefficient management of water resources is that there is little or no involvement of farmers in the management of irrigation system. As a result, the supply of water to farmers is often unreliable, at variance with their needs, iniquitous, unsustainable and insufficient.

The situation can be improved substantially, if farmers are actively involved in the management of the irrigation system. The Command Area Development Wing of the Ministry of Water Resources had urged the States to set up Farmers' Associations and issued guidelines as early as 1987.

The National Water Policy (1987) approved by National Water Resources Council, also emphasized "that efforts should be made to involve farmers progressively in various aspects of management of irrigation system, particularly in water distribution and collection of water rates. It is widely recognised that without active involvement of beneficiaries in irrigation water management, the objectives of irrigation projects could not be realised, and even if they are realised, they can not be sustained in the long run."

An Advisory Committee under my Chairmanship was constituted in 1994 to suggest improvements in CAD programmes. This Committee also suggested active involvement of farmers in the management of irrigation. One of the major recommendations of the Committee was formation of Statutory Command Area Development Boards at the CAD Authority or Project level and an Advisory Council at the State Level. It was envisaged that both these bodies would have at least 60 per cent representatives of farmers and non-officials and 40 percent or less of officials. The Command Area Development Board would be the decision making body at the level of the CAD Authority.

It is now proposed to channel the Plan allocations for CAD Programme directly through CAD Boards to the Farmers' Associations to make them more responsive and accountable. The minutes of the Advisory Committee were circulated to the State Governments for taking action. However, so far no positive action appears to have been taken by most of the State Governments.

In Orissa, it has been reported that 777 Farmers' Associations have been formed in the commands of Mahanadi Stage-I, Mahanadi Stage-II, Hirakud and Salandi Projects. It is understood that many of these Associations are not functional. Further some new projects have been included under the centrally sponsored CAD Programme, where Farmers' Associations have yet to be formed. Moreover, Orissa is going to be included under Water Resources Consolidation Project, one of the conditions of which is that

Farmers' Associations should be formed and empowered. Moreover, Orissa has so far not taken any steps to set up CAD Boards and CAD Council.

Although I realise that it is not possible to have a universally replicable model, I am enclosing some guidelines for formation of Farmers' Associations, CAD Boards and State Council for adoption and implementation at your end. The State Government may make necessary modifications according to the local needs.

We feel that Plan funds under CAD Programme can be better utilized, if these are channelled to Farmers' Associations through CAD Boards. It is, therefore, proposed that hereafter both the Union Government and the State Government should release funds to be utilised by Farmers' Associations directly to CAD Boards.

It is requested that the State Government should immediately initiate steps to constitute Farmers' Associations, CAD Boards and CAD Council. Plan Funds under CAD Programme will be released after the CAD Boards and Farmers' Associations are constituted. I suggest that CAD Boards and Farmers' Associations should be constituted by the end of September, 1995, so that release of funds is not unduly delayed.

Amendments to State Irrigation Acts, Command Area Development etc. will be necessary to provide for constitution of Farmers' Associations, CAD Boards and State Council. This may also please be attended to.

I earnestly hope for an early action by your State in the matter.

Regards,

Sd/-

(VIDYACHARAN SHUKLA)

Shri J.B. Patnaik,
Chief Minister of Orissa,
BHUBANESHWAR

Note : Similar letters have been addressed to the Chief Ministers of other States.

GUIDELINES FOR FORMATION OF FARMERS' ASSOCIATION (FA/WUA)

(enclosure to Minister (WR)s letter no. 7-1/95 CAD dt. 19.6.1995 addressed to all Chief Ministers of the States)

The various steps involved in the formation of farmers' association (FA) are briefly listed below:

* Identify the hydraulic unit for which FA is to be formed; such as
  - Outlet
  - Minor
  - Branch

  It could preferably be the minor because of homogeneity and financial viability.

* Motivate the farmers in order to:
  - Decide who should be incharge of this crucial work; and
  - Involve NGOs and WALMIs.

* Reach agreement among a minimum of fifty one percent of landholders of land in the Command of formation of Farmers' Association.

* Decide the Act Under which to register the Association/Society
  - Cooperative Act.
  - Registration of Societies Act.
  - Companies Act.

Before applying for registration ensure that all statutory formalities have been complied with and ensure that it does not violate existing Irrigation Act and Land Revenues Act.

* Draft bye-laws of Associations. Bye-laws should be in accordance with the objective of Participatory Irrigation Management.
* Undertake joint inspection of the system by Farmers' Associations, Irrigation Department (ID) and CADA.
* Prepare a list of deficiencies and needed improvements for rehabilitation of the system being transferred.
* Define duties, responsibilities and rights of Farmers' Associations and Irrigation Department. These are broadly listed below:

Duties of Farmers' Associations

- Establishment and updating register of members.
- Preparation of cropping plan at the beginning of irrigation season.
- Receiving water in bulk on volumetric basis from ID.
- Payment of water fees to ID.
- Delivering water to the registered members.
- Arranging supply of water to non-members at differential rate.
- Taking the execution of OFD works and maintenance of accounts and submission of accounts to CADA Boards regularly.
- Operation and maintenance of the infrastructure transferred to them.
- Maintenance of water accounts.
- Recovering of water rates.
- Educating of farmers in applying new technology.

Duties of Each Member of Association/Society

- Submission of cropping plan at the beginning to season of Farmers' Associations and applying for irrigation water.
- Preparation for election to officials of Farmers' Associations.
- Payment of dues of water rates.
- Abiding by bye-laws of Association/Society.
- Usage of water efficiently.
- Ensuring no damage to irrigation structure.

Duties of Irrigation Department

- Entering into agreement with Farmers' Associations
- Supply of water to Farmers' Associations as per agreement.
- Providing maintenance grants to Farmers Associations. The amount given by the Government to ID for maintenance of tertiary system should be passed on to Farmers' Associations.
- Maintenance of the equipments for measuring the supply of water at the offtake of minor.
- Preparation of bills seasonwise and send to Farmers' Associations for payment.
- Continuing to collect and maintain statistics regarding irrigation potential created and its utilisation.

Duties of CADA

- Conversion into CAD Board with more than 50 per cent participation of farmers, non-officials and academicians. Necessary legislation has to be passed.
- Assuming responsibility for formation of Farmers Associations.
- Disbursement of fund to Farmers' Associations as received from State and Union Governments.
- Providing technical assistance to Farmers' Associations.
- Maintenance of the accounts.
- Maintenance of register of all agreements entered into between ID and Farmers' Associations.
- Training of farmers to form Associations/Societies.
- Giving utilisation certificate of grants received from Union/ State Governments.
    * Sign MOU between Farmers' Associations and Irrigation Department. (Sample MoU enclosed).
    * Move simultaneously for amendment to Irrigation Act to provide for Farmers' Associations and turnover of the system (Participatory Irrigation Management).
    * Handover the system ceremoniously to Farmers' Associations. The advantage of ceremonial transfer is that all the farmers in the jurisdiction of the Farmers' Associations would come to know about it.
    * Initiate Action Research Programme for one project in the State where transfer process could be scaled up to distributary branch level.

Command Area Development Board

Functions:

CAD Boards will supplant the existing CAD Authority. The functions of the Board will be as follows:

i) To lay down policy guidelines for the implementation of CAD Programme.
ii) To disburse the Central assistance and the State Governments' share to Farmers' Associations/Societies
iii) To provide technical assistance and guidance to the Farmers' Associations/Societies.
iv) To coordinate the activities of different developments involved in the implementation of CAD Programme.
v) To maintain the accounts of amounts disbursed and to give utilisation certificate to the State Governments and the Union Government.

vi) To monitor the work of Farmers' Associations/Societies.
vii) To develop ground water to supplement surface irrigation.
viii) To help the Farmers' Associations/Societies in selection& introduction of suitable cropping pattern.
ix) To carry out soil survey and prepare Geographical Information System.
x) To develop marketing and processing facilities and communications.
xi) To organise annual agricultural fairs, seminars and workshops and exhibitions etc. to motivate the farmers.
xii) To diversify agriculture and develop of activities like animal husbandry, farming, poultry etc.
xiii) To carryout assessment and reclamation of waterlogged areas.
xiv) To act as a catalyst for formation of Farmers' Associations/Societies.

Constitution:
- The Board should be constituted by legislation.
- Chairman of the Board should be the Minister in charge of CAD Programme.
- The farmers' representatives should be elected by Farmers' Associations/Societies are formed, the representatives should be nominated by the State Government.
- Care should be taken that head, middle and tail reaches get proper representation.

The members of the Board should include the following:
- Concerned Members of Legislative Assemblies and Members of Parliament.
- Elected heads of Panchayati Raj Institutions.
- Officials of the Departments involved in the implementation of CAD Programme.
- Representative of the Government of India to be nominated by Ministry of Water Resources.
- NGOs working in the field of participatory irrigation management and academicians.
- Representatives of Farmers.

Other Requirements:
- Chief Executive of the Board will be appointed by the State Government.
- There should be an Executive Committee constituted by the Board out of the members of the Board to take important administrative decisions.
- The life of the Executive Committee would be five years.
- At least 60 per cent of the members of the Board and the Executive Committee should be non-officials.

CAD Council:
This should be formed at the State level by a Government order. It will be an advisory body to be headed by the Minister in-charge of CAD programme. It should include Farmers' Representatives, Members of Parliament, Members of Legislative Assemblies, officials of the State Government and Academicians.

Sample Model Memorandum of Understanding (MOU)
(An agreement between Datta Sahakari Pani Watap Sanstha and Government of Maharashtra (Irrigation Department) for management of irrigation).

This agreement between the Executive Engineer, Mula Irrigation Division, Ahmednagar, on behalf of the Governor, Maharashtra State on one side, and the Chairman, Datta Sahakari Pani Watap Sanstha, on the other side, is executed at Ahmednagar on 30th June, 1989.

As per this agreement the command area, falling under minor 7 in the villages Chanda and Rastapur to the said Society for Irrigation management for the period under this agreement. However, the ownership of the minor, the structures there-on, and the land required for such structures, and also all other works executed at Government cost, vests with the Government. Both the parties with whom this agreement is executed have

given the consent to the following conditions. Any change in the conditions should be done with mutual understanding between both parties.

1. Objectives

The Main objective is to ensure farmers' participation in water management so as to optimize the use of the available water and raise agricultural productivity in the command. The following would be the part of the bye-laws and general objectives.

(a) At least 51 percent of the command of the minor must come in the Society's jurisdiction, or 51 percent of the respective landholders must become members of the Society. Government expects that this percentage would increase by 4 to 5 percent in the next five years.

(b) The Society shall take water from the Government on a volumetric basis and distribute it among members and non-members on a crop area basis; it will ensure water economy and thus generate profits.

(c) The Society shall maintain and repair field channels, drains and other structures of the physical system in its jurisdiction.

(d) The Society shall make available to members modern technology of water use for ensuring water economy and prescribing appropriate doses to the relevant crops. If the Society proposes to incorporate additional objectives in their bye-laws, then government will not have any objection provided the objectives incorporated by the Society do not violate the main objectives mentioned above. But the Society should get the objectives approved from the Government, and the Society should have a provision in the bye-laws to invalidate those objectives consistent with the main objectives.

2. Water Rights

(a) The Society is entitled to receive the following water allocation on a volumetric basis at the head of minor subject to provisions made in the subsequent clause 2 (d)

Kharif Season	433 thousand cum
Rabi Season	1058 thousand cum
Hot Weather (HW) Season	283 thousand cum
Total	1774 thousand cum

This water allocation would be reviewed and suitably modified after a period of two years in mutual consultation with both parties.

The sanctioned water allocation in any season, if not utilized fully during that season is allowed to be stored by the society. The stored water should only be used in the command area and only for crops other than sugarcane and other perennials. In case the Society needs more water than the sanctioned allocation in any season and if the society demand, but the Government does not take the responsibility of sanctioning the additional demand. However, if the additional water is allocated in the adjoining command areas, the Society would also be entitled to receive it on grounds of equity.

(b) After utilizing the sanctioned quota as determined at (a) above, if the Society demands additional allocation and if it is sanctioned by the Government the Society would be required to pay water charges for the additional water at the seasonal rates. For pre-seasonal watering the water charges would be levied at the rates of the previous season and for post seasonal watering the charges would be at the rate of next season.

(c) Government reserves the right to santion/reject the additional water demand over and above the sanctioned allocation. The additional demand would be considered as per the availability of water. If due to some reasons the additional water allocation could not be sanctioned, the Government would not be responsible for any loss caused to the society.

(d) Due to less availability of water in the storage in any year, the quota sanctioned as per clause 2(a) would be proportionately reduced as per the Government policy, with due advance intimation to the Society before the beginning of the season.

(e) Subsequent to the execution of the MoU, if the Government decides to introduce an eight monthly water supply policy or change the cropping patterns, this policy would also be made applicable to the Society in its area of operation. The necessary alterations in the quota sanctioned as per clause 2(a) would be incorporated from the ensuing kharif season.

(f) If the Society uses less of water than allocated in the kharif season, it will have no right to carry forward the balance quantity in the next rabi or a HW season. Whenever the HW season supply is allowed, and if there is saving in the sanctioned quota for utilization in hot weather, in that case, the society would demand the balance quota one month before the close of rabi season as per clause 2(h). However, the Society would be entitled to only 70 per cent of the saved water in the rabi season subject to clause 2(i). For the balance quota of the rabi season allowed to be used in hot weather, if such a demand in HW is low compared to the total irrigable area of the canal, the Government will decide whether this demand is to be entertained, and the decision of the Government would be final.

(g) If any landowner who is a member of the Society sells his land in the command area, he will cease to be a member and the new landowner would be eligible for the membership of the Society.

(h) In every season the rotational programme would be prepared by the Department and a copy of it would be supplied to the Society ten days before the commencement of the season. The Society should intimate to the concerned Canal Officers, before starting of the rotation, the water demand, the period in which it is required and the methods of distribution. The Executive Engineer, Mula Canal Division would intimate the Society the names and designations of the concerned Canal Officers within a period of 10 days after the MOU is executed. A gauge register would be jointly maintained by the Canal Officer and the Society. The Society will not get water outside the rotational schedule.

(i) All the beneficiaries in the command of minor would be eligible for membership of the Society. Every member has a right to receive water in every season. If any member does not require water, or uses less than allocated, the Society has a right to divert that quantify to other members. There is no restriction on the cropping pattern in the command of the minor from the Government side. However, to avoid water logging, Government reserves the right to restrict, the sugarcane areas on each outlet. The Society should be vigilant to see that the water table in the command is kept below 3 m from the ground level. Monitoring of the ground water table in the command of the minor would be done every year by the Directorate of Irrigation Research and Development with prior intimation to the Society. In case the table rises above 3 m the Government reserves the right to reduce the allocated water quota proportionately. The Government would not be responsible for any loss caused to the Society due to reduction in the quota.

(j) The Society will get water for irrigation purposes only. However, if the Society requires water for processing agriculture produce, it should demand separate allocation and should obtain a separate sanction for this demand.

(k) The lands falling in the operational areas of the society, but which were not irrigated prior to this MoU (this includes land which cannot be irrigated by flow), if made suitable for irrigation, may be included buy the Society in its operation area, with a view to increase the irrigation potential. Water would be sanctioned for such additional areas. However, the additional allocation would not be more than 5 percent of the allocation given as per clause 2(a).

(l) The Society will have a right to charge a separate water rate to non-members and would also recover the water charges from non-members. But the water rates for non-members should not be more than 30 percent of the rates chargeable to members.

3. Water rates and Assessment

Government shall, from time to time, fix the water rates chargeable to the Society for the volumetric supply of water. The following rate would remain in operation until further notice.

Kharif	Rs 10 per 1000 cum
Rabi	Rs 15 per 1000 cum
Hot Weather	Rs 37.5 per 1000 cum

If the water charges. calculated on ther water actually utilized at volumetric supply rates are less than those calculated on an area basis, the former would be charged to the Society, otherwise the latter would prevail. After this MoU is executed, the water rates fixed would be reviewed every two years and would be changed, if need be, with the mutual consent of both parties.

4. Rights of the members of the Society

The landowner, or the tenent, of the command of the minor can be a member of the Society, provided such a person is registered as an owner or tenant of that land on form 7/12.

The members would register their demand on the Society for water supply in the prescribed form. The Society, with due consideration, will inform its decision about water supply to the member within a specified time limit. In each season, the Government has sanctioned a certain quota of water to the Society and, according to the policy of the Society, each member has a right to get water in every rotation.

While executing this MoU, under any circumstances the number of members taking water (126 nos:) and the actual irrigable area (225 ha) on this minor, should not be reduced. If it is reduced, the Government will have the right to stop the supply of water to the Society.

5. Recovery of Water Charges

The Government will supply water on volumetric basis at minor head. At the end of each season, demand statements would be prepared on the basis of the total quantity supplied and at the rates indicated at clause 3. The demand statements would be sent to the Society as per the following schedule:

	Kharif	**Rabi**	**HW**
1. Dates by which Government is to send demand statement to the society	30th Nov.	15th March	15th Aug.
2. Dates by which payment to be made to the Government by the Society	1st Feb.	1st May	15th Oct.
3. Last date of payment without 10 percent surcharge	18th April	31st July	31st Dec.

If the Society pays the bill before the dates indicated at '2' above, 5 percent rabate would be given. If the payment is made after the dates indicated at '3' above, a 10 percent surcharge shall be paid by the Society.

The Government reserves the right to stop water if the water charges are not paid within the stipulated period.

6. Maintenance and Repairs on the Minor

(a) After signing the MoU, but before the resumption of water supplies, a joint inspection of the physical system would be carried out, and the required repairs be done at Government cost. The Department would ensure that the actual discharges at various points are as per the design capacities.

(b) The Society would be responsible for maintenance and repairs of the physical system of the minor in its jurisdiction. For that, the Society will receive a grant of Rs.10,000 and the grant will be reviewed after every two years.

Maintenance and repairs of the minor include the following items:

* Desliting the minor
* Service road and inspection path to be kept in proper condition.
* Removing trees, shrubs and grass.
* Structures to be kept in good condition.
* Outlet gates and measuring devices to be in good condition.

Note: If proper maintenance and repairs are not done, then on pre-intimation, the Government will stop the water supply or, on behalf of the Society, the Government will carry out the repairs and will have the right to recover all the expenditure incurred for this purpose.

7. Maintenance and Repair of Field Channels, Field Drains

(a) After signing the MoU, and before resumption of water supplies, a joint inspection of the field channels and field drains and structures thereon would be carried out. As found necessary, required improvement and repairs for proper water supply would be carried out at Government cost. The Department would ensure that the physical system is capable of carrying the designed discharges through the physical system so repaired.

(b) The Society will be responsible for the proper maintenance and repairs of the field channels and field drains and the structure thereon. No grants would be given to the Society by the Government for this purpose. The Government reserves the right to stop water if the physical system is not maintained properly by the Society.

The maintenance and repairs of the field channels and field drains etc. include the following items:

* Removing silt from the field channels and field drains.
* Maintaining service roads and inspection paths in good condition.
* Removing grass, plants and bushes.
* Maintaining structures in good condition.
* Maintaining outlet gates and measuring devices in good condition.

If proper maintenance and repairs are not done, Government will stop the water supply, or carry out the repairs and recover the expenditure incurred thereon.

8. Special Incentives

In order to effectively achieve the objectives, of optimum and judicious use of available water, of preventing unauthorized irrigation, and of bringing the maximum area under irrigation, the following special incentives would be given to the Society, if demanded.

(a) To encourage such Societies or institutions, if the Government of India and the World Bank offer grants, facilities etc., these would be extended to the Society. Presently the Government pays the managerial subsidy at Rs.100 per hectare for the first two years and Rs 75 per hectare for the third year.

(b) The services of one Canal Inspector (CI) would be spared to the Society for water management in the jurisdiction of the Society for a period of 3 years.

The CI so deputed will work under the control of the Society. His salary and allowances would be paid by the Government and would be deducted from the managerial subsidy payable to the Society as per clause 8 (a).

9. Pazar Irrigation

If the percolation water from minor and drains is used, no water charges would be levied on such water use. However, the Society will have no right on the water percolated through canal and nalas.

10. Rights of Government Officials

The Canal officer is entitled to inspect the operational area of the Society, the water supply made and the implementation of the provisions incorporated in the MoU. The Canal Officer is also entitled to inspect the records of the Society from time to time and the Society will be responsible for compliance of the inspection reports submitted by the Canal Officer.

11. Other Points

If any problems related to the provisions in the MoU, or any difference of opinion, etc. arise between the Canal Officer and the Society, the decisions of the Government would be final.

The period of this MoU would be for 5 years and its further continuance would be decided upon with the consent of both the parties.

All the provisions (except those in clause 2) in the MoU would be reviewed after 3 years and further continuance would be decided.

One Government representative would be nominated as a member on the managing committee of the Society.

Sd/-
Executive Engineer

Sd/-
Chairman of the Society

SUGGESTED MEMORANDUM OF UNDERSTANDING (MOU) BETWEEN THE WATER USERS' ASSOCIATIONS (WUAs) AND THE IRRIGATION DEPARTMENT/AGENCY

Introduction

The Agreement between the WUAs and the Irrigation Department/Agency for participatory management of the system of irrigation will be in the form of a Memorandum of Understanding (MOU) stating the duties and responsibilities of the Irrigation Department/Agency and the Associations.

The Irrigation Department/Agency may be represented by the Executive Engineer of the system and the Water User Farmers' Association (registered/duly recognised) may be represented by its President. The non-Governmental Organisation, (NGO), which if involved in the role of a facilitator for the formation of the Association, need not be a party to MOU.

The MOU may cover the following aspects

1. **Objectives**

The main objective of the MOU is to ensure participation of farmers in the management of the system in the demarcated area in order to optimise the use of the available water and raise agricultural productivity in the command.

The Water Users' Associations should be empowered to frame bye-laws to facilitate its task including the distribution of water. The following conditions could be considered:

a) At least 51% of the command area must come within the Association's jurisdiction or 51% of the landholders must become members of the Association. The Association shall receive water from the Irrigation Agency on volumetric basis, but it may distribute it among its members (and non members) on crop area basis or volumetric basis as the Association may deem fit.

b) The Association should be responsible for maintenance and repair of field channels, drains and other connected structures of the physical system within its jurisdiction.

c) The Association shall endeavour to make available to its members modern technology of water use in order to ensure economy in its use and prescribe appropriate doses of water for the crops.

The Association may incorporate any other secondary objectives in its bye-laws consistent with the primary objectives.

2. **Water Supply**

The quantity of water to be supplied to the Associations (on volumetric/crop area basis) season wise may be clearly stated.

The allocation of water could, however, be reviewed particularly and modified by mutual consultations of the parties. The following provisions may also be made:

a) In case the Association does not require a particular amount of water in one season, this may be allowed to be stored in the reservoir (wherever applicable) and may subsequently be released to the Association, as desired by it so long as it is technically feasible;

b) Any additional demand for water could also be considered subject to availability of water at a rate to be fixed by the Agency. However, the Association will not have automatic claim for such additional water;

c) In case of less availability of water in the source of supply because of climatic and other unforseen factors, the quota of water may be proportionately reduced by the Agency;

d) The Association will be given water only for the purpose of irrigation. Water may be made available at the discretion of the Agency on the request of WUA, for any purpose,

3. **Pricing of Water**

The Agency should specify at the beginning of the season the price to be charged for water to be supplied and it will have the right to enhance the rates, if situation so demands, but there should be adequate advance notice and consultations.

4. **Recovery of Water Charges**

The Department will charge the Associations on volumetric basis for the supply of water. But the Associations will be free to charge from their members on cropping area basis, in absence of adequate measuring devices. The Agency may specify the dates by which the collected amounts have to be deposited, depending upon the seasons, with provisions for penalty in case of any delay in payment. The Agency has power to stop the supply of water in case of non payment of the water charges within a stipulated period.

The circumstances under which water charges are to be reduced or their recovery deferred or foregone should be spelt out in the MOU.

5. **Operation and Maintenance (O & M) of the System**

The Association should maintain the minor canal, field channels, field drains, structures and any other object handed over by the Department of Irrigation in good condition. The Department/Agency should, however, specify and extend maintenance grant, if any, to the Associations for upkeep of the system. Modernisation, special repairs and major alternations etc. will be taken up at the cost of the Agency only. Any damage due to natural calamities such as earthquake etc should be repaired by the Agency.

6. **Groundwater Exploitation**

The Associations should have the right to exploit groundwater by conjunctive use without any extra charge. Similarly, any water available through percolation from the canal could be used by the Associations without any additional payment to the Department. Recycling of water by the Farmers' Associations should also be permitted, if it is for their use.

7. **Conflict Resolution**

While the internal disputes could be settled by the Associations, the disputes between the Associations and the Irrigation Agency, unless the same is settled amicably, should be referred to the arbitration as may be agreed to in advance.

8. **Guarantee of Water for the WUAs**

The Irrigation Agency should guarantee the supply of a stipulated amount of water to the WUAs and unless there are compelling circumstances, it should not be changed. If the Agency fails to honour its commitment, it should compensate the farmers according to a specified formula agreed upon in advance. Although the Farmers' Associations should mainly take the responsibilities for distribution of water, yet they may branch into other activities, so long as they are consistent with the basic responsibilities, for raising resources. For example, the Farmers' Associations in Mexico have set up highly profitable agro-industries. Such activities could be taken up by WUAs in India also.

The rights and responsibilities of the Irrigation Agency and WUA have been summed up as follows:

WUA

Rights	Responsibilities
1. Right to information from Irrigation Agency about availability of water and its delivery;	1. To distribute water among its members and non-members equitably and regularly,
2. Right to enter into contracts;	2. To operate and maintain the system handed over to it,
3. Right to earn profits;	3. To pay the water charges to the Irrigation Agency,
4. Right to establish linkage with the concerned Agency	4. To communicate information regarding requirements to concerned Irrigation Agency .

Irrigation Agency

Rights	Responsibilities
1. Right to recover water rates from WUAs according to the terms mutually agreed upon.	1.To deliver the quantity mutually agreed to WUAs according to the schedule agreed upon between WUAs and the Agency,
2. Right to inspect the system to ensure that no damage is done to it;	2. To maintain and operate the system above the minor level or distributary level as the case may be depending upon the extent of transfer,
3. Right to receive timely information about the requirement of water by WUAs.	3. To provide technical assistance and advice to WUAs
	4. To award maintenance contract to WUAs on favoured basis.

Annexure-7
(Ref. : Para 12.4.3)

FORMAT FOR MONITORING OF PARTICIPATORY IRRIGATION MANAGEMENT PROGRAMME

PART A - POLICY ASPECT

Name of the State : _____

Name of the Project : _____

Quarterly Progress Report for the Quarter Ending: _____

Year of Inclusion in the PIM Programme:

1) Whether policy decision taken to introduce PIM in the State? If so, quote letter No. and date with abstract of order and enclose the order as such.

2) Whether following Committees constituted, if so quote letter No. and date and give abstract and enclose orders.
   - i) High Level Committee
   - ii) State Level Steering Committee
   - iii) Whether PIM Wing at the State Level constituted? If so, give details.
   - iv) Whether PIM Wing at CADA/Project Level Constituted? if so, give details.
   - v) Whether work for amendment of Irrigation Act commenced?
   - vi) When is it expected to be amended?
   - vii) Has the work for writing PIM mannual been initiated?
   - viii) Name the agency, which is doing this work?
   - ix) When is it likely to be completed?

PART B - IMPLEMENTATION OF PIM

1) **Identification Work of Minor/Distributary:**
   - i) Name
   - ii) Length (Km.)
   - iii) Command Area (Ha.)
   - iv) Outlets Covered (Nos.)
   - v) Farmers Covered (Nos.)
   - vi) Average Holding (Ha.)
   - vii) Seasons for which water is available in the system
   - viii) Specific problem of the area
   - ix) Specific Work Plan proposed

2) **Motivation of Farmers:**
   - i) Has any agency/agencies for motivation of farmers been decided?
   - ii) Name of NGOs working as motivators
   - iii) Awareness Campaign
     - (a) No. of pamphlets distributed
     - (b) No. of booklets distributed
     - (c) No. of audio/video cassettes

3) **Formation of WUAs :**
   - i) Whether informal Association constituted
   - ii) At which level have the informal Associations been formed?
     (a) Outlet (b) Minor

iii) Have formal Associations been formed?
iv) The Act under which Associations has been registered?
- Society Registration Act 1860
- Co-operative Societies' Act
- Company Laws
- Any other Act
v) The number of informal Associations
vi) The number of formal Associations
vii) Whether the Byelaws prepared
viii) Whether MOU prepared and signed with the Irrigation Agency

4) **Rehabilitation**
i) Whether joint inspection made
ii) Date of joint inspection
iii) Whether report of joint inspection prepared
iv) If rehabilitation is necessary, whether cost estimate prepared
v) What is the cost of rehabilitation
vi) Whether the Agency has been decided which would execute the work of rehabilitation
vii) What is the schedule of rehabilitation

5) **Handing over the Minor/Distributary to Farmers**
i) Portion of Irrigation System transferred (give full detail)
ii) Date of handing over
iii) Who has handed over
iv) To whom handed over
v) Membership
- Total farmers in the command
- No. and percentage of farmers who have become members
- Area and percentage of total area covered under the membership

PART - C - FINANCIAL

1) **Need of Funds**
i) For stationary
ii) For preparation of byelaws and registration of the Association
iii) For preparation of MOU
iv) For appointing staff
v) For rehabilitation of system
vi) For some common material equipment - watch, lanterns, torches, cement, etc. material for minor repairing etc.
vii) For consultants/NGO:
viii) Any other item:

2) **Flow of Funds :**
i) Management Subsidy:
ii) Functional Grants:
iii) Rehabilitation cost given by the Implementing Agency
- In terms of rebate/cess collection
iv) Any other support to the WUA by:
- State Government:
- Central Government:
- Other body

REFERENCES

Ambler, John. 1994. The Language of Farmer Water Users' Associations: Rethinking Irrigation Organizatioon Development in India in Sivamohan MVK and Scott Christopher A. (eds) India: Irrigation Management Partnerships. Hyderabad: Booklinks Corporation.

Bihar. 1992. Personal communication with a senior level chief engineer of the Water Resources Department in Patna, Bihar, who preferred anonymity.

Brewer, Jeffrey D, Sakthivadivel R, and Raju K.V. 1996. Water Distribution Rules and Water Distribution Performance: Rules and User Demands in the Tambraparani System, forth coming Research Paper, Colombo, Sri Lanka: International Irrigation Management Institute.

Bruns, Bryan and Suhar Dwi Atmanto. 1995. How to Turn Over Irrigation Systems to Farmers' Questions and Decisions in Indonesia. In: S.H.Johnson, D.L.Vermillion, and J.A.Sagardoy (eds.) Irrigation Management Transfer Selected papers from the International Confernence on Irrigation Management Transfer, Wuhan, China, 20-24 September 1994. Water Reports 5. Colombo, Sri Lanka: International Irrigation Management Institute, and Rome: Food and Agricultural Organization of the United Nations.

Byrnes, Kerry J. 1992. Water Users Associations in World Bank assisted Irrigation Projects in Pakistan. World Bank Technical Paper Number 173. Washington: The World Bank.

Central Board of Irrigation and Power (CBIP). 1954. Glossary of Technical Terms in Daily Use (For the layman), Popular series, Leaflet no.11. New Delhi.

Daines, R. Samuel and Pawar, Jagannathrao, R. 1987. Economic Returns to Irrigation in India. Submitted by SRD Research Group Inc., Logan. New Delhi: USAID.

Datye K.R. and Patil.R.K. 1987. Farmer Managed Irrigation Systems: Indian Experiences. Bombay: Centre For Applied Systems Analysis in Development.

Government of Andhra Pradesh (1984). Andhra Pradesh Irrigation/ Utilization and Command Area Development Acts, 1984. The Government. Central Press, Hyderabad.

Government of Andhra Pradesh (1987). Andhra Pradesh Irrigation Utilization and Command Area Development Rules, 1985. The Government. Central Press, Hyderabad.

Government of Bihar (1979). The Bihar Agricultural and Rural Area Development Agency Act, 1978, Sone Command Area Development Agency.

Government of Bihar (1991). Bihar Irrigation Laws (a compilation of relevant irrigation acts with rules framed there under). Malhotra Brothers. Patna.

Government of Gujarat (1989). The Gujarat Government Gazette Extraordinary, Vol.30, No.19.

Government of Gujarat (1989). The Gujarat Government Gazette Extraordinary, Vol.30, No.172.

Government of Gujarat. 1994. Report of the Gujarat State Finance Commission, April 1994.

Government of Gujarat. 1994. Draft Policy Resolution on Introduction of Participatory Irrigation Development and Management in Gujarat. Gandhinagar: Narmada and Water Resources Department.

Government of India (1976). The Model Irrigation Bill, 1976. New Delhi.

Government of India (1973). Constiuutional Provisions Relating to Village Panchayats and Municipality in India. (containing text of the constitution 73rd and 74th amendment Act, 1992). Eastern Book Company, Lucknow.

Government of India. 1985. Seventh Five-Year Plan (1985-90)

Government of India. 1987. National Water Policy. New Delhi: Ministry of Water Resources.

Government of India. 2002. National Water Policy. New Delhi: Ministry of Water Resources.

Government of India. 1987. Guidelines for Farmers' Participation in Water Management. CAD and Water Management Division. Ministry of Water Resources, New Delhi.

Government of India. 1992. Eighth Five Year Plan (1992-97)

Government of India, 1992, Report of the Committee on Pricing Irrigation Water (Chairman A. Vaidyanathan), Planning Commission, New Delhi.

Government of India, Central Water Commission - Water and Related Statistics - December, 1999.

Government of India, Ministry of Water Resources International Seminar on Participatory Irrigation Management, Mexico - February 8-15, 1995. Report of the Indian delegation.

Government of India, Ministry of Water Resources, Proceedings of the National Conference on Participatory Irrigation Management, New Delhi 19-23 June, 1995.

Government of India, Command Area Development News, In-house Journal, July, 1995-March 1996 and April-June, 1997, Ministry of Water Resources.

Government of India, Management of Irrigation A New Paradigm Participatory Irrigation Management - National Conference on Participatory Irrigation Management, New Delhi 20-22 January, 1997.

Government of India, Ministry of Water Resources - Proceedings of the National Conference on Participatory Irrigation Management, New Delhi 20-22 January, 1997.

Government of India 1997 Draft Report of the Working Group on Participatory Irrigation Management for the IX Five Year Plan, Ministry of Water Resources.

Government of India (August 2001) Planning Commission - Report of the Working Group on Private Sector and Beneficiaries Participation for the Formulation of Tenth Five Year Plan (2002-2007)

Government of Karnataka (1979). The Karnataka Lift Act, 1974, and the Karnataka Lift Rules, 1976. Government. Press, Bangalore.

Government of Karnataka (1988). The Karnataka Irrigation Act, 1965, and Rules 1965. Shri Laxshmi Narayan Publications, Bangalore.

Government of Karnataka (1991). The Karnataka Command Area Development Act, 1980. (Karnataka Act no.6 of 1980)

Government of Kerala (1992). State Water Policy Thiruvananthapuram.

Government of Kerala (1994). The Kerala Irrigation Bill, 1994. (Bill No.115), Thiruvananthapuram.

Government of Madhya Pradesh.(1974). Madhya Pradesh Irrigation Act, 1931 (No.III of 1931): Irrigation Rules, 1974. Shanta Technology Publication, Bhopal.

Government of Maharashtra (1972). Bombay Irrigation Act,1879 (Act of 1879). In:Law Relating to Irrigation, 1972, pp 15-44.

Government of Maharashtra (1992). Cooperative Water User's Association Guidelines (amended in 1994), Irrigation Department.

Government of Maharashtra. 1994. Cooperative Water Users' Association Guidelines. Irrigation Department. October 1992 and amended in August 1994 (English version). Pune: Irrigation Research and Development.

Government of Rajasthan (1954). The Rajasthan Irrigation and Drainage Act, 1954.(Act No.31 of 1954). Jodhpur.

Government of Tamil Nadu (1981). The Tamil Nadu Irrigation Works (Repair, Improvements, and Construction) Act, 1943 (Tamil Nadu Act-VIII of 1943).

Government of Tamil Nadu (2001), Proceedings of the National Workshop on Participatory irrigation Management ? Farmers? Organisation and Turnover Experiences in Tamil Nadu.

Government of Uttar Pradesh (1979). The Nothern India Canal and Drainage Act, 1973, along with State Amendments and Short Notes. Eastern Book Company, Lucknow.

Government of Uttar Pradesh (1989). The Nothern India Canal and Drainage Act, 1873(Act No.8 of 1873) with State Amendments, Bare Act, 1989. Allahabad: Law Publishers(India) Pvt.Ltd.

Government of West Bengal (1991). The Bengal Irrigation Act, 1876. (Bengal Act III of 1876). In:Bihar Irrigation Laws, 1991 ed. pp. 35-60.

Jacob, Alice and Singh, S.N (1972). Law Relating to Irrigation, Bombay: N.M. Tripathi Pvt. Ltd.

ILI (1992). Role of Panchayat Institutions in Irrigation Management: Law and Policy. New Delhi: The Indian Law Institute.

ILI (1991). Water Rights and Principles of Water Resource Management. Bombay: The Indian Law Institute and N.M. Tripathi Pvt. Ltd.

Maloney, Clarence and Raju.K.V. 1991. Farmers' Organizations for Irrigation Management: Profile Series. Technical Report No.47. New Delhi: LBII/WAPCOS.

Managing Irrigation Together: Practice and Policy in India. New Delhi: Sage Publications, 1994.

Merry, Douglas, N.G.R. de Silva, and R. Sakthivadivel. 1992. 'A Participatory Approach to Building Policy Consensus: The Relevance of the Irrigation Management Policy Support Agency in Sri Lanka for Other Countries.' Paper presented in the Workshop on INDIA-IIMI Collaborative Research in Irrigation Management, held on 13-14 February, 1992, New Delhi. Organized jointly by WAPCOS and IIMI, Colombo.

Mohile, A.D and R.S. Pathak. 1994. "Theme Paper" for the National Workshop on Farmers' Participation in Management of Irrigation Systems in the Proceedings of National Workshop on Farmers' Participation in Management of Irrigation System, held on Oct 12-14, 1993. University of Roorkee. Roorkee.

Navalawala, B.N. 1994. "Planning Perspective of Farmers' Participation in Irrigation Management in India". Paper presented in International Conference on Irrigation Management Transfer, Wuhan, China, September 20-24, 1994.

Parlin, Bradley, and Mark Lusk (eds.) 1991. Farmers' Participation and Irrigation Organization. Boulder CO: Westview Press.

Pathak R.S. 1992 Farmers? Organization in India. New Delhi: CAD Division, Ministry of Water Resources.

Pundarikanthan, N.V; Narayanan.M, and Kallapiran, S.N. 1994. "Tank rehabilitation in Tamil Nadu: A Case Study on Farmers' Participation" in Sivamohan MVK and Scott Christopher (eds) India: Irrigation Management Partnerships. Hyderabad; Booklinks Corporation.

Raju K.V. 1992. Irrigation Panchayats in Madhya Pradesh: A Case Study. London: ODI Network Paper. London. (Also published in Water Resources Journal of ESCAP, Bankok, September 1994).

Raju K.V; Brewer, Jeffrey D. and Sakthivadivel, R. 1996. Multiple Sources of Irrigation in Gandak Command Area. Forthcoming India Country Paper. Colombo: International Irrigation Management Institute.

Raju.K.V, and R.Sakthivadivel. 1995. Changed Agricultural Situation and Unchanged System Rules: A Case Study of an Irrigation System in Tamil Nadu. Colombo, Sri Lanka: International Irrigation Management Institute, Colombo (mimeo).

Rao, Hanumantha C.H. and Gulati, Ashok. 1994. "Indian Agriculture: Emerging Perspectives and Policy Issues". Economic and Political Weekly, December 31, 1994.

Sengupta, Nirmal. 1991. Managing Common Property: Irrigation in India and the Philippines. New Delhi: Sage Publications.

Sivamohan M.V.K.and Scott, Christopher A.(eds). 1994. India: Irrigation Management Partnerships. Hyderabad: Booklinks Corporation.

Srivastava L.P, and Brewer, D. Jeffrey. 1994. Irrigation Management Transfer at Paliganj Canal, Bihar, India,Short Report Series on Locally Managed Irrigation, Report No. 7. Colombo, Sri Lanka: International Irrigation Management Institute.

Sundaram D. 1994. Personal communication in Madras.

Uphoff, Norman. 1986. Improving International Irrigation Management with Farmer Participation: Getting the Process Right. Boulder,Co: Westview Press.

USAID. 1992. "Policy Recommendations on Farmers' Organization for Irrigation Management", Technical Report no 60, New Delhi: LBII/WAPCOS, USAID.

Vermillion, Douglas L. 1992. The Turnover and Self Management of Irrigation Institutions in Developing Countries. A discussion paper for new program of the IIMI. Colombo: International Irrigation Management Institute.

Vaidyanathan, A. 1994. "Transferring Irrigation Management to Farmers". Economic and Political Weekly, November 19, 1994.

World Bank. 1991. India Irrigation Sector Review, Vol 1. Washington, D.C.: The World Bank.

Water Resources Management: A Policy Paper, 1993. Washington, D.C.: The World Bank.

Wijayaratna C.M. and Douglas L.Vermillion. 1994. Irrigation Management Turnover in the Philippines: Strategy of the National Irrigation Administration. Report No.4. Short Report Series on Locally Managed Irrigation. Colombo, Sri Lanka: International Irrigation Management Institute.

Working Paper/Monograph Series 2, IndiaNPIM, "Multi-disciplinary and Participatory Water Management for Irrigation Command Areas" by Rakesh Hooja

Working Paper/Monograph Series 4, IndiaNPIM, "Training for Participatory Irrigation Management in India : Present Status and Needs, A Policy Aid Document" by Rakesh Hooja, Anjali M. Bhatia, Ganesh Pangare.