Transferring Irrigation Management to Farmers in Andhra Pradesh, India

Keith Oblitas and J. Raymond Peter in association with Gautam Pingle, Halla M. Qaddumi, and Jayantha Perera
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Keith Oblitas and J. Raymond Peter
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The World Bank
Washington, D.C.
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Development strategy for poverty alleviation must be rooted in transformation of society by the society. For this, individuals and communities must be energized with a vision for their own betterment, given control over their own destinies, and provided the means -- through resources, shared knowledge and capacity building -- to translate their vision into reality. Strategy implementation must start with a vision -- a precious dream, even an impossible one -- and then energetically set out to translate the vision into practical reality.

It is in this context that I am delighted to write a foreword for this paper. In February 1999 I was privileged to visit Andhra Pradesh’s Water User Associations. I witnessed the efforts of the WUAs to improve their irrigation systems, and their evident pride in their initial achievements. In discussing with the local communities, I learnt of their further aspirations, sensed the ongoing dynamics of the transformation underway, and developed better understanding of the immense practical difficulties of the reform program, the energy with which they were being addressed by Government and civil society alike, and the still formidable challenges ahead.

The program described in this paper is part of an overall vision for alleviation of poverty being applied in many sectors by Andhra Pradesh’s state leaders. The overall context is AP’s “Vision 2020” aspirations to empower local communities to raise rural welfare. I visited many such programs in AP, from primary education to health clinics to forestry, watershed management, rural road programs and women’s self-help schemes. The irrigation reform program is one of the largest of AP’s new endeavors, and one of the most remarkable.

The paper also discusses the further way forward as the irrigation sector reform program develops. Consolidating the institutional and financial strength of the WUAs will be a key need. I expect that another need, also discussed in the paper, will be to further deepen the participation process. This would need to involve a broader participation by the community including the greater involvement of women, hence spreading participation and benefits in a broader and thus more sustainable societal framework.

I am pleased to note the close partnership between the Government of Andhra Pradesh and the World Bank team, and the dynamic learning process and flexible approach being used by both partners. This is an ambitious yet practical program, and if similar energy continues to be applied, there is every prospect that this “dream” will make further strides forward, benefiting many, and inspiring other countries to pursue similar paths.

Mieko Nishimizu
Vice President
South Asia Region
Governments in developing countries play an all pervasive role. Apart from exercising a regulatory role they also assume the role of a major operator and decision-maker in most sectors of economic activity. In India, while this was necessary in the initial decades after independence of the country, now, there is need for bringing about a change in the role of Government particularly in the context of liberalization of the economy.

The Government of Andhra Pradesh has initiated a major shift in its approach to governance; from being a major operator in many sectors of the economy, the Government would like to be a prudent facilitator; from a regulator and controller of economic decision making, the Government would like to be an enabler of market based development through a conducive regulated environment; and, from a top down administration and centralized decision making, to empowering and ensuring people's participation through decentralized decision making.

It has been my cherished desire to usher in a SMART government, which will be simple, moral, accountable, responsive and transparent. I am very keen that the capabilities of the people should be harnessed and enhanced. Involvement of the people and stakeholders in delivery of public services through self-help and collective action should take place in all important sectors such as irrigation, education, health and welfare, civic amenities, for a better quality of life.
The irrigation sector has always been a top down Government administered sector, with no participation of the farmers and users. There was need for reforms and changes. I was keen to see that the management of Irrigation systems should get transferred to the farmers who are the stakeholders, so that there is a total reform and improvement. After enunciating a comprehensive reform policy, the Government of Andhra Pradesh brought in a law, which facilitated the transfer of irrigation system to the farmers. The Andhra Pradesh Farmers Management of Irrigation Systems Act brings in a strong and vibrant participatory approach in Irrigation Management, through the democratically elected organizations of the farmers themselves.

In all reform process of democratization and decentralization, there is every need to look beyond the traditional approaches and structures. Various alternative methods of democratic decentralization, peoples participation, and self help need to be tried out, so that beneficiaries, users and stake holders not only participate whole heartedly in the decision making process but also develop affinity but also a sense of partnership and a sense of ownership. It is only when this is generated that the resultant economic and social development becomes meaningful and real.

I regard PIM as an important step in that direction. Farmers’ Organization such as WUAs are alternative, viable and effective institutions of involving people in self help and self-governance.

The reform measures initiated by Government of Andhra Pradesh have to be carried forward even further by learning through experience and making improvements as we go along. So far the success achieved is a matter of considerable satisfaction.

I am glad to see that this paper has succinctly brought out the various processes of reforms undertaken and has also largely endorsed the strategy of ushering in PIM in the State of Andhra Pradesh. It has also indicated a further agenda for consolidation and sustainability. I am confident that the process will continue in the right direction considering the widespread support it has received from all quarters, particularly the farmers, engineers, bureaucracy, and the intelligentsia.
I am grateful to the World Bank for having given due recognition to the reforms measures ushered in by the Government of Andhra Pradesh and for providing assistance through the Andhra Pradesh Economic Restructuring Project to put them in place and sustain them.

I commend the authors for this scholarly paper.

N. CHANDRABABU NAIDU
Irrigation Sector has a crucial significance to the economic
development of the State. A large share of State Plan Funds has
been invested in irrigation infrastructure and nearly 30% of the
cultivable land brought under assured irrigation. A review of the
Sector in 1995 revealed a declining performance of the existing
systems, a fall in the area under irrigation and a state of
considerable dissatisfaction amongst farmers due to failure of
irrigation in many commands.

While the Irrigation Department was pre-occupied with the
contractor oriented works in new projects, there was practically no
flow of funds for the maintenance of the existing systems. Most of
the schemes had then fallen into disrepair. Government, then,
considered that basic reforms were required to revive the irrigation
sector on a sustainable basis. Transfer of operation and
maintenance of the irrigation systems to the farmers' organizations
was the foremost reformative step taken in this direction.

The technical paper succinctly brings out the legal,
economic, social and political processes through which this reform
program has so far gone through. A vibrant relationship has now
been established between the irrigation officials and the farmers on
a level ground. A new forum is created in rural areas for
development planning. Irrigation systems are now better
maintained. There is a substantial increase in the area of irrigation.
There is an improvement in crop production and productivity and
there is a general satisfaction among farmers. Political commitment
to reforms, a dedicated leadership and an appropriate legal frame
backed by adequate financial support have been the key input to
the reform process.
FOREWORD

Andhra Pradesh has made rapid strides in creating irrigation infrastructure to support its predominantly agriculture based economy. However, the development plans primarily emphasized constructing new irrigation projects, and insufficient attention was paid to sustain and improve the performance of already existing irrigation systems which showed trends of decline. The Government’s diagnosis of the causes for decline revealed insufficient allocation of resources for maintenance, problems of conveyance of water to tailend areas, inequities in sharing of water, and inefficient use of water, besides the non involvement of farmers in management. The only way out for the irrigation sector, to free itself from the ‘vicious circle’ was to take up comprehensive reforms through introduction of participatory management (PIM). The experience of PIM in other States in the Country, as well as in other countries, showed that if the decline was to be reversed, reforms must be introduced with a “Big Bang”. The ‘gradual’ road to reform was not only long and tedious, but also there were dangers of losing the path and direction towards the ultimate destination.

Therefore, the Government of Andhra Pradesh undertook a series of bold reform measures in quick succession. These included, formulating a clear irrigation sector reforms policy, enacting legislation to create farmers organisations to manage and maintain all the irrigation systems, increasing water charges substantially to restore sector viability, launching massive training programmes for farmers and the irrigation bureaucracy to improve efficiency, and thereafter allocating resources to the farmers organisations to take up repairs and maintenance of the irrigation and drainage systems, to improve conveyance of water and bridging the gap between the potential created and actual utilization.
The introduction of these reforms in Andhra Pradesh, has started to yield rich dividends, and these have been well documented in this paper. The World-wide attention that the reforms programme has attracted, makes it imperative that the process should succeed and become sustainable so it can, not only be replicated elsewhere in other States but it could be further improved upon, based on the lessons learnt by experience. Without resting upon the initial successes, the Government of A.P., and the farmers organisations themselves need to continue the reforms process at all levels with the same vigour that has been witnessed in the past 2 years since the process was initiated. The political will and support for the reforms programme must have to continue and the motivation and commitment of the irrigation bureaucracy has to be channelised for continually improving its implementation. The enthusiastic response from the farmers and WUAs has to be harnessed, strengthened and sustained. After assuming the management and control of the irrigation systems, the WUAs will have to pay attention to their most difficult tasks, namely; ensuring equity in distribution of water, ensuring the efficient use of water and improved agricultural production and making their own Associations strong, viable and sustainable.

I commend the authors of this paper for making a very comprehensive and in-depth analysis of the various facets of the process of reforms undertaken, and also laying down an agenda for continuing the reforms process.

S. BHALERAO
Secretary to Government,
Transport, Roads & Buildings
Formerly Commissioner & Ex. Officio Secretary
Irrigation & CAD Department,
Government of Andhra Pradesh
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Within I&CADD, the program is particularly indebted to Mr. P.K. Aggarwal, Secretary Irrigation & CAD, and to Mr. Bhale Rao, former Commissioner CAD, for their strong support and leadership.

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EQUIVALENTS AND UNITS

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Fiscal Year of Government of India/Andhra Pradesh
April 1 to March 31

ABBREVIATIONS AND ACRONYMS

AD Agriculture Department
AP Andhra Pradesh
APERP (IC) Andhra Pradesh Economic Restructuring Project (Irrigation Component)
CM Chief Minister
DC Distributory Committee
DMS Dedicated Monitoring System
AP FMIS Andhra Pradesh Farmers’ Management of Irrigation Systems (Act)
FO Farmer Organization
GOAP Government of Andhra Pradesh
HYV High Yielding Variety
IAIP Irrigated Agriculture Intensification Program
I&CADD Irrigation and Command Area Development Department
IMT Irrigation Management Transfer
NPIM (Indian) Network on Participatory Irrigation Management
IRDAS Institute of Resource Development and Social Management
ISP Irrigation Sector Policy
MC Managing Committee
M&E Monitoring and Evaluation
MIS Management Information System
NGO Non-Governmental Organization
O&M Operations and Maintenance
OMR Optical Magnetic Readable
PACs Primary Agricultural Cooperative Societies
PC Project Committee
PIM Participatory Irrigation Management
PMU Project Monitoring Unit
PRA Participatory Rapid Appraisal
TC Territorial Constituency
VRO Village Revenue Officer
WALAMTARI Water and Land Management Training and Research Institute
WBI World Bank Institute (formerly Economic Development Institute)
WCRC Water Charges Review Committee
WRM (India) Water Resources Management (Sector Review)
WSA Water Services Agency
WUA Water Users Association
ABSTRACT

In 1997, the State of Andhra Pradesh (AP), located in Southern India, embarked on an ambitious irrigation sector reform program. At the heart of the program is the transfer of irrigation management to farmers: over 10,000 water users associations have been created covering the entire surface irrigated area of 4.8 million hectares (ha). This is being supported by an enabling legislation, the improvement of irrigation and drainage systems, and actions to restore the sector’s financial viability. Major government mobilization and extensive public participation have been key features of the reform program. In undertaking irrigation reforms with a “Big Bang” approach, AP is unique in India. Indeed, world-wide, there are few instances of such a reform path, with most countries/states choosing “gradualist” or “partialist” approaches. The boldness of AP’s reform program is already attracting attention, not only in India but also internationally. Andhra Pradesh has been chosen to host the Fifth International Participatory Irrigation Management Conference in December, 1999.

This paper responds to the interest shown. It is written from an implementer’s perspective, by Government of Andhra Pradesh and World Bank staff associated with the program. The paper seeks to track the reform process, highlight key features that have facilitated steps towards reform, and consider both immediate and longer-term actions to support the future sustainability of AP’s irrigation sector. Specifically, the paper first examines the poor initial state of AP’s irrigation sector—characterized as a “vicious circle” of negative self-reinforcing effects and symptomatic of irrigation problems in much of the developing world. This situation prompted the move towards reform. The paper then describes the actions that have been taken to date and gives preliminary observations on initial impacts. The required next steps to consolidate this stage of the reform program are discussed. Finally, consideration is given to further progression of the reform program that would ultimately create a “virtuous circle”. This would entail further institutional and financial reforms to enable a self-generated incentives environment creating mutually reinforcing influences for higher productivity, institutional and financial sustainability, and the ultimate objective of enhanced agricultural productivity and rural welfare.

In assessing the reform program, a cautionary approach is taken throughout the paper. The reforms are continuing and the steps taken so far represent only the beginning of a broader reform program requiring a number of years to further develop and consolidate. AP’s transfer of irrigation sector management is still in its infancy. The major initial drive to begin the change process will require sustained follow-on. The further steps discussed, towards the virtuous circle, are also assessed as key to yet higher productivity and ultimate sustainability. Given that irrigated agriculture is responsible for over 60% of AP’s agricultural production and over 70% of AP’s population relies directly or indirectly on agriculture for their livelihoods, the challenge is clear.

While it is still too early to call the program a success, even at this stage the initial impacts are encouraging. Continuous monitoring and periodic re-assessment will be required to further understand the program and follow its evolution. Indeed, AP’s reform program may well have important lessons for other states/countries which can study AP’s progress—both successes and failures—and perhaps design a similar or modified reform program suited to their circumstances. This paper contributes to the start of this process of review.
I. INTRODUCTION

In the last two years (1997 and 1998), the State of Andhra Pradesh, in southern India, has embarked on an ambitious irrigation sector reform program. This is centered on transferring management of irrigation to farmers, and is linked with actions to improve irrigation and drainage systems, enhance agricultural productivity, and restore the sector’s financial viability. New legislation has been passed for farmers’ management of irrigation, 10,292 water user associations have been created covering the entirety of the State’s irrigation systems, water charges have been tripled, and the first season of rehabilitation works has been carried out. These actions were preceded and accompanied by an extensive public consultation process and a major mobilization of effort by the Government to provide statewide training and logistical support. Box 1.1 summarizes the main actions to date.

Box 1.1. Andhra Pradesh Irrigation Sector Reform Program - Main Actions to Date

- Public consultations, February 1996-March 1997
- Water charges tripled, April 1997.
- FOs created statewide: (i) 10, 292 Water Users Associations (WUAs), elected June 1997 and (ii) 174 Distributory Committees (DCs), elected November 1997.
- First WUA Presidents Sadassu (Convention) April 1998.
- First DC Presidents Conference March 1999.
- Second Maintenance and Rehabilitation Program May to July 1999.
- Agricultural Intensification Program commenced, June 1999.
- Public participation fostered (continuous).
- Major training for farmers and government (continuous).
- Project level and district level conferences (continuous).

The response by farmers has been positive. In the first season of irrigation rehabilitation (1998), 22,887 works at a cost of Rs 118.1 Crores ($28.1 million) were taken up and completed as on March 31, 1999. The total works grounded amounted to Rs 127.3 Crores
($30.3 million), of which over 70% were undertaken directly by the farmer organizations. Impact to date can only partly be captured in currently available data. Nevertheless, the initial indications are encouraging. In the 1998/99 crop season, farmers in many of the State’s irrigation systems reported several improvements: water better reaching tail enders; expansion in irrigated area; and, on major schemes, acceleration by several weeks of the irrigation season (Chapter IV).

Such early and promising signs likely derive from AP’s comprehensive approach to reforming the irrigation sector. Most countries, and the states in India that have promoted participatory irrigation management (PIM), have chosen “gradualist” and “partialist” paths—implementing reforms at a relatively slow pace, piloting, making marginal changes, and tackling certain constraints but not others—to improve irrigation performance. AP has instead opted for a “Big Bang” approach; constituting WUAs covering all of the State’s irrigation systems—an area of 4.8 million ha—at one time, and mobilizing massive governmental support to this task. It is the most recent example of a major irrigation management transfer (IMT) program, the other cases of a “Big Bang” approach being Mexico\(^2\) and Turkey (refer Boxes A3.1 and A3.2, respectively). While containing some similar features, the reform program in AP follows its own circumstances and modalities.\(^3\)

The reforms are continuing, and the steps taken so far represent only the beginning of a broader reform program requiring a number of years to further develop and consolidate. Nevertheless, AP’s reform program is already attracting interest, both within India and internationally. In January 1999, India’s Fourth National Conference on Participatory Irrigation Management was held in AP. AP has also been chosen to host the Fifth International Participatory Irrigation Management Seminar scheduled for December 1999.\(^4\)

This paper responds to the interest shown. It is written from an implementer’s perspective, by GOAP and World Bank staff associated with the program. The paper provides a description of the AP irrigation reform program to date, as well as the authors’ current thinking on the desirable immediate and longer-term directions of the program. The AP program will benefit from continuous monitoring and periodic further assessment as it progresses. This paper contributes to the start of that process, but will need to be followed by additional and independent reviews in the years ahead.

\(^1\) Of the 22,887 works taken up, 17,869 works were executed by WUAs, 2496 works executed by the DCs and 2522 works were by the I&CADD through contracts. Works “grounded” means works commenced but not necessarily completed. There is usually a time lag between the records available for grounding and for completion of works.

\(^2\) For further discussion of the irrigation sector reform program in Mexico, refer to Gorriz, Cecilia M., Ashok Subramanian and Jose Simas, 1995.

\(^3\) The Mexico irrigation reform program began in 1991 and by 1998, 3.0 million hectares (ha) of irrigation were transferred to farmer-managed irrigation districts. The program in Turkey began in 1993 and by 1997, 1.3 million ha were transferred. Mexico and Turkey have been more gradual than Andhra Pradesh in the transfer process. For instance, in Turkey, 570 WUAs have been created and 0.4 million ha remain to be transferred. On the other hand, Mexico’s and Turkey’s approaches have involved more fundamental change at the moment of transfer. For instance, in Mexico, once the WUAs are formed they are largely left to their own devices to achieve financial self-sufficiency.

\(^4\) The first four International PIM Seminars were held in Mexico, Turkey, Japan and Indonesia (Bali).
In the following chapter, the prior situation and need for reform are discussed. Chapter III describes the reform actions undertaken to date. Chapter IV presents some of the impacts that are beginning to emerge. Chapter V highlights the key factors that have enabled the achievements so far. Chapter VI discusses the next steps required to consolidate the reform program, while Chapter VII places the reform program in a longer-term framework. Finally, Chapter VIII considers possible relevance to other states and countries. Provided in the Annex are key materials often requested, including AP’s new ISP and its Farmers’ Management of Irrigation Systems Act.
II. THE PRIOR SITUATION AND NEED FOR REFORM

IRRIGATION IN ANDHRA PRADESH’S ECONOMY

Agriculture, and in turn irrigation, are the foundations of AP’s economy. Approximately 73% of the total population of 72 million reside in rural areas, and AP’s economy is essentially agriculture-based. The majority of farmers have small landholdings, averaging less than 2 ha. The agricultural sector generates about 36% of the State’s gross domestic product and employs some 70% of the population. Irrigation dominates the agricultural sector. Irrigated agriculture constitutes 40% of the State’s cropped area and contributes over 60% of the State’s total agricultural production. Ninety-five percent of rice—the main crop grown in AP and the State’s principal food staple—is produced on irrigated lands. A wide variety of other irrigated crops are also grown, including cereals, pulses, oilseeds and non-food crops. Irrigated agriculture contributes about 18% of oil seed production; 55% of other food crops like chilies, vegetables and fruits; 15% of non-food crops such as tobacco, cotton and sugarcane; and about 36% of other minor crops.

UNDER-PERFORMANCE OF THE IRRIGATION SECTOR

Irrigation has been the primary engine of AP’s agricultural growth. The importance of irrigation is reflected in GOAP expenditures. Irrigation and drainage have traditionally been the largest users of State Plan funds. In the Eighth State Plan (1992/3 to 1996/7), Rs 2500 crores ($600 million) was spent, amounting to 24% of total Plan expenditure. Irrigation was second only to the power sector in usage of public funds.

Notwithstanding this massive public expenditure, under-performance of irrigation is ubiquitous throughout the State. A diagnostic “White Paper” (excerpts attached at Annex 5), prepared by GOAP in 1996 concluded that the irrigation sector was in crisis. Amongst other problems, the “White Paper” noted: (i) a decline in net irrigated area; (ii) low irrigation system efficiencies; (iii) low yields and farmer incomes; and (iv) low agricultural growth. These deficiencies are discussed in turn below.

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5 Farmers’ landholdings average about 1.1 ha in the Coastal region, 1.7 ha in the Telangana region, and 2.1 ha in the Rayasaleema region.
6 World Bank, 1998g; World Bank, 1997a.
7 In India, net irrigated area means the actual geographic area covered by irrigation, exclusive of multiple cropping, while gross irrigated area means area irrigated including multiple cropping. Potential irrigated area created means completed irrigation works, but actual irrigated area is usually less due to conveyance problems and inequitable water management.
8 GOAP’s White Paper, and this paper, focus on the service delivery aspects of irrigation. Another very broad issues area is the whole field of water resources management in general: between sectors, by river basin, holistic management including ground and surface water, and quality as well as quantity. For a discussion of these issues refer to the India WRM reports on “Intersectoral Water Allocation, Planning and Management” and “Groundwater Regulation and Management” (World Bank/Government of India, 1998 c and d; both documents have since been published by the World Bank and Allied Publishers in 1999).
Decline in Net Irrigated Area

Although the major investments in irrigation by GOAP have increased the irrigation potential in public surface irrigation schemes, a crucial need was overlooked. Maintenance was neglected, resulting in dilapidation of infrastructure. As a result, actual utilization in recent years has decreased. In the late 1980s net irrigated area plateaued, and it fell from 2.9 million ha in 1990 to 2.3 million ha in 1994 (refer Figure 2.1). Of the 4.8 million ha of potential irrigated area created to date, only 48% is actually being irrigated (a "gap" of 52%).

Figure 2.1. Decline in Net Irrigated Area in Andhra Pradesh, 1989/90-1993/94

Low Irrigation System Performance

Low system performance is a result of both the age of irrigation schemes and poor maintenance. Some systems are more than a hundred years old and are not designed to incorporate modern technologies now available. For instance, the number of control structures at various levels of the systems is insufficient and communications systems are rudimentary. The most detrimental factor, however, has been the cumulative impact of chronic underfunding of maintenance over many years. This has resulted in the severe disrepair of most surface irrigation schemes: canals and drains are heavily silted, lined sections are damaged, drops are eroded and collapsing, many gates are inoperative, outlets are damaged, and shutters are missing.

Low Yields and Farmer Income

Irrigated yields and production per unit of water are well below their potential. For example, paddy yields average 4.2 tons/ha, sorghum and millet 0.8 tons/ha, barley 1.2 tons/ha, maize 2.6 tons/ha, cotton 0.5 tons/ha, and sugarcane 74 tons/ha. This is a weak showing
compared to a number of other countries and to demonstration farms in India. Inequitable and unreliable water delivery from deteriorating systems have resulted in tail enders not getting water and yield shortfalls for other farmers ranging from 15% to 40%. Environmental problems (waterlogging and salinization in head reaches) have further exacerbated this state of affairs.

Low Agricultural Growth

Agricultural growth has declined, from close to 5% per annum in the 1980s to 1.8% per annum in the mid 1990s. Thus, it was unable to keep pace with the State’s population growth of 2.3% per annum. Given that some 70% of AP’s population is based in rural areas and reliant directly or indirectly on agriculture for their livelihood, low agricultural growth translated into reduced welfare for the State as a whole.

THE CAUSES OF WEAK PERFORMANCE

The problems arising from deterioration in irrigation systems described above derive from a combination of mutually supporting negative influences that have dominated the irrigation sector in AP over the past several decades. These self-reinforcing influences include: (i) government dominance and limited user involvement; (ii) poor cost recovery; (iii) insufficient operations and maintenance (O&M) allocations; (iv) deteriorating condition of the irrigation and drainage network; (v) low quality of agricultural extension; and (vi) weak incentives for government agencies to perform.

Government Dominance and Limited User Involvement

Development and management of the irrigation sector has traditionally been the domain of the public sector, under AP’s I&CADD. The primary focus of I&CADD has been on new construction. Public sector dominance, together with this construction orientation, excluded farmer participation in management and investment decisions. This resulted in a neglect of O&M and, even where provided, a supply rather than a demand-driven approach. Limited contact between I&CADD staff and farmers alienated the actual water users, who best

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9 For instance, the average paddy yield in AP of 4.2 tons/ha compares as follows with other selected countries: Indonesia, 4.5 tons/ha; China, 6.1 tons/ha; Egypt, 8.3 tons/ha; USA, 6.9 tons/ha (World Bank, 1998b, based on FAO Production Yearbook 1996 data). Such comparisons must, however, be interpreted carefully, taking into account actual water use and different natural conditions. For instance, as regards natural conditions, Egypt has more sunlight, favoring higher yield potential per unit of water than in a monsoon climate such as India.

10 World Bank, 1997a.

11 The main government institutions in AP concerned with irrigated agriculture are: (i) the I&CADD, responsible for construction of irrigation, drainage and flood control infrastructure and for O&M of irrigation, as well as bulk water supply services to other sectors; (ii) the AD responsible for providing agricultural extension services to farmers; (iii) the Revenue Department responsible for assessment and collection of water charges; (iv) the Finance Department responsible for allocating finance between government agencies; (v) the District administrations (under the Revenues Department), which provide general administration in the districts; and (vi) various other departments in specialized or supporting roles such as environment, forestry, fisheries, horticulture, marketing, etc. Other institutions mentioned in this paper include I&CADD’s WALAMTARI, I&CADD’s main training institute, and the newly created WCRC.
know their needs, and led to the absence of a client-oriented service. This has been exacerbated at the Government level by limited linkages and coordination between I&CADD and the Agriculture Department (AD).

**Poor Cost Recovery**

Inadequate cost recovery has been due both to the absence of a linkage between revenues and expenditures and to low water charges. Water charges for irrigation are collected by the Revenue Department and go to the general State exchequer rather than to the water service agency (I&CADD). Further, the revenues received are not earmarked for irrigation O&M. Expenditures for O&M are instead financed through separate allocations from the State’s general budget. There is thus no linkage between revenues and expenditures and no basis for commercial operations. As concerns water charges, prior to 1997, their level had been kept constant over many years (since 1986 for agriculture) and had progressively eroded in real terms to comprise only a fraction of O&M costs. The irrigation sector thus became unviable and an increasing burden on AP’s State treasury.

**Insufficient O&M Allocations**

1995/96 O&M budgetary allocations for major and medium irrigation schemes were made on the basis of a uniform flat rate of Rs 99/ha. This amounted to only about 30% of the Rs 300/ha average recommended by India’s 10th Finance Commission (1997) for major and medium irrigation schemes. Insufficient even to cover staff wages (about Rs 200/ha), the shortfall has been made up from the budgetary allocations for planned works and special repair. Rising wage and salary bills of I&CADD have themselves absorbed an ever-increasing share of total expenditures, leaving amounts for maintenance works far below the required level. Highly constrained finances have thus meant that even basic levels of maintenance on canals, drains and structures were not carried out.

**Low Quality Agricultural Extension**

Due to weak agricultural extension for the specific needs of irrigated agriculture, farmers have inadequate access to best practices, research findings, new crop possibilities and technologies. This has also contributed to general productivity levels well below potential. In effect, the AD has also found itself squeezed by limited public funds, which were virtually entirely absorbed by staff salaries, leaving minimal amounts for training, extension literature, demonstrations, and in-field transportation.

**Weak Performance Incentives of Government Agencies**

The dominance of Government in irrigation service delivery without involvement of users has created an environment of inappropriate and, indeed, perverse performance

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In fact, the concept that revenues should at least cover expenditures for irrigation was not recognized, even after land taxes were abolished in 1986 and only water charges were levied. The conceptual linkage between revenues and expenditures was finally made only under the Farmers’ Management of Irrigation Systems Act (1997).
incentives for I&CADD staff. As mentioned above, the absence of demand-driven incentives derives from the fact that I&CADD was not paid by the clients (the farmers) and, therefore, was not accountable to them. I&CADD tended to view farmers as “beneficiaries” or “recipients” of their services rather than as their clients. As a result, incentives for I&CADD were generated only internally, or were driven by political and other vested interests.\textsuperscript{13}

THE RESULTANT “VICIOUS CIRCLE”

The situation that AP has confronted is commonly found in many states and countries and can be characterized as a “vicious circle” of effects (Oblitas, 1992). Under the “vicious circle”, a dilapidated irrigation system also linked with weak agricultural extension—both provided as top-down governmental activities rather than as demand-driven activities relevant to the clients—results in under-performing irrigation systems and irrigated agriculture, low yields, farmer dissatisfaction and unwillingness to pay for irrigation services, low cost recovery, inadequate funding of O&M, de-motivated Government staff, and, repeating the cycle, poor irrigation service (refer Figure 1).

In AP’s diagnostic of its irrigated agriculture sector in 1996, these problems were recognized by GOAP, resulting in the preparation of its irrigation sector reform program.

\textsuperscript{13} In particular, local political interests, influential farmers and contractors put pressure on field engineers, which tended to affect both the costs and quality of irrigation works.
Figure 1
THE VICIOUS CIRCLE

Low Performing Irrigation Dept.

No Farmer Involvement

Poor Irrigation Systems

Poor O&M

Inadequate Funding of O&M

Low Cost Recovery

Farmer Dissatisfaction

Inadequate Agricultural & Water Use Extension

Low Yields

Low Incomes

Source: Adapted from World Bank, 1998b; Oblitas, 1992.
III. LAUNCHING THE REFORM PROGRAM

THE REFORM PROCESS

The broad philosophy behind the reform program is situated within AP’s “Janmabhoomi” concept. Janmabhoomi—land of re-birth—is the term given by AP to a concept of new ways for communities and government to work together to improve their economic and social well being. Central themes include participation by the people in decision making and implementation; cultural changes in the way government works, with emphasis on participatory approaches, partnership and serving the people; a grass-roots orientation in all activities; and programs aiming for self-help and self-reliance of communities. Janmabhoomi covers many sectors, amongst them, village education committees for development and management of primary schools, Vana Samrakshana Samithis (joint forest management groups), women’s thrift groups (DWCRA), youth employment groups (CMEYs), and watershed development committees. Contributions by the community are further augmented by government assistance with investment.

For the irrigation sector, involving complex technical issues and large infrastructure, such broad concepts were background rather than determinants of the specifics of actual design and implementation. In order to identify the specific problems, issues and potential solutions, a process of public consultations was undertaken. As a result of the feedback received from the farmers and the investigations of their complaints and contentions, it became apparent that radical structural changes were needed for the entire irrigation management system. Once this was established, the issues turned to alternate solutions. As these solutions had to be acceptable to farmers and required their cooperation, further extensive public consultations were undertaken. In this process a policy framework began to emerge and continually changed till it crystallized in the AP Farmers’ Management of Irrigation Systems Act (APFMIS). This established the essential features of the reform program, but implementation modalities have continued to evolve in response to lessons from the early experience. Thus, the reform strategy has materialized through the process of public consultation itself, with actions taken and adjustments made in response to needs as they have arisen.

Throughout the reform process, however, the objective of attaining a viable irrigation sector based on farmers’ management—a need recognized as early as 1994—has been firmly held in mind. Thus, the process has been guided, without being harnessed to any pre-determined route. Nevertheless, while the thinking and detailing of the reform program has been an evolutionary process, and is still developing (refer Chapters V and VI), the actual reform program has been “Big Bang” in nature combining simultaneous or rapidly sequenced actions, all implemented with energy and commitment: for instance, the three-fold increase in water charges, passing the APFMIS Act, the WUA and then DC elections, the maintenance and rehabilitation program, and the IAIP, all combined with extensive public discussion and major training. This chapter details the main actions taken thus far.

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14 Government Order No. 316, referring to Sriramsagar irrigation scheme, provided broad guidelines on participatory irrigation management.
MAIN ACTIONS IN THE REFORM PROGRAM
PART I – SETTING THE STAGE

Andhra Pradesh’s “White Paper”

The first proactive step to address the problem was taken with the preparation by GOAP of a “White Paper” (June 1996), containing a diagnostic of the State’s irrigation sector (excerpts attached at Annex 5). The paper was based on substantial reflection, and was subsequently made the subject of extensive meetings at district levels. These discussions centered on the question of how the problems confronting the irrigation sector should be tackled. Two main conclusions were reached on the appropriate direction of the reform agenda:

- Farmer empowerment and management should form the heart of the reforms.
- The process should be bold and comprehensive rather than incremental.

Community Outreach and Participation

Outreach to the community and its active participation began with the discussions following on from the “White Paper”. Indeed, community outreach has been a continuous feature of the reform process, gathering further momentum as actions have been thought through and implemented from 1997 to the present. Extensive discussions have taken place across the State, including state-level large conventions, project (scheme) level workshops and smaller workshops involving NGOs at the District level. Farmer perspectives have been central to crystallizing the policy thrust and program direction. Efforts towards building understanding have been furthered since the formation of WUAs through: rural rallies in every district (30,000 to 50,000 persons each in July 1997) addressed by the Chief Minister; farmers’ conventions; district-level workshops with WUA presidents and I&CADD, Agriculture and Revenue Departments; and state-level conventions of all 10,292 WUA presidents held in April and December 1998. This massive public participation campaign has been instrumental in sustaining dialogue and fostering transparency throughout the process.

Contributing to the community outreach process has been a strong and visionary State leadership. This has been essential to driving the dialogue and reforms forward. The increasing participation of I&CADD, as well as other Government departments, NGOs, the rural community and farmers, is helping to build commitment to the reforms. This will need

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15 In December 1998, two conventions were organized, the first for all Coastal region WUAs and the second for all the WUAs in Rayasaleema and Telangana regions. The conventions had a computerized opinion poll survey of the viewpoints of WUA presidents, including computerized scanning of questionnaires and immediate distribution of results to participants as a basis for discussion and decision-making.

16 Two NGOs—Institute of Resource Development and Social Management (IRDAS) and Society for Natural Resource and Rural Development—have been closely associated with I&CADD from the beginning. They each participated in the implementation by I&CADD of the two pilot IMT exercises on Sriramsagar scheme. IRDAS has also been associated in the core group preparing the State irrigation strategy and implementation program and, with WALAMTARI, has assisted in preparation of the various farmer and Government staff training modules.
to be further broadened—progressively involving more persons, from the grass-roots to technical levels and civil society—to consolidate a shared partnership in the reform process.

**Tripling of Water Charges**

Irrigation water charges were raised three-fold on April 1, 1997, effective from the beginning of the 1996/7 Rabi season. Water charges before and after the revision are provided at Table 3.1.

**Table 3.1. Water Charges per Acre by Crop Type Before and After Revision**

<table>
<thead>
<tr>
<th>Crop Type</th>
<th>Water Charges Per Acre Category I Pre-revised*</th>
<th>Water Charges Per Acre Category II Revised**</th>
</tr>
</thead>
<tbody>
<tr>
<td>First or single wet crop</td>
<td>Rs 60</td>
<td>Rs 200</td>
</tr>
<tr>
<td>Second &amp; third wet crop</td>
<td>60</td>
<td>150</td>
</tr>
<tr>
<td>First irrigated dry crop</td>
<td>40</td>
<td>100</td>
</tr>
<tr>
<td>Second &amp; third irrigated dry crop</td>
<td>40</td>
<td>100</td>
</tr>
<tr>
<td>Long duration crop</td>
<td>120</td>
<td>350</td>
</tr>
<tr>
<td>Aquaculture (per year)</td>
<td>0</td>
<td>500</td>
</tr>
</tbody>
</table>

* Permanent Irrigation Sources; ** Irrigation Sources for at least 4 months.
* Pre-revised effective from July 1, 1986; ** Revised effective from July 1, 1996.

In the Indian political context, this substantial jump in irrigation charges is virtually unprecedented. State governments have been very reluctant to adjust rates, which have often remain unchanged for years, sometimes for a decade or more. Adjustments, if made at all, have usually been marginal, making only limited dents in the general unviability of the sector. However, in AP's case, the water charge increase does not appear to have been a concern of the farmers though it met with stiff resistance (refer below) in the initial stages. It was debated in detail in the AP Legislative Assembly before enacting the amendment. Figures 3.2 and 3.3 illustrate the dimension of AP's new water charges relative to the significantly larger costs of other farm inputs, to overall costs of cultivation, and to gross and net revenues. As can be seen, the charges still represent a small percentage (about 5%) of total farm input costs and only 2% of gross farm revenues. The actual and anticipated increases in farm incomes, assuming production of two paddy crops per year. All costs and revenues are on an annual basis. The comparisons provided are for illustrative purposes based on interviews with several farmers rather than statistically sampled data. On this basis, costs and revenues on a per annum basis have been derived.

The following is the sketch of the costs and returns: (i) Paddy yields of 25 and 30 bags in kharif and rabi season. We assume farmers to grow the coarse variety rice and get at least Rs. 300 per bag of 70kgs. (we could have assumed a good quality rice—samba BPT 5150 at Rs. 500-550 a bag). This means the farmers receive at a minimum Rs. 16,500 acre/annum; (ii) Water charges of Rs. 200 for kharif and Rs. 150 for rabi, a total of Rs. 350 per acre for the year; (iii) seeds—30 Kgs of seeds is required per acre per crop and costs Rs. 300. The total cost for two crops per acre would be Rs. 600; (iv) Fertilizers—DAP, a bag (50 kgs) for an acre for a crop at Rs. 425, urea at Rs. 205 a bag per acre for a crop, and zinc 10kg/acre at Rs. 200 per crop. The cost on fertilizers for one crop is Rs. 830 or Rs. 1660 per year; (iv) pesticides—ten kgs per acre at Rs. 550 or Rs. 1100 per year for two crops; and (v) hired labor—for transplanting, weeding and harvesting at Rs. 40/day. An acre requires around 40 laborers. This means the total cost for labor would be Rs. 1600 per crop or Rs. 3200 per year.
resulting from improved irrigation services, far outweigh the impact of the water charge increase. More important, however, to general acceptability was the approach AP used in discussing and announcing the water charges increase.

**Figure 3.2**

Andhra Pradesh's New Water Charges Compared with other Input Costs per Annum

**Figure 3.3**

Andhra Pradesh's New Water Charges compared with Overall Returns per Annum

Gaining Public Acceptance for the Water Charges Increase

There was, as to be expected (and as desirable), some debate on the water charge increase. When, after public discussion in the districts, it was finally announced, farmers were not unduly agitated, except in the Godavari delta where aquaculturists were upset at the new rates that they had to pay and stimulated opposition. The measure was debated widely in the State Legislative Assembly during the 1997 Budget session. An initial proposal for a slightly higher increase—to Rs 250/acre in the case of paddy, for instance, was thus modified to Rs 200/acre which received assembly approval (the approved rates as in Table 3.1 above). GOAP have as a matter of policy decided to make available the funds collected by way of water charges back to the (FOs) and service agency for undertaking O&M. This combination of a rise in water charges but making available the enhanced amounts towards maintenance of the irrigation system has been the key reason for accepting the increase in water charges.

Even so, other states—also faced with decisions on water charges increases that would have, if looked at rationally, little impact on farmer welfare—have not to-date been able to make such major changes with such apparent ease as AP. It is thus interesting to assess why AP succeeded where other states have not, or have had to settle for more modest increases than APs tripling of rates. The principal reason is considered to be the combination of a widespread consultation and public outreach process preceding the increase, and the presentation of the increase not as a single measure but as part of a package of measures
which were seen by the rural communities and the political parties as overall beneficial to the farmers.

Thus, it was known that GOAP was planning a comprehensive program to help the farmers improve their irrigation systems. The public was already involved in discussion of the draft APFMIS Act and preparation for the WUA elections. It was known that in the following season, GOAP would be helping the WUAs improve their systems. Thus, benefits were anticipated, and government was seen as fair in also asking for an increase in water rates. In fact, so closely were these different ideas associated that the Water Charges Amendment Act, 1997, was passed only the day before the APFMIS Act, 1997 (the Acts were passed on April 16 and 17, 1997, respectively), and the WUA elections also took place closely thereafter (on June 17, 1997). This articulation and public participation process, together with an overall plan, widely discussed in all public fora, to improve the irrigation service, may be the way to go in other states and countries facing similar decisions.

Ancillary to such public outreach and to the simultaneous announcement of comprehensive measures to improve the irrigation sector and farmer incomes, there are also public outreach techniques that can help the public better appreciate a water charges increase and its reasonableness. Full transparency is essential, but the message should also be put in context and be simple to understand. Thus, in AP’s case, the initial message was put to farmers in the form of “give a bag of paddy (per acre)” (one 70 kg bag of paddy would fetch slightly more than Rs 300), or its monetary equivalent. A farmer growing, for instance two paddy crops will pay water charges in AP of Rs 350/acre/annum (about Rs 865/ha). In comparison, that same farmer may obtain about 50 to 60 bags of paddy/acre from his combined two crops, the water charge thus representing only 2% of his gross returns (assuming 55 bags of paddy) or the equivalent of slightly more than one of his 55 bags of paddy. Figure 3.4 provides a visual illustration. Alternatively, the new water charges may be seen as representing less than the annual cost (two crops) of his seed, or a fraction of his fertilizer bill (Figure 3.2). Popularly appreciated comparisons such as in Figure 3.4 may be useful visual tools in state campaigns to involve citizenry in decision making and help gain public acceptance.
Box 3.4: A “Bag of Paddy”

A farmer needs to give an equivalent of a little more than one bag of paddy out of an average production of 55 Bags of paddy/acre/year for the irrigation services.

Enactment of “Andhra Pradesh Farmers’ Management of Irrigation Systems Act” and its “Rules”

In being the first state to establish a law specifically designed for farmer organizations (FOs), AP has made Indian history. The AP Farmers’ Management of Irrigation Systems (APFMIS) Act, enacted with unanimous support in the Legislative Assembly in April 1997 and applicable to the entire State, provides a comprehensive framework for the constitution and functioning of Farmers’ Organizations (FOs) as independent legal entities. The Act was followed by the issuance of “The AP Farmers’ Management of Irrigation Systems Act Rules”. The Rules give procedural guidelines to the 43 sections of the Act. (The APFMIS Act and summaries of the Rules are attached at Annexes 6 and 7, respectively.) Between them, the

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18 Including all major, medium and minor schemes, except irrigation sources vested under Panchayat Raj institutions.
19 GOAP’s intention to promote FOs in all irrigation schemes was first announced in the 1996 Budget Speech. Farmers’ Organizations include Water User Associations (WUAs), DCs and PCs. Depending on the complexity and size of an irrigation scheme, there may be one to three tiers of FOs in an irrigation system.
20 The full Rules, along with the Act, have also been published by GOAP in a convenient book form (GOAP, 1998).
APFMIS Act and Rules provide the basis for the take-over of management and maintenance of irrigation systems by WUAs, and the progressive re-orientation of government-farmer roles to a partnership, with the I&CADD role shifting more to one of facilitator rather than implementer. Their enactment thus forms the foundation for the required shift to a client-driven irrigation sector: the farmers, through their farmer organizations, would now be in the driver’s seat, with I&CADD to progressively become a client oriented—and client paid (refer Chapter VII)—service agency.

Specifically, the APFMIS Act details: (i) delineation of the area of operation on a hydraulic basis;21 (ii) organizational structure; (iii) composition of Farmer Organizations (FOs); (iv) membership criteria; (v) functions of FOs, including the resolution of disputes; (vi) “competent authority”,22 and (vii) resources of FOs. Some salient features are summarized below. Each irrigation scheme is divided into hydraulic units of between 100 to 2,000 ha (depending on the size and topography of the command area under an irrigation scheme), to be managed by a WUA. The area of operation of a WUA is divided (depending on its size) into four to ten (“Territorial Constituencies” (TCs)23—also determined hydrologically—the objective of which is to provide fair representation of all farmers in the WUA. Management thus becomes based on water, rather than on other, boundaries and is more efficient and equitable.24 The organizational structure of the Farmer Organization is determined according to scheme size:25 a one-tiered (WUA) system in minor schemes; a two-tiered (WUA and DC) system in medium schemes and a three-tiered (WUA, DC and PC) system in major schemes.26 WUAs are federated into DCs at the distributory level and a Project Committee (PC) at the scheme (“project”) level. Membership with a voting right is given to each landholder (regardless of the size of holding)27 within the WUA’s area of operation.

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21 Hydraulic basis means based on the identification of a viable irrigated area served by one or more hydraulic structures such as headworks, distributories, minors, pipe outlets and the like.
22 I&CADD engineers have been notified as a “competent authority” to a group of WUAs. The Assistant Engineer is the competent authority of a WUA; the Deputy Executive Engineer is the competent authority to a Distributory Committee and the Executive engineer/Supedt., Engineer is the competent authority for a PC.
23 The area of operation of a WUA is delineated into territorial constituencies on a hydraulic basis which could range from 4 to 10 depending on the size of the command area of the irrigation scheme. In minor schemes up to 200ha—4 TCs; 200 to 400 ha—6 TCs; 400 to 600 ha—8 TCs; 600 to 2000 ha—10 TCs. In major and medium schemes up to 1000 ha—4 TCs; 1000 to 1500 ha—6 TCs; 1500 to 2000 ha—8 TCs; and above 2000 ha—10 TCs.
24 The importance in AP’s case of choosing hydraulic boundaries and new institutions rather than, for instance, Panchayats is discussed in Chapter IV. Use of TCs also breaks the former dominance of head-enders in irrigation decision making and management.
25 Irrigation systems in AP are classified according to the size of their service (command) area: (i) minor irrigation schemes cover less than 2000 ha; (ii) medium irrigation schemes cover 2,000 to 10,000 ha; and (iii) major irrigation schemes cover over 10,000 ha. There are 15 major, 74 medium, and 12,294 minor (or tank) irrigation schemes in the State under the aegis of I&CADD. The number of tanks exceeds the number of minor scheme WUAs because: (i) WUAs are not constituted in “scheduled areas” (tribal areas under schedule 8 of India’s constitution); and (ii) where tanks are connected in hydrological sequence to each other (a series of tanks in a single interconnected system), one WUA will tend to handle the multiple tanks together. Additionally, there are 70,000 minor tanks under Panchayat Raj institutions.
26 The tiering described here is, in practice, generally but not rigidly followed, as it is also influenced by the hydraulic layout of the scheme.
27 Landholder means an owner and/or a tenant (recorded as such in the Record of Rights) and also includes persons in lawful possession and enjoyment of land under a water source.
The Act provides for constitution of FOs through a democratic process of elections by secret ballot. The election process, which is similar to elections in local bodies, is specified in the Election Manual of the APFMIS Rules. A voter’s list is drawn up, according to TC, out of all landholders within the area of the WUA’s operation. The definition of landholder, and hence of the right to be represented and to vote also provides equitable representation to smaller farmers and tenants. One vote is provided to each landholder regardless of farm size. Further, tenant farmers are favored over landlords. Thus, if the tenant farms the whole land of a landlord, he/she has the right to vote, and not the landlord. If the tenant and landowner both cultivate parts of the landowner’s land, both have a vote. Each voter within a TC casts two votes, one for the WUA TC Member and the other for WUA President. The President and TC Members constitute the Managing Committee (MC) of the WUA. The MC is responsible for carrying out the day-to-day functions as specified under the Act. All of the Presidents of the WUAs within a DC area constitute the DC’s General Body, and from this the DC President and a MC of up to five members are elected. A PC will be comprised of all DC Presidents (in a major project). The PC also will have a MC of up to nine members, with a Chairman and Members, responsible for functions at this level. Presidents of all PCs are finally to be federated into an Apex Committee at the state level. This Committee will represent farmers in state-level decisions on policies and priorities in the irrigation sector.

The Act also lays down the primary functions of the FOs, which broadly include:
(i) preparing and implementing plans for the efficient and equitable distribution of water within the command area and, with technical assistance of I&CADD, for system maintenance and improvements; (ii) water regulation, water budgeting and promotion of economy in the use of water; (iii) preparing budgets, maintaining accounts and having them audited; (iv) undertaking social audits; (v) maintaining irrigation and drainage systems records and a register of landholdings; (vi) resolving water and irrigation-related disputes amongst farmers; (vii) assisting the Revenue Department in the collection of water charges; (viii) promoting agricultural improvements, in coordination with AD and I&CADD; and (ix) participating in decisions related to water management, planning, investment and policy-making at whole command levels.

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28 A landholder who has completed 18 years of age by the date of notification of the election schedule is an eligible voter under the Act.
29 An irrigation system may have one or more DCs, depending on its size. If there is more than one, each DC is assigned an area of operation. All the WUAs falling within the area of operation of a DC are its members.
30 The plans for financial management, auditing and social audits are discussed in Chapter VI. Under a social audit, works executed by FOs are inspected through a participatory process by a group of individuals in the village, with a chairman nominated by the District Collector, to assess and report on the quality, quantity and costs of works.
31 A policy statement has been announced in the AP Legislative Assembly (April 1998) that the water charges collected will be given back to the FOs to cover their O&M expenditures. Under AP’s new Irrigation Sector Policy (ISP) (refer Chapter III and Annex IV), it is also intended to transition to direct collection of water charges by WUAs and I&CADD, with appropriate sharing of revenues (refer Chapter VI).
32 The salient features of the APFMIS Act are further detailed in Peter, 1998b.
Creation of WUAs Throughout the State

In June 1997, following an intensive preparation period and mobilization of the entire district-level Government apparatus, elections for WUAs were held. This resulted in the formation of 10,292 WUAs covering the entire State's surface irrigated area of 4.8 million ha. (The logo representing WUAs is reproduced at Box A2.2.) The distribution of WUAs by district and scheme size is shown in Box A2.3. Most WUAs are in minor schemes (8180), followed by major schemes (1699) and by medium schemes (413). However, as illustrated in Figure 3.5, due to the larger size of WUAs in major (and to a lesser extent medium schemes), the greatest area under WUAs is in the major schemes, which comprise 68% of the State's surface irrigated area. Elections for the DCs were held in November 1997, resulting in the formation of 174 DCs. Elections for PCs (federations of DCs at the scheme level) are planned for 1999/2000, to be followed subsequently by the constitution of the state-level Apex Committee.

**Figure 3.5. Percentage of WUAs and Irrigated Area by Scheme Size, 1997/98**

![Graph showing percentage of WUAs and irrigated area by scheme size, 1997/98.]

Source: Peter, 1999.

In creating the WUAs, AP chose to make membership of a WUA automatic rather than voluntary. Membership is simply determined by eligibility as a landholder (refer previous section), and all such landholders are automatically members. The individual is, of course, entirely free to participate or not in WUA proceedings and voting. This contrasts with frequent practices in PIM elsewhere, where membership is voluntary—for example, under India's Societies Act, a WUA could be registered if seven or more farmers get together. In Maharashtra 51% of the farmers, and holding more than 50% of the command area, are necessary to constitute a WUA. Despite the apparent “democracy” of voluntarism, in the end it tends to discriminate against the formation of WUAs and social equity, as head-end farmers are often reluctant to initially form a WUA, thus discriminating against the interests of the truly disenfranchised, the tail-end farmers.
The sequencing of elections, first to WUAs, then DCs, then (on major schemes) to PCs, and eventually to a state-level Apex Committee, is deliberately from the grass-roots up, and is also deliberately phased in time. It is important that for elections to each level, sufficient time is provided for the community to ascertain who are the best leaders amongst them. At WUA levels this is relatively easy as the local community already knows each other. At DC and PC levels, leaders are far apart and need to get to know each other through sufficient opportunity to interact. The PC elections will be held in 1999/2000, after the second rehabilitation and maintenance season and at least part-way through the second water management season. This will have enabled the DC Presidents to have a good basis, from working together over a sufficient period of time, to know who amongst them would form good PC office bearers. Similarly, a further period would be provided before forming the state-level Apex Committee, so that the local farmer leaders, through their participation in state-level conferences, would come to know their fellow leaders and their respective qualities as concerns responsible representation of viewpoints, executive capacity and motives.

AP’s WUAs vary in size depending on scheme size, topography and the hydraulic units. The largest WUAs and DCs are found in the deltas due to the flat topography and size of the hydraulic units. For major systems, the average WUA size in the deltas is about 2600 ha and non-deltaic WUAs average 1200 ha. For medium schemes, the average WUA size is about 250 ha. The smallest WUAs are found on minor schemes, their area defined by the size of the scheme. They can thus range in size from 40 ha (minor schemes below 40 ha are managed by Panchayats) to 2000 ha, with the average for minor scheme WUAs being about 60 ha. DCs on major schemes average about 40,500 ha in the deltas and about 24,000 ha in non-deltaic regions. In the Godavari delta, DCs average 54,000 ha, with the largest DC being 65,000 ha.

Formulation of Irrigation Sector Policy

As the reform actions were commenced, in parallel, the reform strategy was further developed. Refinements to the policy approach were based on a number of workshops, and consultations with State officials, NGOs, farmers and the World Bank. This process culminated in the issuance of the State’s ISP, “Reforming the Irrigation Sector for Sustainable Management and Development” (attached at Annex 4). This was prepared in final draft in November 1997 and approved by the Cabinet in May 1998. The ISP articulates the vision for the irrigation sector, sets out the reform agenda, and gives a detailed presentation of the short and medium term implementation program. In an attempt to break the “vicious circle” pervading AP’s irrigation sector, reforms focus on several fronts simultaneously: (i) the establishment and development of WUAs across the State; (ii) scheme rehabilitation and maintenance; (iii) full cost recovery and financial sustainability; and (iv) an agricultural intensification program. The ISP also discusses broad implementation modalities, and provides pointers to the further steps in the reform program, including further institutional restructuring and strengthening water resources management (WRM) on a river basin basis.
Establishment of “Water Charges Review Committee (WCRC)”

It was felt that a regulatory apparatus was needed to annually review charges and expenditures in the irrigation sector. The WCRC, constituted by Government Order in December 1997 (attached at Annex 9), is a permanent body charged with providing recommendations on all aspects of water charges and maintenance funding levels. The WCRC is responsible for overseeing the transition to full cost recovery, with specific actions including: (i) undertaking annual reviews of financial performance, O&M needs, expenditures, collection rates, revenues, etc.; and, as discussed in Chapters VI and VII; (ii) monitoring and guiding the transition from collection of water charges by the Revenue Department to collection directly by WUAs, with agreed shares retained by WUAs, DCs, PCs, the Apex Committee, and I&CADD; and (iii) guiding the planned transition from the current assessment of water charges on a per hectare basis to volumetric charges. WUA representatives are to be included in the WCRC.

Launching of Training Program

A massive series of training courses and orientation programs for farmer organizations (FOs) and Government staff is being undertaken (refer Box 3.6). This began in July 1997, when I&CADD, Revenue, and AD officials participated in a workshop to determine the thrust of the training program. The preparation of detailed training modules and the training of trainers was commenced, based on the recommendations from the workshop. The first round of training—given to all elected WUA presidents in two-day district-level workshops—was launched in October 1997. In parallel, training modules have been progressively developed and now comprise some eighteen subject areas.\(^\text{33}\) A number of other training rounds involving all WUAs—and including an India Network on Participatory Irrigation Management/World Bank Institute (WBI)/Ford Foundation-sponsored workshop on training of trainers in April 1998—have also been conducted since then.\(^\text{34}\) Training of Government staff in the FO program is also underway. In September 1998, a one-day “Orientation Workshop” for I&CADD accounts officers and irrigation engineers was held to discuss new procedures in accordance with the implementation of the APFMIS Act. Training was also part of the regional and state-level conventions of WUAs in April and December, 1998.

The broad-based nature of the program requires many trainers and decentralization of training to district and sub-district levels. As an example, in April 1999, 330 trainers received intensive four-day training, to then become district-level trainers. Five staff each from I&CADD, AD and the Revenues Department were trained as trainers per district. This is to be followed in July-August 1999 by a broadening out of the FO training to now include all WUA committee (MC) members, requiring the training of 65,000 persons in that period. A

\(^{33}\) The training modules already developed comprise: (ia) water regulation; (ib) water regulation (measurement of flows); (ii) maintenance; (iii) financial management; (iv) on-farm water management; (v) organization and its management; (vi) water budgeting and operation plan; (vii) conjunctive use of water; (viii) behavioral attitudes and group dynamics; (ix) environmental issues; (x) gender issues; (xi) sustainability; (xii) AP-FMIS Act provisions; (xiii) social audit; (xiv) M&E; (xv) communication and training; (xvi) presidents, managing committee members and department roles; (xvii) participatory rapid appraisal; and (xviii) revenue records.

\(^{34}\) India NPIM is the Indian Network on Participatory Irrigation Management. WBI is formerly the Economic Development Institute, an affiliate of the World Bank, which sponsors training and discussion.
"Trainer's Handbook" and a "Manual on Orientation and Training" has also been issued as a guide for the trainers, who will also receive continued upgrading courses to further improve their skills. Likewise, training for FOs and Government staff alike is not seen as a one-time activity but a continuum, with repeater and further training corresponding to needs.

Training also overlaps with conferences and rallies for motivation, coordination, discussion of new ideas and obtaining of feedback from farmers and staff. Examples include the frequent holding of "Saddassus" (large participatory conferences), ranging from whole-state saddassus (for instance, in April, 1998, all 10,000 WUA Presidents attended a Saddassu in Hyderabad), to large rural rallies at district levels (sometimes with attendance exceeding 50,000), to more specific conference such as the District Collector's conference in April 1999, or several regional WUA Saddassu's held in 1998. The media is also involved, with programs ranging from the "dial your CM" live question and answer sessions with the Chief Minister, to other media presentations. Weekly teleconferencing is also practiced to monitor problems being faced by the WUAs.

In 1999/2000, in-state "study tours" for FO leaders are also planned, so that farmer leaders and government staff have the opportunity of seeing best practice examples in schemes other than their own. I&CADD's Water and Land Management Training and Research Institute (WALAMTARI) and its Human Resources Development Unit (created in early 1999) are responsible for heading up the PIM awareness campaign and all training efforts. NGOs, and consulting firms are also being brought into the training effort. Institute of Resource Development and Social Management (IRDAS, an NGO) has played a core role in developing the training modules. For the IAIP, the state agricultural university is being co-opted for training development as well as research and demonstrations. Similarly, to design a computerized financial management system and to train WUAs in financial management and bookkeeping, an experienced accounting firm is being brought in. The training program will need to further develop in all respects: quality, diversity of subject matter, and intensity; as it is the basis for institutional development of FOs and government agencies alike. For high performing staff and selected farmer and civil society leaders, international study tours will also be encouraged.
Box 3.6. Examples of Training Programs and Seminars Undertaken and Planned

| 2. | Seminars on participatory irrigation management for I&CADD and Revenue Department officials, presided over by the Chief Minister, July 1997. |
| 3. | Karshak Sadassus (farmers meetings)-30,000 to 40,000 farmers including WUAs in each district addressed by the Chief Minister in July 1997. |
| 4. | Training programs for I&CADD officials from all districts (260 officials in total) at WALAMTARI, July 1997 and continuous. |
| 6. | Training of I&CADD “competent authority” at one day orientation program, December 1997. |
| 7. | Training program for I&CADD, Agriculture and Revenue Department officials (two from each department for each district) at WALAMTARI, December 1997. |
| 8. | Workshop with Joint Collectors, Joint Directors of Agriculture and Chief Engineers and Superintending Engineers to identify areas of training for WUAs, November 1997. |
| 9. | Training for Resource personnel on various topics to be discussed at district level “Saddassu” at WALAMTARI, April 1998. |
| 12. | One day training program for all I&CADD Superintending Engineers, July 1998. |
| 13. | One day training program for all District Coordinators and Superintending Engineers, August 1998. |
| 14. | One day workshop for PAOs, Senior Engineers in the cadre of Chief Engineers, Superintending Engineers, Deputy Chief Engineers, etc., September 1998. |
| 19. | Training of Trainers Workshops (March-April, 1999). |
| 20. | “Dial your CM” and other media programs for questions and answers. |
| 21. | District-level training of all Presidents and MC members (65,000 persons) in July-August, 1999. |
| 22. | Issuance of state-level FO’s magazine and district level monthly newsletters (June 1999). |
| 23. | (planned 1999) Third round of training on financial management and writing of accounts. |
| 25. | (planned 1999) In-state Study Tours for FOs and government staff. |
| 26. | (other planned 1999/2000, etc.–further training, study tours, Saddassus, etc. |
| 27. | Fifth International Participatory Irrigation Management Seminar (planned by the international organizers to be held in AP at end 1999). |

Joint Farmer-I&CADD “Walkthroughs” of all Systems

Joint “walkthroughs”, involving WUA and DC representatives and I&CADD engineers, were undertaken on all irrigation systems in late 1997/early 1998. Participatory rapid appraisals (PRAs)\(^{35}\) indicated a strong positive response to walkthroughs by most of the

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\(^{35}\) Undertaken by World Bank staff and a consultant anthropologist/community organization specialist in 1998.
participants, signaling the importance of this experience in beginning the development of mutual understanding between farmers and I&CADD officials. The diagnostic of scheme deficiencies arising out of these walkthroughs served as the basis for the subsequent first minimum rehabilitation and maintenance program in May to June 1998. Walkthroughs for the second year were conducted in early 1999 to form the basis for the 1999 maintenance and rehabilitation season.\[^{36}\]

**MAIN ACTIONS IN THE REFORM PROGRAM**  
**PART II—THE PHYSICAL IMPROVEMENTS**

**Improving the Irrigation Service and Agricultural Technology**

The actions described in Section B all preceded (in the case of training it is also continuing) any actions to actually improve the irrigation systems or introduce improved agricultural technologies. They illustrate the extensive preparatory work undertaken by GOAP to undertake key prior reforms (in public outreach, policy, planning, legislation, water charges, establishing the FO institutions and training) as precursors before physical improvements.\[^{37}\] They set the stage for actual improvements in the systems and in agricultural practices.

The following sections describe the implementation of the first season (1998/99) of physical and technical improvements. They encompass: (i) improving the systems through enhanced maintenance and rehabilitation; (ii) improving water management; and (iii) improving agricultural practices and on-farm water management. In the first season, the most successful of these three activities was the rehabilitation and enhanced maintenance program. A start was made with water management, but much still remains to be done there, most of the improvements in management being because of improved conveyance capacity of channels and drains and better cooperation between head and tail-enders rather than scientifically based water management. The IAIP, which was designed at a later stage than the other components of the reform program, did not get underway in the first season, but preparatory activities are now intensive, to commence at field levels in the 1999 kharif season.

These three actions can be considered as the operational arms of the reform program. As discussed in the overview of present and future actions in Chapter VII, together with the reforms described above, the objective is to translate the new enabling environment into actual improvement in crop productivity and farmer incomes. And they lead collectively, with the actions in Section B, to a translation of the “Vicious Circle” (Figure 1 in Chapter II) towards a “Virtuous Circle” (Figure 7 in Chapter VII), containing comprehensive and mutually supporting actions and influences intended to lead to progressive improvements in productivity, incomes and institutional and financial sustainability. The attempted actions to date in these three areas are described below.

\[^{36}\] In some of the early 1999 walkthroughs, AD staff also participated. From 2000 onwards, when the IAIP will be fully underway, the objective should be that AD staff participate in all walkthroughs.

\[^{37}\] By contrast, many states and countries, and much of the literature on participatory irrigation management advocates doing physical improvements before such legislative, pricing and institution creating activities.
Launching of First Maintenance and Rehabilitation Campaign

A major field campaign was launched in early May 1998 to undertake maintenance and minimum rehabilitation on as broad a scale as possible. In preparation for this, engineering and cost norms were prepared by consultants. For each WUA and DC works program, detailed estimates of required maintenance and rehabilitation works were then drawn up by the “Competent Authority (CA)” (the I&CADD engineer) in consultation with the FOs, based on the prioritization of works identified jointly by FOs and the CA in the joint walkthroughs. Each FO subsequently entered into a legal agreement with the CA for implementation of the works (attached at Annex 8). Minimum rehabilitation was carried out on 10 major and 60 medium irrigation schemes covering a total area of 2.45 million ha. Maintenance works were carried out on these major and medium schemes, as well as on all of the State’s minor schemes, covering a total area of 3.7 million ha. The rationale behind this campaign was that early realization of benefits, starting from the 1998 Kharif season (commencing in July), would inspire WUA confidence in the reforms and give further impetus to the program.

In the 1998 maintenance/rehabilitation season, 22,887 works were taken up and completed, with a total cost of Rs 118.1 Crores ($28.1 million). Over 70% of the value of works, and nearly 90% of the number of works, were implemented by the Farmer Organizations: 17,869 works by WUAs and 2,496 works by DCs, with the remainder (2,492 works) executed by I&CADD through contracts. WUA-level works were completely implemented by WUAs. PC-level works were carried out by contractors under I&CADD, and DC-level works were undertaken by either DCs or I&CADD, depending on the complexity of the works.

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38 “Maintenance” refers to low-level expenditures on maintenance activities, funded in 1998/99 and 1999/2000 by I&CADD at the following rates: Rs 100/acre for WUAs and Rs 100/acre for DCs. Funds are provided directly to WUA and DC bank accounts after detailing by the FO and Competent Authority (CA) of the works to be done and joint signature against a work agreement by the FO and CA. Works may exceed the fixed amount per acre, but the excess would be funded by the FO. Maintenance funds were provided by I&CADD to all WUAs in 1998/99, and will again be provided in the 1999/2000 season. In turn, the farmers are paying GOAP the higher water charges (averaging Rs 350/acre for a farmer with two irrigated wet crops). As transition to collection of water charges by FOs and I&CADD is achieved (chapter VI), payment of maintenance by GOAP will cease as O&M will be a self-financing activity by FOs and I&CADD, with revenues generated themselves from collection and sharing of the water charges. “Minimum Rehabilitation”, sometimes referred to in this report as “rehabilitation” refers to a higher level of activity and expenditure to rehabilitate the systems, but still at relatively low levels of expenditure compared with more conventional rehabilitation and modernization. For major and medium schemes, Rs 1350/acre is the average assumed in the APERP-IC, though actual allocations range on either side of this, and are estimated on an actual needs basis. Within this norm, the amount provided to major and medium WUAs and DCs is also Rs 100/acre each, with the varying amount being for the main system (PC works), based on the needs of the particular system. In practice, the two definitions, though important to World Bank/GOAP financing procedures under the APERP-IC, are more of a conceptual continuum, as in AP’s case of dilapidated infrastructure, all maintenance and rehabilitation work is effectively rehabilitation (or, alternatively, “deferred maintenance”) at this stage, and recurrent (normal) maintenance will only start after two or three seasons of the works program. The approach towards rehabilitation of irrigation systems is incremental in nature and spread over two to three years as against total rehabilitation done in a single season.

39 The Engineering Staff College of India, Hyderabad, AP.

40 As discussed in the paragraph below, the works were mainly implemented in the canal closure period of May-June 1998. The above data is from the corresponding financial year ending March 31, 1999.
Most of the works related to desilting, weeding, and raising embankments, and, to a lesser extent, to repairing shutters, repairing or constructing secondary level concrete structures, and rehabilitating or constructing selective canal bank revetments and lining.\(^4\) As indicated above, the great bulk of the works were undertaken directly by FOs.\(^5\) The I&CADD engineers provided technical assistance, but the Farmer Organizations (the WUAs and DCs) handled the direct planning and implementation of the works. The FOs contributed their own labor, hired labor, and hired excavators from the private sector (especially for DC-level works). This high level of FO involvement was not anticipated. In parallel, I&CADD undertook the more complex works on the main systems and headworks, such as repairs of cross regulators and gates. It is noteworthy that the FO implemented works, while primarily earthworks, were found to be in no way inferior to comparable works undertaken by contractors under I&CADD.\(^6\) Also to be noted, the program had to be prepared under extreme time pressure and the great bulk of both FO and I&CADD implemented work was carried out in just a six-week period (from May to June 1998, during the canal closure period). This required a major field effort by I&CADD engineers and FOs, with excavators working nearly round the clock.

First Water Management Season

The first water management season comprised the 1998 Kharif crop. The state-wide efforts on weeding and desilting the irrigation canals and drains, coupled with emergency repairs of key control structures and breaches, had evident positive impact, as discussed in Chapter IV. Project level conferences were held on every major and medium project to discuss and prepare operational plans for water management. However, in the course of the water management season it became clear that there is still substantial room for improvement in water management and sharing decisions for water allocation, both at the levels of I&CADD and the FOs (refer Chapter VI).

Inclusion of Irrigated Agriculture Intensification Program

In the course of discussions between GOAP and the World Bank in late 1997, improved agricultural practices were identified as a further need. An IAIP has thus been integrated into the new ISP. This will include enhanced agricultural extension, dissemination of scientific information and productivity augmenting technologies, on farm demonstrations,\(^7\) The predominance in the first maintenance and rehabilitation campaign of earthworks (desilting, weeding and raising embankments) was because this was the major initial need and there was a very short time period for planning. Accordingly, works on shutters and structures were limited to priority needs.\(^8\) Financing of works done directly by the FOs presented new procedural problems for both GOAP and the World Bank, requiring special implementation features including development of appropriate physical and fiduciary monitoring and controls. GOAP funds now went directly to the WUA and DC bank accounts. For the World Bank, procurement procedures had to be adjusted to enable funding of works done by the FOs rather than conventional international or national competitive bidding. Advances made by GOAP to FOs also required special consideration. A set of special financial monitoring procedures and a fiduciary insurance policy taken out by GOAP enabled disbursements against advances to FOs as a special case.\(^9\) Based on field observations of the APERP-IC World Bank supervision mission in September 1998. This observation relates primarily to major schemes. The quality of works on medium, and in particular minor schemes, tended to be more variable.
and training and skills development of AD staff and WUA members. These efforts will be supported by the production and distribution of technical publications and news-letters for WUAs and by seminars, workshops and studies. The IAIP is being launched under the direction of the AD (under its newly created cell for irrigated agriculture), in conjunction with I&CADD and the WUAs. During the first year of IAIP, the field effort will focus on major and medium schemes.

**Preparation of 1999/2000 Maintenance and Rehabilitation Program**

The 1999/2000 Maintenance and Rehabilitation Program is commencing implementation. The joint walkthroughs between the WUAs and DCs and I&CADD engineers have been completed, and estimates for the forthcoming works have been prepared. The total value of the planned works for maintenance and rehabilitation amount to about Rs 297 crores ($71 million).

**FUNDING SUPPORT**

The reform program has been funded by GOAP, with support from the World Bank. The initial piloting of WUAs on the Sriramsagar scheme was assisted, including use of retroactive financing, under the Andhra Pradesh Third Irrigation Project, approved in May 1997. The state-wide reform program is being financed under the Irrigation Component of the Andhra Pradesh Economic Restructuring Project (APERP), approved in June 1998 and with retroactive financing available from August 1997. The APERP Irrigation Component (APERP-IC) is, in effect, a financial and technical assistance vehicle, based on AP’s ISP, to provide support for AP’s reform program. The main components of the APERP-IC are summarized in Box 3.7.\(^{44}\)

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\(^{44}\) Refer to GOAP, 1998 and World Bank, 1998g for further details.
Box 3.7. Irrigation Component of AP Economic Restructuring Project

The Irrigation Component of APERP provides support, totaling $142 million, to the GOAP’s irrigation sector reform program. The APERP-IC’s main components are:

- **Irrigation performance improvement.** Consists of: (i) minimum rehabilitation of the State’s most needing major and medium irrigation schemes (2.45 million ha) and (ii) recurrent maintenance on major, medium and minor schemes (3.7 million ha) to ensure their sustainable functioning (with declining Bank financial assistance for maintenance ending in March 2000).

- **Scheme improvement/modernization and farmer turnover.** Piloting of more intensive modernization on selective projects.

- **Agricultural intensification.** Intensification of agricultural extension services to FOs, training and skills development of AD staff, dissemination of information and productivity-enhancing agriculture technologies, and on-farm demonstrations.

- **Institutional development of FOs and Government Departments.** Making newly formed FOs fully functional and improving management capabilities through training for farmers, government staff and NGOs.

- **Software support** also includes: establishing or improving procedures in financial management, monitoring and evaluation (M&E), management information systems (MIS) and accounting, computerization, establishing a whole-state satellite based communications system, plus dedicated monitoring systems (DMS) at scheme levels, international and national study tours for staff, FOs and involved civil society, and other actions to upgrade to modern management capabilities and foster innovations. The APERP-IC will also finance various targeted pilot activities including a canal automation experiment on one scheme, piloting of low-cost drip irrigation, and other innovations as they are identified. Currently identified studies include: a baseline survey including use of satellite imagery to assess the current and past status of irrigation for future evaluation purposes, a study to determine how women can be more completely involved in irrigation management, an O&M study to introduce advanced O&M management techniques, a study to identify appropriate technologies to enhance productivity of upland irrigation, a study to assess how to introduce appropriate modern agricultural practices using FOs as the interface, and an Institutional study combined with targeted study tours to assess the next steps appropriate in the institutional restructuring of AP’s water resources and irrigation sector.
IV. PRELIMINARY OBSERVATIONS ON IMPACTS

Andhra Pradesh’s reform program aims to reverse the decline in the State’s irrigated area and to increase the productivity of irrigated agriculture. At the core of the program is the transfer of irrigation management to farmers, integrally linked with improvements in the irrigation and drainage systems and improved water management, improved agricultural extension, revenues generation to self-finance O&M, and adjustment in institutional roles of government and farmer organizations. The longer term objectives are discussed in Chapter VII and the schematic “Virtuous Circle” at Figure 7 in Chapter VII. The ultimate objective is to place irrigated agriculture on a sustainable basis, leading to higher productivity by financially and organizationally strong institutions. Therefore, key performance indicators relate to the impacts of the program on the functioning of farmer organizations and their financial and social viability, more equitable and effective use of water, and enhanced agricultural productivity and rural incomes, including improved social welfare and equity. As the reform program is just beginning, performance data are still partial and being collected. Indeed, observable impacts are confined to only one season. Furthermore, a number of reforms will be progressive, and their full impact will be felt only over a longer time period. However, even at this stage, preliminary observations shed some light on impacts to date and provide background to the future directions to aim for discussed in Chapters VI and VII. These preliminary observations on impacts are discussed below.

FORMATION OF WATER USERS ASSOCIATIONS

The election process for FOs (refer Chapter III) appears to have been highly participatory and democratic. Data from Rayasaleema region (2536 WUAs) reveal that, on average, 80% of WUA members voted (Jaya Raj, 1999a). State records show that 53% of the elections were unanimous, with the remainder contested and, therefore, elected by secret ballot. The major grass-roots campaign by GOAP to carefully prepare and monitor the election, as well as use of secret ballots, contributed to a generally harmonious process with minimal disruptions and little evidence of politicization.

Several data sources, as well as field observations, suggest that WUA leaders are usually socially representative, in terms of the size of their holdings and their location in the schemes. A July 1998 “feedback” survey of 6525 WUAs45 found that 42% of WUA presidents are marginal farmers (less than 2.5 ha) and 31% are small farmers (2.5 to 5 ha) (refer Table 4.1). In Rayasaleema region, 83% of WUA presidents are small farmers or marginal farmers (Jaya Raj, 1999a). PRAs conducted at eight locations in AP and involving 85 WUAs, found that 73% of the WUA presidents have less than 15 acres, or about 6 ha (Perera, 1998; PRA

<table>
<thead>
<tr>
<th>Table 4.1. Farm Sizes of WUA Presidents</th>
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<tbody>
<tr>
<td>Farm Sizes</td>
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<tr>
<td>------------------------------------------</td>
</tr>
<tr>
<td>Marginal Farmers (&lt; 2.5 ha)</td>
</tr>
<tr>
<td>Small Farmers (2.5 ha - 5 ha)</td>
</tr>
<tr>
<td>Large Farmers (&gt; 5 ha)</td>
</tr>
</tbody>
</table>
* 4% of WUA presidents did not respond.
Source: I&CADD “feedback” survey (July 1998).

45 Conducted by I&CADD.
attached at Annex 10). Systematic data on the location of WUA presidents’ holdings within the scheme (head, middle or tail reaches) are not currently available, although PRAs undertaken in 1997 and 1998 (Perera, 1998) and 1999 (Pingle, 1999) suggest no particular bias towards the head ends of commands.46

An encouraging outcome of the elections has been the general competence and dynamism of most WUA and DC committee members and presidents. For instance, WUA presidents tend to be young. The “feedback” survey found that 23% of WUA presidents are under 30 years old and 71% are under 50 years. The PRA found 65% of WUA presidents sampled to be under 45 (Perera, 1998), while the Rayasaleemma survey found 52% to be under 36 years and 84% to be under 46 years (Jaya Raj, 1999a). Field observations and some data sources also suggest a frequently higher level of education for WUA members and presidents than the general populace. The “feedback” survey found that 56% of the WUA presidents have education levels up to tenth class or more, 27% have intermediate levels or more, and 11% are university graduates (refer Table 4.2). In electing the membership and presidents, the quality of individuals as implementers and consensus builders appears to have been a serious consideration in most instances.

### Table 4.2. Levels of Education of WUA Presidents

<table>
<thead>
<tr>
<th>Levels of Education</th>
<th>Percent of WUA Presidents*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to 7th class</td>
<td>42</td>
</tr>
<tr>
<td>Up to 10th class</td>
<td>29</td>
</tr>
<tr>
<td>Up to intermediate level</td>
<td>16</td>
</tr>
<tr>
<td>Graduate</td>
<td>9</td>
</tr>
<tr>
<td>Post graduate (incl. technical)</td>
<td>2</td>
</tr>
</tbody>
</table>

* 2% of WUA presidents did not respond.

Source: I&CADD “feedback” survey (July 1998).

**FIRST MAINTENANCE AND REHABILITATION SEASON**

The magnitude of works implemented in the first maintenance and rehabilitation season (May to June 1998) is discussed in Chapter III and speaks for itself. It is particularly noteworthy that, of the Rs 118.1 crores ($28.1 million) maintenance and rehabilitation works completed, over 70% of the works (value terms) were undertaken directly by the Farmer Organizations (FOs). From disagegated data on “grounded” works, Rs 67.6 crores ($16 million) of the farmer undertaken works were done at WUA level and Rs 22.9 crores ($5.5 million), at the DC level, compared with total grounded works of Rs 127.3 million. In terms of numbers of works, FOs undertook 20,365 of the 22,887 works or nearly 90% of the works. Every WUA and DC carried out works, and the works were thus spread throughout the State. The quality of works implemented by the FOs on major schemes was as high a quality as works executed by contractors under I&CADD supervision.47 The total works undertaken by scheme size is provided at Figure 4.3. These figures are all the more remarkable given that implementation took place within several constraints: planning was done in a short time period; the great bulk of work had to be done in only a six-week period.

46 It is recommended that further social assessment is undertaken, including factors such as representation in committees and as WUA president of women, castes, and tribals.

47 Source: World Bank mission observations based on review mission visits to Godavari and Krishna delta schemes, Nagarjunasagar and SRSP schemes. At the time of report writing, insufficient field visits are available to comment on works quality on the medium and minor schemes.
during canal closure; WUAs, DCs and I&CADD were finding their feet under the new arrangements; and there were several administrative confusions, such as delays in transfers of funds to the FOs and other issues.

Figure 4.3. Total Works Undertaken in First Maintenance/Rehabilitation Season by Scheme Size

<table>
<thead>
<tr>
<th>Scheme Size</th>
<th>No. of Works Grounded (in thousands)</th>
<th>Value of Works (in million US$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major Schemes</td>
<td>25</td>
<td>15</td>
</tr>
<tr>
<td>Medium Schemes</td>
<td>20</td>
<td>10</td>
</tr>
<tr>
<td>Minor Schemes</td>
<td>15</td>
<td>5</td>
</tr>
</tbody>
</table>


Preliminary indications also suggest a reduction in costs of rehabilitation and maintenance if such works are done by the FOs (WUAs and DCs), with I&CADD technical and advisory help, than when done by contractors under I&CADD. At present, a cost saving of about 20% may be present, but this assessment is anecdotally and observation based rather than on systematic data. One example of savings is from the hire of excavators when done directly by the FOs rather than under contractor arrangements. Thus, for the forthcoming 1999 canal closure period and maintenance/rehabilitation season, I&CADD has set an agreed upper limit state-wide price of Rs 16.25/m3 of earth removal in channel de-silting, embankment raising and re-sectioning for jobs involving more than 15,000 m3, and of Rs 17.25 for jobs less than that. However, FOs, in their direct negotiation with excavator operators, are free to agree on a lower price. Particularly if the FOs start work early before the main season, better rates can be agreed by the FO and excavator operator. Thus, examples from the delta schemes show WUAs negotiating down to as low as Rs 900/hr of machine operation, compared with norms of about 1333 Rs/hr. By contrast, contractors usually bid at rates ranging from 10% to 100% above the norms. The FOs have a direct interest in getting as much done, and to good standards, as possible with their funds, and thus an in-built incentive is present to be cost and quality conscious.
WATER DELIVERY

In the first crop season (1998/99 Kharif), available data and observations suggest an increase in irrigated area, improved equity in water distribution, and, in major schemes, earlier water delivery. I&CADD data indicate that in the 1998/99 Kharif season, gross irrigated area on 12 major and medium schemes increased to 5.37 million acres (2.17 million ha) from the average of the previous three years of 4.86 million acres (1.96 million ha) (refer Table 4.4). This represents an increase of 0.51 million acres, or 10%. A qualitative assessment is also available from the “feedback” survey. Commenting on the Kharif season, increased irrigated area was reported by 87% of WUA presidents in coastal AP and by 73% in Telangana and Rayasaleema regions.

Table 4.4. Increased Irrigated Area in 1998/99 Kharif Season on Select Major and Medium Schemes (in thousand acres)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Vamshadhra</td>
<td>128</td>
<td>110</td>
<td>18</td>
<td>127</td>
<td>17</td>
</tr>
<tr>
<td>Godavari</td>
<td>987</td>
<td>987</td>
<td>0</td>
<td>987</td>
<td>0</td>
</tr>
<tr>
<td>Krishna</td>
<td>1288</td>
<td>1239</td>
<td>49</td>
<td>1239</td>
<td>0</td>
</tr>
<tr>
<td>NSLGC</td>
<td>889</td>
<td>778</td>
<td>111</td>
<td>828</td>
<td>50</td>
</tr>
<tr>
<td>NSRC</td>
<td>1109</td>
<td>990</td>
<td>219</td>
<td>1043</td>
<td>53</td>
</tr>
<tr>
<td>TBP HLC</td>
<td>288</td>
<td>190</td>
<td>98</td>
<td>200</td>
<td>10</td>
</tr>
<tr>
<td>TBP LLC</td>
<td>153</td>
<td>87</td>
<td>66</td>
<td>98</td>
<td>11</td>
</tr>
<tr>
<td>RDS</td>
<td>37</td>
<td>20</td>
<td>17</td>
<td>22</td>
<td>2</td>
</tr>
<tr>
<td>Nizamsagar</td>
<td>231</td>
<td>114</td>
<td>117</td>
<td>185</td>
<td>74</td>
</tr>
<tr>
<td>Sriramsagar</td>
<td>659</td>
<td>115</td>
<td>544</td>
<td>366</td>
<td>251</td>
</tr>
<tr>
<td>Kadam</td>
<td>68</td>
<td>35</td>
<td>33</td>
<td>58</td>
<td>23</td>
</tr>
<tr>
<td>KC Canal</td>
<td>274</td>
<td>196</td>
<td>78</td>
<td>217</td>
<td>21</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>6162</strong></td>
<td><strong>4861</strong></td>
<td><strong>1300</strong></td>
<td><strong>5370</strong></td>
<td><strong>512</strong></td>
</tr>
</tbody>
</table>

Note: Irrigated area as reported to I&CADD.

Equity in water distribution has also improved, especially in more water scarce schemes. A qualitative assessment was given by WUA presidents in the state-wide “Saddassu” survey of December 1998. Some 81% of the WUA presidents responded positively to the question, “in your estimation, did all the tail enders receive water?” In the PRA conducted in January 1999, of eleven WUA presidents, seven reported improved water distribution. Six of the seven are tail enders, one of whom is receiving water for the first time in 21 years (Pingle, 1999).

Another positive impact, primarily for major schemes, has been the acceleration in water availability. This is attributable to two factors. First, the conveyance capacity of the main canals was greatly improved—by just carrying out simple but extensive weeding and desilting operations. Second is the institutional effect. This led to continuous interaction

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48 The 1998/99 Rabi season is just completed as this paper is finalized.
49 Conducted by I&CADD.
between I&CADD officials and WUAs, among neighboring WUAs, between WUAs in the DCs, and between DCs. As a result, the usual conflicts over water distribution were avoided and tail-end areas received water—in some cases earlier than the head-reach areas. Water at the tail ends is reported to have become available some two to three weeks early in a number of schemes. For instance, transplanting in the Krishna and Godavari delta schemes was advanced by about 20 to 30 days on 230,000 and 240,000 acres, respectively. Early transplantation has a positive impact on crop production, potentially increasing average yields by up to 10%.  

These encouraging indications emerging so early in the implementation program mirror the positive experience under the two pilot WUA projects in SRSP. The pilots, commenced in 1994, provided important learning material for the present state-wide program. As shown in Table 4.5 and A2.4, reported irrigated area expanded considerably.

Table 4.5. Increased Reported Irrigated Area on Pilot WUA Areas under Sriramswgar Scheme Project (in ha)

<table>
<thead>
<tr>
<th>Items</th>
<th>Pilot 1 (D-51)</th>
<th>Pilot 2 (D-64)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area planned for irrigation</td>
<td>3111</td>
<td>5940</td>
</tr>
<tr>
<td>Area actually irrigated prior to WUA formation (1993-94)</td>
<td>1852</td>
<td>2690</td>
</tr>
<tr>
<td>Percent planned area actually irrigated (1993-94)</td>
<td>60%</td>
<td>45%</td>
</tr>
<tr>
<td>Area irrigated with involvement of WUAs (1995-96)</td>
<td>2541</td>
<td>4666</td>
</tr>
<tr>
<td>Percent planned area actually irrigated (1995-96)</td>
<td>82%</td>
<td>79%</td>
</tr>
<tr>
<td>Increase in area irrigated (1995-96)</td>
<td>689</td>
<td>1976</td>
</tr>
<tr>
<td>Percent increase in area irrigated (1995-96)</td>
<td>37%</td>
<td>73%</td>
</tr>
</tbody>
</table>

Source: Peter, 1998a (adapted from results of a study by Institute for Rural Development and Social Change, 1996).

**AGRICULTURAL PRODUCTIVITY**

Only very limited data are currently available on yields from the 1998/99 season. Discussions with farmers during site visits suggest that yields have either increased or have remained the same, with very few accounts of yield reductions. The more typical response of yield increases would be attributable both to the improved systems and to a very favorable monsoon season. At least several years of survey data will be needed before yield impacts can

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50 Earlier arrival of irrigation water has several advantages affecting average irrigated yields in AP. First, earlier irrigation enables earlier planting of the crop, which can, thus, more effectively utilize monsoon rainfall; the crop is already established early in the monsoon season, thereby able to benefit from most of the monsoon’s precipitation. Second, there is lower risk from crop damage or failure due to heavy rains or cyclones. The first cyclone season is in July-August. Through earlier planting, the crop is more mature and better able to withstand cyclone conditions. The second cyclone season is in October-November. Earlier planting enables earlier harvesting, reducing the extent of risk from the second cyclone season.

51 "Reported" irrigated area refers to irrigated area reported by the farmers and so recorded. As discussed in Box A2.4, the change here thus reflects the combined effects of an actual increase in irrigated area and farmers’ greater willingness to report their irrigated area (and/or Revenue Department field officials recording of this). Increased reporting of irrigated area is likely to be a larger factor than increase in actually irrigated area on most schemes, but on SRSP, the contribution of increased reporting and increased actual irrigated area is assessed, based on observations of the SRSP CE, to be about 50% each.
be reliably quantified. Other possible impacts should also be assessed over time, including possible diversification into more remunerative crops, higher cropping percentages, the effect on yields and crop production possibilities of reduction of water-logging in head reaches, reductions in flood damage, and environmental impacts.

FUNCTIONING OF WUAS

At the time of preparing this report, the WUAs have been in existence for only 24 months and the DCs for 18 months. The over 10,000 institutions created are still finding their feet and will require sustained technical support for a number of years if their success is to be assured. Nevertheless, enthusiasm of the Farmer Organizations is typically strong. The decision to immediately embark on a self-help program (rehabilitation and improved water management), together with the training and technical assistance being provided by I&CADD, has helped the FOs make an encouraging start. The immediate perceived tangible benefits from the first maintenance and rehabilitation season, discussed below, have been important to maintaining farmer support and progressively building the confidence and commitment of the I&CADD field engineers.

In the “feedback” survey, WUA presidents were found to be positive in their opinions on matters of transparency in water distribution, better supervision of maintenance, better decision-making, flexibility in management, quality control, and minimization of corruption (refer Table 4.6). A number of other indicators suggesting initial positive impacts were also reported, including significant reduction in water-sharing disputes (refer Table 4.7).

Table 4.6. Presidents’ Perceptions of Benefits from WUAs

<table>
<thead>
<tr>
<th>Beneficial Impacts</th>
<th>Percent in Agreement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transparency in water distribution</td>
<td>96</td>
</tr>
<tr>
<td>Better decision-making</td>
<td>96</td>
</tr>
<tr>
<td>Better supervision of maintenance</td>
<td>96</td>
</tr>
<tr>
<td>Flexibility in management</td>
<td>92</td>
</tr>
<tr>
<td>Satisfactory quality control</td>
<td>95</td>
</tr>
<tr>
<td>Minimization of corruption</td>
<td>85</td>
</tr>
</tbody>
</table>

Source: I&CADD “feedback” survey (July 1998).

Table 4.7. Presidents’ Perceptions of Benefits from WUAs by Region

<table>
<thead>
<tr>
<th>Beneficial Impacts</th>
<th>Percent in Agreement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maintenance works taken up in all reaches</td>
<td>95</td>
</tr>
<tr>
<td>Irrigation water supplied on time</td>
<td>92</td>
</tr>
<tr>
<td>Increased irrigated area</td>
<td>87</td>
</tr>
<tr>
<td>Decreased irrigation disputes</td>
<td>91</td>
</tr>
<tr>
<td>Irrigation received at tail-end reaches</td>
<td>92</td>
</tr>
</tbody>
</table>

Source: I&CADD “feedback” survey (July 1998).

The “Saddassu” survey in December 1998 casts some light on relationships between the FOs and core Government departments. About 70% of WUA presidents were found to be satisfied with I&CADD and its engineering cadre, 50% to 60% with the Revenue Department, and 45% to 50% with the AD. These perceptions are likely to be quite dynamic and changing over time, especially as the AD’s IAIP gets underway, and as water charges collection is transferred by the Revenue Department to the WUAs. From the January 1999 PRA, the most
notable trend was improving perceptions of WUAs towards I&CADD. Several presidents, however, said that their WUAs were having difficulties with the Revenue Department. These assessments are likely to change significantly as start-up problems are worked out and as these institutions grow in their new roles. For instance, if the AD’s IAIP for WUAs gets successfully underway, favorable viewpoints towards the AD can be expected to rise sharply. Similarly, if I&CADD manages to resolve the various “teething problems” characterizing the first year of implementation, the positive perceptions of WUAs towards I&CADD would likely increase further.

In terms of future directions, WUAs report strong interest in more training and further improvements in training programs, including specialist training of WUA committee members. There also appears to be widespread interest amongst WUAs in handling more of the rehabilitation works themselves and in collecting water charges themselves. PRA techniques are being used to regularly take stock of the attitudes, needs and performance of WUAs and the other institutions involved. One such PRA report (Perera J., 1998) is attached at Annex 10, and provides further insights than can be provided here.

<table>
<thead>
<tr>
<th>Box 4.8. Castes of WUA Presidents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Caste</td>
</tr>
<tr>
<td>Scheduled tribes</td>
</tr>
<tr>
<td>Scheduled castes</td>
</tr>
<tr>
<td>Backward castes</td>
</tr>
<tr>
<td>Other castes</td>
</tr>
</tbody>
</table>

*4% of WUA presidents did not respond. Source: I&CADD “feedback” survey (July 1998).

COMMUNITY DYNAMICS AND GENDER PARTICIPATION

There is, as yet, only limited understanding of the social dynamics of WUAs and DCs or of the involvement of women and disadvantaged groups (such as scheduled castes and tribes and the poor). However, preliminary data indicate an encouraging degree of involvement of backward castes. The “feedback” survey found that 31% of WUA presidents are from backward castes, while 3% are from scheduled castes and 2% are from scheduled tribes (refer Box 4.8).

There are currently very few WUAs headed by women (98 out of 10,292 WUAs), although one example is discussed in Box 4.9. The effective and equitable participation of traditionally marginalized groups will be key for the sustainability of FOs in the future. In effect, what is expected to be important is increasingly fuller participation by the community.

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52 In particular, WUA presidents reported then that the Revenue Department field officials had not cooperated in providing maps of irrigated areas or registers of irrigated land-holders. This would have significant implications for the ability of WUAs to collect water charges. GOAP is currently addressing this issue and land records are being provided to the WUAs.

53 Panchayat Raj institutions are local government bodies, established under the Constitution of India. The most relevant to the WUAs are the Gram Panchayats, which are village-level statutory bodies.

54 For instance, the issue (now resolved) of whether WUAs had to pay taxes, which delayed provision of funds to WUAs; unfamiliarity of the engineers and WUAs with the new procedures; difficulties experienced by many engineers in adjusting to the client-oriented approaches now required.

55 Jaya Raj, 1999b (forthcoming) looks further into changing perceptions of WUA presidents, through a study of many of the indicators discussed here.

as a whole. Women may be particularly important in this process. Women represent half the population and more than half the labor input to irrigated agriculture. With greater participation by women, they may have potential contributions to make in terms of: (i) women’s possibly greater orientation than men towards equity; (ii) their greater propensity to accept less influential groups; (iii) their propensity for consensus seeking; and (iv) their greater recognition than men of water as a multi-use good including for domestic purposes, the environment and water quality. A study of gender participation in the FOs is to be undertaken under the APERP-IC in year 2000.

Box 4.9. Women’s Roles in Farmer Organizations in Andhra Pradesh

| Women have an important role in agriculture in AP. The division of labor in agricultural production is well defined, with men carrying out ploughing, threshing and heavier manual labor. However, women are entirely responsible for transplanting, weeding and harvesting operations, and, thus, their work constitutes the largest labor input per hectare. In 1988 AP—alone in India—broke with both historical law and tradition by conferring to women inheritance rights in agricultural land. Even without acquired or owned land, women’s dominance in agriculture means that they, just as men, have a major stake in irrigation. Their participation in all aspects—from decision-making to monitoring—is, thus, required for the smooth functioning and sustainability of farmer organizations, and, indeed of the irrigation sector.

Due to the continued gender bias in land-holdings, the membership of women in WUAs is low relative to men. The number of women-led WUAs is even more rare, although there are a few instances—98 statewide—of women presidents. For instance, a WUA in Sriramsagar-Karimnagar district, has a woman president, and of its 500 members, 50 are women. In keeping with the general profile of WUA presidents, this president is dynamic (she purchased her own land) and well-respected in the community as a social worker. The social dynamics of women-led WUAs are still to be understood. However, it is interesting that in her role as WUA president, she deals almost exclusively with women, although not simply with the women members. Men members typically ask their wives to discuss and negotiate matters with the president on their behalf. Such behavior did not appear puzzling to the president, and, in fact was mentioned by her only in passing. When asked to explain she simply said that gender tends to talk to gender: if the WUA president were a man, women members would ask the same of their husbands.

FUTURE MONITORING AND STUDIES

Important to the program will be regular stock-taking and reassessment as the reform program progresses. A baseline survey is underway to provide a basis of data at the beginning and before the program, including field surveys and use of satellite imagery and interpretation. I&CADD has also established a Project Monitoring Unit (PMU), which will be computerized and connected to a computerized state MIS system. I&CADD has already developed instant feed-back processes that it uses in its “Saddassu” conferences with WUAs, using computerized optical magnetic readable (OMR) techniques enabling analysis, reporting of results to farmers and discussion of actions to address problems all on the same day. Question and answer sessions in the media, and the state WUA magazine and district level newsletters are also serving the purpose of involving the public and getting feed-back. Weekly
teleconferencing during the working season is being used for monitoring progress and facilitating solutions to problems as they emerge.

Another assessment technique being developed is the use of PRAs about twice a year to develop a more in-depth understanding (Annex 10 provides one example). These can also be targeted to examine specific issues. Targeted special studies are also to be launched, the study of gender participation next year, an institutional study a little later, and others in various technical fields. There will also be need for periodic further review reports like this one, possibly every two or three years, and for studies at reasonable intervals by independent consultants, institutions and academics.

57 For instance: as currently identified, a financial management study, and studies in communication systems and management information systems to help establish management, accounting and financial management systems and computerization; a canal automation study and subsequent pilot; and two studies looking to the future including review of available international appropriate technologies in the technology transfer areas of: (i) agricultural and water management technology transfer through FOs; and (ii) modern irrigation technologies for upland (water short) areas.
V. FEATURES FACILITATING THE REFORM PROGRAM

The reform program thus far has been described in Chapter III and its first impacts discussed in Chapter IV. A number of states and countries have particular interest in understanding the key features that have contributed to the progress so far of the AP program. This chapter attempts to answer such questions. The technique that will primarily be used is to briefly highlight the key features, limiting background description where it has already been provided in the first three chapters, or where further elaboration is forthcoming in the subsequent chapters. It is to be emphasized that, as elsewhere in the report, the assessment must be viewed as an initial assessment, and our understanding of causes and their significance will evolve over time as further experience and reflection becomes available.

RECOGNITION OF NEED FOR CHANGE

It was fundamental that AP candidly recognized the critical issues confronting its irrigated agriculture sector. It was also important that this recognition was widely shared: between different political parties and between both civil society and Government. Various papers and discussion processes enabled this broad-based awareness. AP’s “White Paper” (1996) on the state of the irrigation sector, which resulted in a series of discussions held in various fora, was a seminal document early in this process. Simultaneously, there were field-based consultations on most of the major and some medium irrigation projects, which were important in identifying the practical problems and the direction the reform program should take.

VISION AND BOLDNESS

Characterizing all aspects of the reform program—from the first diagnostic to the new ISP and through implementation to date—has been a visionary outlook, supported by a bold approach, at the highest levels of Government.

Visionary Leadership

Far-reaching vision and willingness to embrace radical change has been provided by the entire “core group” (refer below), starting, most importantly, with the Chief Minister. The vision is still changing and, as will be discussed in Chapter VII, may need further evolution, but it has always been innovative, and never timid (refer Box A2.1).

“Big Bang” Approach

Andhra Pradesh deliberately chose a “Big Bang”, rather than a “gradualist” or “partialist”, approach (refer Chapter I). Instead of pursuing progressive establishment of farmer organizations (FOs) or tackling certain constraints but not others, AP has moved as rapidly as possible: WUAs were created across the State; completely new legislation was
enacted; a major water charges increase was implemented; and the full strength of the Government apparatus has been applied to support the program. The approach reflects AP’s realization that marginal and partial changes would not be able to break the vicious circle it confronted. Pursuing such an approach was reinforced by the desire to ensure that the benefits of reform were distributed equitably across the State over a relatively short time period (Peter and Pingle, 1999).

**Underpinning Strategy**

As discussed in Chapter III, the reform process has been evolutionary, with no one policy statement acting as a definitive mold. Policies themselves have developed over time—through various fora, ranging from AP’s “White Paper”, GOAP deliberations, issuance of the APFMIS Act, and other documents—reflecting this process. This led to the preparation in 1997 and Cabinet approval in 1998 of AP’s new ISP, “Reforming the Irrigation Sector for Sustainable Management and Development” (attached at Annex 4). Preparation and discussion of this document enabled a comprehensive articulation of the underpinning strategy for the reform program. It also served to add refinements and further detailed implementation actions, focusing on a number of fronts simultaneously. In line with the evolutionary and adaptive approach being followed in the reform program, it is likely that the policy will need progressive modification over time.

**POLITICAL WILL AND STRENGTH**

It would not have been enough to have a visionary outlook. The political will and the strength of conviction of GOAP has been crucial to translating the vision into the change process: driving forward the changes and their early implementation. In large part, this stems from a few key political and Government leaders. However, it has progressively grown to a broader consensus—politically, within Government, and amongst civil society—through extensive public debate. Continued strong political will and leadership will remain essential for the success of the reform program until the FOs and I&CADD’s O&M activities become sustainable (Chapter VII).

**ESTABLISHMENT OF A STRONG FOUNDATION**

While the vision and political will for reform have been constant driving forces, these needed to be translated into specific preparatory and early implementation actions. The following features form the enabling backdrop for the actions described in Chapter III.\(^{58}\)

**Capacity of Core Team**

This started as a very small group of dedicated individuals in I&CADD. From its original nucleus at the Secretariat level, it expanded to include several of the engineering cadre, WALMATARI and individuals from NGOs and academia. Increasing numbers of

\(^{58}\) Also discussed in Oblitas, 1998b.
I&CADD staff at various levels of the institution were then progressively involved. The number of involved individuals has subsequently mushroomed as a result of the extensive training and public awareness programs from 1996 onwards. This was a natural consequence of the formation of WUAs, and, in particular, the encouraging results emerging from the first maintenance and rehabilitation season (refer Chapter IV). Nevertheless, the close intellectual and executive synergy of a small group of individuals, primarily from Government but also including NGOs, academia and World Bank staff, have been important from the beginning of the reform process.

Participatory Process

This has been an important part of the culture during all stages of conceptualization, preparation and implementation (refer Chapter III). In addition to being the central feature of the reform program—Participatory Irrigation Management—constant recourse to public debate, workshops and seminars, and involvement of the media, have been fundamental to consensus building and political acceptability.

Detailed Preparation

Intensive preparation provided a strong spring board for launching the reform program. This was characteristic in most areas: from strategy and legislation, to community organization and training, and to engineering aspects. Even so, the rapidity of preparation and implementation has meant a constant scramble to keep pace. Once the WUAs were created, they caused their own momentum, and the race now is to keep up with them.

Piloting

Two pilot participatory irrigation management experiments, of about 16,000 ha each on Sriramsagar scheme, commenced in 1994 with World Bank assistance (refer Chapter III). This experience, including adjustments found necessary, provided demonstration of potential success and lessons for the state-wide program. In 1996, a report was prepared by consultants—in consultation with farmers, I&CAD, Agriculture and Revenue Departments, and political parties—to advise GOAP and the Bank on how to expand the PIM program. In response to this report, GOAP opted for a state-wide program because it was felt that this would ensure regional equity. As a result, the “Big Bang” approach was launched. The piloting was important, because, unlike a number of other states in India, AP until then had had minimal experience with farmer organizations in irrigation, except for the traditional informal organizations found with tank irrigation.

Notwithstanding the substantial increase in the number of I&CADD engineers and other parties now strongly identifying with the reform process, it will take some time before the entire cadre has been substantially brought into the reform culture. This is inevitable given the degree of change in work approaches and attitudes required and the huge size of the institution. Ingraining the cultural change throughout I&CADD remains a major challenge (refer Chapter VII).

As frequently found elsewhere in India, the old (largely tank) irrigation schemes in AP, often have had traditional farmer organizations dating back in some form to their construction in antiquity by the villagers. However, an attempt by I&CADD in 1975-76 to form “Pipe Committees” at the level of outlets in major and medium schemes, had failed, and had generally discouraged consideration of FOs since then.
The modalities of the approach adopted for the state-wide program differ significantly from the pilot approaches. The piloting was a "gradualist" approach (Chapter I), with substantial hand-holding by government, and virtual complete subsidization by the state, and it assumed thereafter a gradual phasing in of WUAs, as adopted elsewhere in India and most other countries. There was much that was not clear in the pilots: farmer rights, legal clarity, the respective roles of I&CADD and farmers. Procedures were still complicated, and the pilots relied on NGOs and specially selected senior I&CADD staff. Also, works were primarily implemented by I&CADD rather than the WUAs. Nevertheless, the pilots served as a learning phase for I&CADD and, even within their limitations, provided confidence to go forwards, and lessons of what worked, what did not, and what instead was needed. Remarkably, even simply the opportunity for farmers to discuss with I&CADD and between themselves had significant impact on improved and more equitable water distribution. A rough estimate is that this by itself may have increased irrigated area by 20%.

Legal Framework

The AP Farmers' Management of Irrigation Systems Act and Rules, discussed in Chapter III, provides the legal framework for the establishment and functioning of FOs. Thus, as in Mexico, these provisions enable the transfer of irrigation management to farmers and provide backing for the entire reform program. AP is the first Indian State to have created such legislation, which has been crucially important and is likely to be a required base for any "Big Bang" reform program.

Choice of Hydraulically Based Farmer Organizations

An implementation strength has been the use of existing institutions to implement the reform program (refer discussion later in this chapter). The exception to the use of existing institutions has been the choice for forming at grass roots levels entirely new institutions based on hydraulic lines; the minor (or tank) for WUAs, the distributory for DCs, and the whole scheme for the eventual PCs. The alternative was to use the existing grass-roots institutions under the Panchayat Raj structure, which have Gram Panchayats at village levels and Zilla Parishads at higher levels. Although GOAP is encouraging the strengthening of the Panchayat Raj institutions for other functions, they were deliberately not chosen as a basis for the water sector FOs for several reasons.

The first reason was that water needs to be managed on a hydraulic basis, and the Panchayats only coincidentally have boundaries corresponding to the hydraulic units required. Secondly, Gram Panchayats have diverse functions, including local political functions, and it was felt that insufficient attention would be paid to water management if Panchayats had responsibility. Third, as it is turning out, there is advantage for an entirely new grass roots activity to have fresh elections and choice of leaders specific to the purpose in mind, chosen.

61 Since then, the pilots, and the approach to WUAS and rehabilitation and maintenance for the entire AP Irrigation III project, have been modified to conform to the state-wide and APERP-IC implementation model.
62 For further discussion of the legal framework for WUAs, including a cross-country comparison of enabling legislation already in place, refer Salman, 1997.
primarily for their capacity to fairly represent the WUA community, including tail-enders and disadvantaged groups, and to coordinate water management and system improvements and maintenance. The WUA election process, based also on sub-hydraulic units (TCs), allows representation throughout the irrigation scheme, of tail enders as much as head-enders, and with one vote for each member regardless of holding size, tenurial status and wealth. The new structures thus are not only based on the necessary hydraulic basis, but also have in-built features tending to work against traditional power structures; the dominance of rural elites based on caste, holding size, wealth, and political connections. Such structures still have influence in most Panchayat institutions in India.63

STRENGTH OF IMPLEMENTATION

Implementation efforts to date have also been strong. Although described in Chapter III, the following features merit highlighting, as they have been key to the achievements so far. 64

Concerted and Major Mobilization

All actions have been undertaken vigorously. For the elections, the entire State apparatus—from the District Collectors to a number of Government departments—was mobilized. As an example, in all of the State’s 22 districts, mass rural rallies were organized and addressed by the Chief Minister in 1997. Training and outreach activities for the WUAs have been recognized as requiring “war footing” efforts for capacity building and implementation. I&CADD staff undertook a massive field effort to assist the over 10,000 FOs in the system walkthroughs, preparation of maintenance plans, and technical assistance during field works.65 Without a major mobilization this reform program could not have been initiated. Its continued momentum and future success depends as critically on sustaining this effort.

63 Nevertheless, GOAP has in-built to WUAs some features to recognize panchayat institutions, including a small contribution of water charges to the panchayats.

64 Background to issues in participatory irrigation management can be found in Subramanian, Ashok, N. Vijay Jagannathan, and Ruth Meinzen-Dick, 1997. This discusses the theoretical literature as well as case studies world wide on experience with water user organizations. Also refer to Pathak, R.S., 1991, which considers cases both in India and internationally.

65 Further examples of the energy and state-wide effort put into the reform program can be found in chapter III and in the discussion of intended next steps in chapter VI. A few illustrations can also be cited here: mass conferences addressed by senior I&CADD officials and the Chief Minister (CM) have been held in all districts and in state level conferences (Saddassus): the district collectors have been intimately associated with the program, utilizing their entire district-wide administrations on occasion (for instance, at the time of the WUA elections), regular teleconferences are held between the CM and I&CADD and the District Collectors; and training has had to be scaled up to a major program (for instance, in April 1999, 330 trainers were trained (5 staff each from each of I&CADD, AD and Revenue Department per district), to be followed by training at district levels in July/August, 1999 of all of the state’s WUA committee members (65,000 persons in all).
Development of Rural Leaders

The efforts placed on development of local leadership have had positive results to date and are likely to become even more important to ultimate success and sustainability. The emerging rural leaders—the committee members and presidents of WUAs and DCs—have tended to be community-oriented “doers”, rather than politicians. Thus, although not in all WUAs and DCs, a new class of rural leadership appears to be emerging (refer Chapter IV). This has been enabled by a number of factors: the use of elections and their monitoring to ensure fairness; full geographical representation assured by delineation of each scheme into TC; and by basing WUAs and DCs on hydraulic rather than existing village, Panchayat, political, or administrative boundaries. Fundamentally the major difference between WUAs and other institutions is that WUAs are organized for a specific narrow focus of work. This involves management of vital irrigation water for crop production, identification and execution of maintenance works and, in the near future, collection of water charges. As a result the WUA officials are forced to perform and be accountable to the farmers’ needs, at the risk of recall and substitution.

A New Accountability for I&CADD

As discussed in Chapter II, the former Government dominance and limited user involvement meant that I&CADD engineers were not accountable to farmers. Changing I&CADD to a client-focused organization was recognized early on as a central need, and actions were taken accordingly. Farmers have been empowered through the APFMIS Act’s provisions and other actions, which place farmers in the prominent position and give I&CADD a facilitating and supporting role.66 Also, in the program’s implementation, money for FO works is not handled by the “competent authority”. Rather, Government investment support goes directly to the FOs’ bank accounts. Additionally, the network of junior I&CADD officials—laskars (works inspectors), irrigation construction assistants, and the work charge establishment—has been transferred from I&CADD’s management to that of the FOs.67 These changes have created the conditions for a developing new accountability for I&CADD, enabling demand-led decisions by the farmers. This was important to the first maintenance and rehabilitation season, but much still remains to be done, in terms of both further improving and ingraining accountability (refer Chapter VI) and creating permanent conditions for its sustainability (refer Chapter VII).68

66 For instance, field engineers are assigned as “competent authorities” to the FOs: (i) an Assistant Engineer to a number of WUAs; (ii) a Deputy Executive Engineer to a DC; and (iii) an Executive Engineer or Superintending Engineer to a PC.

67 Wages, however, are currently paid by I&CADD.

68 Such changes in public sector agencies have often resulted in staff protests and even court actions in India. No formal resistance was encountered with I&CADD staff except at the level of laskars (junior-level employees below the engineer cadre). Laskars have been advised that they must now report to the WUAs. When, at the request of the WUA Presidents, GOAP also issued a Government Order (GO) in October 1998 that laskars were to be paid only after the WUA certifies that the laskar has worked during the month, the laskars went to the courts, and the GO was stayed by the court in January, 1999. The otherwise limited formal resistance by I&CADD staff is partly attributed to the efforts at communicating made by GOAP, the clarity of the new roles laid down in the new APFMIS Act, and the perception of I&CADD staff that GOAP is determined to implement the program, that farmers want it to be implemented, and that resistance would be largely futile. Such major change in required culture is nevertheless, world-wide, a difficult transition, and as also discussed in Chapter VI,
Use of Existing Institutions in Partnership

Other than the entirely new FOs themselves (refer discussion earlier in this chapter), GOAP and the APERP-IC has used existing state institutions, operating largely within their existing mandates, to implement the reform program, seeking only to coordinate and enhance each institution’s role to the common purpose: I&CADD handles all aspects of the water service and is the main, but by no means only, interface with the FOs; AD is to handle the IAIP in close coordination with I&CADD; the Revenue Department and I&CADD together will cooperate in the transition from collection of water charges by the Revenue Department to collection and retention for O&M by WUAs and I&CADD; the state universities, research centers, I&CADD’s WALAMTARI, and various district training centers and other district facilities are being used for training; NGOs and local consulting firms have assisted in training and various preparation and specialist implementation activities; the Finance Department and other financial related entities play their financing and monitoring roles, and, as needed, other agencies are and will be brought in, within their specialist function, for activities such as horticultural advice, marketing, input supply, fisheries, tree planting, etc.

In operating modalities, while financing and procurement procedures have been adapted for the WUAs, existing channels and procedures have also been used as far as practicable. An important feature for all such departments has been their individual leaderships (Secretary and other senior management levels), together working to the common purpose, and strongly led at central state levels by the Chief Minister’s and Chief Secretary’s Office, with I&CADD as a communicator between departments of needs.

The Role of the District Administrations

A special mention is appropriate for the important role of the District Collectors and their district administrations. They have been brought in as front-line communicators and coordinators throughout the entire process, starting with public outreach, the organization of the FO elections, and as motivators and solvers of coordination and implementation difficulties as they have arisen. The energies put into the program by the Collectors and their

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69 Another difference with other initiatives to promote rural grass-roots institutions has been not to see NGOs as necessary players in the agency-FO interface or as primary implementers of the program. In a program of this scale—over 10,000 WUAs—use throughout of NGOs would simply not have been possible. Only the government agencies have the staff and capacity to implement on this scale, and the program has thus relied on using government agencies, but through attempted adaptation of roles, style and incentives, a still ongoing process (refer next chapter). However, NGOs have been and continue to be significant specialist players in the program. Two NGOs were central players with I&CADD in the two pilot operations, IRDAS has been a major contributor to the training manuals, and NGOs and civil society have been part of the state dialogue and conceptualization process. NGO roles in this fashion, or in other ways in future initiatives, will continue to be encouraged.
staff have been remarkable, and have included significant individual initiatives by them to promote the program and to forge new initiatives at local levels.\footnote{For instance, the first District WUA news-letters began as initiatives by individual District Collectors and local I&CADD staff. Based on interest generated, there will now be a monthly WUA news-letter for each district, and an overall state-level WUA magazine published by WALAMTARI.}

Open Communications

It was recognized that the significant changes to be introduced—affecting the entire irrigated agriculture rural community, various government agencies in particular I&CADD staff, contractors, panchayat institutions, local politicians and civil society generally—required good communications. A major effort was thus made, and is a continuing process, to communicate with all stakeholders, so that objectives and modalities are known, understanding is shared, feedback is provided to the implementers, and stakeholders are clear on their rights and obligations and have questions answered and, to the extent possible, apprehensions allayed. Numerous examples have been provided in this report, from the earlier discussions in the state assembly and various other fora, major training programs for FOs and staff, the state-level and district-level conventions, and the open dialogue encouraged with the media and other mechanisms. Changes such as the three-fold increase in water charges could not have been introduced without this open dialogue and communication process.\footnote{More recent examples include, for instance, the “dial-your-CM” regular television programs where phone questions are answered live by the Chief Minister, the plans to have monthly WUA newsletters in each district and a state WUA magazine, the District Collector’s tele-conferences with simultaneous communications between the CM and all district Collectors and district level I&CADD and other staff, and computer scanned instant feedback surveys at WUA and DC conferences where, using computer scanning techniques, surveys are conducted, analyzed and results discussed and decisions taken with the stakeholders on the same day.}

Non-Politicization

The reform process has been fortunate in being largely free from undesirable political influences. Because the process has been transparent and participatory, there has not been a window for political manipulation by any particular party. While the entire political establishment has been involved in the core decisions, this has been in a benign, non-partisan manner. For instance, the APFMIS Act was unanimously adopted in the Assembly. Thereafter, local politics have been kept out of detailed implementation. The elections for the WUAs and DCs were not party based. Additionally, decision-making is vested with farmer organizations based on new hydraulic boundaries. The absence of party politics in implementation of the reform program to date needs to continue. In the longer term, the best guarantee that FOs and I&CADD will be kept free from possible undesirable pressures is their full financial autonomy and independence (refer Chapter VII).

Readiness to Learn and Adjust

Although intentions and actions have been bold, GOAP has been receptive to the need for change through continual learning during implementation and to adjustments as needed. For instance, an amendment has already been made to the APFMIS Act and Rules, field...
implementation is under constant review with adjustments made as they become necessary, reflections are underway on how to better involve women and disadvantaged groups, and, as discussed in Chapter VII, higher agricultural technology and further advances in water-saving technologies are now to be researched.

**Government–World Bank Partnership**

The partnership between GOAP and the Bank, in a supporting capacity, has given further strength to the change process. The Bank has been able to contribute knowledge gained from other countries, has assisted in the development of the sector strategy, and has contributed multi-disciplinary staff and consultant inputs. The Bank has also provided funding support through the APERP-IC (refer Box 3.7) and, for earlier piloting, through the Third AP Irrigation Project. In this GOAP-Bank partnership, continuous interaction and adaptability—including learning from mistakes and seizing new opportunities—are likely to remain important if this still fledgling reform program is to succeed.

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72 For instance, in response to farmer requests, construction, irrigation and drainage divisions were amalgamated for single window provision of services in SRSP, and in the Godavari delta, irrigation and drainage divisions were amalgamated. Particularly useful in the feedback process have been the results of the “Saddassus”, and extensive consultations with FOs during field visits by I&CADD senior staff and Bank missions.
VI. THE NEXT STEPS

CONSOLIDATING THE REFORM PROGRAM

The AP reform program is in its infancy. The key change that has occurred is the formation of FOs and a transfer of power and responsibility to them. There are over 10,000 new Farmer Organizations covering in total some 4.8 million ha distributed throughout the State. Providing these new and still fragile institutions with logistical, technical and training backing—and on such a massive scale—is the greatest priority for now. The following actions would support the development of strong Farmer Organizations, and, more generally, would consolidate this phase of the reform process.

ONGOING PRIORITY ACTIONS

The most pressing current need is to continue the major mobilization of effort to support the new FOs through: further major build-up of training and technical assistance; continuation of the state-wide rehabilitation program for the irrigation and drainage systems; improving water management; and parallel improvements in provision of agricultural services. Other priorities include helping the FOs to federate to Project and Apex Committees and to build their financial and accounting systems; improving water charges collection, including transition to collection by the FOs themselves; and further building participatory processes. There are, in addition, a number of management and administrative matters to deal with.

Training and Extension for Farmer Organizations

A significant effort has been made by I&CADD, in association with its WALAMTARI and IRDAS, to develop training modules covering the spectrum of new skill areas required by the FOs and I&CADD staff. Eighteen training modules have been prepared as described in Chapter III. Similarly, major training campaigns have been undertaken for all of the over 10,000 WUA presidents. The needs are recognized as still enormous, as evidenced in I&CADD’s December 1998 “Saddassu” census survey of WUA presidents and found in the September 1998 PRA (Annex 10). The FOs were calling for further intensification of training, not only for the presidents but also for other committee members. The most immediate needs are in management and accounting, water management, and systems rehabilitation.

In response to these needs, the training program is planned to be significantly expanded. In March and April 1999, 330 staff (five each from I&CADD, AD, and the Revenue Department for each of AP’s 22 districts) were trained as trainers. Immediately following this, in July-August 1999, a mass training program for all MC members, as well as presidents of WUAs—65,000 persons in all—will be conducted at district levels. The

73 The Institute of Resource Development and Social Management (IRDAS) is a NGO associated with I&CADD’s reform program. IRDAS, directed by Mr. Sithapathi Rao, also assisted with one of the WUA pilot programs and has been closely associated with GOAP’s policy deliberations.
1999/2000 training program will also include extensive use of study tours within AP for WUA MC members, so that they can exchange experiences with other farmers, and familiarize themselves with best practices from different parts of the state.

**Capacity Building for Government**

I&CADD and AD staff, and staff involved in the District administrations, also need major training and incentives to equip them for the new challenges. I&CADD have already undertaken widespread short training for field staff, but mainly to brief staff in the new procedures under the reform program and the APFMIS Act and Rules. There has not yet been much in-depth training, despite the very significant cultural change that the engineering cadre must go through. There are also increased skill demands: in the largely unfamiliar area of community outreach; in all aspects of O&M, previously not a focus area for I&CADD; and in the new accounting and financial management areas not previously required from them. Technical skills will need enhancement as the next opportunity for improved water productivity will come from much more finely-tuned water management, with engineering design and operating procedures to match. Engineers have so far largely learned "on the job", and to their great credit many have responded well to the new environment. There is, nevertheless, need to gear up training for the engineering cadre to the same levels of intensity and motivation as happening for the FOs. Similarly, AD staff will also need major training to implement the IAIP.

This need is recognized by I&CADD and AD, with reflections underway on how to build up the training program. At the moment, all training capacity is being used on the FOs, and training capacity may thus need to be further augmented, and to higher levels of sophistication. Capacity building should also consider professional incentives and recognition for well performing staff. Various forms might be considered, from awards for excellence and achievement, access to study tours or professional development sabbaticals, faster promotions or monetary incentives. Intensive training for both FOs and government personnel, will need to be a continuing major thrust for some years to come.

**Systems Rehabilitation**

The positive results from the first maintenance and rehabilitation season in 1998 (refer Chapter IV) need to be expanded in the 1999 season and beyond. Intensive preparations for this are underway in a joint exercise between the I&CADD and FOs. The forthcoming 1999 campaign will also aim to improve the quality of the maintenance and rehabilitation works. Although the great majority of works undertaken in 1998 had positive benefits, the inevitable inexperience in that first season resulted in some inadequacies. Early and continuous benefits to farmers and their FOs—a further boost in the equity of water distribution and the productivity of the irrigation and drainage systems—will continue the forward momentum of the reform program and encourage both the FOs and I&CADD.

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74 For instance, where excavators were used by WUAs and DCs, desilting was sometimes in excess of requirements. Desilting, where done with hired machinery by the WUAs, was sometimes carried out for a minimum one meter depth determined by the machinery specifications, rather than by the needs of the particular distributory, drain or minor.
Rehabilitation works are being funded under a cost-sharing arrangement with the FOs, involving a 15% contribution by the WUA in the form of cash or donated labor. Under the APERP-IC, these rehabilitation works are termed “minimum rehabilitation” works, reflecting the deliberately low cost nature of the works. “Minimum rehabilitation” is, in effect, a deferred maintenance exercise to substantially restore system capabilities. The estimated average cost is Rs 1350 ($32) per ha, and such works are typically planned to be carried out over a two to three year period. For more intensive modernization, consideration should be given to a higher level of contribution by the FO. Such cost sharing is essential to the program’s client-driven and demand-led approach and is also a central philosophy in AP’s “Janmabhoomi” program. Within a short period, as indicated above, system rehabilitation is planned to give way to normal maintenance activities, which are fully funded by the FOs.

Water Management

As discussed in Chapter IV, there were generally positive impacts from the first water management season (Kharif 1998): water conveyance was significantly improved; water was more equitably distributed, with particular benefits for tail enders; irrigated area increased; and, on the major schemes, the irrigation season was advanced by two to three weeks. There were also far fewer disputes between farmers on water allocation, and formal complaints to I&CADD radically reduced. Notwithstanding, while the continued progressive rehabilitation and upgrading of the systems in future annual maintenance/rehabilitation programs will handle the physical improvements, much needs to be done regarding water management. Field reviews by I&CADD and Bank staff found that on major and medium schemes, coordination between DCs (and sometimes between WUAs within a DC) was a particular problem. Such coordination can likely be improved with the establishment of the PCs and through regular consultation meetings between I&CADD and the farmer organizations during each water management season.

Water management can also be improved at upstream levels. Careful preparation of operational plans for each system as a whole will usually reveal ways of improving management of headworks and the bulk source of water to further optimize use of water in the system as a whole. Opportunities for investment in upstream works that can enhance the service, would also likely be identified. O&M generally, and related hydrology and hydraulics, is a professional area still needing major development in India. For both I&CADD engineers and the DCs/WUAs, further training is required in water management, and technology and procedures need to be further built up for continuous measurement and monitoring of water flows.

Access to rehabilitation grants are also planned to include monitored satisfactory performance in a number of other areas, besides capital cost sharing. Details are still being worked out, but might include such areas as full payments of water charges and a set of indicators demonstrating sound management (eg., regular GB and MC meetings, financial and social audits, certified good quality works the previous year, water charges collection in excess of requirements to build the FO’s bank account, etc).
Agricultural Intensification

The reform program will include an IAIP (IAIP), also funded under the APERP-IC. This will intensify agricultural support to farmers using the WUAs as the inter-face for contact between Government and the farmers. The IAIP will enhance the services provided to farmers in irrigated areas by the AD. It will include regular training of FO representatives, farm-level demonstrations on WUA lands, bulletins on specific technical subjects, newsletters, and use of the media. The State’s agricultural universities and research institutes will also be brought into this effort. The rapid initiation and build-up of the IAIP needs to be a major priority. Improved irrigation and drainage is only one facet contributing to growth in the productivity of irrigated agriculture. Agricultural improvements must match the water service improvements. Indeed, over time AP is looking to much higher technology levels in both irrigation and agriculture, and practices found in countries such as the USA (California), Israel, Chile, Jordan and Egypt will have relevance (Chapter VII).

A lesson already learned is that planning and implementation for boosting agricultural productivity should go hand in hand with system rehabilitation. In AP’s case, the IAIP was conceived a year after the rehabilitation program, and will be starting its first season in kharif 1999, the second year of the irrigation service improvement program. Also emerging is the need for a close partnership between I&CADD and AD. This was apparent in the first season’s walk-throughs, when AD staff were largely not part of such walk-throughs. The two agencies need to work closely together, and in partnership with the FOs, to take the irrigated agriculture reform program forward.76 Actions by AD to urgently get the IAIP underway and by I&CADD and AD to build this partnership are underway.

Federation for Higher Level Participation

Also planned in AP’s ISP is the federation of WUAs and DCs to higher levels. Minor and medium schemes already have, through their WUA or DC, an administrative structure covering the full system. On major commands, the DCs are planned to further federate to PCs. For participation in state-level policy and management decisions, an Apex Committee is also planned. These steps will be implemented as soon as is practicable so as to further enhance the role of farmer organizations in whole scheme and state-level irrigation management.

Timing for the PC elections, as discussed in Chapter III, is deliberately being delayed till later in the 1999/2000 water management season, to enable DC Presidents to have sufficient time to get to know each other, and to make good decisions on their representatives and President based on knowledge of the capacity and motives of their colleagues. Similarly, it may be advisable to allow a bit of time before the FOs elect the state representatives on the Apex Committee, to enable well motivated natural leaders to become known through capacity

76 The considerably greater impact that successful integration of agriculture and irrigation staff working together with WUAs can make is becoming evident in Orissa State’s Aunli pilot scheme. The combined impact on irrigated agriculture productivity—increased irrigated area, increased yields and crop diversification—is considerable, in only the second year of implementation at Aunli (funding support under the Orissa Water Resources Consolidation Project, supported by the World Bank). (Source World Bank staff reports and Departments of Water Resources and Agriculture, Government of Orissa, 1999.)
and achievement rather than first impressions. Community orientation, integrity and executive ability would be the qualities to be hoped for, with politics to be avoided by every means possible.

**Water Charges Collection**

Achieving financial viability for both the FOs and the O&M service activities of I&CADD, is a central policy objective under the reform program (refer AP’s ISP, Section E, attached at Annex 4). This is further considered in Chapter VII, but some short-term steps towards this are discussed here. The immediate priority for the 1999 water charges collection campaign is to improve the collection percentage. Also a short term priority, but one which may take several years to complete, is to transition as soon as possible from the present collection of water charges by the Revenue Department to collection and retention of water charges by the FOs and I&CADD (refer Chapter VII). A further step that might be considered would be for the FOs and the I&CADD to collect fees from their members in excess of the specific needs for O&M and administration costs. Such extra revenues could be put into a “renewals fund” held by each WUA and DC to build their capital and save for replenishment of assets.

Other actions will also be pursued and introduced progressively. These include: (i) appropriate billing for bulk water supplies by I&CADD or FOs to other users, and (ii) introduction of a computerized billing system by I&CADD to WUAs, which would charge water to the WUA as a whole and, eventually, volumetrically. The Hyderabad Metropolitan Water Supply and Sewerage Board has one such system (refer Box A2.5). The billing system would transparently break down the costs of O&M, thus serving as a monitoring and participation tool in discussions of O&M costs, needs and service fees. Close monitoring will also be made of the cost effectiveness of O&M, including both the works component and expenditure levels on establishment. This would be an input to decision-making in the future regarding the staff needs of I&CADD as it carries out its new role. Emphasis will also be placed on making the newly established WCRC (refer Chapter III and Annex 9) operationally effective. The WCRC will be making annual reviews of O&M expenditure needs and levels, cost recovery and financial viability, as a basis for annual recommendations on these matters. Future steps should include granting the WCRC full autonomy to set water charges and vesting it with regulatory authority over the irrigation sector.

**Transparency and Accountability**

Achieving transparency and accountability in the operations of FOs is a critical need. To ensure that the needs of all are catered to and that FO presidents and committee members do not acquire corrupt practices, full participation by all members is required. To a great extent, this cannot be prescribed as it depends on the individual concerned. It is a matter of the way in which FO leaders outreach to their community and maintain personal integrity. It can, however, be fostered through training, and, more specifically, by ensuring a variety of

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77 For example, one WUA in Hazurabad, Karimnagar District, Sirarmsagar Project has innovatively set a “grievance fee” of Rs 50 for a petition. All parties gain from this arrangement: the grievance is redressed by the WUA and the Rs 50 helps build the WUA’s financial strength.
practices: regularly convening general body meetings (at least twice annually) and MC meetings (monthly); practicing sound bookkeeping; promptly writing-up cash books; making all expenditures and accounts available for public scrutiny; placing accounts and expenditure records on permanent and constantly updated display; thorough auditing; making social audits and subsequently discussing them in public fora; and undertaking other helpful practices that may be thought of over time. A further need, at I&CADD’s level and progressively at PC and possibly DC levels, is the computerization of accounting and expenditure information to enable effective monitoring. Various initiatives are ongoing and planned to tackle these areas, likely requiring a sustained drive for some time to come.

Public Participation

Public participation—through conferences, workshops, the media, feedback surveys, walkthroughs, etc.—has been a vital part of the reform program and the acceptance of the new policies. In program implementation, it will become even more important. Society as a whole should continue to be involved: WUA members, Government, NGOs, the media and the general population. This has been an ongoing thrust area for GOAP, and is planned to continue. Use of the media as an extension and participation vehicle is one channel already used and to be further developed. The forthcoming state-level WUA magazine and district level monthly newsletters (in Telugu) will be another. The “Dial Your CM” program is an opportunity for the general public to pose questions and engage in dialogue on the program. The district Collectors have played a significant role in public outreach and dialogue. Such mechanisms and other fora will likely need to continue and be further developed as the program continues.

Monitoring, Evaluation, Management Information, and Communications

A PMU is being established in I&CADD and will undertake M&E and build up a MIS. A good M&E and MIS system will be important for the successful management of the reform program and its continuous improvement and adaptation. A major baseline survey is underway to provide a sound initial database. Thereafter, M&E will be an ongoing activity

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78 The current bookkeeping procedures for the FOs are under further review by I&CADD. At present, the bookkeeping requirements are too complicated, which does not add to accountability and reduces the ease with which they can be transparently monitored by others.

79 This is an ongoing thrust area for I&CADD and the Bank alike. A financial management firm is to be recruited to assist I&CADD in further developing financial management procedures and in training of staff and FOs. The procedures will include conventional accounting and auditing practices, and progressive computerization of financial management and accounting, eventually to DC levels and perhaps to the more progressive larger WUAs. It will include an equal amount of emphasis on the style of leadership and participatory processes, as described in this paragraph, and also using such community oriented procedures as the “social audit”. The social audit is to be done annually and is described in the APFMIS rules and one of I&CADD’s training manuals. The objective is to have a participatory public audit, additional to the conventional audit, where the community as a whole participates in discussion of what has been done and is to be done, reviews the works and their costs, and is joined by a respected member of civil society appointed with approval of the District Collector (e.g., a local doctor, teacher, retired civil servant, etc) not connected with I&CADD or the FO. Sound and transparent financial management, emphasizing participation, transparency and accountability, and including regular MC meetings, General Body meetings, up to date audits, social audits, full payment of water charges and other matters will also be made conditions for receipt of cost-sharing support for rehabilitation and modernization grants from government.
and will be supplemented from time to time by special assessments and studies. Independent evaluations of the program will also be essential. A computerized MIS system will also be established, covering all aspects of financial, administrative, and technical management. Both MIS and M&E systems will be designed to provide rapid feedback to stakeholders and managers. For instance, the “Saddassu” survey in December 1998 was able to use a computer scanned OMR questionnaire to get feedback from most of the over 10,000 WUA presidents and to discuss the results with them on the same day.

A modern communication system will also be established under the APERP-IC, connecting I&CADD with all field sites, using a combination of the National Informatic Centre Network or similar private satellite communication system and telephone lines. Additionally, within each major irrigation scheme a DMS with very high frequency communications will be established to facilitate the management of each major irrigation scheme by the Project, Distributory, and WUA Committees.

**WUAs for New Projects**

It has been decided that PIM principles will be applied to new projects, not only when they become operational, but also during the decision-making, planning and investment stages. Thus, the community, in a partnership with Government, would be involved right from the beginning: when considering the proposal; when planning and designing the project; and during construction. Their involvement would become progressively more formalized as the process advances.

**Other Action Areas**

As the reform program moves forward, various constraints and needs will naturally emerge. For instance, many “teething problems” were present in the first (1998) maintenance/rehabilitation season. One such problem was the issue of whether WUAs and DCs should pay income tax and sales tax as they would have had they been private contractors. Delays in resolving this issue held up the final installment of Government financial assistance to the FOs. It has now been decided to exempt FOs from sales taxes in accordance with their non-profit status, although income tax matters are yet to be sorted out by the central Government’s Central Board of Direct Taxes. Other current concerns are to simplify approval procedures, to streamline I&CADD’s management decisions, and to update the standard data book by incorporating the latest construction technologies.

**VISION 2020**

In January 1999, AP issued a draft document, “Vision 2020”, reflecting on the future of the State and the priority issues to be addressed over the next two decades across all sectors in the economy. This document is intended to form the base for wide-spread discussions—from the grassroots to technocratic and political levels—to forge new initiatives for the future. The forthcoming intellectual debate is likely to be a fruitful period and to result in many new
ideas on, inter alia, the future of the irrigation sector reform program. The following chapter offers some thoughts that may contribute to this debate.
VII. THE LIKELY WAY FORWARD

CONTEXT FOR THE LONGER TERM PROGRAM

The AP irrigation reform program illustrates many of the points discussed in a recent sector study between the World Bank and Government of India.\(^8\) The “Report on the Irrigation Sector” in the “India Water Resources Management Sector Review” series, may thus provide a structured context within which further progression in AP’s reform program can be discussed.

As discussed in the WRM Irrigation Report,\(^8\) AP’s prior situation is typical of many publicly managed irrigation sectors—both in India and other countries—and can be characterized as a vicious circle of influences collectively contributing to a downwards spiral in performance (refer Chapter II, Figure 1).

AP’s reform program represents a start towards breaking the vicious circle and ultimately creating a virtuous circle (refer Figure 7).

Under the virtuous circle, an incentives environment for change is created encouraging both farmers and the service agency to progressively enhance performance. (Oblitas, 1998; Oblitas & Peter, 1999.)

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CREATING ANDHRA PRADESH’S VIRTUOUS CIRCLE

Agricultural & Water Use Extension

New Technologies

Better/Sustained Irrigation Systems

Higher Yields

Institutional Restructuring

Training & Capacity Building

Participation & Accountability

I&CADD

WUAs DCs PCs

Adequate O&M

I&CADD - Farmer Organization Partnership

Financial flows

Impacts and Actions

Higher Incomes

Farmer Satisfaction

Water Charges Paid Adequate Revenue

Source: Adapted from World Bank, 1998b; Oblitas, 1992, 1998
The WRM Irrigation Report recommends the following six “Action Areas” to create the virtuous circle. The fundamental needs are two major institutional changes, with the first of these being the most important and the driver of the second. Actions in four other areas are also required. As will be seen below, AP has focussed its efforts on the first and most important of the institutional changes, but has not tackled the second recommended institutional change. Also, some actions in the other Action Areas (discussed in Chapter VI) are being undertaken, but are in progress rather than complete. The six Action Areas are:

- **Action Area One: Irrigation Management Transfer to Farmers.** Farmers as “the clients” need to become the driving force in the change process. They need to become involved in management, directly managing the lower systems and participating in management of the main systems. As the client, they are directly motivated to drive cost-effective improvements. For this, grass-roots farmer institutions need to be created and given lead responsibility and autonomy.

- **Action Area Two: Client-Driven and Funded Service Agency.** The government institution needs to transform to a commercially oriented, client driven and responsive agency, paid by the clients (farmers) and thus accountable to them.

  These two institutional layers—the grass-roots farmer institutions and the reformed and restructured service agency—would be *inter-linked, institutionally and financially, in a partnership.*

  These two core changes need parallel efforts to: (iii) achieve financial viability; (iv) upgrade the irrigation systems; (v) improve agricultural extension; and (vi) introduce transparent information and public involvement.

- **Action Area Three: Financial Viability.** Financial viability is crucial for all the institutions, both the service agency and the farmer organizations. Typically, water charges in the state or country concerned would need to be increased and would be collected by the FOs, with a portion retained by them and the balance passed on to the service agency. The amounts collected and the proportional share of the FOs and the agency need to enable both to be financially self-sufficient for at least O&M. Reliance on the historically inadequate Government subsidies would thus cease.

- **Action Area Four: Upgraded Irrigation Systems.** To improve the irrigation and drainage systems demand-led investment is required to help the FOs and the service agency invest in system improvement (rehabilitation and modernization). At least some of the investment contribution should come from the FOs, to ensure demand-led investment (so that it is responsive to client needs) and “ownership” (required for sustainability).

- **Action Area Five: Improved Agricultural Services.** Agricultural improvements need sponsoring, using the FOs as the new inter-face for extension services. In this
manner a more responsive service relevant to the needs of farmers would be provided by the AD; and

- **Action Area Six: Public Involvement and Transparency of Information.**
  Transparent information (especially in grass-roots accounting at FO levels), good monitoring systems, and public involvement in all decisions are crucial for the sound management and continuous improvement of both the FOs and the service agency.

  The AP reform program has made a vigorous start in a number of the above areas. Most fundamentally, significant responsibility has been transferred to farmers (Action Area One). Also, a cultural change towards client-orientation at the level of I&CADD engineers is beginning (Area Two), though will require further development; water charges have been tripled and transition to collection by FOs and I&CADD is planned (Area Three); the rehabilitation of the irrigation and drainage systems has been launched (Area Four), primarily implemented by the FOs; the agricultural intensification program is getting underway (Area Five); and excellent public outreach has been employed in creating the FOs, but accounting and other actions in Area Six need follow-on.

  Further actions that need to be undertaken—including attending to the various issues that have arisen during the start-up of the reform program—have been discussed in Chapter VI. These actions will go far in creating most of the features of the Virtuous Circle (Area One and Areas Three to Six). They also lay the groundwork for Area Two, the creation of a client-driven and funded service agency. However, further actions may be required to firmly establish the financial interlinkage between the water service agency (I&CADD) and the FOs and their full partnership in irrigation management and development. The following sections—Creating Financial Interlinkages and Strengthening the Partnership—discuss such options, as considerations for the further evolution of the reform process.

**CREATING FINANCIAL INTERLINKAGES**

**Financial Self Sufficiency**

  The tripling of water charges, undertaken in 1997, and the intended transition to collection of water charges by the WUAs and I&CADD for exclusive use on O&M provides a good basis for creating client-driven and funded water services. However, to assure the future financial sustainability of both the FOs and I&CADD’s O&M activities, and to establish a direct financial interlinkage between the two, further financial and institutional transformation is needed. First, each institutional layer—WUAs, DCs, PCs and I&CADD—needs to collect and receive revenues generated by themselves at least to cover their full costs for O&M and related staffing and administration. As discussed earlier, this would enable all of these institutions to be financially independent from Government subsidies, which have been notoriously unreliable: in AP, in other Indian states, and, indeed, world-wide. The water charges collected by the WUAs should thus
be appropriately shared between the FOs and I&CADD, in correspondence with their respective responsibilities and reasonable costs of O&M.  

**Systemic Incentives for Performance Improvement**

Achieving the above would also create a systemic financial connection, not only between the various tiers within the FOs (WUA, DC and PC), but also between the FOs and the Government. Both the Government and the FOs would now be directly interested in cost effectiveness and thus in monitoring each other. WUAs would wish to see cost-effective activities by their DC and PC. All FOs would want to assure that the Government O&M and technical support activities are similarly efficient. Likewise, it would be in Government's best interest to ensure its own efficiency and to encourage the FOs to maximize their effectiveness at minimum cost. Thus, at all levels, the internal incentives would be created, driving greater effectiveness and efficiency.

**Unbundling, Commercialization and Decentralization**

7.11 Systemic financial viability also opens up possibilities for further institutional transformation of I&CADD, opportunities for private sector investment, and options for independently managed irrigation schemes. First, I&CADD could consider the option of unbundling and decentralizing its activities. In the unbundling, the O&M activity would become a separate and specialized “Water Services Agency” (WSA), responsible for O&M and services to the FOs and other clients (bulk supplies to municipalities, flood control and drainage, etc.). The WSA would be funded by the FOs and other recipients of WSA services. It might also make sense for further decentralization into separate WSAs by major basin/irrigation systems. The WSAs could also be corporatized and commercialized (as either a public or a private entity). Essentially they would be similar to private utilities, but would differ in that the farmers would form a strong presence in the WSA board and management structure.

**Private Sector Investment**

Second, attainment of financial viability and a more productive and profitable agricultural sector would also set the stage for private sector investment. Investment

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82 The WUAs might collect the water charges from their member farmers and these revenues would then be shared between the WUA, the DC, the PC, and the I&CADD (WSA). A small contribution would also be made to the local Panchayats and perhaps also to the state-level Apex Committee. Each share would correspond to the responsibilities and needs of each party, with the purpose being to fully cover O&M and administration cost needs. The break-down currently proposed by I&CADD is: (i) for major schemes, 50% for WUAs, 20% for DCs, 20% for PCs (going to I&CADD until PCs are established), and 10% for Gram Panchayats; (ii) for medium schemes, 60% for WUAs, 30% for DCs, and 10% for Gram Panchayats; and (iii) for minor schemes, 90% for WUAs and 10% for Gram Panchayats. It is to be noted that this distribution would likely need revision in due course as, at present, no or inadequate shares are allocated for the O&M costs of the I&CADD (WSA).

83 The WSA's services to the FOs would comprise O&M of the main systems and advice to the FOs, including technical, management and training support and monitoring.

84 As discussed in the World Bank's policy paper, "Water Resources Management", 1993, "The principle is that nothing should be done at a higher level of government that can be done satisfactorily at a lower level."
would now be attractive to the private sector, whether in the form of investments by FOs, agribusinesses, private entrepreneurs or private corporations. It would also enable competitive access to debt and capital markets, based on real financial strength and returns. The major investment opportunities still available in AP could thus be supported by the private, as well as the public, sector.

**Independent Irrigation Schemes**

Third, options for financially and managerially independent irrigation schemes would become available. The farmers and agency staff in a particular scheme could form an independent commercial entity, analogous to some of the water user organizations found in Chile. In India, a number of successful Milk Marketing Unions also provide examples of financially-viable commercial entities, with significant and equitable benefits to their member farmers. Such independent schemes could hire their own staff (as done by Mexico and Chile water user organizations and by India’s Milk Marketing Unions). They could also choose to corporatize, thereby opening direct access to private investment and capital markets. With appropriate arrangements, they could also have access to Government financial assistance with investments for scheme modernization through capital cost sharing (as done in India’s dairy sector).

**Water Rights and Water Markets**

The APFMIS Act and development of WUAs offers an eventual opportunity for voluntary transactions in water, as practiced in Chile and western USA. In Indian circumstances, this might use the WUA and other bulk users as the transacting units (within a WUA, individual farmers could also undertake such transactions with their water rights), and might rely more on part transactions (a portion of a water right rather than the whole of it) and leases rather than sales. A WUA could negotiate a larger or smaller share of water with other WUAs or with another bulk consumer such as an industry or municipality. The negotiated price would reflect a lease or sale value mutually attractive and beneficial to both renter and leaser of water. This could facilitate water going to its most viable use. Such options, while potentially attractive, would need careful assessment of experience in the few countries where formal water markets have developed successfully, including examination of regulatory requirements to ensure environmental sustainability and social safeguards.

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85 This is distinct from the floating of bonds for irrigation that has already been done in several Indian states. As discussed in World Bank, 1998b, such bond issues have not been based on financially viable entities and have been floated through provision of full government backed guarantees. Without financial viability, such bond issues are merely an expedient way of incurring more government debt, and at a very high interest rate.

86 The dairy cooperative program is sponsored under the National Dairy Development Board’s “Operation Flood” program. Experience under the program varies, both between states and within states. The successful commercial entities, including the Milk Marketing Unions of Gujarat, would be the ones to emulate.
STRENGTHENING THE PARTNERSHIP

Cultural Change and Capacity Building

The roles of both I&CADD and the FOs will adjust over time, as they strengthen their capabilities to take on new responsibilities. I&CADD engineers will need to take on the role of service-oriented professional advisors. Already, this cultural shift is commencing in I&CADD, but substantial further evolution in this direction is required. Similarly, FOs will need to gather institutional, technical and financial strength, a process that can also be observed as commencing. The development of both levels of institutions (I&CADD and FOs) to be able to carry out their respective and required roles, will be essential to the sustainability of the reform program. They will thus evolve to form a partnership in the management of AP's irrigation sector.

Government–Farmer Organizations Interactive Partnership

By taking an increased role in management of irrigation, FOs are stepping into an area where the former exclusive public sector management was not able to cope effectively. It would be as great a mistake to assume that FOs by themselves are a panacea. The vital role for Government is to provide high quality support to the FOs in a wide range of areas, from organizational to technical. Government also needs to provide financial support on a cost-sharing basis to investments by FOs, to directly manage the main systems and large structures, and to implement specialist works beyond the engineering capabilities of the FOs. Further, Government would also carry out various planning, monitoring and regulatory functions.

The roles of Government and the FOs will need to be interactive in both directions. For instance, if Government manages main systems, at least for some time, this should not preclude active participation by the FOs in decisions on priorities and operational plans. Similarly, the FOs, while now directly responsible for managing irrigation systems at their levels, need oversight from Government and direct intervention if necessary. As an example, it will be important that the Presidents and Management Committees of the FOs do not adopt the negative features of some past contracting practices, i.e., attempt to make profits for themselves rather than serving their members. For this, full transparency and accountability to their members (as discussed in

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87 Progress and steps being taken to foster this cultural shift are discussed in Chapter VI. The cultural change required is major and will take time to build and spread throughout I&CADD. The engineers are adjusting from their former role of an autocracy with limited dealings with the people, to irrigation professionals advising and helping the people. The role is no less important, indeed, it is more so, but with less authority and in a shared partnership with the FOs. The Assistant Engineer (and higher ranks) who adjusts well will have the respect and revered affection in the community of a highly respected doctor or teacher. The doctors "authority" comes not from any actual authority, but from the respect of the community for his professionalism and the help he/she provides. The AE still has somewhat more authority than the doctor, and the best will gain the same respect. While this cultural change is inevitably a long one, with greatly varying response within I&CADD's engineering cadre, a significant beginning is already underway to the great credit of I&CADD's field engineers as well as their senior ranks.

88 The term "Government" used in this section also includes possible commercialized agencies.
Chapter VI) will be essential, fostered by Government through required procedures, monitoring and intervention as needed.

More generally, the FOs and the agency would each be influencing the other to improve their respective performance. The FOs would receive critically needed technical and managerial support from the Government agency, and Government would also provide monitoring and oversight. Likewise, the FOs, through client pressures on the Government agency—in particular, as they are paying for the agency’s O&M and technical services, and for the agency staff salaries and wages—would provide the incentives for continued improvement in the agency’s performance. Thus, Government and the FOs would act in a mutually supportive and complementary partnership. Establishing this partnership—and providing that full transparency and public participation are maintained at both the FO and agency levels—would create an internally-driven incentives structure which is systemic rather than one that depends on continued political will (Oblitas, 1998; Oblitas and Peter, 1999).

Various countries offer examples of this progression, such as Australia (refer Box A3.3). This financially and institutionally inter-linked partnership would help ensure the continuous good management of the irrigation systems, thereby providing the sector’s best chance for sustainability and further performance improvement. Given the vital role that irrigation plays in AP’s agriculture, the implications for agricultural development and rural incomes would be significant.

IMPROVING WATER RESOURCES MANAGEMENT

WRM issues are included in AP’s ISP (Annex 4), although the ISP’s main focus is on the irrigation service. Several pointers concerning actions under consideration—such as the establishment of a multi-sectoral State Water Resources Board, preparation of multi-sectoral river basin plans, environmental management needs, and integrated conjunctive use of surface and groundwater resources—are included in the ISP.

WRM issues are beyond the scope of this paper. AP is currently placing a single-minded effort to make its irrigation reform program a success. These issues are, however, crucially important for AP, and will become more so as the economy develops and demands on scarce water resources grow. WRM can thus be expected to become a core part of the agenda as the reform process further advances.

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89 Similar issues may need to be dealt with for agricultural services. The IAIP will, hopefully, enable the AD to substantially boost the impact of its extension services to irrigated agriculture. Perhaps due to the fact that it will now be inter-facing with the FOs, the AD will become subject to significant client pressures to perform. However, further steps might be considered, including the provision of additional incentives to AD staff through performance-related bonuses, or the private hire of agricultural specialists by the FOs themselves.

TECHNOLOGIES FOR FURTHER AGRICULTURAL GROWTH

Higher Growth Scenarios

It is appropriate at the end of this review to return to the ultimate objectives of AP’s reform program. Through a combination of Virtuous Circle initiatives being undertaken by AP, the aim is to rectify the Vicious Circle entrapping irrigated agriculture: to halt and reverse the decline in irrigated area; to increase the equity of water distribution; to provide better irrigation and agricultural technologies, thus stimulating yield increases and perhaps diversification to higher value crops; and to transform the irrigation sector into an institutionally, financially and socially sustainable sector, with community management and involvement as the centerpiece.

The low-cost nature of the interventions—the minimum rehabilitation program averages Rs 1350/ha ($32/ha)—and the early gains that have come from rehabilitation and improved maintenance and water management, provide for a potentially viable program. The APERP-IC appraisal document\(^9\) anticipates the following impacts by completion of the project: (i) an increase in the State’s irrigated area of 12%; (ii) crop yield increases averaging about 10%; (iii) an increase in agricultural value added of about Rs 420 crores ($100 million) per annum; (iv) an increase in food grains production of about 1.1 million tons per annum; and (v) an increase in average irrigated farm incomes of between 10% to 30% depending on region and scheme size.\(^9\) Such impacts were estimated to yield an economic rate of return of 38%.

These impacts would clearly represent a successful program, and would be significantly beneficial to AP’s economy, and in particular to rural welfare. The above objectives are, however, substantially lower than the more ambitious development agenda now being developed by GOAP. As discussed in AP’s “Vision 2020” report and also referred to in the Chief Minister’s address to India’s Fourth National Conference on Participatory Irrigation Management (attached at Annex 11), AP is seeking to radically shift the production frontier of irrigated agriculture. From the past low annual agricultural growth rate of less than 2%, AP is aiming to reach an annual agricultural growth rate of as high as 6%. This would be a massive feat. Very few countries have managed to achieve such rapid growth. Even a still very ambitious 4% annual growth rate has major implications, as illustrated in Table 7.1. This would mean an increase in agricultural production of 128% by 2020; 6% annual growth implies a 240% increase by 2020. With AP’s irrigated agriculture responsible for over 60% of the State’s agricultural production, the direct challenge is clear.\(^9\)

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\(^9\) These figures are averages of more variable impact estimates by scheme size and region. For instance, most of the irrigated area impact is estimated to be on the major and medium schemes, with average area expansion for minor schemes estimated at about 5%.
\(^9\) The same challenge applies to rainfed agriculture, which is, however, beyond the scope of this paper.
Table 7.1. Agricultural Productivity Growth in AP Under Various Growth Rate Scenarios  
(in % increase in value of agricultural production compared with base year 1998)

<table>
<thead>
<tr>
<th>Agricultural Growth Rates (% per annum)</th>
<th>2010 (% increase on base year)</th>
<th>2020 (% increase on base year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.8*</td>
<td>+22</td>
<td>+45</td>
</tr>
<tr>
<td>3.0</td>
<td>+38</td>
<td>+86</td>
</tr>
<tr>
<td>4.0</td>
<td>+54</td>
<td>+128</td>
</tr>
<tr>
<td>5.0</td>
<td>+71</td>
<td>+179</td>
</tr>
<tr>
<td>6.0</td>
<td>+90</td>
<td>+240</td>
</tr>
</tbody>
</table>

*corresponding to Andhra Pradesh’s past agricultural growth rate (1989-1997).

As also discussed in the WRM Irrigation Report, a “paradigm shift” is required—to much higher agricultural productivity—meaning, effectively, a “Second Green Revolution” in irrigated agriculture. This would be enabled by the further options for institutional and financial transformation discussed in this chapter. However, it would also require major gains in technology for both irrigation and agriculture. AP thus must look to the most relevant higher technologies available world-wide—for instance in the USA, Jordan, Chile, Israel and Egypt—and harness them in locally suitable and cost-effective ways.

Shifting the Technology Frontier

First, irrigation and drainage services need to move beyond improved equity, enhanced irrigated area, greater reliability, and higher efficiency, to include practices increasingly tuned to significantly enhancing the productivity of water use. For example: (i) system modernization, including use of advanced technologies for improved water management; (ii) development where appropriate of high response systems such as dynamic regulation; (iii) promotion of water rights and water markets to enable water trading to its most productive use; (iv) low-cost drip irrigation; and (v) integrated land and water management on a watershed basis, including water conservation and

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94 As discussed in World Bank, 1998b, and Oblitas, 1999, the first “Green Revolution” of the 1960s to mid 1980s—the rapid adoption of high yielding varieties (HYV) and fertilizer use made possible through the expansion of irrigation—has now run out of impetus. New water sources have become more scarce, area expansion has slowed, and the first basic technology change—use of HYV seed and fertilizer—is now widespread. The next “revolution” is identified in the India WRM to come largely from performance improvement of existing irrigation, made possible by new approaches to irrigation sector management together with advances in agricultural and irrigation technologies. This discussion is further developed in “Strategic Needs for a Second Green Revolution of India’s Irrigated Agriculture Sector” (Oblitas, K., 1999, Forthcoming).

95 Ways to introduce advanced agricultural technologies are already under consideration, and will, inter alia, include a study specifically to identify such technologies, and ways to introduce them using the WUA as the interface. An objective will be to find viable technologies suitable for small farms, and a non-subsidy based approach for introduction, with eventual dissemination favoring the private sector and WUAs rather than government agencies.
harvesting. Both delivery systems and on-farm water management would need to be tackled; water management is as important on the farm, as is water delivery to the farm.  

Second, the agricultural technology in use must advance. This would be assisted through the improved water service, as reliable and timely water suited to crop requirements is of the essence. There is still, however, a large “agricultural technology gap” between the present practices of the great majority of AP’s farmers and the technologies currently available world-wide, to say nothing of those that will come on-stream as the 21st Century advances. A challenge is to find appropriate technologies that are not necessarily high cost, yet have significant impact, and to foster their dissemination: higher yielding seed varieties, optimal nitrogen phosphorous potassium applications, micro-nutrients, biotechnology, new remunerative crops for diversification, and yield and labor enhancing farm implements.

To make a start in these directions—i.e., improved irrigation and agricultural technologies—various actions, pilot activities and studies will be launched by AP, a number of which are to be funded under APERP-IC. An increasingly rich array of initiatives, including extensive recourse to international best practices, will be appropriate. The way ahead would likely require the combined talents and efforts of farmers, the university and research community, and the private sector.

CHOOSING CHANGE

Some mistakes will inevitably be made along the road to reform. However, the attempt to stop and reverse the decline in irrigated area and low agricultural growth, thereby ensuring higher levels of rural welfare, is well worth the risks involved. To this end, the reform program—including the further options that have been discussed in this chapter—should be embraced and continued. As experience is gained further ideas should be constantly sought. In the words of AP’s Chief Minister, “Change will come, it has to

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97 To enhance capacity in communications, a state-wide communications system, combining satellite with telephone and VHF systems, and a computerized management information system is to be established. The APERP-IC’s Scheme Improvement/Modernization and Farmer Turnover Component will pilot more intensive scheme modernization, including a pilot experiment in remote controlled canal automation. An institutional study and a study on women’s participation in irrigation management will also be conducted to consider future institutional transformation options and ways of better integrating women and minorities in participatory irrigation management. A pilot experiment with low-cost drip irrigation, using local technologies on a minor in a water-short irrigation system, will be established with assistance from International Development Enterprises, an international NGO with experience in India. Most recently (January 1999), it has been decided by GOAP and the World Bank to undertake two further studies on: (i) modern irrigation technologies for upland areas and (ii) agricultural technology transfer to farmers through farmer organizations. Both studies will consider international best practices and their adaptation for AP’s specific circumstances.
come, it is better to initiate it than to become subject to chaos. A great writer [has] said, 'if things have to remain the same, they have to change.'

98 Inaugural Address to India’s Fourth National Conference on Participatory Irrigation Management, 19 January, 1999 (attached at Annex 11).
VIII. POTENTIAL RELEVANCE TO OTHER STATES/COUNTRIES

The AP irrigation sector reform program is just beginning. It is too early to call it a success, though an encouraging start has been made. The understanding of the program will develop over time and should be the subject of continuous review and re-assessment. The program itself will be evolving, further adding to the lessons available. Nevertheless, even at this early stage, the AP program is attracting interest both in India and internationally.99

The interest in AP’s program is for several reasons. First, as debated in India’s Fourth National Conference on Participatory Irrigation Management, there are few states in India where participatory irrigation management—the central feature of AP’s reform program—has been successfully implemented. A number of Indian states have had successes on a small scale or have had partial successes in that WUAs have been formed but, even years after establishment, are not managerially and financially independent. West Bengal has had significant success in transferring the management of public tubewells to farmer groups under Panchayats100 but these facilities are small scale in nature, unlike surface irrigation schemes which in India can exceed several hundred thousand hectares. States such as Maharashtra, Rajasthan, and Gujarat have been promoting WUAs for many years and positive pilot efforts are also underway in states such as Orissa and Tamil Nadu. However, and without dismissing these very positive efforts in other states, AP stands out. Only three years ago AP had minimal experience with farmer organizations. It has since launched a comprehensive state-wide program, surpassing the other states in only two years of implementation.

The AP program represents a “Big Bang” approach. In the boldness and scale of its approach—in a single year 4.8 million ha were transferred to over 10,000 WUAs—it is not only unique in India (and indeed in South Asia as a whole). It is also one of the few examples of the “Big Bang” approach in the world, with other notable recent examples being Mexico and Turkey (described at Boxes A3.1 and A3.2, respectively). By contrast, most other countries in the world—and in all of South Asia—have adopted “gradualist” approaches. The usual result of such gradualism has been very slow progress in the pace of establishment of FOs. Also often the case, such “gradualist” approaches have typically been “partialist”; FOs may have been formed, but other necessary features such as improvement of the systems and financial viability may not have been achieved.

AP’s reform program is also interesting because it differs significantly from the programs in Mexico and Turkey. AP created WUAs across the State in one go, whereas Mexico and Turkey chose sizable but phased irrigation transfers, yet with more

99 India’s Fourth National Conference on Participatory Irrigation Management (PIM) held in January 1999 was located in AP, and attended by participants from states throughout India. The decision has also been made to hold the Fifth International Participatory Irrigation Management Seminar, planned for December 1999, in AP. Within India, over half a dozen states have sent delegations to AP, and Nepal is also planning to send a delegation to see the AP irrigation reform program.

100 For further discussion, refer to Kanwar, D.M. and N.K. Bandyopadhyay, 1994.
fundamental changes than in AP at the moment of transfer. For this paper’s discussion, however, the more interesting difference between AP and the Mexico/Turkey situations is that AP has most of the apparent disadvantages of poorer and less developed rural societies. In this respect AP is quite distinct from Mexico and Turkey: farms are smaller in AP, averaging less than two hectares (versus, for instance, typically 15 to 20 ha in most of Mexico’s irrigation districts); family incomes and rural education levels are lower (annual per capita agricultural income is $175 and overall literacy is 44%, with rural literacy significantly lower). Further, AP has all of the social complexities to be found in Asia, including the mix of castes and presence of disadvantaged groups such as tribal peoples. The poor initial state of the irrigation sector in AP is also not atypical of many other Indian states and Asian countries. AP’s evolving reform program thus offers a “home grown” experiment, which, if it succeeds, may provide a more relevant example for other developing countries.

Thus, the AP reform program may well have important lessons. As the process of AP’s reforms continue, other states and countries have a distinct advantage in being able to study AP’s progress—both successes and failures—and to perhaps adopt a similar or modified program suited to their circumstances. The particular features of AP’s reform program and its initial achievements towards revitalizing the ailing irrigation sector certainly make this significant ongoing effort “one to watch”.

102 In this respect, the starting state for AP—a sector with deteriorating irrigation and drainage systems and in financial disarray—is also similar to Mexico’s and Turkey’s irrigation sectors at the start of their reforms.
CAPTURING ANDHRA PRADESH’S IRRIGATION SECTOR REFORM PROGRAM

IN PICTURES
THE STATE LEVEL DIALOGUE

Chief Minister and the 10,292 WUA Presidents at a State-level convention ("Sadassu") at Hyderabad in December 1998

District and state-level rallies, seminars and conventions have been a standard part of the reform process from its inception.
TRAINING OF TRAINERS

I&CADD’s Water and Land Management Training and Research Institute conducts a Training for Trainers Course

The Classroom

In the Field
A FIELD-LEVEL DISCUSSION
WUA Presidents discussing with I&CADD and World Bank Staff
(Nagarjunasagar scheme)

DESIGNING A PRA
I&CADD and World Bank Staff designing a participatory rapid appraisal questionnaire
TECHNICAL DESIGN

I&CADD and World Bank Officials at site visit
(Nagarjunasagar scheme)

PIM TRAINING OF TRAINERS PROGRAM

The I&CADD/EDI (World Bank)/Ford Foundation sponsored Training of Trainers seminar
A PARTICIPATORY JOINT WALK-THROUGH

A WUA Managing Committee conducts a pre-works participatory walk-through with I&CADD’s Assistant Engineer (AE)

A JOINT WORKS INSPECTION

WUA Managing Committee members and farmers showing completed rehabilitation works on a minor to I&CADD’s AE
WORKS IN PROGRESS (1998 SEASON)

WUA members getting to work
Rehabilitation works in progress at Denkhada medium scheme

WUA hired excavator at work (SRSP scheme)
WORKS IN PROGRESS CONTINUED (1998 SEASON)

WUA Weeding/Desilting a Minor

WUA Rehabilitating a Minor
WORKS IN PROGRESS CONTINUED (1998 SEASON)

Excavator hired by DC desilting a distributory

Excavator hired by WUA desilting a minor
WORKS IN PROGRESS CONTINUED (1998 SEASON)

WUA repairing an outlet from a minor to a water course

WUA laborers excavating a water course
BEFORE AND AFTER THE 1998 WORKS SEASON

Resectioning and Repairs of Control Structure’s Shutters on Vamshadara Major Project (Works done by Distributory Committee)

Before

After
BEFORE AND AFTER THE 1998 WORKS SEASON CONTINUED

Desilting and Weeding a Minor Canal
WUA Works in Nagarjunasagar Major Project - Right Bank

Before

After
(WUA hired excavator completing the works)
BEFORE AND AFTER THE 1998 WORKS SEASON CONTINUED

Argalam Minor Scheme

Before
(WUA members with hired excavator commencing weeding and desilting)

After
(The Resectioned Minor Canal)
BEFORE AND AFTER THE 1998 WORKS SEASON CONTINUED
Nagarjunasagar Major Project - Left Bank

Before
(WUA taking measurements on a major with I&CADD engineers)

After
(The WUA President with his WUA's Rehabilitated Minor)
BEFORE AND AFTER THE 1998 WORKS SEASON CONTINUED

Improvements to a Minor on MPSC Major Project (3 L Minor of 10th Distributory)

**Before**
(The minor: silted up)

![Before Image](image1.png)

**After**
(WUA members completing desilting and resectioning of the minor)

![After Image](image2.png)
BEFORE AND AFTER THE 1998 WORKS SEASON CONTINUED

Godavari Delta, E. Godavari District – Bodduvenkatayapalem Minor Drain

Before

After
MANUAL RE-EXCAVATION OF A DRAIN
Vemavaram Minor Drain, Godavari Eastern Delta

COMPLETED REVETMENT AND STEPS FOR BATHING AND WASHING
Improvements to Left Bank MPSC Major Scheme, Anantapur, 1998
(Works done by WUA)
STATE LEVEL WUA CONVENTION ("SADASSU")
DECEMBER 1998

Left: Ministers Lighting the Ceremonial Lamp    Right: A WUA President Addressing the Convention

Lower: I&CADD’s EICs in Discussion
A WUA President addressing delegates

Delegates - WUA Presidents
Principal Secretary I&CADD Addressing the Conference
(On Dais: Additional Secretary I&CADD; President of India NPIM; EDI representative; Secretary MOWR, GOI and Commissioner CAD, GOI)

Additional Secretary MOWR (GOI) presenting bouquet to Chief Minister, GOAP
(On Dais: Principal Secretary I&CADD; and Minister of Irrigation, GOAP)
Panel Discussion led by WUA Presidents
(On Dais: WUA Presidents from different States of India)

Chief Minister with I&CADD and Bank Staff
INDIA’S FOURTH NATIONAL CONFERENCE ON PARTICIPATORY IRRIGATION MANAGEMENT, HYDERABAD - JANUARY 1999

Distributory Committee and Member of Parliament Addressing Delegates during a Field Visit

Delegates Discussing with WUA Presidents in the Field
VISIT OF WORLD BANK VICE PRESIDENT, SOUTH ASIA REGION, TO ANDHRA PRADESH (FEBRUARY 1999)

With District Collector and Superintenship Engineer, I&CADD (West Godavari)

Discussing the Improvements Made on Aracoderu Main Drain with DC and WUA Presidents and I&CADD Staff (West Godavari)
DISTRIBUTORY COMMITTEE PRESIDENTS
STATE LEVEL CONFERENCE (SADASSU) MARCH 1999

Chief Minister discussing with Principal Secretary and Additional Secretary, I&CADD

The Delegates – AP’s 174 Distributory Committee Presidents
The strength of government commitment has been centrally important to the bold beginnings of AP's irrigation sector reform program. This is exemplified by the following excerpts from a speech given by Sri N. Chandrababu Naidu, Honorable Chief Minister of AP, on the floor of the AP legislative assembly on April 2, 1998.

“Our government have accorded the highest priority to the Irrigation Sector with a view to promote economic prosperity and agricultural development of the State. The strategy adopted is to not only complete the ongoing irrigation projects in the shortest possible time but to do so with the active involvement and participation of the farmers. Though Government have invested substantial public resources for the construction of a large number of irrigation schemes, the people have not derived full benefits thereunder due to inadequate maintenance and management and also due to deficient water regulation. Government has, therefore, taken the bold decision to hand-over the management and maintenance of all the irrigation schemes to the farmers' organisations. For this purpose, we have enacted the AP Farmers Management of Irrigation Systems Act, 1997.”

“In June, 1997, elections were conducted to 10,292 WUAs for all major, medium and minor irrigation schemes. In November, elections to 173 Distributory Committees were also completed. In the near future, Project Level Committees will also be constituted to translate into action a total transfer of management to the farmers' organisations.”

“Our Government have decided to give complete functional and administrative autonomy to these bodies and to make the ID accountable to the farmers organisations. To begin with, the laskars working on the irrigation canals will be brought under the administrative control of the WUAs. The ID is directed to assist the WUAs in the improvement of the irrigation systems and in the preparation of operational and maintenance plans. The functioning of the WUAs will be transparent with a high degree of social and financial accountability.”

“An Action Plan has now been drawn up by the Government for taking up essential repairs and maintenance works in all irrigation systems in the State in the three months period commencing from April 1998.” [Mr. Naidu then included a detailed account of the specifics of implementation and the financing arrangements included in the plan].

“In order to create a movement which is centred around the people and the farmers, District level conferences will be conducted to educate the farmers and particularly the WUAs in the efficient use of irrigation and to improve the agricultural production. This will be followed by a State level conference. Through this, our Government proposes to educate and also disseminate information and technology to the farmers and make them aware of their rights and responsibilities.”

“Our government is for the first time embarking on creating a democratic, decentralised structure under the irrigation sector which will be totally managed by the farmers themselves. Our Government seeks the cooperation of the august House in making our efforts succeed.”

Source: GOAP
The WUAs of AP have created a logo to represent their more than 10,000 groups. The above logo is described by the WUAs as, "...a visual depiction of the complete water management system, with its various components coming together in an integral mnemonic. It attempts to capture the essence of the entire system."

The system has its origins in nature, visually depicted by the rising sun in the horizon of a bright sky and green earth. A river shown emanating from this horizon forms the input source of the water management system. The next layer in the logo is a bund which indicates a storage of water, visually depicted by bold horizontal lines, indicating the static nature of stored water. This is followed by a wave leading to a crop which indicates efficient management of the available water. Therefore, this logo covers the system right from its origin to the end use. The human chain depicts the harnessing of the resources by the members through collective action for their common good.

(A color version of) "the logo has bright, warm and lively colors, depicting happiness and prosperity—happiness and prosperity that accrues as a member of the Water Users Association 'Sagu neti Sangham'".  
Source: I&CADD, based on artist’s notes
## Box A2.3

**Distribution of WUAs by District and Scheme Size**

<table>
<thead>
<tr>
<th>District Name</th>
<th>Major Scheme</th>
<th>Medium Scheme</th>
<th>Minor Scheme</th>
<th>District Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adilabad</td>
<td>35</td>
<td>27</td>
<td>221</td>
<td>283</td>
</tr>
<tr>
<td>Karimnagar</td>
<td>249</td>
<td>10</td>
<td>586</td>
<td>845</td>
</tr>
<tr>
<td>Nizamabad</td>
<td>78</td>
<td>13</td>
<td>267</td>
<td>358</td>
</tr>
<tr>
<td>Nalgonda</td>
<td>91</td>
<td>45</td>
<td>538</td>
<td>674</td>
</tr>
<tr>
<td>Warangal</td>
<td>29</td>
<td>18</td>
<td>683</td>
<td>730</td>
</tr>
<tr>
<td>Khammam</td>
<td>50</td>
<td>4</td>
<td>183</td>
<td>237</td>
</tr>
<tr>
<td>Mahabubnagar</td>
<td>21</td>
<td>31</td>
<td>478</td>
<td>530</td>
</tr>
<tr>
<td>Medak</td>
<td>0</td>
<td>12</td>
<td>585</td>
<td>597</td>
</tr>
<tr>
<td>Rangareddy</td>
<td>0</td>
<td>3</td>
<td>165</td>
<td>168</td>
</tr>
<tr>
<td>Srikakulam</td>
<td>37</td>
<td>28</td>
<td>459</td>
<td>524</td>
</tr>
<tr>
<td>Vizianagaram</td>
<td>0</td>
<td>25</td>
<td>439</td>
<td>464</td>
</tr>
<tr>
<td>Vishakapatnam</td>
<td>28</td>
<td>18</td>
<td>375</td>
<td>421</td>
</tr>
<tr>
<td>East Godavari</td>
<td>106</td>
<td>12</td>
<td>225</td>
<td>343</td>
</tr>
<tr>
<td>West Godavari</td>
<td>71</td>
<td>6</td>
<td>217</td>
<td>294</td>
</tr>
<tr>
<td>Krishna</td>
<td>189</td>
<td>12</td>
<td>288</td>
<td>489</td>
</tr>
<tr>
<td>Guntur</td>
<td>245</td>
<td>8</td>
<td>81</td>
<td>334</td>
</tr>
<tr>
<td>Prakasam</td>
<td>124</td>
<td>5</td>
<td>317</td>
<td>446</td>
</tr>
<tr>
<td>Nellore</td>
<td>110</td>
<td>58</td>
<td>695</td>
<td>863</td>
</tr>
<tr>
<td>Chittoor</td>
<td>0</td>
<td>51</td>
<td>644</td>
<td>695</td>
</tr>
<tr>
<td>Ananthapoor</td>
<td>46</td>
<td>7</td>
<td>305</td>
<td>358</td>
</tr>
<tr>
<td>Kurnool</td>
<td>116</td>
<td>12</td>
<td>153</td>
<td>281</td>
</tr>
<tr>
<td>Cuddapah</td>
<td>74</td>
<td>8</td>
<td>276</td>
<td>358</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1699</strong></td>
<td><strong>413</strong></td>
<td><strong>8180</strong></td>
<td><strong>10292</strong></td>
</tr>
</tbody>
</table>


Classification of irrigation projects is done on the basis of command area. Further, the hierarchy of water users associations (WUAs) is dependent on the type of the irrigation scheme given as under:

<table>
<thead>
<tr>
<th>Acreage</th>
<th>Tiers of F.Os</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) Major Irrigation schemes</td>
<td>WUA</td>
</tr>
<tr>
<td>&gt;10,000 ha.</td>
<td>WUA</td>
</tr>
<tr>
<td>(b) Medium Irrigation schemes</td>
<td>WUA</td>
</tr>
<tr>
<td>2000 ha-10000 ha</td>
<td>WUA</td>
</tr>
<tr>
<td>(c) Minor Irrigation schemes (tanks, weirs, LI schemes)</td>
<td>WUA</td>
</tr>
</tbody>
</table>
Box A2.4
Increase in Reported Irrigated Area following WUA Formation on Sriramsagar Scheme

The data from the Sriramsagar Project (SRSP) above demonstrate the dramatic increase in reported (refer para below) irrigated area experienced after the hand-over to WUAs in June 1997. Piloting of WUAs in Sriramsagar began on about 8,000 ha two years earlier, but was not extended to the whole scheme until June 1997. There was no increase in total water supplied to the scheme after the piloting was expanded. In fact, less water was used than previously. The total water consumed in SRSP during 1997 was 28,000 m³, while in 1996, some 43,000 m³ were used. The figures in the chart above show more than a doubling of gross irrigated area (Kharif and Rabi seasons), with two-thirds as much water.

As remarkable as these figures appear, at this early stage, care is needed in their interpretation. The doubling of reported area is due to two factors. First, it illustrates that under WUA management, farmers are more willing to report irrigated area than previously and/or Revenues Department officials to record this. This will have direct positive impact on cost recovery. Second, from interviews with farmers and site inspections, the area actually irrigated has also increased substantially. The exact contribution of each of these factors, as well as other influences that may apply, has yet to be determined from the survey data. In the case of SRSP, each factor may have contributed about equally to the reported increase. Clearly, this is one area of study that should be followed up, on this and other schemes undergoing irrigation management transfer and system improvements.

Source: Adapted from World Bank, 1998b.
Improving Financial Viability and Information Transparency through Computerized Billing

The Hyderabad Metropolitan Water Supply and Sewerage Board provides an Indian example of a computerized billing procedure in the water sector. With appropriate adaptations, computerized billing could have a variety of advantages in the irrigation sector. For all schemes—major, medium and minor, and whether managed by the Irrigation Department (ID), a “Water Service Agency” (WSA), WUAs, or another management structure—itemized billing can be useful for accurate and accountable record keeping (including, for example, information on the survey number, irrigated acreage, crops grown, in addition to the water charge). This is a critical component for establishing and maintaining the financial sustainability of irrigation schemes. In India’s irrigation sector, the billing would most appropriately be done at the level of the WUA (one bill per WUA, with the WUA responsible for collection between members and internal record keeping).

The bills can also be a useful tool for stakeholder participation and cost management. By providing itemized information on the bill—including the relative amounts and types of separate charge—customers (WUAs) will be made aware of how their water use is related to their costs and the ID/WSA’s individual costs. For example, transparent information could be provided to WUAs on how much of their bill goes toward covering O&M; fixed costs associated with ID/WSA management (staff costs, capital investment, facilities overhead, extension activities, etc.); WUA management; and actual water use. Thus, WUAs and their members will be able to see the costs associated with each activity. Without the linkage between the amount of water used, activities and their costs, farmers have less incentive to conserve water—whether through better on-farm management, alternative cropping patterns, or other techniques—and no information with which to become involved in cost management.

Itemized computer billing can provide an essential service to the irrigation sector, through improved record keeping, accounting, cost recovery. The provision of such transparent information to the water users themselves will have a major influence on incentives for water conservation and service cost management.

Source: Adapted from World Bank, 1998b.
Box A3.1
Comprehensive Irrigation Sector Reform in Mexico

Mexico’s irrigation management transfer program is breaking new ground in redefining the relationship between the irrigation users and the State. It has successfully turned around a former situation of inadequate cost recovery, inadequate maintenance, declining infrastructure, declining services and farmer dissatisfaction, substantially analogous to the “vicious circle” present today in many of India’s states.

Progress with Irrigation Management Transfer (IMT). The transfer of Mexican “Irrigation Districts” (DIs) (10,000 to 270,000 ha or equivalent to a small to larger sized “major” irrigation command in India) to Water User Organizations (WUOs) began in 1991, essentially on a pilot basis. The original program aimed to transfer 21 DIs comprising 1.9 million ha up to 1996. Based on successful experience, the program was expanded from the original 21 DIs to 80 DIs. There are now 58 DIs transferred, covering about 3.0 million ha, and a further 28 DIs are in process of irrigation management transfer.

The Prior Situation: Serious Decline of Infrastructure and Services. In Mexico about 6.1 million ha are under irrigation, of which about 3.3 million ha are in 81 large scale Irrigation Districts (DIs). These districts vary from 10,000 to 270,000 ha, and average farm sizes are about 6 ha, ranging from 4 to 20 ha. The irrigation systems serving these districts were developed by the public sector. Cost recovery declined over time, from 95% in the early 1950s to less than 18% by the late 1980s. The low cost recovery and inadequate budgetary appropriations by government resulted in poor maintenance, progressive dilapidation of the irrigation schemes, declining system performance and a serious reduction in agricultural output, a situation very similar to that found or developing in many states in India.

Facing the Problem. It was recognized in Mexico that government was not successfully managing the irrigation schemes, and did not have the funds to do so. The President of Mexico backed a radically new approach, centered on handing responsibility over to farmers. This required strong political commitment from the top, a key factor in Mexico’s success. In 1989, the government instituted a program to transfer management from the National Water Commission (CNA) to farmers under Water User Organizations (WUOs).

The Transfer Process. Transfer is in two stages. First, the responsibility for O&M of lateral canals and minor drains is given to the users, in areas up to about 25,000 ha, which are organized in WUOs. CNA requires that the WUOs demonstrate their capacity to function before moving to the second stage. A minimum duration of at least one year is automatically imposed on stage one. During the second stage, which takes place depending on the size of the DI, WUOs form an Enterprise Association (Sociedad) which takes over the O&M of the headworks, main irrigation and drainage canals, as well as the government machinery and equipment required for O&M. Only the dams and the major headworks are left with the government (CNA). Water charges are collected by each WUO at the beginning of the season, covering the combined O&M costs of the system in control of CNA, Sociedad and the WUO. The WUO then pays the CNA and Sociedad their shares.

Impact of Irrigation Management Transfer. The main observation is that the “service concept” has improved substantially. Maintenance, repairs, and operations are professionally performed and on schedule. Money is available in a timely fashion to the WUOs, Sociedades and CNA. Modern, efficient technology was introduced; and WUO/Sociedad staff are both trained and motivated. As a result irrigation deliveries are more responsive, drains work better, and roads provide better traffic conditions year round.

Most WUOs/Sociedades have proven capable of jointly operating and maintaining their irrigation schemes, even up to sizes in excess of 50,000 ha (excludes in most of the cases the major headworks still managed by CNA). Water tariffs collected by the users (in excess of $150 million in 1995) have supported not only the water user’s O&M activities but also the majority of the O & M activities by CNA.
staff. Most importantly, the maintenance activities carried out by the WUOs have stopped the
deterioration in the infrastructure and hence have accomplished one of the major objectives of the transfer
program. This is in sharp contrast to the previous situation when the systems were heavily dependent
upon government subsidies and consequently were deteriorating rapidly due to lack of stable funding.

A “new deal” between users and CNA also developed, making it possible to begin a new cycle of
improvements in the sector. The improvements include co-financing of public works in DIs between the
WUOs/Associations and the government (CNA). Under the Irrigation Modernization Program (IMP), the
government grants 50% and the WUO funds an equal share. A new culture is now growing in the DIs, of
self-reliance and self-help. As a consequence, a strong modernization program is now on-going and is
beginning a desirable transformation in the sector that would not have been possible with only public
funds. The IMP is now considered as a second step after the transfer stage.

Impact on Staffing and Staff Quality. The number of CNA staff dedicated to DIs has reduced
significantly. The WUOs/Sociedades have, however, put emphasis on staff quality, and have tended to
recruit staff with higher levels of training. The elimination of unionized staff controlling O&M activities
has removed one of the major past complaints of the farmers. It has been reported that the ability to hire
and fire their own staff has improved the responsiveness of the operational staff to the needs of the users.
With increased O&M budgets including more funds for maintenance, and more responsive staff, the
transfer program has created a situation that is much more sustainable than previously.

Some Issues Needing Attention. The Need to Refine Water Charges and Build Financial Strength:
Additional changes are required to ensure that Mexico’s program is sustainable over time. The current
system of water fees is being changed so that the DIs develop a reserve fund for improvements,
modernization, emergencies, future replacement, and rehabilitation. DIs are also shifting to a billing
mechanism where the DI collects a set amount to cover fix costs (staff, facilities, etc.) as well as a
volumetric fee to cover the variable costs of water delivery.

The Need to Clarify Water Rights and Develop Water Markets. Mexico’s population growth rate, as well
as the structural transformation from an agricultural society to an industrial nation, means that competition
for water is increasing. For instance, in the case of the Bajo Rio San Juan Irrigation District, a major city
expropriated its water supply, even though the DI was operating under a legal water concession. This
illustrates that the DIs are in potentially vulnerable positions. Mexico’s legal system does not clearly
specify what water rights exist for irrigated agriculture and how those rights can be protected against
demands for water from municipal as well as industrial users. The government has recognized the
problem and is presently working to clarify terms of the law pertaining to water concessions to reduce
future water conflicts between agricultural, municipal, and industrial users. Formal water markets are also
being piloted as a way of enabling transfer of water under remunerative terms to farmers.

Source: World Bank, 1998b, Box A2.2 prepared by Jose Simas and adapted by M. Munshi and K. Oblitas.
Box A3.2
Successful Transfer of Irrigation Management in Turkey

Background and Issues. A World Bank review of Turkey’s irrigation sector in the early 1990s showed that the vast irrigation systems completed and managed by the government faced the problem of inadequate O&M. The paucity of O&M funds resulted in the deferral of maintenance, the deterioration of the irrigation system, and the growing dissatisfaction of users. The main contributing factor to this problem was declining government funding for irrigation O&M combined with declining cost recovery. These factors were aggravated by the demands for very high pay from the unionized government employees responsible for carrying out O&M.

Envisaged Solution. Considering the positive results of transfer of the irrigation O&M responsibility to users in Mexico in the early 1990s, and considering the encouraging results of the limited transfer activity in Turkey, it was concluded that the most effective and sustainable solution to the problem would be to transfer irrigation management (TIM) to users.

Decision to Transfer Irrigation Management to Users. With the World Bank’s persuasion in mid-1993, the State Hydraulic Works General Directorate (DSI) of Turkey started a large-scale TIM program.

Progress on TIM. As shown in the following table and chart, TIM proceeded successfully at a very fast rate.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Transferred systems (ha)</td>
<td>62,620</td>
<td>9,422</td>
<td>195,320</td>
<td>711,214</td>
<td>211,758</td>
<td>88,705</td>
</tr>
<tr>
<td>Cumulative ha)</td>
<td>62,620</td>
<td>72042</td>
<td>267,362</td>
<td>978,576</td>
<td>1,190,334</td>
<td>1,279,039</td>
</tr>
</tbody>
</table>

TIM Rates

[Graph showing TIM rates with transferred systems (ha) and cumulative (ha) data for years 1993 to 1997]
Type and Number of Water User Organizations (WUOs). In Turkey WUOs consist of Water User Associations (WUAs) that are called Irrigation Associations, village organizations (democratically elected), municipalities, cooperatives and others like universities. The following table gives the number and area transferred to these organizations as of December 31, 1997.

<table>
<thead>
<tr>
<th>Type of WUO</th>
<th>Number</th>
<th>Total Area (ha)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>WUAs (ranging in size from a few hundred to 34,000 ha)</td>
<td>222</td>
<td>1,162,634</td>
<td>90.9</td>
</tr>
<tr>
<td>Village Organizations</td>
<td>209</td>
<td>30,488</td>
<td>2.4</td>
</tr>
<tr>
<td>Municipalities</td>
<td>105</td>
<td>51,607</td>
<td>4.0</td>
</tr>
<tr>
<td>Cooperatives</td>
<td>31</td>
<td>33,353</td>
<td>2.6</td>
</tr>
<tr>
<td>Universities &amp; Research Centers</td>
<td>3</td>
<td>957</td>
<td>0.1</td>
</tr>
<tr>
<td>Total</td>
<td>570</td>
<td>1,279,039</td>
<td>100</td>
</tr>
</tbody>
</table>

Results of TIM. The main results of TIM are: (i) improved and reliable availability of funds collected and managed by WUOs for irrigation O&M— the annual budget met from the payment by the members for large WUOs is in the range of $1,000,000; (ii) improved and more equitable distribution of irrigation water to users; (iii) more efficient performance by the pumping stations managed by WUOs; (iv) improved maintenance of transferred irrigation systems; (v) radically improved O&M cost recovery— the rate of recovery of O&M cost (including late payments recovered with penalty) by WUOs from members approaches 100%, whereas the rate of recovery from government managed systems with adjustment for inflation is closer to 20%; (vi) substantial improvement in distribution in water-scarce areas; (vii) major reduction in the number of irrigation-related complaints (from about 400 to about 10 per year); (viii) substantial increase in production as stated by users and DSI officials; and (ix) major reduction in government spending on irrigation O&M as shown in the following table:

<table>
<thead>
<tr>
<th>Year</th>
<th>Area Managed by DSI (not transferred yet ) in ha</th>
<th>Government O&amp;M Cost $</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990</td>
<td>1,251,251</td>
<td>55,769,806</td>
</tr>
<tr>
<td>1991</td>
<td>1,269,571</td>
<td>63,234,274</td>
</tr>
<tr>
<td>1992</td>
<td>1,300,561</td>
<td>55,225,825</td>
</tr>
<tr>
<td>1993</td>
<td>1,341,495</td>
<td>70,122,713</td>
</tr>
<tr>
<td>1994</td>
<td>1,188,534</td>
<td>70,969,964</td>
</tr>
<tr>
<td>1995</td>
<td>543,650</td>
<td>48,173,094</td>
</tr>
<tr>
<td>1996</td>
<td>413,813</td>
<td>27,373,973</td>
</tr>
<tr>
<td>1997</td>
<td>367,991</td>
<td>20,349,803</td>
</tr>
<tr>
<td>1998</td>
<td>398,807</td>
<td></td>
</tr>
</tbody>
</table>

Note: Increase in the area in 1998 is due to development of new area by government (DSI).

Contributing factors to the success of accelerated TIM are the following: (i) declining O&M funding (which is common to many countries as demonstrated by the need for repeated rehabilitation); (ii) unreasonable pay demands by unionized workers; (iii) decline in the service and condition of irrigation systems; (iv) importance of irrigated agriculture for farmers; (v) basing the TIM program on the enabling conditions in the country, including positive experience in small scale TIM, availability of capable national staff to carry out the program and enabling legislation; (vi) conviction of a small number of DSI officials that TIM is the right solution, and building a team with such officials and those who were not opposed to TIM to promote the idea and implement the program; (vii) assisting concerned officials with building confidence in carrying out large-scale TIM by visiting TIM experience in Mexico;
successful initiation of the program by the above team in a simple and flexible manner; (a) dedicated work by the team members; (b) excellent cooperation of users (farmers) and excellent performance by them in establishing WUAs without any financial assistance from outside the associations; (c) Bank’s persuasion and consistently promoting it mainly through participation and advice, that contributed to initiating the process, and its speedy progress. Also, Bank’s readiness to finance the purchase of O&M equipment for WUOs was an incentive for users to participate.

**Strengthening of WUOs and Transfer of Irrigation Investment Capacity to Users.** An important issue with TIM in Turkey was that the responsibility for irrigation O&M was transferred to WUOs without the transfer of related O&M equipment. DSI assisted the WUOs by providing them with maintenance equipment on ad hoc basis, but this is not a sustainable and efficient arrangement. To address this and the related issues, the Bank-financed “Participatory Privatization of Irrigation Management and Investment Project”, has been recently made effective, which, among other activities, is assisting WUOs to purchase required O&M equipment, while financing on average about 70% of the cost. The balance of the cost (average of about 30%) will be granted by the government using the Bank loan. The project has just started and indications are that it will contribute to solving the above O&M equipment and related problems. The two main features of this project are: (i) strengthening the WUOs and consolidating their role; and (ii) transferring the irrigation investment responsibility from government to users.

Source: World Bank, 1998b, Box A2.3 prepared by Joma Mohammadi.
Box A3.3
Australian Journey to Financially Sustainable Irrigation

The past and ongoing irrigation management reforms in Australia offer development of a management model which largely is independent of government; commercial in focus; financially autonomous; close to and responsive to customers and other stakeholders including environmental ones; and providing high quality services that are wanted by customers and for which they are prepared to pay. Farmers have benefited from an increase in the reliability and predictability of water supplies—in turn, allowing for better irrigation planning at the farm level—and enhanced equity in water distribution. The decade from 1984 to 1994 was a period of major reform in the Victorian irrigation industry. The State Rivers and Water Supply Commission, the authority responsible for irrigation since 1905, was abolished in 1984 following an inquiry by the Public Bodies Review Committee of the Victorian Parliament. Policy and regulatory functions were transferred to the newly created Department of Water Resources, and a more commercial Rural Water Commission established to operate the irrigation systems.

The history of irrigation in Victoria provided the new organization with particular challenges. The objectives of closer settlement in rural Australia had a great influence on the development of irrigation. Unfortunately the lack of financial discipline inherent in these policies left a legacy of irrigation enterprises of low profitability, small farms, financially unviable irrigation authorities, aging irrigation infrastructure, a large public debt, and environmental degradation through salinity and water logging. Any reform of irrigation would have to overcome this inheritance.

Agreeing on clear financial targets with the Victoria Government, and attention to strategic planning were the first steps in setting a new course to overcome the burdens of the past. Ultimately the target of reducing the shortfall of revenue against business costs from $66.9 million in 1984 to zero over twenty years was agreed with the Government. Business costs were defined as the total of operating, maintenance, administration, any finance charges, and a renewal annuity to fund replacement of the aging irrigation infrastructure. The Rural Water Commission now had a clear target to use as the basis for strategic planning. The target was to be achieved by a combination of cost reductions and increases in water prices, with emphasis on the cost reductions.

Use of a new annuity as a measure of capital consumption instead of current costs depreciation was a major step forward. A more constructive debate with the irrigation community on the risk, level of service and cost trade-offs has created better relationships and opportunities to progressively deliver more cost effective services.

In order to achieve the long term target of financial self sufficiency a series of financial and business plans were developed. The Financial Management Strategy covered the four years from 1985/86 to 1988/89. Recurrent expenditure was held constant in nominal dollar terms in a period of 7% to 8% inflation. In the end a 30% reduction in recurrent expenditure was achieved. Even with these last reductions in recurrent costs, real increases in water prices of 2% annually were required over the twenty years to achieve self sufficiency. Use of inflation forecasts that underestimated the actual inflation resulted in under achievement of the pricing target. Real prices increased by 0.9% annually over the four years.

A Business Plan covering the five years from 1990/91 envisaged further efficiency improvements, increases in asset maintenance and renewal, and real price increases of 2.8% annually. The price increases were now based on the actual inflation in the preceding year.

In 1991 prices for agricultural commodities fell and the increases in water prices became the focus for the irrigators' concerns. A “Rate Protest” was organized to withhold some USD$30 million of water rates. The Government decided that an inquiry into water pricing and the efficiency of the Rural Water Commission was the best way to resolve the impasse, and established the Future Management Review. After extensive consultation with water users the Review supported the target of financial self sufficiency,
and made recommendations to create the Rural Water Corporation out of the Commission as a
government business enterprise outside the Victorian Public Service. The Corporation would have much
greater flexibility to achieve large gains in operating efficiency. The Review concluded that despite these
large potential gains in efficiency real price increases of 2.1% annually were still required.

The Future Management Review supported the appointment of expertise based boards to manage the
irrigation systems. A wider range of skills, including commercial skills, was introduced to the irrigation
authority. In fact the Act that transformed the Rural Water commission into the Rural Water Corporation
in July 1992 specified the range of skills to be considered by the Minister when appointing board
directors. the skills of the new board directors played a vital role in the ongoing reform process.

The expected efficiency gains were made, and the shortfall of revenue against business costs was reduced
to $13.3 million by June 1994, within sight of the ultimate target that had now been brought forward to the
year 2001. Some 62% of the improvement in financial performance came from efficiency gains, and 22%
from price increases to the irrigators. The remaining improvement came from broadening the revenue
base including hydroelectric power generation. For an irrigation authority to make such improvement in
financial performance, and to come within sight of long term financial viability is a major achievement.

During the implementation of the financial plans the Rural Water Commission and its successor were
active in other reform areas. Steps were taken to create a market for water in order to stimulate
improvement in the profitability of irrigation. New, more profitable irrigation enterprises would be able to
gain access to water, and the opportunity cost of water would be exposed for the first time. Temporary
transferability of water entitlements was introduced in 1987 and permanent trading started in 1991. In
1988 the rural Water commission organized what is believed to be the first auction of water entitlements
in Australia. By 1994 a market for water was emerging.

New technology was introduced to improve the efficiency of irrigation deliveries so that more responsive
and new services could be provided to irrigators to take advantage of the opportunities offered by water
trading. Central communication and planning of water deliveries was successfully implemented, and a
water management system using surveillance control and data acquisition technology was conceived and
introduced. The water management system had the potential to fundamentally change the way the
irrigation systems were operated to produce a more customer focused, commercial approach.

The Rural Water Commission and its successor corporation became leaders in staff training with the
objective of supporting the introduction of new technology and other initiatives to improve service and
efficiency. The Commission achieved the status of a private provider of courses so that its training was
recognized nationally. The career structures and employment conditions were reformed resulting in one
industrial award for the staff with four levels to create a more efficient multi-skilled workforce that was
rewarded for the acquisition and use of skills. these initiatives made a significant contribution to the
reduction in cost described.

The Victorian Government, after an inquiry into salinity, adopted the concept of community leadership in
the development of salinity mitigation plans. The technical experts in the irrigation authority became
advisors to the community groups. A series of plans were developed that have the potential to
progressively halt the spread of salinity.

The strategy implemented in Victoria over this decade brought about significant improvements in
irrigation. Furthermore the experience gave those involved important insights into the conception and
implementation of a complex reform program. If the reforms can be repeated in other parts of the world,
significant economic and environmental benefits will flow through the global economy. the Australian
experience is not to be taken as a prescription to treat the maladies that have beset irrigation over the
centuries, but rather a roadmap with signposts to indicate the way for those facing similar challenges and
who must make the same journey.

ANNEX 4

Andhra Pradesh Irrigation Sector Policy

GOVERNMENT OF ANDHRA PRADESH.
IRRIGATION & COMMAND AREA DEVELOPMENT DEPARTMENT.

REFORMING THE IRRIGATION SECTOR
FOR SUSTAINABLE MANAGEMENT AND DEVELOPMENT

POLICY STATEMENT

I. THE NEED FOR REFORM

1. Andhra Pradesh’s irrigation sector is severely under performing despite the massive investment put into the sector. Irrigation and drainage has traditionally been the largest user of Plan funds, and even in the Eighth Plan (1992/93 to 1996/97), expenditure amounted to Rs 2500 Crores, or 24% of Plan expenditure, second only to the power sector in usage of investment funds.

2. Yet today’s situation is far from satisfactory. First, infrastructure is in disrepair and irrigated area is declining. Notwithstanding the vast expenditures on the sector, expansion of the state’s irrigated area plateaued out in the late 1980s, and in the early 1990s irrigated area actually declined. From 1991/92 to 1993/94, gross irrigated area dropped from 4.3 million ha to 3.9 million ha. Today, of 4.8 million ha of net irrigated area created, only 2.8 million ha are actually being irrigated.

3. The second major concern is low agricultural productivity. Agricultural growth has declined in recent years, to less than 2% per annum. A major factor has been the weak performance of irrigated agriculture where most of the growth potential should be found. For Andhra Pradesh’s main crop—rice—yields average only 2.6 t/ha, which is low relative to international comparators. Increasing the productivity of irrigated agriculture will be important to the state’s goal of achieving much higher agricultural growth.

4. A primary reason for these gaps, both in the area actually irrigated compared to potential created and in yields, is due to the cumulative impact of very inadequate maintenance of infrastructure. For instance, expenditures on O&M in 1995/96 were only Rs 99/ha, as against the 10th Finance Commission (1997) recommendation of Rs 300/ha for major and medium irrigation schemes. Further, because of inflation of wage bills, over 75% of O&M expenditures went to wages, leaving negligible amounts for actual maintenance works. The low maintenance problem has been compounded by a purely governmental approach to the sector, despite the limited capacity for government to intervene, especially at the lower levels of the systems, and by extremely low cost recovery. With the three-fold increase in water charges made effective from the 1996/97 Rabi season, revenues, for the first time in many years, exceeded O&M expenditures.
in 1996/97. However, as O&M expenditures remained far too low, revenues remain inadequate to cover full O&M needs. Further, to make up for the cumulative neglect, significant additional expenditure is required to rehabilitate the systems.

5. The sector's importance is such that this situation cannot be allowed to continue. About 40% of the state's gross cropped area is irrigated, and irrigation's contribution to state agricultural production is about 60%. It is in irrigated areas, despite their low yields, where the bulk of agricultural growth has occurred. Andhra Pradesh is predominantly a rural economy. Some 70% of the population are based in rural areas, and 36% of the state GDP comes from agriculture. Rehabilitating and sustaining irrigation, and enhancing its agricultural productivity, are thus of paramount importance to Andhra Pradesh.

II. RECENT POLICY INITIATIVES

6. The state Government, headed by Chief Minister, Mr. N. Chandrababu Naidu, has taken full cognisance of this situation, and has already commenced a major reform program. This began with a diagnostic of the situation and subsequent issuance of a “White Paper” on irrigation outlining the performance of the irrigation sector over the years. The paper was debated in the Assembly, where it received unanimous support, and subsequently distributed widely and made the subject of extensive meetings at the district level. A comprehensive reform agenda was considered necessary, with--at its heart--the involvement of the people in irrigation management. It was decided not to be incremental in the reform agenda. Bold steps were considered better. Parallel actions were needed for maintenance, rehabilitation works, and improvement in cost recovery. Improving agricultural support services is also considered important. The following major actions have been taken:

- **Three-fold Increase in Water Charges:** Extensive discussion with local communities was conducted to explain the need for this measure. The increase was ratified in April 1997 and made retroactively effective from the 1996/97 rabi season.

- **The Andhra Pradesh Farmers Management of Irrigation Systems Act:** This was enacted in April 1997. It enables: (a) creation of WUAs in all irrigation projects of the state; (b) gives water rights to the WUAs; (c) provides functional and administrative autonomy to the WUAs; (d) makes ID staff accountable to the WUAs as the competent authority, requiring ID staff to implement the decisions of the WUA; (e) enables WUAs to resolve conflicts themselves; (f) enables improvement of the irrigation systems by the WUAs based on resources raised by the WUAs or from out of the grants given by the government as a percentage of water charges collected from the WUA’s; (g) allows access to information by the WUA on scheme operations; (h) permits preparation of the operational plan and the maintenance plan by the WUA; (i) provides freedom of cropping pattern to farmers; and (j) contains procedures and guidelines on accounting, social auditing, water budgeting, election procedures, and other administration.

- **Creation of Water User Associations Across the State:** After a massive publicity and extension campaign involving all political parties and the full state administration, state-wide elections for WUAs were organised on the 17th June, 1997 for the president and the
territorial constituency members of WUA's for all the irrigation systems in the state. In total, 10,292 WUAs have been constituted. The jurisdiction of the WUA has been delineated on a hydraulic basis and typically covers a minor or a group of minors or a small distributory, or in the case of minor irrigation, the entire system. In November 1997, elections took place for the second management tier of the water user associations, the Distributory Committees.

- **Commencement of a Massive Campaign to Make the WUAs Functional:** A massive campaign has been launched through the media and the press. The peoples representatives being fully involved in the WUAs. The concept has been familiarised by the Chief Minister in every public meeting. Farmer’s workshops with about 30,000-50,000 farmers (Karshaka Sadassus) each have been organised in every district in which the concept & philosophy of participatory irrigation management (PIM) including other aspects relating to agriculture and marketing have been explained to create awareness among farmers. 234 trainers from the ID have been trained in a five day workshop to train the Presidents of Water User Associations in batches of 30 Presidents each in a two day workshop in October 1997. In April 1998, one day district level conferences were organised at the district headquarters of all WUA Presidents, and the revenue and agricultural personnel in all the 22 districts of the State. This was followed by a one day State level convention of 10,292 WUA Presidents at Hyderabad. The Convention was addressed by the Chief Minister, Minister for Major & Medium Irrigation and the Minister for Minor Irrigation and other Ministers and was well received by the WUA Presidents.

- **Constitution of Water Charges Review Committee:** The committee was constituted in December 1997. It is a permanent body, charged with annual review and recommendations on water revenues and O&M expenditures.

### III. POLICY OBJECTIVES AND FUTURE STRATEGY

7. The above actions represent a major commitment by Andhra Pradesh. The unprecedented step to form WUAs across the state is an action only undertaken on this scale in recent times by countries such as Mexico and Turkey, international success stories in irrigation reform. The major increase in water charges, traditionally a politically sensitive area, required extensive public consultation and bipartisan agreement by all parties. These steps are nevertheless recognised as only a start for the difficult actions that must follow. Section IV discusses the next steps intended in the reform path. These must be seen in the broader context of Andhra Pradesh’s long-term vision for the water resources sector within which irrigation, though important, is only a component part. The core elements of Andhra Pradesh’s Irrigation and Water Resources longer term vision are discussed below, recognising that it will take concerted effort and cumulative steps over some time to get there. Broadly, they encompass two areas: reforms in ownership, financing and management of the state’s irrigation systems, and progressive development of comprehensive multi-sectoral water resources management.
Democratic Decentralization, Farmer Management and Financial Autonomy

8. Considered as top-priority in the immediate is to launch a process changing the past “Vicious Circle” of influences (a purely governmental approach, inadequate revenues from water charges, no linkages between revenues and expenditures, inadequate funding of maintenance, systems in disrepair, low productivity, low incomes, farmer dissatisfaction, low farmer contributions, etc., also exacerbated by inadequacies in agricultural extension and inputs), to a “Virtuous Circle” where these constraints are tackled systematically to generate mutually reinforcing improvement, and with inbuilt incentives to achieve this transformation.

9. A core objective, with implementation commencing immediately, will be democratic decentralization of irrigation management and turn-over of the state’s irrigation facilities to ownership and management by farmers. As found in countries such as Mexico, Chile and Australia, farmers can better manage and maintain systems than government, and have the direct incentive to do so. They have a direct stake in the quality of the service, have far better understanding of local needs and can better resolve water management issues than a remote government service. The objective will be to rapidly build from the present WUAs at minor level to federated WUAs at distributory and then project (scheme) level. The end-objective is to have self-financing and autonomous irrigation schemes managed by the WUAs. A farmers Apex committee at state-level will also provide a decision forum for state-wide decision making. The government role will be progressively reduced as this occurs, as a provider of technical assistance, and eventually only managing the headworks of the larger systems.

10. This process will be accompanied by institutional and financial reforms and capacity building to create financially and administratively autonomous entities. The short-term objective is that WUAs and I&CADD should become financially autonomous for O&M revenues and expenditures. They would generate their own revenues from water charges and entirely finance O&M from their revenues, thus giving them the financial independence and cost-quality consciousness critically lacking in the past. WUA members will also contribute to interest earning reserve fund accounts, to progressively build-up financial capacity to reinvest or undertake improvements. New investment will continue to be financed by Government, but with users or prospective users contributing through appropriate cost-sharing arrangements.

11. For I&CADD, its role will necessarily change quite radically as the above progression takes place. The first major transformation, commencing immediately, is to switch staff orientation to a service provider role to the WUAs, and to commence an immediate program to rehabilitate existing systems and upgrade maintenance. This needs significant cultural re-orientation, broad-based major training in the skills required, and a realignment of expenditures to these priorities. The services of NGOs and consultants will also be used, especially in community organisation and training support. A parallel process of change in the short-term will be in financial management and accounting. Water charges revenues will be brought up to cover O&M expenditure needs, will be collected by WUAs, with I&CADD’s share passed directly to I&CADD for direct use on its responsibilities on system O&M. The newly constituted WCRC will guide this transformation. The key need is to ensure the necessary direct financial link between revenues and expenditure, and the availability of funds for this purpose. WUA participation in decision making, and reporting mechanisms to ensure accountability to users, will
also drive a cost-service consciousness throughout the organisation, and incentives to build efficiency.

12. In the longer term, further change may be appropriate as experience is gained and opportunities develop. In other countries such as USA, Australia, Chile and Mexico, where WUAs have taken significant responsibilities and where the private sector has developed as a provider and investor in irrigation and water provision (direct private investment, growth of capital markets), the government agencies have adjusted their roles. The government agencies have tended to become smaller, with fewer activities, but highly specialised in their roles. Necessary government functions such as water planning, design, investment funding, monitoring and regulatory activities typically continue, but include more contracting out of services. Corporatisation of some operational and investment activities and development of a regulatory agency are features sometimes found. An institutional study is planned in two years, which will include consideration of further institutional adjustments based on Andhra Pradesh’s initial experience with farmer management and financial reforms, including consideration of further options as chosen in other countries and sectors.

**Sustainable Water Resources Management**

13. For the long-term sustainable use and development of the state’s water resources, water must be recognised as a prime natural resource, to be harnessed in the best possible manner. Andhra Pradesh is blessed by many rivers, including the mighty Godavari, Krishna, Vamshadhara and Pennar, and is appropriately called the “river state”. Managing and planning the development of Andhra Pradesh’s water resources forms one of the biggest challenges of our time. This must be done comprehensively, in an environmentally sustainable manner, and recognising that water has not only social dimensions but must be managed as an economic good, to maximise its contribution to Andhra Pradesh’s economic and social development. The state not only has a vast infrastructure network already developed, but has nearly 40% of development potential still available. How investment is planned and existing resources are managed will be a cornerstone of the state’s future economic development. The following main principles will guide our future development and management of water resources:

(a) **Comprehensive Water Resources Management:** Water should be managed and developed comprehensively: on river basin lines; considering all sectoral uses from domestic needs, industries, agriculture, power and other uses; managed and developed conjunctively for both surface and groundwater resources; recognising the “four water” concept of rainwater, surface water, groundwater and soil moisture; and considering water quality as well as quantity.

(b) **Environmental Management:** The environmental and social dimensions of water must be fully integrated in water development. Particular attention needs to be paid to managing groundwater, to ensure sustainable development and usage. Studies will need to be conducted on the resource situation; in particular of over-exploitation situations, or its converse, waterlogging and salinisation, and of pollution situations. Economic incentives including metering and pricing will need introduction. Regulation of groundwater development and exploitation will also need consideration. Pollution of surface water will also need increasing attention and remedial actions. Drainage and flood control will also be integrated in water development and management.
conservation will need to be an integral feature of resource management; from watershed management and water harvesting, to recycling and demand management. Finally, but not least, social welfare needs to be fully safeguarded in water development. Persons affected by water development projects should have livelihoods fully protected by appropriate resettlement and rehabilitation programmes.

(c) **Water as an Economic Good:** Treatment of water as an economic good will need full integration in policy formulation, evaluation of development options and management of resources. Cost-benefit analysis should be used in all investment evaluations. Production should emphasise efficiency and maximisation of production per unit of water. Water charges should as far as possible reflect economic costs and be designed to create incentives for economic use, through volumetric charging for water and agricultural power. For investments in existing irrigation projects, cost-sharing will be introduced to ensure demand-led investment, ownership and future sustainability. Economic incentives and disincentives should also be introduced to control pollution, over-exploitation and other excesses. Prospects for introducing water markets should be studied, especially given the opportunities for water trading now available as WUAs and volumetric charging develop. This could significantly increase the productivity of water, to the mutual benefit of both leaser and renter of water.

(d) **Technology Development:** New technologies will need to be introduced to enhance the productivity of water use and investments, and the sustainability of water resources. Significant improvements are possible in all water uses: reduced unaccounted for water in the urban sector, water treatment and re-use, water conservation technologies, etc. Particular effort will be needed in agriculture, the largest user of water. The productivity of irrigation will be further enhanced by parallel actions in agricultural extension and agricultural technologies to further enhance yields. Crop diversification to higher value and less water demanding crops will be encouraged. New irrigation technologies such as dynamic control systems for surface irrigation and other technologies to improve irrigation efficiency should be introduced, and sprinkler and drip irrigation will be promoted. Watershed management techniques will be further developed to enhance water conservation and productivity of rainfed lands and on watersheds as a whole.

14. The above considerations will guide future resource management. In some areas, actions to achieve these objectives are well advanced. In others, much remains to be done, or detailed study and preparation is required. Steps considered particularly appropriate include:

- establishment of a state multi-sectoral Water Resources Board or committee to guide development of actions along the above lines;
- development of multi-sectoral river basin plans and environmental management plans to provide guidance for management and future development;
- continued development of watershed management practices and integrated conjunctive use of surface and groundwater resources;
promotion of technologies for greater water use efficiency, with particular emphasis on irrigation, the largest user of water (eg. dynamic control systems for surface irrigation schemes, drip and sprinkler irrigation);

progressive development of institutional and human resource capabilities in water resources management; and

public awareness campaigns on water resources management issues to foster an environment for change.

IV. STRATEGY IMPLEMENTATION

15. The vision outlined above will take concerted major effort over time and will need step-wise actions and progression for its achievement. As actions are achieved, these in turn will generate further possibilities. The urgency of starting the process is clear. This section outlines intended actions, with emphasis on the shorter-term actions, particularly in irrigation management, the subject of this policy statement.

16. The immediate priority is to provide follow-up to the change process already commenced: the Farmer's Management of Irrigation Systems Act in 1997, the three-fold increase in water charges also introduced in 1997, and the state-wide elections for WUAs in June 1997, followed in November 1997 by the elections state-wide of the second tier of WUA management structures. These actions need urgent follow-up if they are to succeed and generate the further reforms envisaged. They will require the full focus of government attention in the forthcoming months to make the Farmers’ Organisation sustainable.

17. The immediate needs are to restore and improve the productivity of the existing irrigation systems, to assure their sustainable management by transferring management to farmers through the new WUAs, and to put the sector on a sound financial footing. This needs a massive drive to provide follow-up support to make the recently created WUAs fully functional and to get quick benefits. Urgent attention to maintenance and rehabilitation, continued improvement in cost recovery, a realignment of public expenditures, and rapid capacity building of sector institutions are required to meet these new challenges. Actions in the water resources management area (Paras 13 and 14) will also be initiated, commencing slightly later, but intended to build to a major and sustained drive.

18. Concerted actions are thus being launched in the following areas:

A. Creating a Farmer - Government Partnership.
B. Consolidation of Irrigation Management Transfer to Farmers
C. Maintenance and Rehabilitation
D. Agricultural Extension
E. Cost Recovery and Financial Self-Sustainability
F. Expenditure Prioritisation
G. Institutional Reforms and Capacity Building

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A. Creating a Farmer-Government Partnership

19. A foundation for success will be the establishment of a close partnership between the farmers and their WUAs and the key government agencies working with them: the Irrigation and CADA Departments, the AD and the Revenue Department and local administration. A new relationship will be forged with the farmer as the client and government responsive to the client, following a demand-driven approach. The respective efforts of the various government departments will be closely co-ordinated. In particular, a new close association will be maintained between agriculture and irrigation/CADA officials, and regular meetings held between them and WUAs. Other Government departments will also be mobilised, in particular, the district administrations and Revenue Department. The energy of NGOs, the academic community and other civil society will also be enlisted to support these efforts.

B. Irrigation Management Transfer to Farmers

20. Following the unprecedented formation of WUAs across the state for all irrigation systems, the urgent need now is to help these associations to gather strength to take on their new roles. This will require a massive campaign to provide the technical support required. This is already getting underway, and will be one of the state’s top priorities in the Ninth Plan period. Major social change is required to create the conditions for an entirely new approach to irrigation where the farmer is in the driving seat and the government apparatus switches to a supporting role, no less technically demanding than in the past but requiring new skills in community outreach. Appropriate lessons from success stories in other countries such as Mexico and Turkey are being adapted to the particular conditions and needs in Andhra Pradesh. The WUAs will be provided with intensive training and technical support to assume their roles as managers of their systems including full responsibility for O&M and investment for the parts of the system under their control, and as participants in planning of investment and in management of O&M for the main systems.

21. Over time, WUAs will progressively take higher levels of responsibility, with the longer-term goal of managerially and financially autonomous irrigation systems managed by the WUAs. The capacities of water user associations will have to be built with a view to ultimately turn over the total management of irrigation systems to farmers. In the interregnum there will be a period of joint irrigation management by the ID and the farmers. This initiative will be tried out on a pilot basis and progressively spread in all the irrigation projects of the state.

22. The immediate priorities are to provide intensive training and technical support to the WUAs, and to encourage federation of WUAs into associations for participation in management decisions of the systems at higher-levels. The drive to achieve these goals is receiving top priority in the state, and is being given concerted support by the political establishment, the district administrations and the irrigation, CADA and other departments. NGOs have also played a lead role in designing and piloting these initiatives, and the involvement of NGOs will be further encouraged in the future. In October 1997, the first round of training, initial orientation for all WUA Presidents, was completed. In November, the next round of elections—for the Distributory Committees—was undertaken. Elections for the scheme level Project Committees will take place in the next several months, and will be followed by constitution of an Apex
Committee at the state level. A massive training drive for all WUA functionaries is under intensive preparation, commencing with preparation of training manuals in all required skill areas from management and financial areas to technical subjects, and intensive training of trainers. WUAs, depending upon their areas of operation, shall identify three volunteers from amongst their member farmers to be trained by I&CADD and AD as motivators for their WUAs.

C. Maintenance and Rehabilitation

23. A sharp rise in funding levels for maintenance will be undertaken immediately. Because of the serious deterioration of the irrigation systems, this will also need to be accompanied by a massive program to rehabilitate the irrigation systems to their original design capacity. Thereafter, annual funding of maintenance works to required levels will be a first priority in the state’s expenditure’s on irrigation and drainage, which will be assured above all other expenditures in the sector. To achieve these goals, the following campaign will be launched:

(i) Maintenance Works Funding: For the 1998/99 season, maintenance works funding will be raised to a state-wide average of Rs 300/ha for major and medium irrigation and Rs 150/ha for minor irrigation. Together with the funds required for operations, comprising primarily salaries and wages, O&M funding for major and medium irrigation will be raised to an average of Rs 500/ha as compared to Rs 147/ha in 1996/97. The important component in this jump is the allocation to works, and this component must be protected from erosion due to the salary/wage bill and interest burden. Accordingly, allocations for O&M will henceforth be split into two categories; works and salaries/wages, with separate budget appropriations for each. The annual budget allocation for maintenance works will be held at not less than an average of Rs 300/ha for major and medium irrigation and Rs 150/ha for minor irrigation (to be inflation adjusted from constant end-1997 prices), or such other higher level as may be determined in annual reviews of maintenance requirements.

(ii) Minimum Rehabilitation Program: Because of the widespread deterioration of the irrigation and drainage systems, the enhanced maintenance program above will need to be paralleled in the first several years by supplementary investment to take account of the years of deferred maintenance that has resulted in deterioration of the systems. A minimum rehabilitation program will thus be undertaken on 2.5 million ha, the bulk of the state’s major and medium irrigated area. An average expenditure (end 1997 prices) of Rs 1500/ha will be allocated to this.

D. Improving Agricultural Extension

24. The improvements in irrigation services must also be matched by enhanced efforts to provide WUAs and their farmers with access to better agronomic and water use technologies. A targeted program to achieve this is being devised for launching in 1998/99. The objective will be to provide the existing network of AD staff, and ancillary entities such as training centres, the agricultural universities, I&CADD and WALAMTARI with targeted support to increase effectiveness. The focus will be on the WUAs, which provide a new vehicle for targeting assistance. Principal elements will include:
• Dissemination of information on irrigated agriculture technology;
• Training for AD staff;
• A system of regular extension visits by AD staff to WUAs;
• Selection by each WUA of one progressive farmer to receive special training and to become the WUAs “agricultural manager”, providing linkages with the AD and I&CADD and an extension role within the WUA;
• On-farm demonstrations; and
• Organisational features to ensure close partnership between farmers, I&CADD and AD.

The approach will include use of the media, technical bulletins distributed to all WUAs, visual aids, etc.

E. Cost Recovery and Financial Self-Sustainability

25. Achieving Coverage of O&M Costs: Along with the irrigation maintenance and rehabilitation programs, it will be critically important that action is also taken on the revenues side to ensure that the irrigation service is financially self-sustainable. The major start in this direction is shown in the table below of the new water charges compared with the previous water charges.

Application of New Water Charges

<table>
<thead>
<tr>
<th>Sl. No</th>
<th>Nature of crop</th>
<th>Rates of water tax per acre in respect of water sources under</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>CATEGORY I Pre-revised #</td>
</tr>
<tr>
<td>1</td>
<td>First or single wet crop</td>
<td>60-00</td>
</tr>
<tr>
<td>2</td>
<td>Second and third wet crop</td>
<td>60-00</td>
</tr>
<tr>
<td>3</td>
<td>First crop irrigated dry</td>
<td>40-00</td>
</tr>
<tr>
<td>4</td>
<td>Second and third crop irrigated dry</td>
<td>40-00</td>
</tr>
<tr>
<td>5</td>
<td>Dufassal crop in fasti year</td>
<td>120-00</td>
</tr>
<tr>
<td>6</td>
<td>Aquaculture per year</td>
<td>0</td>
</tr>
</tbody>
</table>

# w.e.f. from 1-7-1986 (pre-revised)
* w.e.f. from 1-7-1996 (revised)

The goal, is to achieve cost recovery such that revenues fully cover the costs of O&M, and thereafter maintain this situation. A major step towards this has been the three-fold increase in water charges that was introduced in 1997. This has resulted in water charges/ha being about 76% of estimated O&M requirements. However, revenue collection efficiency remains low at
about 64%. Hence, actual revenues realised amounted to about 49% of required O&M needs. The following actions will be taken to achieve the goal of full cost recovery:

(i) **Raising revenue collection rates:** As part of the massive irrigation extension program to be launched by I&CADD with the WUAs, the need for achieving full collection percentages will be stressed, supplemented also by media campaigns, and the work of the Revenues Department staff, and by incentives to WUAs for full recovery. This, coupled with the increased confidence of the WUAs, is expected to have significant short-term impact. The endeavour will be to reach over 90% collection efficiency through progressive step up in collection over the project period. Additional measures will be introduced progressively, including computerised billing, possibly contracted out, and transfer of collection responsibilities to WUAs.

(ii) **Revisions of Irrigation Water Charges:** Water charges shall progressively be adjusted such that water charge revenues fully cover the Irrigation and CAD Departments O&M expenditure requirements. The water rates will be adjusted annually on the basis of annual examination and recommendation by the state’s WCRC, in line with inflation and actual O&M needs.

(iii) **Introduction of Investment Cost-Sharing:** Capital cost sharing will be introduced for investments in existing irrigation projects. Typically, a 15% contribution will be required from WUAs for rehabilitation and modernisation, with higher percentages against certain items. This is being introduced now. Its importance goes beyond fiscal objectives as such cost-sharing is important to a demand-led program, a sense of ownership and sustainability of infrastructure. A medium-term goal will be to introduce a reserve fund at the level of WUAs and possibly at the level of I&CADD. An additional percentage on water charges would be allocated to the accounts of the WUAs and to a capital account in I&CADD, in each case building the capital of the agencies for future investment and renewals. Modalities for this development would be assessed over the next two years and discussed with farmers, with the objective of at least partially achieving this from kharif 2002.

(iv) **Water Charges for other users:** Other users (e.g., bulk water supplies to municipalities, industries, power plants, fisheries) will be billed for the service provided by the ID. Assessment of modalities will be done in the forthcoming months.

(v) **Exemption of Non-O&M Related Staff Costs:** Farmers should also not bear the bill for I&CADD salaries and wages not related to O&M. While all O&M related staff and work charge wages will be charged to the users, the bill for surplus staff will be isolated as a transparent and monitored government subsidy to I&CADD, reviewed annually in the context of the Government’s programme to reduce expenditure on surplus establishment.

(vi) **Annual Reviews of Cost Recovery:** The above actions will be monitored and supervised by a Standing WCRC already established at the state-government level. The Committee’s constitution and terms of reference have been approved by the State Government. Its membership includes all concerned government departments, and three members appointed by the WUAs’ Apex Committee. The Committee, which will hire consultants to undertake
detailed analysis, will make annual reviews and recommendations to Government. A cost-accounting and attribution model will be developed to enable improved decision making on cost recovery. The committee’s mandate will be to make annual analysis and recommendations such that revenues provide for full coverage of O&M requirements.

(vii) **Improve cost-effectiveness of O&M:** The WCRC and I&CADD would also annually examine the cost-structure of O&M, in particular of staff and work-charge establishment. Ways of reducing inefficiencies and over-staffing would be under constant assessment and would be shared with the farmer organisations, also formal members of the WCRC.

(viii) **Revenues to be Directly Recovered and Used by the Irrigation Provider:** Water charges are presently collected by the Revenue Department from individual farmers. Furthermore, the revenues go into the general state exchequer and are not earmarked for irrigation O&M. As a result, there is no linkage between revenues received and O&M allocations, and no assurance in the long-term that O&M will be adequately financed. This system needs to be replaced by a commercially based system where the operating entities directly charge for the service and fund their operations from revenues, assuring long-term sustainability of the service. This change will be introduced in two phases as follows:

- **Phase I:** The Revenue Department will continue to collect water charges, but now with the assistance of the WUAs. Accounts will be maintained by the WUAs as well as the Revenue Department as a basis for allocation of funds to the WUAs for O&M of their systems. Also, the Revenue Department will transfer the amounts collected to a special head of account of the ID to be exclusively used for financing O&M. Until water revenues fully cover O&M needs, this account will be further supplemented by the state Finance Department. This will become operative from the 1998/99 financial year.

- **Phase II:** The WUAs will be empowered to collect water charges directly from their members. The WUAs would retain their share of revenues for O&M at their levels, transferring agreed amounts to the ID, the WUA distributory committee, and the project-level committee and the local bodies. Revenues will thus be directly supporting expenditure needs, representing the full commercialisation of systems desired for their long-term sustainability. This phase requires study and subsequent changes in existing legislation, but would be aimed for within the next five years, with likely earlier piloting on some schemes. This phase will create self-financing irrigation entities at all levels in the system, and scope for further investment by the private sector and access to capital markets.

### F. Expenditure Prioritisation

Despite the massive public expenditure on irrigation of the past—a quarter of the total state Plan expenditures in the last three Plan periods—irrigation infrastructure has expanded only marginally in recent years, and from the early 1990s irrigated area has actually declined. Irrigation will remain a priority for the state, but the composition of expenditure must be radically
changed. In effect, a complete reversal of the past order of priority in the composition of public expenditure is needed. The priorities will now be ordered as follows:

- First and foremost, the expenditure requirements for maintenance must be assured to halt the decline of infrastructure, and the procedures to achieve this, involving both budgetary allocation and social changes to transfer responsibility to the users have been described above.

- Nearly similar emphasis must be given to the massive needs for rehabilitation of infrastructure, the campaign for which has also been described above.

- Smaller requirements, but also given top priority, are required to underpin a drive to raise the quality of sector management through investment in human capital and technology; training, computerisation, communications equipment, study tours, consultancies.

- Modernisation of irrigation and drainage is also needed on massive scale. Existing infrastructure, even after the first round of minimum rehabilitation, must then be brought to higher levels of productivity. Techniques to achieve this will be piloted, and then brought to a state-wide campaign for progressive WUA managed schemes, phasing in as the first-round rehabilitation program is completed.

- Construction activities must be sharply focused, based on rigorous cost-benefit analysis and realistic estimation of public resources and social development objectives. Instead of spreading investment over a large array of projects, with investment levels on each insufficient to bring them to completion, investment should be concentrated on a few viable investments with near-term completion as an objective.

- selection of viable scheme completions as first priority within available public funds.

- new constructions should be undertaken only after meeting the above commitments, and be based on thorough examination from technical, water availability and economic and social criteria.

The following “drivers” for the new approach will be introduced:

(i) annual examination of expenditures within the priority ranking above. A zero-based budgeting system will be introduced for analysis;

(ii) introduction of discounted cost-benefit procedures to evaluate investment proposals, and more rigorous technical evaluations;

(iii) introduction of cost sharing and requirements for community participation as a basis for investment. For instance, the drives on maintenance, rehabilitation and modernisation are all designed within this principle, fostering an inbuilt self-selection process, and better chances of sustainability based on community commitment. Even new construction can involve communities and require some demonstrated commitment; and
(iv) progressive development of improved hydrological assessments and a comprehensive State Water Plan, to establish a technical and social development framework within which to evaluate water investments.

G. Institutional Reforms and Capacity Building

27. The drive to improve sector performance will need to be underpinned by improved management capacity for the sector. The above objectives will greatly increase the skill demands on irrigation, CADA and other government staff, and in the short and medium-term, work demands will be very high. However, in view of state objectives to reduce public sector staffing, the short-term peak of activity will need to be done by the same, and progressively fewer, staff. Emphasis will thus be placed on improving the effectiveness of government intervention, bearing in mind that major institutional disruptions at this time would undermine the ongoing major initiatives to involve farmers, and the shortly commencing O&M and rehabilitation campaign. A sustained drive will be mounted to build the capabilities of the irrigation and CADA staff. Parallel initiatives will be taken to augment agricultural extension for irrigation. In the short-term, these efforts will rely on government capacity building and involvement of other actors: farmers, NGOs and the private sector. A study for further institutional reform in irrigation and water resources management will then be undertaken, benefiting from the initial experiences with irrigation management transfer. More comprehensive institutional restructuring will then be carried out, including down-sizing as appropriate. The following actions are intended:

(a) Government Capacity Building: Immediate actions to launch a sustained capacity building exercise to provide irrigation and CADA staff with the supplemental training, consultancy and equipment needs to improve performance and meet the new challenges, many in unfamiliar skills. Short-term emphasis will be placed on:

- a major training program for officials and farmers to support the irrigation management transfer, O&M and rehabilitation programs;

- creation of linkages and a partnership approach between key government agencies (e.g., irrigation/CADA, agriculture and the district administrations) and between government and farmers; and

- selected capacity creation in key areas: human resources development and training capacity, monitoring and evaluation, management information systems, communications equipment and computerisation;

(b) Contracting out and Interlinkages with NGOs and the Private Sector: Maximum use will be made of capacity in the non-Government sector. Initial experience with NGOs helping the piloting of WUAs has been positive and will be expanded to the maximum NGO capabilities presently available and that may further develop in the future. The university sector will be interlinked with the human resources development, training and technology development drive. Consultants and the private sector will be used to develop new areas such as MIS, computerisation, monitoring and evaluation and communications technology. Certain activities—
for instance, eventual computerised billing for water charges, some of the design and supervision of construction activities—may be unbundled and contracted out to the private sector. Maximum use will be made of contracting for maintenance operations and other activities formerly done by government.

(c) Institutional Restructuring: An institutional study will be carried out after two years of initial experience, following which further reforms would be introduced. This would include examination of the difficult issue of “zoning” of field staff, preventing their transfer from low to high areas of work activity. Staff and in particular work-charge staff requirements for the revised responsibilities of government will be examined. As discussed in para 12, further changes may also be appropriate, and lessons will be drawn from experience in other countries such as Mexico, Chile and Australia. First, a review by independent consultants will be undertaken of the initial experience with the WUA management transfer programme, including establishment of linkages with the I&CADD, Revenue and ADs. Following this, a broader institutional study will include examination of the future role of I&CADD, its institutional and financial structure, its administrative organisation, staff skill needs and numbers, opportunities for further commercialisation of operations, unbundling and contracting out of some activities, how to accommodate growth of the private sector and capital markets in water sector investment, regulatory activities as may be needed, and the future role and responsibilities of the WCRC. For irrigation management, financially autonomous irrigation management entities managed by WUAs would be an objective for progressive development as the irrigation management transfer process develops and strengthens.

Source: GOAP, 1998
ANNEX 5

Excerpts from Andhra Pradesh Irrigation “White Paper”

“The steep decline in the net financial situation of [the] irrigation sector is due to the combined impact of nominal revenues from water charges and a huge increase in recurring expenditure.”

“Receipt of revenue from water rates… is barely sufficient to even pay the salaries of the workcharged establishment.”

“The entire irrigation system in Andhra Pradesh is currently being maintained by the Government. There is practically no involvement of the farmers in the maintenance or operations of irrigation schemes. Area under irrigation is shrinking in many of the major and medium commands. By improving the conductor system and drainage network, considerable water can be made available for additional ayacut [irrigated area].”

“Farmers in the head reaches of major and medium irrigation schemes are drawing water far in excess of their allocation and as a consequence, water is not flowing to tail end areas.”

“People at this juncture should come forward and strengthen the hands of the Government in its resolve to bring about overall development of the State through rapid expansion of irrigation and for the purpose offer their considered views generally and in particular for the following:

1. Management of irrigation system by the farmers’ organisations;
2. Cost recovery policy, including principle for levy of water charges;
3. Mobilisation of resources, for completion of on-going and new irrigation schemes;
4. Improving sector financing and funding of maintenance to ensure sustainability of irrigation schemes.”
AN ACT TO PROVIDE FOR FARMER’S PARTICIPATION IN THE MANAGEMENT OF IRRIGATION SYSTEMS AND FOR MATTERS CONNECTED THEREWITH OR INCIDENTAL THERETO.

Whereas the State of Andhra Pradesh is essentially an agricultural State depending on an efficient and equitable supply and distribution of water which is a National Wealth, ensuring optimum utilisation by farmers for improvement of agricultural production is the immediate need;

And whereas; scientific and systematic development and maintenance of irrigation infrastructure is considered best possible through farmers’ organisation;

And whereas; such farmers’ organisations have to be given an effective role in the management and maintenance of the irrigation system for effective and reliable supply and distribution of water.

Be it enacted by the Legislative Assembly of the State of Andhra Pradesh in the Forty-eighth year of the Republic of India as follows:-

CHAPTER - 1
PRELIMINARY

1.(1) This Act may be called the Andhra Pradesh Farmers’ Management of Irrigation Systems Act, 1997.

(2) It extends to the whole of the State of Andhra Pradesh.

(3) It shall come into force on such date as the Government may, by notification in the Andhra Pradesh Gazette, appoint and they may appoint different dates for different areas and for different provisions.
Definitions

2.(1) In this Act, unless the context otherwise requires,-

(a) ‘area of operation’ in relation to farmers organisation means a contiguous block of land in the command area of an Irrigation system as may be notified for the purposes of this Act

(b) ‘ayacut road’ means a road within the area of operation of farmers’ organisation for the purpose of irrigation and agriculture but does not include a road vested in a Gram Panchayat, Mandal Parishad, Zilla Parishad, Municipality, Municipal Corporation or Roads and Buildings Department of the Government.

(c) ‘command area’ means an area irrigated or capable of being irrigated either by gravitational flow or by lift irrigation or by any other method from a Government or the Corporation source and includes every such area whether it is called ‘ayacut’ or by any other name under any law for the time being in force.

(d) ‘competent authority’ means the authority appointed under section 21.

Act 12 of 1997

(e) ‘corporation’ means the Andhra Pradesh Water Resources Development Corporation constituted under the Andhra Pradesh Water Resources Development Corporation Act: 1997;

(f) ‘distributory’ system, means and includes,-

(i) all main canals, branch canals, distributaries and minor canals constructed for the supply and distribution of water for irrigation,

(ii) all works, structures and appliances connected with the distribution of water for irrigation; and

(iii) all field channels and other related channels and structures under a pipe outlet.

(g) ‘District Collector’ means the collector of the district in which the irrigation system is situate and includes any officer specially notified by the Government to perform all or any of the functions of the district collector under this Act;

(h) ‘drainage system’ in relation to an irrigation system includes,-

(i) channels either natural or artificial, for the discharge of waste or surplus water and all works connected therewith or ancillary thereto;

(ii) escape channels from an irrigation or distribution system and other works connected therewith, but does not include works for removal of sewage;

(iii) all collecting drains and main drains to drain off surplus water from field drains; and

(iv) all field drains and related structures under pipe outlets.

(i) “farmers’ organisation” wherever it occurs, shall mean and include:-

(i) water users association at the primary level consisting of all the water users, as constituted under section 3;
(ii) distributory committee at the secondary level, as constituted under section 5; and
(iii) project committee at the project level, as constituted under section 7;

(j) 'field channel' includes a channel existing or to be constructed by the Government or by the land holders or by any agency to receive and distribute water from a pipe outlet.

(k) 'field drain; includes a channel excavated and maintained by the land holder or by any other agency, to discharge waste or surplus water from the land holding under a pipe outlet; and includes drains, escape channels and other similar works existing or to be constructed.

(l) 'financial Year' means a year commencing from the 1st April of the relevant year to the 31st March of the ensuing year.

(m) 'financing agency' means any commercial bank, or any cooperative society or any other bank or organisation established or incorporated under any law, for the time being in force, which lends money for the development of the area of operation of the farmers' organisation.

(n) 'Government' means the State Government of Andhra Pradesh.

(o) 'hydraulic basis' means the basis for identifying a viable irrigated area served by one or more hydraulic structures such as headworks, distributories, minors, pipe outlets and the like.

(p) 'irrigation system' means such major, medium and minor irrigation system for harnessing water for irrigation and other allied uses from Government / Corporation source and includes reservoirs, open head channels, diversion systems, anicuts, lift irrigation schemes, tanks, wells and the like;

Explanation: (1) 'Major irrigation systems' means irrigation system under major irrigation Project having irrigable command area of more than 10,000 hectares.
(2) 'Medium Irrigation System’ means irrigation system under Medium Irrigation Project having irrigable command area of more than 2000 hectares and upto 10,000 hectares.
(3) 'Minor Irrigation System’ means irrigation system under minor irrigation project having irrigable command area upto 2,000 hectares.

(q) 'land holder' means an owner and or a tenant recorded as such in the record of rights-under the Andhra Pradesh Record of Rights in Land Act 1971 in respect of land in the notified ayacut area of an irrigation system.

(r) 'maintenance' means execution of such works on the irrigation system as are necessary to ensure that the physical system designed to the standards operates for proper distribution of water to the land holders in the area of operation.

Act 26 of 1971
(s) 'notification' means a notification published in the Andhra Pradesh Gazette, and the expression 'notified' shall be construed accordingly.

(t) 'operational plan' means a schedule of irrigation deliveries with details of the mode and duration of supplies drawn up for regulation of irrigation in the command area of an irrigation system.

(u) 'prescribed' means prescribed by the Government by rules made under this Act.

(v) 'warabandi' means a system of distribution of water allocation to water users by turn, according to an approved schedule indicating the day, duration and the time of supply.

(w) 'water allocation' in relation to an irrigation system means distribution of water determined from time to time by a farmers' organisation in this area of operation.

(x) 'water user' means and includes any individual or body corporate or a society using water for agriculture, domestic, power, non-domestic, commercial, industrial or any other purpose from a government or the corporation source of irrigation.

(2) The words and expressions used in this Act, but not defined, shall have the same meaning assigned to them in the Andhra Pradesh Irrigation Utilisation and Command Area Development Act., 1984.

CHAPTER - II
FARMERS' ORGANISATION

3.(1) The District Collector may, by notification and in accordance with the rules made under this Act, in this behalf, delineate every command area under each of the irrigation systems on a hydraulic basis which may be administratively viable; and declare it to be a water users' area for the purpose of this Act;

Provided that in respect of the command area under the minor and lift irrigation systems, the entire command area may, as far as possible, form a single water users' area.

(2) Every water users' area shall be divided into territorial constituencies, which shall not be less than four but not more than ten, as may be prescribed.

(3) There shall be a water users' association called by its local distinct name for every water users' area delineated under sub-section (1).

(4) Every Water users' association shall consist of the following members, namely:-

(i) all the water users who are land holders in a water user area;

Provided that where both the owner and the tenant are land holders in respect of the same land, the tenant;
Provided further that any person who is in lawful possession and enjoyment of the land under a water source, on proof of such possession and such enjoyment in a crop year, may claim membership notwithstanding whether he is a recorded land holder or not, in which case the Water Users Association shall not refuse the membership of such person for the purposes of this Act, and such person shall be liable to pay the water charges and the fees as may be prescribed as if he is a land holder under a water source.

(ii) all other water users co-opted in a water users' area;
(iii) members specified in clause (i) and (ii) shall constitute the general body for a water users association;
(iv) a person eligible to become a member of more than one territorial constituency of a water users association under clause (i) shall be entitled to be a member of only one territorial constituency and he shall exercise his option thereof as prescribed;
(v) members specified in clause (1) shall alone have the right to vote.

Election of President and Members of the Managing Committee of Water Users Association

4.(1) There shall be a Managing Committee for every water users' association

(2) The District Collector shall make arrangements for the election of President of the managing committee of the water users' association by direct election by the method of secret ballot in the manner prescribed.

(3) The District Collector shall also cause arrangements for the election of a managing committee consisting of one Member from each of the territorial constituencies of a water users' area, by the method of secret ballot in the manner prescribed:

(4) If at an election held under sub-sections (2) and (3), the president or the members of the territorial constituencies of water users' association are not elected, fresh elections shall be held in the manner prescribed:

Provided that the Government for the reasons to be recorded in writing may, from time to time, postpone elections.

(5) The President and the members of the managing committee shall, if not recalled earlier, be in office for a period of five years, from the date of the first meeting.

(6) The managing committee shall exercise the powers and perform the functions of the water users association.

* As amended by the L. A. Bill No. 32 of 1998. For convenience, such amendments (here and below) have been shown in italics.
### Delineation of Distributory area and constitution of the Distributory Committee

5.(1) The Government may, by notification and in accordance with the rules made in this behalf, delineate every command area of the irrigation system, comprising of *two* or more water users' associations, and declare it to be a distributory area for the purpose of this Act.

(2) There shall be distributory committee called by its local distinct name for every distributory area declared as such under sub-section (1).

(3) All the Presidents of the water users associations in the distributory area, so long as they hold such office, shall constitute the general body of the committee.

### Election of President and Constitution of Managing Committee

6.(1) There shall be a managing committee for every distributory committee.

(2) The District collector shall cause arrangements, in the manner prescribed, for the election by the method of secret ballot of the President and members of the managing committee who shall not be more than five from among the members of the general body of the distributory committee.

Provided that the government may for the reasons to be recorded in writing, may from time to time postpone elections.

(3) If, at an election held under sub-section (2), the President and the members of the managing committee are not elected, fresh elections shall be held in the prescribed manner.

(4) The term of office of the President and the members of the managing committee shall, if not recalled earlier, be coterminous with the term of the general body specified in sub-section (3) of section 5.

(5) The managing Committee shall exercise the powers and perform the functions of the distributory committee.

### Delineation of Project area and constitution of Project Committee

7.(1) The Government may by notification and in accordance with the rules made under this Act in this behalf, delineate every command area or part thereof, of an irrigation system and declare it to be a project area for the purpose of this Act.

(2) There shall be a project committee called by its distinct name for every project area declared under sub-section (1).

(3) All the Presidents of the distributory committees in the project area, so long as they hold such office, shall constitute the general body for the project committee.

* As amended by the L. A. Bill No 32 of 1998
There shall be a managing committee for every project committee. The District Collector shall cause arrangements in the manner prescribed for election by the method of secret ballot of chairman and managing committee consisting of not more than nine members from among the members of the general body of the project committee: Provided that the Government for the reasons to be recorded in writing may, from time to time, postpone elections.

If, at an election held under sub-section (2), the chairman and the members of the managing committee are not elected, fresh elections shall be held in the prescribed manner.

The term of office of the chairman and the members of the managing committee shall, if not recalled earlier, be coterminous with the term of general body specified in sub-section (3) of section 7.

The managing committee shall exercise the powers & perform the functions of the project committee.

The Govt. may, by notification, constitute an Apex Committee with such number of members as may be considered necessary.

The Committee, constituted under sub-section (1), may exercise such powers and functions as may be necessary to:

(a) lay down the policies for implementation of the provisions of this Act, and

(b) give such directions to any farmers’ organisation, as may be considered necessary, in exercising their powers and performing their functions in accordance with the provisions of this Act.

A motion for recall of a Chairman or president or member of a managing committee, as the case may be, of a farmers’ organisation may be made by giving a written notice as may be prescribed, signed by not less than one-third of the total number of members of the farmers’ organisation, who are entitled to vote:

Provided that no notice of motion under this section shall be made within one year of the date of assumption of office by the person against whom the motion is sought to be moved.

If the motion is carried with the support of majority of the members present and voting at a meeting of the general body specially convened for the purpose, the District Collect or the government as the case may be shall by order remove, him from office and the resulting vacancy shall be filled in the same manner as a casual vacancy.
11. The managing committee of a farmers’ organisation may constitute subcommittees to carry out all or any of the function vested in each organisation under this Act:

12. Every farmers’ organisation shall be a body corporate with a distinct name having perpetual succession and a common seal and subject to the provisions of this Act vested with the capacity of entering into contracts and of doing all things necessary, proper or expedient for the purposes for which it is constituted and it shall sue or be sued in its corporate name represented by the chairman or the president, as the case may be:

Provided that no farmers’ organisation shall have the power to alienate in any manner, any property vested in it.

13. The Government may in the interest of a farmers’ organisation in the command area by notification and in accordance with the rules made in this behalf,-

(a) form a new farmers’ organisation by separating the area from any farmers’ organisation;
(b) increase the area of any farmers’ organisation;
(c) diminish the area of any farmers’ organisation;
(d) alter the boundaries of any farmers’ organisation; or
(e) cancel a notification issued under this Act for rectifying any mistake:

Provided that no such separation, increase, diminution, alteration and cancellation shall be effected unless a reasonable opportunity is given to the organisation likely to be effected.

14. No village servant and no officer or servant of the Government of India or any State Government or of a local authority or an employee of any institution receiving aid from the funds of the Government shall be qualified for being chosen as or for being a chairman, or president or a member of a managing committee.

Explanation: For the purpose of this section the expression village servant’ means in relation to,

(i) the Andhra Area, any person who holds any of the village offices of neeruganti, neeradi, vetti, kawalkar, toti, talayari, tandalagar, sathsindhi or any such village office by whatever designation it may be locally known;
(ii) the Telangana Area, any person who holds any of the village offices of neeradi, kawalkar, sathsindhi or any such village office by whatever designation it may be locally known.
(2) No person who has been convicted by a criminal court for any offence involving moral turpitude committed under any law for the time being in force shall be qualified for being chosen in or for being a chairman or president or a member of a managing committee.

(3) A person shall be disqualified for being chosen as a chairman or a president or a member of the managing committee if on the date fixed for scrutiny of nominations for election, or on the date of nomination he is,-

(a) of unsound mind and stands so declared by a competent court;
(b) an applicant to be adjudicated as an insolvent or an undischarged insolvent; or
(c) a defaulter of land revenue or water tax or charges payable either to the government or to the farmers’ organisation
(d) Interested in a subsisting contract made with, or any work being done for, the Gram Panchayat, Mandal Parishad, Zilla Parishad or any State or Central Government or the farmers organisation:

Provided that a person shall not be deemed to have any interest in such contract or work by reason only of his having share or interest in-

(i) a company as a mere share-holder but not as a director;
(ii) any lease, sale of purchase of immovable property or any agreement for the same; or
(iii) any agreement for the loan of money or any security for the payment of money only; or
(iv) any newspaper in which any advertisement relating to the affairs of the Farmers’ Organisation is inserted.

Explanation:
For the removal of doubts, it is hereby declared that where a contract is fully performed it shall not be deemed to be subsisting merely on the ground that the Gram Panchayat, Mandal Parishad, Zilla Parishad, the Farmers’ Organisation, the State or Central Government has not performed its part of the contractual obligations.

(4) A chairman or a president or a member of a managing committee shall also become disqualified to continue in office if he,-

(a) is convicted in a criminal case involving moral turpitude; or
(b) absents for three consecutive meetings without reasonable cause

Provided that such disqualification under item (b) shall not apply in the case of women who are in an advanced stage of pregnancy and for a period of three months after delivery and he shall cease to hold the office forthwith.
(4A) A member of the Water Users Association shall cease to be a member or a Chairman, or a President or a Member of a Managing Committee shall become disqualified to continue in office, if he ceases to be a land holder.

(5) A person having more that two children shall be disqualified for election or for continuing as a Chairman or a President or a member of the Managing Committee.

Provided that the birth within one year from that date of commencement of this Act, hereinafter in this section referred to as the date of such commencement, of an additional child shall not be taken into consideration for the purposes of this section:

Provided further that a person having more that two children (excluding the child if any born with in one year from the date of such commencement) shall not be disqualified under this section for so long as the number of children he had on the date of such commencement does not increase.

### Filling up of vacancies

15. A vacancy arising either due to disqualification under sub-section (4) of section 14 or due to death or resignation or by any reason, such vacancy shall be filled up by nomination in the following manner;

(a) a vacancy in the water users' association shall be filled, by nomination by the managing committee of the distributory committee in the manner prescribed:

(b) a vacancy in the distributory committee shall be filled, by nomination by the managing committee of the project committee in the manner prescribed; and

(c) a vacancy in the project committee shall be filled by nomination either by the apex Committee or by the Government, as the case may be in the manner prescribed.

(2) The District collector shall take necessary steps to conduct elections to fill up any vacancy caused within a period of one month from the date of occurrence of such vacancy.

(3) The term of office of a member or a President or a Chairman of the farmers' organisation, elected under sub-section (2), shall expire at the time at which it would have expired, if he had been elected at the ordinary election.

* As amended by the L. A. Bill No. 32 of 1998.
CHAPTER-III
Objects and Functions of the Farmers’ Organisations:

Objects

16. The objects of the farmers’ organisation shall be to promote and secure distribution of water among its users, adequate maintenance of the irrigation system, efficient and economical utilisation of water to optimise agricultural production, to protect the environment, and to ensure ecological balance by involving the farmers, inculcating a sense of ownership of the irrigation system in accordance with the water budget and the operational plan.

Functions of Water Users Association

17. The Water Users’ Association shall perform the following functions, namely:

(a) to prepare and implement a warabandi schedule for each irrigation season, consistent with the operational plan, based upon the entitlement, area, soil and cropping pattern as approved by the distributory committee, or as the case may be, the project committee;
(b) to prepare a plan for the maintenance of irrigation system in the area of its operation at the end of each crop season and carry out the maintenance works of both distributory system and minor and field drains in its area of operation with the funds of the association from time to time;
(c) to regulate the use of water among the various pipe outlets under its area of operation according to the warabandi schedule of the system;
(d) to promote economy in the use of water allocated.
(e) to assist the revenue department in the preparation of demand and collection of water rates;
(f) to maintain a register of landholders as published by the revenue department;
(g) to prepare and maintain a register of co-opted members;
(h) to prepare and maintain an inventory of the irrigation system within the area of operation;
(i) to monitor flow of water for irrigation.
(j) to resolve the disputes, if any, between the members and water users in its area of operation.
(k) to raise resources;
(l) to maintain accounts;
(m) to cause annual audit of its accounts;
(n) to assist in the conduct of elections to the managing committee;
(o) to maintain other records as may be prescribed;
(p) to abide by the decisions of the distributory and project committees;
(q) to conduct general body meetings, as may be prescribed;
(r) to encourage avenue plantation on canal bunds and tank bunds
by leasing such bunds; and
(s) to conduct regular water budgeting and also to conduct
periodical social audit, as may be prescribed.

The distributory committee shall perform the following function
namely:

(a) to prepare an operational plan based on its entitlement, area,
soil, cropping pattern at the beginning of each irrigation
season, consistent with the operational plan prepared by the
project committee
(b) to prepare a plan for the maintenance of both distributories and
medium drains within its area of operation at the end of each
crop seasons and execute the maintenance works with the
funds of the committee from time to time:
(c) to regulate the use of water among the various water users’
associations under its area of operation;
(d) to resolve disputes, if any, between the water users’
associations in its area of operation;
(e) to maintain a register of water users associations in its area of
operation;
(f) maintain an inventory of the irrigation system in the area of its
operation, including drains.
(g) to promote economy in the use of water allocated:
(h) to maintain accounts:
(i) to cause annual audit;
(j) to maintain other records as may be prescribed;
(k) to monitor the flow of water for irrigation;
(l) to conduct general body meetings as may be prescribed;
(m) to abide by the decisions of the project committee;
(n) to cause regular water budgeting and also the periodical social
audit as may be prescribed;
(o) to assist in the conduct of elections to the managing
committee; and
(p) to encourage avenue plantations in its area of operation;

(a) to Approve an operational plan based on its entitlement, area,
soil, cropping pattern as prepared by the competent authority in
respect of the entire project area at the beginning of each
irrigation season;
(b) to approve a plan for the maintenance of irrigation system including the major drains within its area of operation at the end of each crop season and execute the maintenance works with the funds of the committee from time to time;
(c) to maintain a list of the distributory committees and water users association in its area of operation;
(d) to maintain an inventory of the distributory and drainage systems in its area of operation;
(e) to resolve dispute if any, between the distributory committees;
(f) to promote economy in the use of water;
(g) to maintain accounts;
(h) to cause annual audit of its accounts.
(i) to maintain other records as may be prescribed;
(j) to conduct general body meetings as may be prescribed;
(k) to cause regular water budgeting and also the periodical social audit as may be prescribed; and
(l) to encourage avenue plantation in its area of operation.

20. A farmers’ organisation may, for carrying out the purposes of this Act, achieving the objects of the organisation and performing its functions, levy and collect such fees as may be prescribed from time to time.

21. The Government may by notification appoint such officer from the Irrigation and Command Area Development Department, or any other Department or Corporation including Irrigation Development Corporation, as they consider necessary, to be the competent authority to every farmers’ organisation for the purpose of this Act.

(2) The competent authority appointed under subsection (1) shall be responsible to the respective farmers’ organisations in the implementation and execution of all decisions taken by the farmers’ organisation.

CHAPTER - IV
RESOURCES

22. The funds of the farmers’ organisation shall comprise of the following, namely:-

(i) grants received from the Government as a share of the water tax collected in the area of operation of the farmers’ organisation;
(ii) such other funds as may be granted by the State and Central Government for the development of the area of operation;
(iii) resources raised from any financing agency for undertaking any economic development activities in its area of operation;
(iv) income from the properties and assets attached to the irrigation system within its area of operation;
(v) fees collected by the farmers' organisation for the services rendered in better management of the irrigation system; and
(vi) amounts received from any other sources.

CHAPTER--V

OFFENCES AND PENALTIES

23. Whoever without any lawful authority does any of the following acts, namely:
(a) damages, alters, enlarges, or obstructs any irrigation system;
(b) interferes with, increases, or diminishes the water supply in, or the flow of water from, through, over or under any irrigation system;
(c) being responsible for the maintenance of the irrigation system, neglects to take proper precautions for the prevention of wastage of the water thereof or interferes with the authorised distribution of water there from or uses water in an unauthorised manner, or in such manner as to cause damage to the adjacent landholdings;
(d) Corrupts or fouls, water of any irrigation system so as to render it less fit for the purposes for which it is ordinarily used.
(e) obstructs or removes any level marks or water gauge or any other mark or sign fixed by the authority of a public servant; and
(f) opens, shuts, or obstructs or attempts to open, shut or obstruct any sluice or outlet or any other similar contrivance in any irrigation system,
(g) violates the Warabandi or the water distribution and regulation Schedule made by the Water Users Association or the Distributory Committee or the Project Committee*.

Shall, on conviction, be punished with imprisonment which may extend to two years or with fine which may extend to five thousand rupees or with both.

24. Nothing in this Act shall prevent any person from being prosecuted and punished under any other law for the time being in force for any act or omission made punishable by or under this Act. Provided that no person shall be prosecuted and punished for the same offence more than once.

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* As amended by the L A. Bill No. 32 of 1998.
Composition of offences.

25. A farmers’ organisation may accept from any person who committed or in respect of whom a reasonable belief can be inferred that he has committed an offence punishable under this Act or the rules made thereunder, a sum of money not exceeding rupees one thousand by way of composition for such offence.

(1) On payment of such of money, the said person, if in custody, shall be discharged and no further proceedings shall be taken against him in regard to the offence, so compounded.

CHAPTER–VI
SETTLEMENT OF DISPUTES

Settlement of disputes

26. Any dispute or difference touching the constitution, management, powers or functions of a farmers’ organisation arising between members; shall be determined by the managing committee of the farmers’ organisation.

(1) Any such dispute or difference arising between a member and the managing committee of a water users’ association or between two or more water users’ associations shall be determined by the managing committee of the distributory committee.

(2) Any such dispute or difference arising between a member and the managing committee of a distributory committee or between two or more distributory committees shall be determined by the managing committee of the project committee.

(3) Any such dispute or difference arising between a member and the managing committee of a project committee or between two or more project committees shall be determined by the apex committee, whose decision shall be final.

(5) Every dispute or difference under this section shall be disposed of within fifteen days from the date of reference of the dispute or difference.

Appeals

27. A party to a dispute or difference aggrieved by any decision made or order passed by the managing committee of a water user’s association may appeal to the managing committee of the distributory committee, whose decision thereon shall be final.

(1) Any party to a dispute or difference aggrieved by any decision made or order passed by the managing committee of a distributory committee may appeal to a project committee, whose decision thereon shall be final.

(2) Any party dispute or difference aggrieved by any decision made or order passed by the managing committee of a project committee may appeal to the apex committee, whose decision thereon shall be final.

(3) Any appeal under sub-section (1) or sub-section (2) or sub-section (3) shall be preferred within 15 days of communication of the decision or the order to the person aggrieved.
(5) Every appeal under this section shall be disposed of within 15 days from the date of filing of the appeal.

CHAPTER-VII
MISCELLANEOUS

Records 28. Every farmers’ organisation shall keep at its office, the following accounts, records and documents, namely:-
(1) an up-to-date copy of this Act,
(b) a map of the area of operation of the farmers’ organisation along with map of the structures and distributory networks prepared in consultation with the irrigation department.
(c) a statement of the assets and liabilities
(d) minutes book;
(e) books of account showing receipt and payments;
(f) books of account of all purchases and sales of goods by the farmers’ organisation;
(g) register of measurement books, level field books, work orders and the like
(h) copies of audit reports and enquiry reports;
(i) all such other accounts, records and documents as may be prescribed from time to time.
(2) The books of accounts and other records shall be open for information to the members of the farmers’ organisation.

Audit 29. Every farmers’ organisation shall get its accounts audited in the manner prescribed.

Recovery of dues 30. All the amounts payable or due to a farmers’ organisation shall be recovered as arrears of land revenue.

Meetings 31. The meeting of the farmers’ organisation and the managing committees thereof, at such intervals, the procedure, the presidency and the quorum thereof and the cessation of membership thereof shall be, as may be prescribed.

Resignation 32. A member of managing committee of a farmers’ organisation may resign his office by a letter sent by registered post or tendered in person to the chairman or president of the managing committee concerned.
(1) The president of the managing committee of a water users’ association may resign his office by a letter sent by registered post or tendered in person to the president of the distributory committee concerned.
(3) The president of the managing committee of a distributory committee may resign his office by a letter sent by registered post or tendered in person to the chairman of the project committee concerned.
<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>(4)</td>
<td>The chairman of the managing committee of a project committee may resign his office by a letter sent by registered post or tendered in person to the chairman of the apex committee.</td>
</tr>
<tr>
<td>(5)</td>
<td>Such resignation as above mentioned shall take effect from the date of its acceptance or on the expiry of 30 days from the date of its receipt whichever is earlier.</td>
</tr>
<tr>
<td><strong>Appointment of a commissioner.</strong></td>
<td>33. The Government may by notification appoint a Commissioner to exercise general control and superintendence over the competent authorities and the District Collectors in performance of their functions under this Act or the rules made thereunder.</td>
</tr>
<tr>
<td></td>
<td>(1) The powers to be exercised and the functions to be performed by the Commissioner shall be such as may be prescribed.</td>
</tr>
<tr>
<td><strong>Transitional arrangements.</strong></td>
<td>34. The government may by notification appoint an officer or officers to exercise the powers and perform the functions of a farmers’ organisation and the managing committee there of till such time such farmers’ organisation is duly constituted or Reconstituted and such managing committee assumes office under the provisions of this Act.</td>
</tr>
<tr>
<td><strong>Authentication of orders and documents of the Farmers’ Organisation</strong></td>
<td>35. All permissions, orders, decisions, notices and other documents of the farmers’ organisation shall be authenticate by the signature of the chairman or president of the farmers’ organisation or any other member of the managing committee authorised by the managing committee in this behalf.</td>
</tr>
<tr>
<td><strong>Acts not to be invalidated by informality or vacancy etc.</strong></td>
<td>36. No act or proceedings of the managing committee of a farmers’ organisation shall be invalid by reason only of the existence of any vacancy in, or defect in the constitution of, the said committee.</td>
</tr>
<tr>
<td><strong>Deposit and administration of the funds.</strong></td>
<td>37. The farmers’ organisation shall keep their funds in a Nationalised Bank or a Co-operative Bank namely a Primary Agricultural Cooperative Society or the District Cooperative Central Bank or the Andhra Pradesh State Cooperative Central Bank.</td>
</tr>
<tr>
<td></td>
<td>(1) The funds shall be applied towards meeting of the expenses incurred by the managing committee of the concerned farmers organisation in the administration of this Act and for no other purpose.</td>
</tr>
<tr>
<td><strong>Sinking fund</strong></td>
<td>38. The managing committee of the farmers’ organisation shall maintain a sinking fund for the repayment of moneys borrowed and shall pay every year into the sinking fund such sum as may be sufficient for repayment within the period fixed of all moneys so borrowed.</td>
</tr>
<tr>
<td></td>
<td>(2) The sinking fund or any part thereof shall be applied in or towards, the discharge of the loan for which such fund was created, and until such loan is wholly discharged, it shall not be applied for any other purpose.</td>
</tr>
</tbody>
</table>
39. The managing committee of a farmers’ organisation shall prepare in such form in every financial year a budget in respect of the financial year next, showing the estimated receipts and expenditure of the committee and shall place before the general body of the farmers’ organisation for its approval as may be prescribed.

40. No suit, prosecution or other legal proceedings shall be instituted against any person for anything which is, in good faith, done or intended to be done under this Act or under the rules made thereunder.

41. If any difficulty arises in giving effect to the provisions of this Act or as to the first constitution or reconstitution of any farmers’ organisation after the commencement of this Act, the Government, as the occasion may require, by order published in the Andhra Pradesh Gazette, do anything which appears to them necessary for removing the difficulty.

41-A Notwithstanding anything contained in this act it shall be competent for the Government or, as the case may be, the Commissioner either on its own accord or an application made issue such directions, as they may consider necessary, to any Farmers’ Organisation for the proper working of the said Organisation and such Farmers’ Organisation shall implement those directions for effective functioning of the said Organisation.

(1) wilfully omitted or refused to carry out the directions of the Government or the Commissioner for the proper working of the Organisation; or

(ii) Abused his position or the power vested in him; or

(iii) is guilty of misconduct in the discharge of his duties; or

(iv) persistently defaulted in the performance of his functions and duties entrusted to him under the Act to the detriment of the functioning of the concerned organisation or has become incapable of such performance; or

(v) incurred any of the disqualifications under the provisions of Act, the Government or, as the case may be, the Commissioner may proceed either suo-motu or on a representation or application, and may remove such member or the President after giving him reasonable
opportunity of making a representation against such action.

Revision by the 41-B Government or the Commissioner

The Government, or the Commissioner may either on its own accord, or an application made call for and examine the records of any Committee of a Farmers Organisation or, as the case may be, the records of the Apex Committee in respect of any decision, order, or other proceedings made under this Act to satisfy themselves or himself as to the correctness, legality or propriety of any such decision or order, or as to the regularity of such proceedings and if in any case it appears to the Government or to the Commissioner that such decision, order or proceedings should be modified, annulled, reversed or remitted for reconsideration, they or he may pass orders accordingly:

Provided that the Government or the Commissioner shall not pass any order prejudicial to any party unless he has been given an opportunity of making a representation."

Savings 42. Nothing contained in this Act shall affect the rights or properties

(1) vested in a Gram Panchayat, Mandal Parishad, zilla Parishad, Municipality or Municipal Corporation under any law for the time being in force.

(2) Nothing contained in this Act shall apply to the minor water bodies in the Scheduled Areas in the State of Andhra Pradesh.

Power to make rules. 43. The State Government may, by notification in the Official gazette,

(1) make rules to carryout the purposes of this Act.

(2) Every rule made under this Act shall immediately after it is made, be laid before the Legislative Assembly of the State, if it is in session and if it is not in session, in the session immediately following for a total period of fourteen days which may be comprised in one session or in two successive sessions and if, before the expiration of the session in which it is so laid or the session immediately following, the Legislative Assembly agrees in making any modification in the rule or in the annulment of the rule, the rule shall, from the date on which the modification or annulment is notified, have effect only in such modified form or shall stand annulled as the case may be, so however, that any such modification or annulment shall be without prejudice of the validity of any thing previously done under that rule.

G. BHAVANI PRASAD.
Secretary to Government,
Legislative Affairs & Justice,
Law Department

* As amended by the L. A. Bill No. 32 of 1998.
ANNEX 7

Summaries of Andhra Pradesh Farmers’ Management of Irrigation Systems Act Rules

G.O.Ms. No. 541, Irrigation and Command Area Development (CAD.IV) Department, Date 27-12-97.

These rules deal with the functioning of farmer organizations. They specify the rights and responsibilities of farmer organizations, rights of members, responsibilities of individual water users, the manner of conduct of General Body and Managing Committee meetings, powers of General Body and Managing Committee, powers and functions of the Managing Committees, duties of Chairman/President, constitution and functions of Sub-committee, the functions of Presidents of farmer organizations, the constitution of sub-committees, procedures for taking up works, social audits, water regulation, records to be maintained, the different types of records relating to property registers, water flow monitoring registers, command area and types of crops, cash book and related registers etc., have been specified financial audits, offences and penalties, and the functions of the “competent authority”

G.O.Ms. No. 45, I&CAD (CAD.IV) Department, Date 30-04-97 corrected with Amendments up to 31-12-97.

These rules specify the delineation of command areas of irrigation systems on a hydraulic basis and delineation of territorial constituencies, the guidelines for preparation of land-holders lists, voters lists and water users lists, and procedures for recall. There is also a detailed section on elections, specifying the procedures for the conduct of election to farmer organizations.

Election tribunals with respect to WUAs, Distributory Committees and Project Committees. G.O.Ms. No. 130, I&CAD (CAD.IV) Department, Date 08-09-97.

These rules specify the manner in which election disputes could be resolved and the limitations for the presentation of election petitions. They also specify the constitution of tribunals which are empowered to entertain petitions.

Amendment to Election Manual under APFMIS Rules, 1997. G.O.Ms. No. 124, I&CAD (CAD.IV) Department, Date 30-08-97.

These rules specify the procedures for election of a Distributory Committee.

ANNEX 8

Legal Agreement between FO and “Competent Authority” for Implementation of Works

AGREEMENT FORM

FOR EXECUTION OF O&M WORKS

BY FARMERS ORGANISATIONS

IRRIGATION & COMMAND AREA DEVELOPMENT DEPARTMENT

GOVT. OF ANDHRA PRADESH.
AGREEMENT FORM FOR EXECUTION OF MINIMUM REHABILITATION / MAINTENANCE WORKS BY FARMERS ORGANIZATIONS

Articles of Agreement

1. This deed of agreement made in the form of agreement on ________________ between the Governor of Andhra Pradesh (herein after referred to as the “first party”, which expression shall, where the context so admits include his successors in office and assigns) and * Water Users’ Association / Distributory Committee / Project Committee / Ayacutdar Committee ________________ under ________________ system / scheme / Project, ________________ Village, ________________ Mandal, ________________ District. (hereinafter referred to as the second party, which expression shall include its successors and legal representatives) to execute the work of ________________ (hereinafter referred to as work) on the following terms and conditions.

2. **Cost of Contract:**

   The total cost of the works (hereinafter referred to as the “total cost”) is Rs.__ (Rupees ...) as reflected in Schedule ‘A’.

3. **Disbursement of funds:**

   3.1 The second party shall have a bank account opened in its name to be operated jointly by two persons (President/Chairman and one member of the Managing Committee nominated) with the branch of a nationalised/scheduled/District Cooperative Central Bank. As soon as this Agreement is signed and shall provide its Bank account number to the first party.

   3.2 The second party shall notify the first party in writing the names and address of those who will jointly operate the Bank account mentioned in Clause 3.1. Such signatories shall not be changed without the prior consent of the first party.

   3.3 The works shall be carried out as per the “Andhra Pradesh Standard Specifications” and any other additional specifications enclosed with this agreement for the items of work at agreed rates indicated in Schedule A’

   3.4 Payment to the second party for the construction work will be released by the first party in the following manner:

   - * delete whichever is not applicable.
   - ** specify name of the village
• Advance (Mobilization advance) on
  Signing of agreement : 40% of the total cost
• On completion of 50% of work : 40% of the total cost
• On completion of work : 20% of the total cost

3.5 Payment at each stage will be made by the first party on certification by the Competent
authority of the farmers organization / chartered engineer based on measurements of the
works executed.

4 Maintenance of Accounts:

4.1 The second party shall maintain separate accounts for all the expenditure incurred out of
the payments made by the first party from time to time for execution of the work. Such
accounts shall be available for inspection by the first party or its authorised
representatives.

4.2 In the event of any misuse of funds, the first party shall have the right to freeze the bank
account of the second party after such inquiry as may be deemed necessary.

5 Completion time:

The works should be completed in ________ (months/weeks/days*) from the date of
conclusion of this agreement. In exceptional circumstances, the time period stated in this
clause may be extended in writing by mutual consent of both the parties.

6 Duties and responsibilities of the first party:

6.1 The first party shall be responsible for providing regular and frequent supervision and
guidance to the second party for carrying out the works as per specifications. This will
include written guidelines and regular site visit of the authorized personnel of the first
party, for checking quality of material and construction to ensure that it is as per the
norms.

6.2 The first party shall supply drawings, specifications and guidelines to the second party
for the proposed works.

6.3 The Executive Engineer/Deputy Executive Engineer shall hold meeting once in a month
at the division level/sub-division level where in the second party, the Competent
Authority of the farmers organization will submit the latest information including
progress report duly counter-signed by the President/Chairman of the Farmers’
organizations. The whole team may jointly inspect any site on a particular day to take
stock of activities.

* Delete whichever is not applicable
6.4 The first party shall have the right to instruct to stop or suspend the construction at any stage if there is any deviation from the specification or violation of any of the terms of this Agreement.

7 **Duties and responsibilities of the second party:**

7.1 **The second party shall:**

- a) take up the works and arrange for its completion within the time period stipulated in Clause 5;
- b) employ suitable skilled persons to carry out the works;
- c) make labour payment as per the schedule of labour payment for different items of work;
- d) ensure that all material required and procured for the works are of good quality (with ISI certification mark for the manufactured items where feasible and available);
- e) regularly supervise and monitor the progress of work;
- f) abide by the technical suggestions/directions of supervisory personnel of the first party regarding construction;
- g) be responsible for bringing any discrepancy to the notice of the representative of the first party as soon as noticed by it;
- h) ensure that the work is carried out in accordance with specifications, drawings and also within the total sanctioned amount without any cost escalation;
- i) keep the general body of Farmers organization / Committee informed about the progress of work;
- j) ensure that there is no mis-utilisation of the money/materials during construction;
- k) ensure full compliance of the conditions of the comprehensive insurance policy against loss of materials/cash/workman compensation etc. taken by the Chief Engineer on behalf of the Government of Andhra Pradesh. The premium towards the said insurance shall be paid regularly by the second party to ensure coverage for the entire period of contract. [In the event of failure of second party to pay the premium, this will be paid by the first party and adjusted against payments due to second party]. The premium amounts shall be reflected in the Bill of Quantities as a separate item and shall be paid from the advance paid.'
- l) pay all duties, taxes and other levies payable by construction agencies as per law under the contract. ‘(First party will deduct taxes at source in respect of such taxes as may be imposed under the law).’

7.2 In special circumstances, the second party may, after prior approval of the first party, entrust execution of the works on a piece work basis or otherwise to any appropriate non-governmental organization or a recognized Construction agency with a good track record. The non-governmental organization or the agency, as the case may be, shall however assume full liability towards any insurance for loss of material/cash or disability compensation claims of the personnel deployed on the works and no part of the liability on this account shall devolve on the first party.
Dispute Settlement:

If any dispute arises between the two parties, relating to any aspects of this Agreement, the parties shall first attempt to settle the dispute through mutual and amicable consultation. If the dispute is not settled through such consultation, the matter may be referred for settlement to the * Executive Engineer, Division/Superintending Engineer/Circle/Chief Engineer, ____________.

SIGNATURE

Signed and delivered by Sri _______________ Chairman/President of Water Users Association / Distributory Committee / Project Committee / Ayacutdar Committee for and on behalf of the Association / Committee.

In the presence of the Witnesses:

i)  

ii)  

SIGNATURE

Signed and delivered by Sri _______________ Deputy Executive Engineer/Executive Engineer / Superintending Engineer ___________ of _______________ for and on behalf of the Government.

In the presence of the Witnesses:

i)  

ii)  

(* Retain as appropriate for each work).
## Schedule – A
### Schedule of Rates and Approximate Quantities

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Probable Quantity</th>
<th>Description of work</th>
<th>A.P.S.S. Number</th>
<th>Units words</th>
<th>Amount</th>
</tr>
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<tbody>
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</table>

*Insurance premium shall be as decided by the government and the insurance agency.

(Signature of President/ Chairman)

__________________________
WUA/DC

Signature of the Competent Authority.

__________________________
WUA.

146
Format of Certificate

Certified that the works of the value of........ % of total cost in respect of
construction of ________________ at ________________ have been executed in
accordance with the approved plans and technical specifications.

Signature

Name & Designation of the Competent
Authority / Chartered Engineer authorised.
(Official address)

Office seal

Place :

Date :
“1. It is a matter of concern that irrigation projects completed at substantial cost have over the years failed to provide irrigation to the ayacut originally contemplated as a result of poor maintenance of the entire system. Inadequate budget provision for maintenance of the systems has not only created problems of water being provided only for a part of the contemplated ayacut but also generated problems of excess utilisation of water in the head reaches resulting in problems of drainage and salinity etc. One of the main reasons for insufficient budget provisioning is the competing demands from various sectors for scarce resources and absence of linkage between the water rates collected and application of those funds for maintenance of the irrigation system. The problem is further compounded by the present rate structure, which does not cover even a portion of the cost of desirable levels of maintenance.

2. The Finance Commissions appointed once in five years by the Government of India to determine the shares of states in the revenues raised by the Union Government examined the issue of neglect of maintenance of irrigation projects/schemes and made recommendations regarding the desirable levels of maintenance expenditure and made suitable provisions in their forecast of States expenditure commitments for the five year period. They had also recommended that the expenditure on maintenance of the irrigation sources should be met by a corresponding increase in levy and collection of water rates from the beneficiaries of the irrigation systems. Though the State has been increasing the maintenance grant periodically, it has been found to be inadequate to meet the full requirements of maintenance due to steep increases in staff expenditures and cost of materials, wages of the labour etc. The water rates have also not kept pace with the increasing requirements for maintenance and in view of the various commitments of the State on limited revenue resources the budgetary support for maintenance of the irrigation system has been found to be inadequate.

3. The Government is of the view that there is urgent need for greater attention paid to the maintenance of the irrigation projects/schemes already commissioned and the water rates should be enhanced periodically to meet the increasing maintenance requirements. Government hereby constitute a Standing WCRC as indicated below:

- Principal Secretary Irrigation
- Principal Secretary Revenue
- Secy. to Commissioner, Land Revenue
- Secy. Finance & Planning (Finance Wing)
- Secretary Energy
- Secretary Industries
- Secretary Panchayat Raj
- Secretary Municipal Administration
- Secretary Irrigation (CADA)
- Secretary Agriculture
- Director, Ground Water Dept.
- Commissioner, CADA
- Engineer-in-Chief (Irrigation)
- 3 Nominees from Apex Committee
- Consultant (appointed by Govt.)

Chairman
Member
Member
Member
Member
Member
Member
Member
Convener
Member
Member
Members
Member
4. The three Members referred to above from “Apex Committee” (constituted under the Andhra Pradesh Farmers Management of Irrigation Systems Act 1997) shall be nominated by the Apex Committee as their representatives on the WCRC.

5. The consultant referred to above will be appointed by the committee and will have expertise in economic and financial disciplines. The consultant will undertake periodic (as required) and an annual analysis and review report each year and the direction of the committee, and provide other analytical advisory services to the committee as may be required by the committee.

6. The WCRC shall also have a small core-working group termed the WCRC Technical Working Committee to undertake the analytical and report preparation work required by the WCRC. The Technical Working Committee shall comprise the Commissioner CADA (Chairman), the Additional Secretary, Irrigation (Convenor) and the Consultant plus other invited Members or subject specialists as may be required from time to time.

7. The objective of the review of the water charges is to ensure that the water charges and their collection rates provide revenues sufficient to cover:

   (i) the desirable level of maintenance works required to maintain the system to ensure that irrigation systems operate at the optimum level as well as;

   (ii) the establishment cost and other recurrent costs (e.g., fuel, electricity and other overheads) required for operating and maintaining the systems in a reliable, economical, equitable and predictable manner; and

   (iii) phased introduction of an affordable presentable addendum to water charges to be placed in a reserve fund for future contingencies and renewal of the infrastructure; and

   (iv) passed transition from the present system whereby revenues assessed on per acre basis are collected by the Revenue Department to volumetric assessment of water charges collected by WUAs, with agreed share retained by WUAs, distributory committees, project committees, apex committee and I&CADD.

8. In making its recommendations, the committee shall:

   (i) review data on operation and maintenance expenditure incurred at the time of review;

   (ii) evaluate the adequacy of maintenance carried out and identify the causes of inadequacy, if any, and determine the levels of maintenance requirements;

   (iii) review the water charges, collection rates and total revenues received, including from services (e.g., bulk water supplies) to non-agricultural users;

   (iv) assess appropriate measures through publicity, extension campaign and incentives to achieve high collection percentages;

   (v) monitor and make periodic recommendations relative to the phased transition to farmer and I&CADD managed collection of water charges and volumetric charging (para 7 (iv));

   (vi) examine the structure of staff and work charge numbers and costs relative to actual requirements for O&M and identify any excess staff costs not to be borne by water users and to be subsidized or otherwise dealt with by Government and make recommendations on how to increase O&M efficiency and reduce excess staff cost burdens; and

   (vii) annually share the findings of its analysis and recommendations with the “Apex Committee” constituted under the Andhra Pradesh Farmers Management of Irrigation Systems Act, 1997.
9. The WCRC shall meet at least once in a year (its Technical Working Committee would require meeting frequently for guidance of studies and analysis) for undertaking various studies and make recommendations to the Government on an annual basis the water rate to be levied the expenditure requirements for the maintenance works of the irrigation systems and other recommendation areas as described in paras 7 and 8 above.”

Authors' Note

Participatory Rapid Appraisals are a standard part of the AP irrigation reform program’s monitoring and self-assessment process. The intention is to carry out such exercises about twice-yearly or on an as-needed basis to understand particular issues or thrust areas, and to build up capability of local universities, NGOs, I&CADD and AD to carry out such PRAs. The PRA below has been reproduced without change as an illustration of one such PRA. This PRA is a combined PRA undertaken in November 1997 and September 1998. A number of observations made below are now partly outdated. Also, as intended in the process, a number of recommendations mentioned in the PRA are in process of implementation (refer text of this paper).

Introduction

1. These PRA notes are primarily meant for those who are interested in first-hand information about how the FO program under the APERP is functioning, and how farmers view and perceive their own as well as government officials’ performance in irrigated agriculture. In this sense, the PRAs could be treated as a “self-strengthening” process. By evaluating their own performance, farmers can detect the strengths and weaknesses of their group behavior. Such self-understanding is vital for improving the performance of farmer organizations.

2. A strong leadership with a commitment to quality service, transparency and accountability is one of the main requirements for making farmer organizations efficient and viable. Therefore, the emerging leadership patterns in AP as a result of the FO organization program is discussed first. This is followed by a discussion on how farmers perceive and assess the FO program. A short discussion on the DCs and their linkages with WUAs, and how both associations interface with government departments is in the next section. Finally, the results of a self-evaluation by farmers in Godavari and Krishna Delta areas is presented.

3. The main objective of writing detail notes on various issues pertaining to farmer organization and social change in AP is to inform policy makers, administrators, project managers and NGOs of the current operational status of farmer organizations. The PRA notes are not vigorously analyzed to meet the academic standards of Anthropology. Perhaps it is not necessary as the entire process of FOs in AP is in a continuously fluid state with adjustments and readjustments. It is however necessary to capture these adjustments, anxieties and expectations of all players in this exercise, and to repeat such exercises at regular intervals. Subtleties of

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1 The PRAs were undertaken by Jayantha Perera (Anthropologist/Community Organization Specialist) with the support of S Murthi (Irrigation Engineer/Irrigation System Manager) and Sithapathi Rao (Agriculturist and Farmer Organization Specialist/Director, IRDAS, an NGO in AP). The PRAs were also assisted by I&CADD and World Bank Staff. Jayantha Perera analysed the data and wrote the annex.
human behavior and grass-roots level development cannot be grasped by occasional and ad hoc research and evaluations conducted with questionnaires. It should be done rather through a 'process documentation' conducted by resident researchers/observers over a long period of time.

The PRA Methodology

4. Four PRAs were conducted in November, 1997, at four locations in Nagarjuna Sagara Project and Sri Ram Sagara Project, during the APERP (Irrigation) Appraisal Mission to evaluate the process of forming of WUAs at the minor level and their future work programs. During these PRAs, a broad WUA leadership profile was also developed. In September, 1998, as part of the first Supervision Mission of the APERP (Irrigation Component), another four PRAs were conducted in the Godavari Delta and the Krishna Delta areas to evaluate the performance of FOs and how well they are federated and have established linkages with each other and with government agencies. In addition, during these PRAs, an attempt was made to update the November 1997 leadership profiles. The aim of the latter was to develop a leadership profile across the state with a view to analyzing whether farmer organizations' leadership was captured by traditional rich landlords or distributed among various socio-economic groups as expected by the FO policy makers. In each PRA, at least 20 farmers and government officials participated. The smallest group was 12 and the largest was 35. Among the participants were the WUA presidents, MC members of WUAs, WUA members, and officials of the Departments of Irrigation, Agriculture and Revenue. During the September 1998 exercise, several DC members and DC Presidents also took part in PRAs. In two PRAs conducted in 1997, ten women participated, while in 1998, only men took part in PRAs.

5. Several indicators were used in PRA discussions which could broadly be categorized into five groups: water management, system maintenance, communication, upward and downward linkages, and water charges payment. Each PRA was designed to exploit interactive interview design. Group discussion is the main mechanism of PRAs. Each indicator was discussed among participants and at the end of the discussion, participants evaluated their own performance in an order scale of 'no action', 'some action', 'satisfactory' and 'excellent'. During most PRAs, farmers evaluated their performance on a numerical scale from 1 to 100. Most of the time, participants managed to express their view as a group and on only a very few occasions, participants disagreed with each other. Although the groups comprised different socio-economic sub-groups and displayed a wide range of education and jobs, ranging from a senior surgeon of a government hospital to post-graduate degree holder, to a poor farmer with very little education, in group discussions such differences were not visible and almost all freely discussed the indicators.

6. The first four PRAs were conducted by an anthropologist/WUA specialist and an irrigation engineer-cum-irrigation system manager who has mastered the PIM principles and methodologies. The second set of PRAs were conducted by the anthropologist/WUA specialist and an agriculturist/NGO leader. The NGO leader is one of the pioneers of the FO program in

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2 This could ideally be done by local NGOs and/or universities after undergoing training in PRA techniques and process documentation methods.

3 FO is used to denote the entire farmer organization program. WUA is only a tier of farmer organization under the Farmer Management of Irrigation Systems Act of 1997.
AP. He has participated in the FO program from its inception and has contributed to various training modules for farmers, WUA leaders and government personnel. The anthropologist/WUA specialist did not understand or speak local telugu dialects. But he was fully supported by the engineer and NGO leader in the discussions by translating questions and answers and comments made by participants.

Emerging Leadership Patterns and Participatory Irrigation Management

7. The State of AP can be divided into three agro-ecological areas: coastal, Telangana, and Rayalaseema. Broadly, farmers in the coastal area are well-to-do farmers with ample water to cultivate two annual paddy crops and lucrative upland crops such as coconuts. The average landholding size is about 12 acres. Education and social mobility are higher in the coastal areas compared to the other two areas. Telangana region is the poorest of the three. This region was under the control of Nizam dynasty for several centuries. As a result, landownership and social groups show a feudal character. The backward classes and scheduled caste farmers were at the bottom of the rigidly established socio-economic hierarchy without any representation or voice in society for several centuries. The FO program has changed their socio-economic disability. It has provided the opportunity for the backward classes and scheduled castes to participate in irrigation management and agricultural development. As members of WUAs, they suddenly found an ‘identity’ as members of FOs and more importantly, a ‘voice’ in rural and agricultural development matters. This is a tremendous change which encourages them to ask for further rights such as water to cultivate their lands, agricultural credit and inputs. As farmers they too hold Pass Books issued by the Revenue Department which indicate the type of land (irrigated/upland/dry irrigated), survey numbers of the holdings, and the total holding size. Because of the membership in FOs, they have become pukka (accredited) landowners with privileges and rights. Earlier, they depended on the discretion and ‘favors’ of irrigation officials to get water to their marginal lands in the tail-end areas of irrigation commands. Now they go to their WUA and DC leaders to negotiate water requirements and enjoy some sense of ownership over irrigation facilities with other farmers.

8. One major observation at the PRAs was that WUA Presidents share the socio-economic characteristics of the majority of farmers. This is a major shift in rural leadership, which had earlier been in the hands of the larger, traditional landowning class. It is interesting to note that this change has occurred even under the minor irrigation systems, where leadership has passed to middle and small land owners from big landlords. These changes are likely to result in more representative and viable farmer organizations in rural AP.

9. Leadership in rural and agricultural development programs was usually captured by large land owners. For example, the leaders of Outlet Committees established under the Irrigation Utilization and Command Area Development Act, 1984 were generally the big land owners, who had lands at the head-end of canals. The merging of several outlet command areas into a unified command area called ‘territorial constituency’ of a WUA provides farmers with an opportunity to break the traditional leadership based on land ownership and high caste status. The value of TCs is that they empower farmers in tail-end areas to elect the MC members of WUAs. Public campaigns, media coverage of elections, and secret ballot provided young, popular and social service-oriented villagers an opportunity to get elected as WUA Presidents and MC members.
Generally, the WUA elections were not fought on political or caste lines. As a result, 52% of WUA leaders were elected unanimously by farmers. A reputation as a knowledgeable farmer or community worker is what farmers considered most in electing their WUA Presidents and MC members. Another change noted in FO elections is the election of a few women as WUA leaders and members of MCs. This positive development is however not yet very common, not because of their lack of leadership qualities; but due to their disadvantaged position in respect of land ownership, the criterion used to select voters at WUA elections: each landholder (regardless of size of landholding) has one vote.

Table 1: WUA leaders by Age Categories (n = 85)

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>Number of WUA Presidents</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>18-30</td>
<td>06</td>
<td>07</td>
</tr>
<tr>
<td>31-45</td>
<td>49</td>
<td>58</td>
</tr>
<tr>
<td>46-60</td>
<td>23</td>
<td>27</td>
</tr>
<tr>
<td>60 and above</td>
<td>07</td>
<td>08</td>
</tr>
<tr>
<td>Total</td>
<td>85</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: PRAs at 8 locations in AP (1997 and 1998)

10. Most of the WUA leaders are young to middle-aged farmers who are also 'small' to 'medium' land owners (tables 1 and 2). Significantly, 18% of WUA leaders own less than five acres each (table 2), indicating a major changing pattern in rural leadership. Most of the Presidents are married with children. They have traveled widely, at least within A P; about 20% of them are engaged in business and small industries. A few retired government servants, lawyers, graduates in agriculture, engineering and commerce are also among the Presidents and MC members especially in Godavari Delta and Krishna Delta areas where socio-economic conditions of farmers are much higher compared to that of the other two socio-economic regions. A great many of them who have close links with politicians, panchayat leaders, district administrators, and I&CADD officials have some experience in community work. The Distributory Committee Presidents and Committee members are also comparatively young, educated and ambitious villagers who are well versed with the Andhra Pradesh Farmers Management of Irrigation System Act of 1997 and the FO program objectives. Of the six DC Presidents and 10 Committee members who participated in the four PRAs conducted in the Godavari Delta and Krishna Delta, four are locally well-known social workers with some political connections. The other two are graduates with entrepreneurial skills and both are in their early thirties.
Table 2: WUA Leaders by Land Ownership Categories (n=85)

<table>
<thead>
<tr>
<th>Land Ownership (acres)</th>
<th>Number of WUA Presidents</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Below 05</td>
<td>15</td>
<td>18</td>
</tr>
<tr>
<td>06-10</td>
<td>17</td>
<td>20</td>
</tr>
<tr>
<td>11-15</td>
<td>30</td>
<td>35</td>
</tr>
<tr>
<td>16-20</td>
<td>09</td>
<td>11</td>
</tr>
<tr>
<td>21-30</td>
<td>09</td>
<td>11</td>
</tr>
<tr>
<td>30 and above</td>
<td>05</td>
<td>05</td>
</tr>
<tr>
<td>Total</td>
<td>85</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: PRAs at 8 locations in Andhra Pradesh (1997 and 1998)

11. Presidents of WUAs and DCs think that their fellow MC members, Committee members, and farmers are supportive of the FO program. Their support comes in the form of participation in WUA meetings and contribution of their labor for minor maintenance. The enthusiasm shown by farmers in the ‘deferred maintenance’ program is unprecedented in AP. FO leaders and farmers think that they could do canal rehabilitation and maintenance economically and efficiently. Their enthusiasm in minimum rehabilitation is shown in good quality work, completed in a short period of time. Such enlightened and enthusiastic fellowship enhances the commitment and performance of FO leaders. Many MC members have already informed project personnel that they too would like to participate in the government-WUA dialogues and conferences. This is a definite sign of rapidly increasing leadership potential among farmers.

12. Field level irrigation workers such as laskars now find it difficult to justify their role and functions in irrigation management as FOs are progressively taking over many functions earlier carried out by them. Earlier they were virtually the leaders and advisors of farmers. They, as the lowest level of ID functionaries, still carry the identity as those “who work with engineers” or “government officers” vis-a-vis farmers. FO leaders think that laskars are useful, at least for an interim period, until FOs fully take over operation and maintenance of irrigation systems. Decades of dependency on officials as well as inter-personal rivalries that characterize village communities need time to disappear. The rapidly emerging partnership between WUAs and Assistant Engineers (AEs), the competent authorities of WUAs, and the visible changes in official’s attitudes towards farmers have definitely influenced the working relations between laskars and farmers. The consensus among farmers is that if the present cadre of laskars is going to continue (until they retire), they should be brought under the control of WUAs. A resolution passed by 25 WUA Presidents in August 1997 at Kadam, specified that laskars should work under WUAs and meet the MC members regularly. The WUA Presidents requested the Deputy Executive Engineer (DEE) of the area to release the salaries of laskas only upon a certificate from them. As WUAs gain confidence in irrigation management, the present perceived need for laskars may very well change.

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4 Since preparation of this report, the conference and training program is broadening out. Following intensive "Training of Trainers" workshops scheduled in April 1999, the next round of training (in May and June 1999) will provide district level training for all MC members across the state; about 65,000 persons in all.
13. Some WUA Presidents have informed the Mandal Committees (local bodies) that they should be invited for Mandal Committee monthly meetings. The Presidents believe that the Mandal meetings would provide them with an opportunity to resolve revenue-related matters such as re-surveying the command areas, localizing unauthorized cultivated lands and also to meet Agricultural officers.

14. At several locations, WUAs have established informal sub-committees to deal with irrigation-related disputes, assessment of irrigated area, and with repairing canals. Their preliminary inquiries have revealed that a substantial area of non-localized lands are being cultivated by farmers. One WUA President insisted that the village revenue officer (VRO) should walk with MC members to ascertain the correct irrigated area. MC members of a WUA found during a ‘walking-the-channel’ exercise that 1400 acres are actually cultivated although the localized area is 597 acres. The WUA requested the VRO to revise the Village Survey Map and to collect water charges from the free-riders.

15. Many WUA Presidents are unhappy with delays in payment for minimum rehabilitation and the I&C ADD’s reluctance to revise rates to match current prices. The pressure of work have started to demoralize some WUA leaders seriously. They feel that their good intentions towards WUAs have brought them hardship and frustration. One WUA President said “this is the betrayal of farmer leaders. WUA leaders are honorary social workers without any privilege or compensation. Therefore it is unjustifiable to create unnecessary hardship on them”. Some WUA leaders feel that they are being overloaded by the FO program and as a result they cannot concentrate on important things such as the Agricultural Plan, input supplies and cultivation loans. They want to take more responsibilities only after WUAs are well established. One leader said “please do not give us any unnecessary powers.” One WUA President wanted to “liberalize” the canal activities. All these indicate that WUAs are now faced with a dilemma. They feel that the government expects too much from them without providing flexible work plans and rules, and adequate financial support. Although they do not want any more powers, they feel that they are still subordinated to government officials who could impose various limitations on them through various circulars and government orders (GOs). Sometimes they are confused as politicians and government officials tell them contradictory things to do. For example, when the Hon. CM visited the area, he publicly told FOs that canal banks and trees on them are the property of FOs. But WUAs cannot auction any of the grass on the canal banks without the approval of the District Collector and the Chief Engineer. One irrigation engineer told them not to auction such rights “until further notice.” One DC President said “bureaucrats are more powerful than us.”

16. Despite these difficulties, both leaders and fellow member of FOs for the first time feel that they are empowered and they can have some control over their destiny. As one farmer put it, this leadership springs from the leadership of the Hon. Chief Minister who is genuinely interested in the liberation of rural people and their socio-economic welfare. The district level and state level FO jamborees and CM’s field visits to meet farmers give a tremendous boost to the local leadership. How the government agencies and officials adapt themselves to this changing scenario is a fascinating topic for further research.
17. Farmers believe that a WUA is the most appropriate rural institution for efficient water management and agricultural development. They appreciate the efforts of the Hon. Chief Minister, government officials and the World Bank in evolving a healthy and state-wide WUA program in AP. One WUA leader said “FO program is a blessing”. Many WUA members think that the CM is a visionary who is committed to the upliftment of rural people. They pointed out that the CM has a very clear perception of the FO program. If the bureaucracy follows his advice and works efficiently, the majority of PRA participants (75%), felt that the entire society could benefit from the FO program. Bureaucratic delays cause anguish among farmers and sometimes demoralize them. For example, if the Section Officer of the ID is not present, there is no way of getting any information from the Center (Hyderabad). A government circular takes more than 4 months to reach farmers, which they call “transmission loss”. For example, a I&CADD circular issued in May 1998 reached Godavari in late September, 1998. In some areas, farmers refer to the FO program as the “World Bank Program.” Some educated WUA members in Godavari Delta area thought that soon after the nuclear tests in May 1997, the FO program might lose the Bank’s support.

18. In every WUA, especially in major and medium irrigation projects, a variety of physical activities are going on. Minimum rehabilitation of canals and drainage works cover the entire command area of a WUA. This is a remarkable change. Earlier, everything happened at the head-end or where large or influential landlords had land. This widespread attention to the entire command areas of WUAs make the concept of “tail-end”, in the sense of it implying significant disenfranchisement, no longer valid.

19. Rehabilitation works completed by farmers are of very high quality. De-silting, de-weeding, strengthening of canal banks, re-sizing of outlets etc are among such works. Farmers not only carried out works according to a time schedule but also spent money carefully without exceeding the original estimates. Their estimates were often 20%-30% less than that of private contractors. Some of them were of the opinion that accountability and transparency should be established through good work and mutual trust. They were vigilant over the spending of money and formed their own quality control standards. FOs have already spent Rs. 590 million on minor rehabilitation works. They believe that they could also do major rehabilitation works. However, heavy reliance on bureaucratic rules, orders and circulars would hamper FO work. As FO is a major component of good governance in AP, flexibility and mutual trust are essential in dealing with government agencies, particularly with I&CADD.

20. WUA members visited are increasingly becoming financial managers in addition to water managers. The majority of WUAs collect membership fees from WUA members. The fee ranges from Rs.10 to Rs.30 per year\(^5\). WUAs have deposited the money (Rs.50,000 as a grant for a WUA whose members were elected without a contest and Rs.30,000 for a WUA whose members contested at the election) they received in bank accounts. Many WUAs utilize these

\(^5\) This is additional to the water charges currently collected by the Revenue Department.
funds to carry out minor irrigation repairs and also to hire office space and buy furniture and stationery. Many WUAs use hired private buildings or a room or two at panchayat centers as their offices. Some of this money was used to repair irrigation works. For example, one WUA has spent Rs 7,600 of the initial grant to build an aqueduct to convey water to about 100 acres which was cut off from a drainage canal built recently under the minimum rehabilitation program. The same WUA has also raised Rs 5000 worth of free labor from its members for this work. The IE provided pipes and the WUA, building material, masons and labor.

21. WUAs have already started to improve water distribution, maintenance and the revision and updating of land records. Almost all WUAs have completed the “walk-through” exercises with their competent authorities (CAs). During these walk-throughs, WUA leaders discuss with CAs as well as with WUA members the maintenance needs, water piracies, free-riding and the ways in which farmers waste water in their own TCs. They also noted minor repairs that they could do by themselves to improve water distribution. Farmers as groups have desilted some canals, repaired broken gates and sluices and prioritized their maintenance needs with the assistance of CAs.

22. Farmers have started to cultivate land kept fallow over decades due to water shortages. A good example of group action and efficient planning is how 7 WUAs of Nidma Moor Mandal along the Mudhi Manikyam Major in Nagarjuna Sagar Project reclaimed about 3,500 acres at the tail-end area of a major canal. The localized command area of the Major is about 30,000 acres. About 3500 acres at the tail-end of a branch canal have not been cultivated over 20 years due to water shortages created by farmers of a nearby village who illegally took water from the Major to their fields. The AE attempted many times to stop the farmers pumping water illegally. But without 24-hour patrolling, it was difficult to stop water pumping from the Major. After the formation of WUAs, WUA members of the tail end area seized the water pumps and closed all illegal watercourses. They patrol the area day and night during the cultivation season and use the saved water to cultivate the abandoned area of 35,00 acres. Farmers believe that without WUAs they would not have gathered together to stop water stealing or to be concerned about tail-end farmers.

23. Some WUAs have already formalized warabandi system at the distributory and field canal levels. At the Kadam Reservoir of SRSP, for example, several WUAs have printed the season’s water rotation schedule and distributed among farmers. The rotational distribution is strictly followed with full farmer cooperation in SRSP. WUAs in the Kadam Reservoir command area had postponed the issue of water until the reservoir had water to issue to all distributories. Each distributory is closed for 2 days in every five days so that the tail-end areas could be provided with irrigation water.

24. Farmers are willing to pay the increased water charges. They think that if the water charges are correctly worked out and collected effectively, WUA would have sufficient funds to operate and maintain canal systems. The above examples of functioning of WUAs indicate that they are active and have won the support of farmers. The work schedules of some of the WUAs prepared with the assistance of AEs show that they address important issues pertaining to their livelihood and are keen to make the WUAs viable institutions. The support they receive from
I&CADD strengthens their position and facilitates their activities. A similar enhanced support and guidance is urgently needed from the revenue and agricultural officers.

25. WUAs maintain a variety of registers and account books. In this regard, they need training. There is a big demand for training, particularly in how to keep accounts and office records. Currently most WUAs obtain free services from those who know basic book-keeping to do their work. WUAs have designed their registers following the government official registers. They paid for the printing of registers. The Pipe List Registers which were handed over to WUAs need revision and transfer to new registers. Practically each WUA and DC have their own official letterheads. Some leaders carry their visiting cards with them and exchange with officials and visitors. Each WUA leader wears an official identity card which gives him some recognition in banks, government agencies and also facilitates his dealings with them.

26. WUA leaders believe if they could diversify their income and improve local resources they could become self-financing institutions in the near future. For this, they would like to obtain the auction rights over canal bank grass and trees. In addition, they want to get the licensing rights over fish ponds and the right to lease out government reservations along irrigation canals which are now mostly encroached by nearby farmers.

27. WUA leaders believe that FOs have fulfilled the vision of farmer-managed irrigation and agricultural systems in AP by assisting the government to reach the targets set out in the FMIS Act and rallying farmers around a major agricultural development program.

Distributory Committees: Brief Overview of their Role and Functions

28. Distributory Committees are now well established. Each DC has a President and four Committee members, elected by WUA leaders and MC members of a distributory canal’s command area. The Committee members head water management, finance and resources, monitoring and training, and works committees sub-committees. The titles of Committees vary from region to region. Some DCs have still not established all Committees. DC leaders believe that Committees should be established when there is a need for them. DC members are elected for five years. Farmers are satisfied with the democratic manner in which DC elections were held. WUAs are well represented in DCs. For example, one DC President represents the furthermost tail-end WUA of the distributory canal’s command area. In the majority of DCs (4 out of 6), the Presidents and Committee members were unanimously elected by WUA leaders. WUA leaders and farmers believe that the DC is the next level of farmer organization to serve irrigated agriculture.

29. According to DC Presidents the main tasks of a DC are to (a) resolve problems and conflicts that may arise among WUAs in its command area; (b) act as an appeal board for WUA members who do not agree with WUA decisions or sanctions; (c) identify and prioritize rehabilitation works in consultation with WUA leaders and MC members; (d) carry out distributory canal rehabilitation including revetment, construction of culverts and sizing pipes for minor canals; (e) supervise rehabilitation works and to obtain CA’s approval; and (f) raise funds for system rehabilitation and operations from among farmers.
30. At present, DC as well as WUA leaders are engrossed in minimum rehabilitation works. As a result, almost all DC Presidents have acquired a perspective of a contractor rather than the role of a leader of a self-reliant, participatory institution. They have been busy from the day they were elected with physical rehabilitation works. Currently (October 1998) the main and only focus of DCs is minimum rehabilitation of canals and drainage facilities. Therefore DCs do not prepare agricultural production plans. However, one DC has already identified and informed farmers from where they can buy good quality seed paddy and discussed with AD officials a suitable cropping pattern, and planted trees on the canal banks. The DC has already planted 350 trees on distributory canal banks.

31. DCs have gained sufficient experience in handling large sums of money, selecting contractors and supervising large-scale rehabilitation works. Several DCs have rehabilitated long distributories with the assistance of WUAs. Some distributories are more than 25 km long. The rehabilitation works are of high quality. DC Presidents together with WUA leaders complain that ID follows two sets of rules for FOs and private contractors. Usually the ID allows 10-15% over and above the ID’s specified rates for private contractors. For example, in 1991, on one distributory canal, contractors collected 140% of the estimated cost of desilting the canal. The work was of poor quality compared to the works supervised and carried out by the DC in 1998. Despite the good quality work and low estimates, the ID does not allow FOs similar concessions that were extended to private contractors. For example, ID’s daily wage rates for a laborer and a mason are Rs 53 and 73 respectively as against the prevailing rates of Rs 70 and 120 in the Godavari Delta area. DC leaders think that for each distributory canal and its service area, its DC should have the right to specify the rates in consultation with the CA. DCs have found the ID’s rule of allocating rehabilitation funds on the basis of cusecs multiplied by the length of a canal (cusecs x km) as unfair. Sometimes the smaller command areas get more funds than larger command areas when this formula is applied. The allocation of funds for three DCs on the Godavari Eastern Delta illustrates this point:

<table>
<thead>
<tr>
<th>Distributory Canal</th>
<th>Acreage of Command</th>
<th>Allocation (Crore Rs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kotipalli</td>
<td>56,000</td>
<td>5.5</td>
</tr>
<tr>
<td>Ramchand Puran</td>
<td>100,000</td>
<td>3.5</td>
</tr>
<tr>
<td>Kakinada</td>
<td>84,000</td>
<td>4.5</td>
</tr>
</tbody>
</table>

32. DCs are ready to collect 15% of minimum rehabilitation costs from farmers from 1999/2000. Many farmers are willing to pay this amount as they get assured water supplies and better yields as a result of the minimum rehabilitation program. One DC has already decided to give priority in system modernization program to those WUAs who come forward to pay 15% of the estimated costs upfront. As WUAs and DCs know this decision to charge 15% from farmers towards irrigation maintenance, they could plan well ahead how to raise this money. They expect similar advance information with regard to other programs as well.

Distributary Committee and WUAs

33. DCs have developed a cordial and functional relationship with WUAs in their command areas. The majority prefer to call the command area as “service area” DCs are involved in WUA
operations in many ways: The most important is the DC’s role as the arbitrator in conflicts between WUAs. Each DC resolved, on average, 20 such conflicts during the last 10 months. DCs take special care to ensure that each minor canal or watercourse receives its allotted water share. But usually at the tail-end areas of a distributory canal, WUAs have some difficulties in sharing water equitably due to drainage and conveyance difficulties. In such events, DCs act as arbitrators and attempt to resolve such conflicts amicably. The majority of DC leaders consider the improvement of drainage in their command areas as the top priority work as WUAs cannot attend to drainage improvement by themselves. DCs have developed a healthy working relationship with other district level institutions such as Mandal level revenue offices, gram panchayats and Primary Agricultural Cooperatives (PACs).

Interface Between Farmer Organizations and State Departments

34. A major shift in irrigation management, introduced by the FO program, is the incorporation of farmer groups in water management, and the combination of ‘below the outlet’ and ‘above the outlet’ irrigation management functions. The widely prevalent assumption that most, if not all, water management problems are ‘below the outlet’ is effectively rejected by the FO program. FOs provide an effective and formal forum for farmers to work out irrigation plans and budgets and to resolve irrigation problems in consultation with irrigation engineers. This forum has a legal identity and provides certain powers and responsibilities for farmers. At the same time, irrigation engineers are answerable to FOs for conducting their functions. The emphasis on system management and improvement together with the focus on irrigation canal operation and maintenance allow FOs at various levels to participate effectively with irrigation engineers in irrigation management.

35. The WUA rules quite exhaustively deal with the functions of the Assistant Engineers (AEs) who are the Competent Authorities of WUAs. They assist WUAs by attending meetings convened by the WUAs, preparing operational and maintenance plans and estimates for works identified for execution, and giving technical clearance for maintenance works. In addition, an AE will be responsible for advising farmers on water regulation, water budgeting and in assessing the area irrigated.

36. Changes that are being introduced under the FO program indicate a gradual erosion of power and benefits the irrigation officials have enjoyed over decades. But a significant number of engineers are happy that the responsibilities for efficient O&M have shifted to WUAs. As one Chief Engineer stated, now the distress in managing deficit water is equally shared by the WUAs and irrigation officials. Blame for inefficient water supplies will soon be directed at WUAs. The irrigation officials will continue to have an “advisory” role in managing irrigation systems. Thus WUAs have introduced an interface between farmers and the state.

37. The attitudinal changes and cooperation shown by irrigation officials are not evident among the Revenue and Agricultural officers. The reason for this is the absence of integration of revenue and agricultural officers with FOs. Irrigation officers are the CAs of FOs. Similarly a clear attachment of the revenue and agricultural officers to WUAs would have brought them too into close collaboration with WUAs. According to the FMIS Act, revenue officers are only expected to obtain the assistance from farmers for water charges collection. No arrangement is in
the Act to bring revenue and agricultural officials together to support irrigated agriculture. No
officer from the Agricultural Department or Revenue Department was present at PRAs, except at
one. In fact, FOs did not invite them. As found in PRAs and individual discussions with
farmers, revenue officials, especially VROs initially did not cooperate with WUAs. In some
places, they have tried to sabotage the revision of field survey maps and land records. Threats,
refusal to attend meetings and concealing information are the main tactics VROs use in many
places to maintain the status quo regarding the collection of water charges. However several
WUAs have already completed revising field survey data and village maps. Some WUAs have
used traditional drum beaters to spread the news regarding the land record revisions. Others are
quite confident that they could obtain the support and cooperation of VROs for WUA activities.

38. DC members and Presidents have cordial relationship with the ID. Their main contact
person in the ID is the EE or DEE. DC Presidents attended (4 out of 6) PRA meetings with their
CAs. Both CAs and DC members discussed many issues raised at the PRA meetings and
displayed a strong collegial relationship. DC Presidents are keen in evolving transparency and
accountability at the DC as well as at the WUA level. One DC President suggested that only the
President and the CA should be held responsible for any malfunction of a DC, without “diluting”
the responsibility in a complicated bureaucratic hierarchy. DC leaders welcome the need for
CA’s certification for the release of funds as that binds him too into a system of administration
which is characterized by its transparency and accountability. At the same time the need for
realistic rates and prompt payments are also emphasized. One DC President said “although the
estimated rate for desilting canals with a machine is Rs.20 per cubic meter, we paid Rs.25 as
desilting involves clearing the jungle as well. If the rates are not revised, I have to sell my land to
pay the machine owner.” Another DC President said that he has to pay about Rs 40,000 out of his
pocket as the estimates were too low compared to the actual works completed by the DC. The
third DC President pointed out that the government officers and political leaders had told them in
public rallies that farmers should go ahead and do the minimum rehabilitation by themselves and
they should not worry about estimates and payments. Such promises and encouragement
motivated farmers to do wonders. But if they knew such promises are only rhetoric, no canal
would have been excavated by farmers.”

39. DC Presidents complained about the delays in payments for the physical works that have
already been completed by FOs. These delays and some lack of clarity in agreement over the
rates for de-silting canals have caused widespread discontent among DC and WUA Presidents.
They believe that the government follows rules and regulations which are archaic and anti-
participatory. They think that the ID has entangled itself in lots of paper work. Several DC
Presidents pointed out that EEs call them to irrigation offices just to discuss a point or to clarify
records. These trips are becoming frequent which in turn waste their time and money. DC
Presidents believe a strong attitudinal change is necessary at higher levels of the ID. As one DC
President put it “we do not have time to attend to our command area work as we have to go to
EE’s office for paper work”. DC Presidents feel that EEs do not share information with them
adequately. As a result, they get confused as to the rationale of certain decisions taken by the
government. For example, DC Presidents do not know the reasons behind why only 50% of
work will be given to them next year and the rest to contractors in the canal modernization
program. Sometimes farmers find it difficult to follow the ID’s demands as they are already
pressurized with work. Pressure to prepare work estimates by the ID does not allow farmers to
prioritize their work. The ID sometimes tends to decide works at the distributory canal level without detailed consultations with DCs.

40. DC Presidents believe that the ID, Revenue and AD officials should be trained to understand and apply the FMIS Act. It seems, according to them, that the officials do not know what is expected of them under the Act and FO program. As a result, they try to bring in their own views and procedures which do not match with FOs'. At the same time, DC leaders would like to get more training in office maintenance and record and book-keeping. Currently subdivisional Head Clerks go around teaching DC leaders in record keeping and basic book-keeping. They believe many registers - Administrative Sanctioning Register, Technical Sanctioning Register, Check Memo Register, Bill Register etc - could be simplified for the use by farmers. DCs need training in how to prepare a Work Plan for the next year.

Self-Strengthening Evaluation Results of PRAs Held in Godavari and Krishna Delta Areas

41. In this section, a summary of the self-strengthening evaluations carried out as part of four PRAs in the Godavari and Krishna Delta areas is presented. As the Godavari and Krishna Delta areas share similar socio-economic and agronomic characteristics, it is possible to combine the results of four group evaluations to prepare one composite report. It is however necessary to conduct similar group evaluations in the other two agro-economic regions of AP to develop a comprehensive picture of what is happening under the FO program.

42. Both Godavari and Krishna are water abundant areas with very fertile land. The average landholding size is 1.5 ha. At many locations in the command areas, tenants cultivate land on an annual basis by sharing inputs and harvest. The area cultivated by tenants in both areas ranges from 20 - 70%.

Water Management

43. Adequacy of water distribution to all holdings in the command area: All participants were of the view that recent minimum rehabilitation carried out by them have significantly increased assured water supplies especially at the tail-end areas. In a DC command area in Guntur District, only 40,000 acres out of 47,000 were cultivated for several decades due to inundation of tail-end lands. After the rehabilitation of canals and the drainage system, the full command area is ready for paddy cultivation. In one WUA command area, until recently the maximum discharge of water was 40 cusecs; but after the rehabilitation, it has increased to 95 cusecs, the original design discharge. On one distributory canal, prior to rehabilitation, it took about five days to convey water to its tail-end areas; but after the rehabilitation, it takes only 12 hours to reach its tail-end area. This was mainly due to two reasons. First, the rehabilitation of canals, de-silting and de-weeding have brought the canals to their original design level. One WUA had to "excavate" over 20 km of canals to bring water to the tail-end areas. Some abandoned lands were brought under cultivation after many years as water became available in the tail end areas as well. In one DC command, the total land reclaimed as cultivated land exceeds 1200 acres. Second, drainage works at the tail-end areas helped to remove excess water, particularly after the recent heavy rains in the area. Drainage rehabilitation has not taken the same momentum of irrigation canal rehabilitation. But a substantial part of drainage
rehabilitation is over. A good indicator of this is that although most of the cultivated lands are low-lying, floods or inundation did not threaten them during the recent heavy monsoon season mainly because of better drainage facilities. One major benefit of this is a significant change in the transplantation calendar. Earlier it, on average, took 45 days to complete; but now it takes only 15-21 days. At several villages visited, paddy transplantation was done after several decades. Many farmers had managed to transplant by mid-August. This allows them to harvest the paddy crop before the on-setting of floods at the beginning of the harvesting season. Farmers could also reap at least 10% more of yield. The average yield per acre is about 28 bags (70 kg/bag) per acre. During the last season, each farmer harvested 2-3 extra bags due to early transplantation. The overall performance of this indicator is 75%.

44. **Farmer Participation in Warabandi:** As both delta areas are usually water abundant areas especially in the kharif season, warabandi is not widely practiced. During the rabi season, there is some shortage of irrigation water to cultivate the entire command. After the rehabilitation of canals, there is no warabandi system as all areas of the command, including tail-end areas receive adequate water for cultivation. In some delta areas, an informal warabandi system called puta is practiced by villagers. Under this system, water is issued in 12 hour turns. Water is rotated along the minor among watercourse outlets. But as farmers cultivate only one crop of paddy in their irrigated land and they irrigate field-to-field, the need for warabandi hardly arises. No evaluation.

45. **Adoption of Water Saving Methods by Farmers:** Farmers do not waste water even though in kharif water availability exceeds demand. Many farmers allow water to remain in their holdings until the silt is deposited. In the water deficit rabi season, they do not hold water in the holdings but send water to their adjacent holdings. Field-to-field cultivation of land demands careful use of water. Most farmers know that the over use of water does not give them extra yield. "water management awareness is there - minimum use of water gives more yield" one WUA leader said. Overall evaluation - 50 to 75%.

46. **Capacity to Resolve conflicts among farmers by WUAs:** Before WUAs were elected by farmers, there were several rural organizations in the area - gram panchayats, Primary Agricultural Cooperatives and Village Committees. Especially Village Committees ensured the cooperation among villagers in water distribution matters. This role is now taken over by WUAs. The important factor in this regard is the legal recognition and sanctions FOs could impose on those who break rules. Now WUAs’ Territorial Constituency Directors (TCDs) deal with conflicts among farmers in their respective constituencies. If a Director fails or any party to the dispute does not agree with him, an appeal may be made to the WUA or if necessary, to the Distributory Council. Usually, water-related conflicts do not go beyond a WUA. Another important change in villages is that earlier various political factions tended to control local institutions which in turn lead to bias decisions and political favors. But WUAs, as independent bodies, could arbitrate conflicts and deliver fair judgments. Farmers believe that FOs are impartial in arbitrating disputes related to irrigation water management. Overall Evaluation - 100%

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6 Managing Committee (MC) members of a WUA.
Operation and Water Management

47. **Canal Cleaning by farmers in each cultivation season:** Traditionally farmers do minimum cleaning of watercourse just before the *rabi* cultivation season. Many farmers were free-riders and most of the work was done by tenants. De-silting and de-weeding were done only to get water to their individual holdings. One reason for the scarcity of water at the tail-end areas is the conveyance difficulties due to poor canal maintenance. The ID cleaned the main, branch, distributory and sometimes minor canals, with its own labor or hired labor from nearby villages. Under the minimum rehabilitation program, FOs have de-silted, de-weeded and strengthened the canal banks so that the designed duty of water could flow in the canal. All these works were completed by farmers themselves. They did not hire contractors to do these works. About 4 years ago, a group of villagers mobilized farmers of several villages to de-silt the distributory canal. For this, the group collected Rs 200 per acre from each farmer. Next year there was no need to organize free labor for canal cleaning. But WUAs will either have to raise sufficient funds for canal maintenance or have to donate free labor towards this task. But most of the WUA presidents feel that at least for several years they will not have to do major canal cleaning. Moreover, if water charges are collected from all farmers, WUAs should be able to maintain canals in good working condition. Overall evaluation - Overall evaluation - 75%

48. **WUAs’ capacity to minimize damages to irrigation structures:** Farmers frequently damaged irrigation structures during water scarce periods. Often the tail-enders damaged upstream structures in order to get water to their fields. After the establishment of WUAs, such damages have drastically reduced. The main reason for this is the significant improvement of water supply to all command areas as a result of minimum rehabilitation program. The second reason is the powers vested with WUAs under the 1997 FMIS laws to punish transgressors. The collective interest in using water efficiently and an incipient sense of ownership of canals also discourage any farmer who wants to damage the canals. The more important thing is if a farmer has any complaint about his water allocation, he can appeal to the WUA or DC for a correction. Overall evaluation - 100%

Communication through WUAs

49. **Upward linkages from WUA to Distributory Committee Level:** A clear and constructive relationship is evolving between the two institutions. The main reason for this is the election of DC members from among WUA presidents. DCs, on the other hand, share their views with WUAs and attempt to make decisions in consultation with WUAs. Farmers of all WUAs within the command area of a DC attend meetings and discuss issues related to them. Overall evaluation - 75%

50. **Downward linkages from WUAs to farmers:** Cordial relationship prevails between WUA leaders and farmers. Farmers have easy access to their TCDs who could resolve problems and conflicts without referring them to WUAs. Farmers feel that their leaders are highly committed and honest workers who spend their time for the benefit of others. A farmer said “they [WUA leaders] mix with us, listen to us, worry about us and we do not have any quarrel with them...They are not egoistic.” Farmers have a clear perception of WUA leaders’ role in water management and conflict resolution. Overall evaluation - 75%
51. **WUAs relationship with the State Agencies:** In one DC area, WUA leaders felt that their relationship with the ID officials is strained. They think that the ID officials are still not mentally prepared to work with farmers as partners in “rural awakening.” They still cannot accept WUAs or the philosophy behind their creation. Sheer inertia runs their lives and they would like to protect their “rights”. However there are some state officials who are keen on the devolution of powers to rural farmers. In their area things move because of the District Collectors, despite the ID officials’ resistance. One District Collector has vested WUAs with the management of irrigation canal banks, drainage bunds, trees, and grass in their command area. Others, farmers think, will follow suit. Earlier, these resources were controlled and managed by the gram panchayats. Then these resources were auctioned for Rs.1000 or less. But WUAs now auction these lands for grass cutting and earn Rs 20,000 on average. WUAs think that they should take over the management and maintenance of canal banks and inspection roads. This right emanates from the duty of a WUA to safeguard the canal banks. Unless WUAs stop cattle feeding on the canal banks, it is difficult for them to take the responsibility. One WUA President said “Cattle feeding is the number one enemy of canal irrigation.” Another issue that WUA wants to take up with the ID is how to recover the encroached land by farmers by the canal banks. These lands are to be included in revenue records as cultivated land. At some locations, it is necessary to recover encroached lands to safeguard canal banks. Overall evaluation - 25%

52. **Relationship with other WUAs:** WUAs in a DC command area usually support each other in water distribution matters. For example, WUAs in the upper end of a Distributory canal usually are aware of the irrigation needs of the WUAs downstream. Through WUAs and DCs they have widened their horizon to include their fellow WUAs in irrigation management. WUAs are willing to introduce water rotation if water is scarce in order to provide water to the tail-enders. Many water-related disputes among WUAs are amicably resolved, and sometimes the DC’s assistance is useful. Overall evaluation - 75%

53. **Capacity to fulfill agricultural needs through WUAs:** WUAs have not thought about agriculture and marketing as they are thoroughly busy with construction and rehabilitation works. But once system rehabilitation is over, they plan to have Agricultural Plans for each cultivation season. Already they have transplanted their paddy in less than 50% of usual time that they used to do. Primary Agricultural Cooperative Societies (PACs) play a vital role in agriculture. They attend to farmers’ input needs such as seed paddy and fertilizer. At a number of locations, WUA Presidents are also the Presidents of PACs. This facilitates the mutual work of WUAs and PACs. Agricultural Department’s activities are conspicuous by their absence. Farmers think that the AD should work along with farmers so that farmers could improve their agricultural production using assured water supplies. Overall evaluation - 25%

**Water Charges Payment**

54. **Percentage of farmers who pay water charges:** Usually less than 50% of landholders paid water charges. After the creation of WUAs and especially after the completion of minimum rehabilitation, farmers get assured water and therefore they are willing to pay water charges. They (farmers in the areas covered by PRAs) estimated that over 95% of collection is possible from the next cultivation season. Currently water charges are collected by the Revenue
Department on the basis of crop and area. WUA Presidents expect the government would carry out a formal land and agricultural census with WUAs and estimate the real area of the command of each outlet and the cropping patterns. As land records are now updated, WUA leaders do not envisage any difficulty in assessing water charges and collecting them. Overall evaluation -75%

Suggestions for Reflection and Further Action

55. The above discussion based on various performance indicators shows that the FOs are beginning to function well and perform a useful role in rural areas particularly in the sphere of irrigated agriculture. But there is no reason to be complacent about the FO program as it is still at its formative stage. Moreover, it has so far received all political and legal recognition, financial and technical support to function well. The real test will come when the government withdraws its fund supply to FOs and FOs take over the irrigation systems for management.

56. Human component of the FO program is very heavy. Therefore a ‘learning process’ is the most appropriate style of management. This requires constant vigilance, careful process documentation, adjustments and real adjustment of rules and expectations.

57. Major state-wide training for farmers, WUA and DC leaders and government officials is urgently necessary. Carefully planned training programs are needed to catalyze farmers and government officers in participatory management of irrigated agriculture. Training should be demand-driven. Different regions, different socio-economic classes need different training. It is necessary to separate minor irrigation systems from major and medium systems for training purposes.

58. Continuing joint walk-throughs by WUA leaders and the ID to locate area or site specific problems and to remedy them are needed. Thus the role of the ID officials does not cease with the handing over of irrigation systems to FOs. In this regard, a Maintenance Plans prepared by FOs with the assistance of ID would be useful. The Plans could elaborate the exact requirements of the service need, labor and capital requirements and how farmers could contribute towards such works.

59. A strategy is to be developed to bring other local institutions such as PACs and gram panchayats to work with FOs. This is necessary to avoid jealousies, unhealthy competition and possible sabotage. However, it is important to keep party politics out of FOs as such interventions would destroy the representativeness, independence and fair-play FOs now enjoy.

60. Administrative rigidity, complicated rules and anti-participatory regulations should be removed or at least minimized. Transparency and accountability cannot be built by rules and regulations in a participatory atmosphere, but by mutual trust, support and respect.

61. Too much of pressure and overloading with various activities could lead to a ‘burnout syndrome’—WUA leaders may lose their interest in their work believing participatory irrigation is something that they cannot handle efficiently. Political and bureaucratic demands must take into consideration farmers’ socio-economic conditions and capacities. If farmers’ capacity is not matched by such demands, there is high chance for corrupt practices to creep into FO activities.
62. Practical and simplified book-keeping and record keeping system should be introduced. WALAMTARI’s attempts in this regard are commendable. These simplified proformas should be approved as early as possible and FOs trained in how to use them.

63. Irrigation communication infrastructure is poor. This is one reason for poor communication between farmers and the ID. Quick and efficient information transfer system is essential.

64. Sudden and deep state interest in farmers’ welfare and the large-scale investments in irrigation rehabilitation works could give farmers the impression that the state has at last realized the importance of rural welfare. Although at the regional and district training programs, farmers are being told that the State’s support to rehabilitate their irrigation system is only one-time intervention and therefore farmers should get ready to maintain their irrigation systems in the future, some farmers still believe that the state would come to their rescue if the need arises. Such a deep-rooted dependency on the state is detrimental to participatory development endeavors. The state should take appropriate action to arrest the spread of such views and to convince them that they have to take over the management and maintenance of irrigation systems and run them as self-financing entities. While government assistance to FOs with investment is appropriate, self reliance as regards O&M is a goal to be reached as soon as possible.

Jayantha Perera
Anthropologist/WUA Specialist
5th October, 1998
ANNEX 11

AP Chief Minister’s Inaugural Address to India’s Fourth National Conference on Participatory Irrigation Management, January 1999

FOURTH NATIONAL CONFERENCE ON PARTICIPATORY IRRIGATION MANAGEMENT, NIRD, HYDERABAD

INAUGURAL ADDRESS OF
SHRI NARA CHANDRA BABU NAIDU,
HONORABLE CHIEF MINISTER OF ANDHRA PRADESH
NIRD, JANUARY 19, 1999

Ladies and Gentlemen,

I welcome you all to the Fourth National Conference on Participatory Irrigation Management being conducted for the first time in the historic city of Hyderabad. It is all the more appropriate to have this Conference in Hyderabad, in view of the major strides we have made in Andhra Pradesh in the field of PIM. In the last few years we have initiated a paradigm change in irrigation management across the State. So far, we have been talking about the experiences of the Philippines, Mexico and Turkey on PIM. Today, my Government has initiated a paradigm shift, which covers 4.84 million hectares, which to my mind ushers in a phase of economic independence for the irrigated farmer. Our idea was to allow farmers to undertake management of State irrigation systems so as to realize the full potential of these projects as well as to ensure their own prosperity by embarking on a self-sustaining and autonomous growth path.

My Government has taken a pragmatic view of development. This, we intend to do by adopting the most modem methods and techniques available to us. In governance, in infrastructure, in industry and communications, we seek the best, and the best is usually cheaper in the long run.

What then is our strategy and methodology for the rural sector?

- The first issue of importance is that my Government's programs are based on direct participation of the beneficiaries.
- The second issue is that it has been decided that all development works should be conducted, supervised and overseen by village-level institutions of a permanent nature.
- The third issue is the need to simplify the process of governance and development.

We have formed a number of self-help groups under Jammabhoomi. These include Water User's Associations, Village School Education Committees, Vana Samrakshan Samithis, Watershed Committees, Women's Thrift Groups, Chief Minister's Employment for Youth (CMEY) and many more to come. These program involves the officers, elected representatives and people, in doing the simplest things that people want - clean water, freeflowing drains, roads,
schools, hospitals etc. But the people must participate, they must contribute their share either in labor, cash or material. Unless they participate it will not be their program but the government's.

Coming to irrigation, this is the leading input in our agriculture. It defines the man and the family. It determines his income, his status, and his security: money is lent to him, crops are safe, uncertainty is reduced, and in many instances, he is free to do other things in between ploughing and harvesting.

For nearly 20 years we have been talking about irrigation management. The State has been spending huge amounts of money on irrigation. Great dams, wide canals carrying water to great lengths have been built. Yet no one is happy of the outcome. The State finances do not receive a rate of return sufficient to pay back moneys borrowed; irrigated farmers were in a state of revolt over failure to deliver water on time. New projects were being held up as financial institutions needed to be shown how money could be returned if projects did not pay for each other. The State budgets were in a horrendous condition and could not accommodate the requirements of irrigation projects.

Whatever O&M funds were available were spent in areas without following any rationale. Even this expenditure was made in a hurry during the short canal closure period, without planning, usually inevitably at high cost and low quality and, sometimes, without the work being done. A few individuals, either elected representatives or engineers, set work priorities and some contractors made full use of the situation and everyone involved was happy in his own way, except farmers.

My Government was motivated as much by the desire to empower the farmers as to bring about efficiency and self-reliance to the irrigation schemes. It decided to take on the task of covering the entire State in one go.

Yet to do this was not as simple as it sounds. We went about it systematically. We involved a core group to plan a strategy of introducing Participatory Irrigation Management. We used every modern method available to us. Mass meetings of farmers, workshops, seminars, audio-visual presentations, data dissemination, posters, and handbills created an environment in which the entire State was taken into confidence. This openness, transparency, willing to carry on a dialogue and listen, has helped us immeasurably. The White Paper, the Draft Bill, and finally the Act and Rules set not only the legal framework but also helped establish the political consensus on this issue. The Act passed the Assembly without a single dissent vote - unanimously.

Naturally, there was some resistance to this change coming from within the Government- the ID. They had got used to the exercise of power and like anyone else were reluctant to give it up. There were chaotic conditions on the canals, farmers were agitating, canals and other structures were being breached to gain access to vital water. It took some time to convince the ID to accept the change.

This paradigm shift would mean, that after two or three years, the farmers will be in a position to run their own projects, pay and execute their own O&M and they will be liberated from the Government and ID.
The Government of India has been promoting PIM, but that is not enough. It requires more focused and concrete action. While seminars and conferences serve an important purpose by creating awareness, these have to be followed up by providing funds also for making PIM successful. Funds are needed for rehabilitation, which could be done through farmers' organisations. The Government of India may like to recast the Command Area Development Programme to make it more oriented to PIM. The WUA's can then take care of on-farm development works much better that the present agencies. AP has demonstrated the big bang model, perhaps you could draw very many lessons from this exercise. We also could benefit from your constructive criticism.

I deem it fit that Government of India should make a renewed commitment to Participatory Irrigation Management and start a corpus fund for promoting PIM, besides making available funds for minimum rehabilitation of irrigation projects, through farmers organisations. Time has come for us to optimize production and productivity by maximizing irrigation efficiency. PIM should not be merely viewed as a water management program but an integrated strategy to irrigated agriculture - a basis for the second Green Revolution.

During the Vijayanagar Empire, the state built irrigation projects but the farmers managed them. They had their tank supervision committees, their tank fund, and they had hereditary "nerritti" who received grants of land in the tank ayacut for managing the water. They paid half their output as tax and yet managed to finance O&M. In Nellore district any number of inscriptions of the Vijayanagar period exist stating that farmers were to pay a "kuncham" for every "putty" of paddy produced for the upkeep of the tanks. This amounted to 1.25% of the output. My government has raised water charges, a bold step no doubt, but it is not enough.

Now what we need to do is to develop an integrated plan for the development of irrigated agriculture for ensuring food security, crop diversification and growth of rural incomes. Modernization is achieved by following modern methods and practices, by using modern tools and training, by developing a rational and scientific culture. My Government will help in doing this for the farmers for as long as it is needed.

The Government intends to apply the WUA system from the very planning stage, to the new projects. In future, WUA's will participate in design, planning and funding as well as in execution of the projects.

You will see that there is considerable interest in our reform process both in India and abroad. People see us doing what was previously considered impossible. My Government has shown that the impossible needs only effort, time and planning - above all it needs political determination and will to do it. People who see us doing these tasks will be confident that we can do other, less exacting work. They will join us in developing industry, infrastructure and any other venture that they may be interested in undertaking in Andhra Pradesh. Get these basic works, literacy, education, healthcare, power, irrigation, rural development right and the other sectors will be taken care of by the private sector, Indian or foreign. Even law and order is critically dependent on the economic and cultural level of the people. Where the population is prosperous and content, law and order will not break down.
To modernize agriculture we have to help to modernize farmers. Their attitudes should become more like businessmen who calculate their costs, interest and time. The irrigated farmers of today are no longer the subsistence farmers of times past. They are hiring tractors for ploughing, mechanical harvesters, applying expensive fertilizers and pesticides. Their cost of cultivation works out to Rs. 3,500 per acre or more. My Government believes that every ordinary citizen is prepared to pay reasonable cost for services, as long as these costs are not based on inefficiency and waste., and as long as these costs are made clear and transparent.

I welcome you all to this Seminar and request to take this opportunity to study our reform. I am sure that many of the features will appeal to you, but also know that some will not be, applicable to your States. You may also think of things, which we have missed. We would be grateful for your feedback and contribution.

Again I urge all of you to take this message home to your States: Change will come, it has to come, it is better to initiate it than become subject to chaos. A great writer said, “If things have to remain the same, they have to change”. If irrigation has to be maintained, our institutional structures and relationships have to change. True, there will be resistance. What change can ever take place without resistance? If there is no resistance then the change is fictitious. We too have encountered resistance from irrigation officials and bureaucrats. All have to be overcome. The interests of the farmers are critical for our country’s survival.

"JAI JANMABHOOMI"
ANNEX 12

Map of Districts and Water User Associations in Andhra Pradesh
(Source: I&CADD, Government of Andhra Pradesh)
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