

**FINANCIAL VIABILITY
OF
IRRIGATION COOPERATIVES**

An Exploratory Study in Gujarat

*Research Report
(PIM)*

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PREFACE

DIMENSIONS OF FINANCIAL VIABILITY OF IRRIGATION COOPERATIVES

Anil C Shch¹

Mohani failed, may fail again

Mohani Irrigation Cooperative in Gujarat (India) was a highly acclaimed successful Farmers' Organization managing the canals transferred to it by the State Irrigation Department. From 1978 when it was established, for the next 16 years it held its reputation high attracting visitors and admirers from all over the country. The reputation was well deserved. For 16 years it recovered almost 100% of the water charges from members. This amount varied between Rs.1, 60,000 to Rs.3, 00,000², depending upon the area and crop raised by the members. The society paid to the Irrigation Department 100% of its due charges, ranging from Rs.1, 80,000 to Rs.2, 30,000. Mohani irrigation cooperative purchased a tractor and complimentary implements in the very first year and hired them to members at rates that covered society's cost but still lower than the prevailing rates.

All this mainly due to the first Chairman Bhikhubhai who managed the society for first 10 years and brought glory to it. I had visited the Mohani society sometime in 1986 to learn from its experience how to initiate Participatory Irrigation Management (PIM) in AKRSP programme where I was its Chief Executive. We were all admiration the way society was managed. However around late nineties one started hearing stories that mocked the achievement and reputation of Mohani, which had started failing in payment of water charges to the Irrigation Department. I was therefore shocked to learn about disparaging remarks about Mohani. I visited the society in April 98, was distressed to find a changed situation. The recovery of charges from the farmers declined to 92% in 1996-97, 75% in 1978-98 and then 59% in 1998-99 and when I visited in 1999 the

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recovery was 35%. The arrears of payment to Irrigation Department started accumulating. In 1995-96 as against Rs.160 lakhs³ due to Government, only Rs.18 lakhs were paid, then no payment for the next two years.

The maintenance was poor. The research team of our organization - Development Support Centre (DSC) - that visited the society next year found that there were big holes, uneven levels and silt deposition in the canals.

The management efficiency had declined. In 1994, the society had decided that the farmers who do not clean their field channels would not get water. This was not enforced. Again the conflicts were increasing, mainly related to breaking of norms like head-reach farmers taking water twice in rotation, excessive wastage of water. The Executive Committee made rules, not observed even by members of the Executive Committee. The society raised the penalty / fine from Rs.50 to Rs.500 for those who break the norms of rotational water supply. Not enforced. Society's tractor and ancillary equipments that were contributing revenue to the society, started making loss.

This downhill slide was mainly because after Bhikhubhai retired, there were five presidents in the next 10 years. There was too much dependence on the secretary, in charge since society's inception. In fact secretary's control and domination is one of the reasons for Mohani's failure. He had equated his position to a Government official and therefore whenever there was revision in government pay-scale, dearness allowance, the society, virtually the secretary applied the same in his case. Consequently the administration cost went on rising so much so it became 38% of the total expenditure of which 60% was salary component. Laxity in administration aggravated. Farmers so managed that they were charged for paddy crop at lower rate when they actually raised sugarcane crop depriving society of its due charges.

The society's decline first showed in its failure to pay Government charges but the decline was all-round in its physical assets and in its financial, administrative and leadership areas.

² Approximately 1 US \$ is equivalent to 46/- Indian Rupees

DSC studied Mohani and found that it had failed because the management did not enforce its rules and norms – water charge collection declined, society defaulted in paying dues to Government, physical system deteriorated – and neither the local management nor the supervising authorities – the Irrigation Department and the Cooperative Department- discharged their responsibilities of supervising and checking when deterioration was taking place. Following the study, DSC's intervention and Irrigation Department's constructive response restored the financial health of Mohani. However, DSC was not confident that Mohani would be shining forever. If those responsible for ensuring healthy working of irrigation cooperatives, particularly society's own management, did not attend to their responsibility, Mohani may fail again. In fact that was the title of DSC's study – "*Mohani may fail again*"⁴

Issues in healthy working of irrigation cooperative

DSC is engaged in promoting and supporting local organizations of the stakeholders like irrigation cooperatives and therefore it is interested in examining their functioning and identifying issues that need to be attended to for their healthy functioning. DSC therefore undertook study of seven irrigation cooperatives in Gujarat promoted by NGOs as well as Irrigation Department. The sample irrigation cooperatives were purposively selected that were functioning for five years and were located in different districts. The study looked at viability of the ICS from financial angle - the expenditure and the income of each society over the last 5-7 years.

The main items of **expenditure** for irrigation cooperative are:

- administrative expenses - secretary's salary and other administration costs.
- Maintenance and repairs

While transferring the responsibility of maintaining and operating the canal system, Irrigation Department in Gujarat permits irrigation cooperatives to retain 20% of water charges collection for its administrative cost and 30% for maintenance and repairs (M&R).

³ 10 lakhs is equivalent to 1 million

Expenditure Analysis

The study brings out to what extent expenditure on administration is covered by the grant for administration and similarly for M&R. From the detailed comparable information available from four irrigation cooperatives, it is found that the expenditure on maintenance and repairs is 2 to 4 times the grant received from Government.

The situation with regard to grant and expenditure for administration for the four irrigation cooperatives is as under:

Names of Irrigation Cooperatives	Government Grant for Administration Rs.	Expenditure on administration Rs.	Proportion of expenditure over grant (times)
Kakdiamba	7507	42000	6
Chopadlavav	13700	25700	1.8
Rangpur	10700	6000	0.43
Thalota	5900	11500	1.95

It is seen that except in case of Rangpur, all irrigation cooperatives are spending 2 to 6 times more than the Government grant they received for the purpose.

The irrigation cooperatives in Gujarat are able to spend more than Government assistance because they are permitted to fix water charges that may be higher than the Government rates. Considerable efforts had gone into securing such an order from Government that is recorded in my paper "More or Less"⁵.

It is highly creditworthy of the irrigation cooperatives that they decide to charge much higher charges for supplying water than India's Irrigation Departments, which in most of the states are unable to raise water rates for decades.

⁵ Describes the process of influencing changes in conditions of incentives and disincentive in the govt schemes of transferring govt irrigation projects to Water Users' Association (Prepared in IDS in 1996 and updated in 1999)

Income Analysis

Analysis of average of income generated through additional water charges as compared to government grant for administration as well as operations and maintenance is presented below:

Names of irrigation cooperatives	Average total govt. assistance	Average income of additional water charge	Proportion of addl. water charge income over govt. grant (No. of times)
	Rs.	Rs.	Rs.
Kakdiamba	20000	61000	3.05
Chopadvav	34400	70000	2.03
Rangpur	26700	23000	0.86
Thdota	14500	18000	1.24

The irrigation cooperatives are deciding water rates 1.43 to 2.7 times the Government rates, to raise funds that would enable them to meet their obligations of maintenance of canals as well as management of water distribution. Thus the experience validates the assumption that ICs would behave in responsible manner, when irrigation cooperatives were permitted to decide their water charges. The stipulation that water charges to be fixed by irrigation cooperatives should not be less than the Government rates, was based on apprehension that some irresponsible leaders of irrigation cooperatives may decide water rates below the Government rates but adequate to meet their obligation of paying Government charges. This is possible because from the water charges collected, the irrigation cooperatives have to pass on to Government 50% of the charges levied. Some irrigation cooperatives, short of funds, may indulge into populism and in the process, may neglect its responsibilities for good management and particularly, good maintenance.

Managing funds wisely

- Raising adequate resources for administration and O&M is not enough. It is necessary to make sure that the management of the cooperatives is efficient and economical. The study brings out that this is not always the case. Chopadvav IC

for instance, doubled the secretary's salary in the year 1998-99. As the case of Mohani has shown irrigation cooperative has to be very careful and vigilant about secretary's salary. It has to be adequate to attract a competent person, but at the same time it should have some relation with quantum of work that may come down substantially in the years when there may not be any irrigation as it happened in case of Rangpur and Thdota in 1999-2000 and 2000-2001. No irrigation, no Government grants, no income from additional water charge and yet minimum expenditure on administration has to be incurred. Since in such a situation workload comes down substantially, the irrigation cooperative can negotiate with the secretary how much of his regular salary he would forego. This has actually happened in case of Rangpura when the secretary did not draw any salary during the drought years where there was no irrigation.

- The irrigation cooperative has also to maintain tight control on other administrative expenditure – for example, in case of Kakdiamba IC, administrative cost is much high at an average of Rs.32,000/ per year - (per hectare Rs.116/-) as compared to Chopadvav IC's average of Rs. 13500/- (per hectare Rs 36/-), Rangpur's average Rs.2000/- (Rs.9/- per hectare) and Thdota's average Rs.5,500/-,(Rs.7/- per hectare). Obviously there is considerable scope for reducing expenditure on administration in Kakdiamba and Chopadvav that incidentally are in tribal areas of south Gujarat.

Real Test of Financial Strength

Even if a good irrigation cooperative attends to routine and major (annual) repairs, as discussed later, it may suddenly need funds for meeting emergency needs. Like any other well managed organization, irrigation cooperatives should regularly save funds that they can access in emergency. DSC study has brought out the financial strength of the irrigation cooperatives in terms of surplus funds available, as shown in the following table:

Financial Strength of ICs (as on March 31, 2002)

(Figures in Indian Rupees)

	Kakdiamba	Chopadav	Degawada	Jetpur *	Rangpur	Thdot
1) Cash at bank	220445	6827	79124	73	223943	82348
2) Payables	205910	474919	0	1300	0	0
3) Receivables	139742	567259	84424**	0	40000	0
4) Share Capital	102700	69802	1900	3410	13400	22200
5) Surplus available (1+3-2-4)	51,577	29,365	161,648	-4637	250,543	60,148

*It is now almost defunct because of extremely high non-recovery problem. Figures of this IC are for year ending March 31, 2000

** Recovery low last year because of consecutive droughts.

It would be seen that except irrigation cooperative Jetpur, which is almost defunct, all irrigation cooperatives have saved sizeable amounts which they can access during emergency. These funds also help the irrigation cooperatives to tide over drought years when there may be small or no area under irrigation and therefore small or no income required for unavoidable expenditure.

Tricky Issues in Maintenance and Repairs

Maintenance of canals is a very important responsibility transferred to irrigation cooperatives. They must attend to proper maintenance of the systems transferred to them, otherwise as in case of Mohani, the system would deteriorate, reducing the area irrigated and consequently fall in water charges collection - leading downhill the working of entire society. DSC's researcher has looked into various facets of maintenance such as Government norms (which are never applied in practice), norms suggested by various cooperatives (for which there is no large basis). However the subject is so important that HR Wallingford UK, instituted a study leading to their publication of "Guidelines for Irrigation System Maintenance"⁶. They have suggested regular inspections during operations and major inspections at the end of irrigation season. Some of the important points made in the Guidelines are:

- Routine maintenance

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- Annual maintenance – should be planned when the irrigation system is shut down to permit desilting, gate repair and painting, channel protection works, earthwork etc.
- If regularly maintained, maintenance costs are small as compared to the benefit of reliable water supply.
- Maintenance is preventive – “a stitch in time saves nine”.
- Emergency maintenance – urgent or temporary repairs required to maintain water delivery following breaching or sudden failures in the system.
- Calendar for repairs and records to be maintained
- Inspections, survey and design
- Priorities for various maintenance problems
- Budgeting for maintenance etc – reserves for future and emergency maintenance

However it would be unrealistic to expect that the ICs will follow scrupulously such Guidelines. The tendency is to “stitch” when there is a “tare”, to undertake repair only when there is a breakdown (emergency). This is true for other assets also – motor car, house, even one’s own body! As a rule no one likes preventive care. This may be unwise and the supporting as well as supervising agencies must help the ICs to introduce regimes that will ensure preventive maintenance as well as damage control in time. Maintenance regimes should be certainly part of the training of the office bearers of the irrigation cooperatives. This should also be part of “performance review” by a multi-disciplinary team, at least once in two years, as recommended by the Gujarat Task Force on Participatory Irrigation Management. Unless this is introduced and observed, irrigation cooperatives may go the same way as Mohani.

Executive Summary

Financial viability of an institution implies that the institution is capable of generating enough funds for meeting its regular operation and maintenance (O & M) and emergency expenses. The objectives of the study were- identify and analyze the critical factors for financial success/ failure of irrigation co-operatives, elicit the conscious steps taken by the supporting agency and farmers for ensuring the financial strength of these ICs, and develop recommendations for fostering and enhancing financial viability of the ICs while simultaneously taking adequate care of M & R of canals.

Only the ICs that have been active for at least five years and had experience of watering for at least three years were considered for the study. Seven ICs were studied. Four supporting agencies - AKRSP, NMSWDF, DSC, and Irrigation Department were involved in the study. The present financial status of the WUAs (including expenditure and income analysis) along with situation of maintenance and repairs, situation in drought years, comparison of water charges, and scope of diversification was analysed.

Analysis of expenditure revealed that the WUAs are incurring high expenditure on salaries and administrative expenses. Of the total expenditure incurred, secretary's salary is almost 15% in Kakdiamba, 26% in Chopadvav, 10% in Rangpur, and 22% in Thdota. Operators' salary takes the largest portion of the expenditure- 33% in Kakdiamba, 22% in Chopadvav, 41% in Rangpur and 33% in Thdota. Administrative expenses are very high in Kakdiamba (45%), then Chopadvav (29%), followed by Thdota (20%) and is very low in Bhetasi (7%) and Rangpur (only 5%). Kakdiamba invests very less in maintenance and repairs. After including voluntary labour, around 8% is invested in M & R here. In Bhetasi 58% of expenditure is on M & R, followed by Rangpur (43%) & Thdota (33%) and then Chopadvav 24%. In both the lift irrigation co-operatives, salaries (operators' and secretary's) account for nearly 50% of the total expenditure. Expenditure on M & R of lift-irrigation infrastructure account for 15% in Degawada and 20% in Jetpur. Rest is spent in administrative component which is again also very high.

Per hectare surplus generated by the different ICs are- Rs.16 (Kakdiamba), Rs. 128 (Chopadvav), Rs. 127 (Rangpur) and Rs. 124 (Thalota). Lift irrigation society Degawada generates per hectare surplus of Rs. 294 while Jetpur generates only Rs. 21.

The additional water charges (ranging normally from 15-20% higher than government water charges) levied are diverted to meet the salary of the paid employees and administrative expenses. For reducing expenditure, voluntary labour was found to be an effective means and has been institutionalized by Rangpur and Kakdiamba, and to some extent by Chopadvav. Kakdiamba saves around Rs. 25000-30000 every year through voluntary labour on minors as well as main canal. Chopadvav has also saved through voluntary labour in the past but this is not a regular exercise. Rangpur also saves around Rs. 15000-20000 each year through voluntary labour.

Income analysis revealed that government rebate for operation & maintenance is important for meeting the financial needs of the ICs. On an average Kakdiamba and Chopadvav have got around Rs. 20000 and Rs. 33000 as rebate respectively. Rangpur and Thalota Rs. 27000 and Rs. 15000 through rebate. Additional water charges (over and above government rates) is the only flexible and substantial means to augment the revenue of ICs. It varies from 15-20% for individual crops, and Rangpur has even levied up-to 100% higher additional water charge on one crop. Different ICs employ different method of charging additional water rates, Rangpur & Thalota charge on crop-area basis (margin being higher for high value crops e.g. for Wheat the margin is Rs. 85/ Ha while for Castor & Mustard, the margin is Rs. 143 / Ha), Kakdiamba & Chopadvav charge flat rate for all the crops per watering, Degawada charges flat rate for all crops consuming less water for whole season while higher rate for crops needing higher amount of water, Jetpur charges on volumetric basis, while Bhetasi doesn't levy additional water charges. Interest from bank is very useful to meet the needs of ICs in the drought years and for building reserves.

Analysis for drought years revealed that apart from diversification (only undertaken by Thalota), interest from cash at bank is the only source of income. Kakdiamba, Chopadvav and Degawada have incurred heavy losses. In Kakdiamba, Chopadvav,

Rangpur, and Thidota the expense incurred on M & R is nil. In Kakdiamba and Chapadvav substantial expense on salary of secretary in the drought years have been incurred (Rs. 12000 and Rs. 24000 respectively)

Analysis for diversification was done and it was found that this is an over-emphasised area by the PIAs. Diversification has a limited scope and has to deal with a number of issues. Hence this policy should not be over-emphasised and generalised. Diversification should only be undertaken after sound planning for long-term effects and effective management.

The study has brought out factors affecting financial viability which can be grouped into two major categories- Factors which can be altered and those which cannot be altered. Factors which cannot be altered are- command area per unit length of canal, canal sections & structures, water availability, number of shareholders. The factors which can be altered to assure higher financial gains and minimum losses for the irrigation cooperatives are- lined and unlined canals, interest from cash at bank, subsidy for maintenance and repairs, avg. additional water charges gained/ha, voluntary labour, recovery problems, efficient water distribution, diversification activity and administrative expenses.

Findly, the outcome of the research study suggests that voluntary labour should be institutionalized as it is an effective cost-cutting measure. Value of voluntary labour contributed by the member farmers should be entered separately in the book of accounts. Margin on water charge should be higher for high value crops than that of low value crops and charges on per watering basis can be levied for ensuring that farmers using higher quantity of water should pay higher.

Better management of irrigation system should be ensured to increase the command area irrigated. Some portion of yearly surplus of the IC should be deposited as fixed deposit to earn a fixed stream of money. As of now, of the rebate of 30% on the timely payment of water charges is for O & M (which includes Operators' salary as well as M & R grant for the canals). From this

rebate of 30% of water charges offered by the government, some proportion should be reserved exclusively for maintenance & repairs. Norms should be evolved for ensuring adequate investment in M & R.

Rule conformance should be ensured for avoiding grave problem of non-recovery, and diversification should be undertaken only after long-term planning. Separate entry should be made in the book of accounts for the secretary and the operator instead of one entry under salaries for better analysis and monitoring of the expenditure. Secretary's salary should be linked with the amount of work done. During drought years, no salary should be paid to the staff. The IC should monitor its administrative expenses.

In the schemes where the government has charged higher rates for one or two support watering in Kharif season, charges should be taken back by the loser ICs in retrospect. Supporting agencies like AKRSP (I) and DSC should facilitate this process.

Bi-annual performance review of the irrigation cooperatives as recommended by the Task Force on PIM in Gujarat should be introduced.

These suggestions if adopted can provide the much needed push to ICs for achieving good financial health and financial viability. Finally the study points to the need of a new research study – 'Consequence of non-maintenance of canals', 'maintenance needs for long term infrastructure health', and 'procedure for proposing grant requirement for maintenance and repairs of irrigation system'.

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List of Abbreviations

- AKRSP- Aga Khan Rural Support Programme
CCA- Culturable Command Area
CIC- Canal Irrigation Cooperative
DSC- Development Support Centre
EC- Executive Committee
FGD- Focus Group Discussion
GO- Government Organisations
GoG- Government of Gujarat
Ha- Hectare
IC- Irrigation Cooperative
ICMP- Irrigation Operation and Maintenance Policy
ISF- Irrigation Service Fee
LIC- Lift Irrigation Cooperative
M & R- Maintenance and Repairs
NGO- Non-Government Organisations
NMSWDF- NM Sadguru Water and Development Foundation
O & M- Operation and Maintenance
PIM- Participatory Irrigation Management
WUA- Water Users' Association
PIA- Project Implementation Agency

1. Introduction

“ Financial viability of a canal water users’ association (WUA) implies that it is able to generate enough income to meet its regular and emergency expenses and at the same time invest adequately in the maintenance & repairs of canals.”

Though the financial viability of the Irrigation Cooperatives (ICs) is considered imperative and vital for the overall smooth functioning and sustainability of this institution, there is this dearth of studies specifically dealing with the financial functioning of ICs. This may be attributed to the fact that in the initial stages of formation of any institution, the social dynamics are very important. It is the social processes and the dynamics between the various stakeholders, which ensure a sound initiation of any institution. However, as the institutions start functioning, they need money to cover their running cost. Thus, it is here that the financial working issue gains much importance along with the social dimension. The IC should be able to generate some surplus for coping with the unforeseen requirements. A national workshop on participatory irrigation management (PIM) (Water Resource Organisation, World Bank Institute, and IndiaNPIIM, 2001) discussed issues related to financial sustainability of ICs. It recommended vesting of water tax and operation & maintenance (O & M) funds with the ICs; issue of water cards like ration cards, and diversify into profit generation activities like agro-forestry and development of community grazing land.

Oblitas and Peter (1999) recommend raising water charges to three times and also going for private sector investment and water rights & water markets. Water charges are a very important source of income for any IC. Though this issue has been widely accepted by many scholars and researchers, Perry (2001) insists that this is unlikely to be within the “politically feasible” range. He emphasizes the significance of marginal price of water. The issue on water pricing faces a much debated dilemma- to regard water as an economic good or as a basic necessity. Perry, Rock, and Sedkler (1997) discuss this issue very interestingly and adeptly and explain that the complexity of the characteristics associated with this resource make it extremely difficult to arrive upon a water charge and in some cases use of purely economic instruments may even lead to unpredictable negative consequences. Diversification into other activities has been also

advocated to increase the revenue of the ICs. Meizen-Dick (1994) point that increasing profitability implies a need to diversify the activities into multiple functions. Helmi (2000) goes further and suggests the need to venture beyond water-focused management. "Beyond Irrigation as a Socio-technical Process: Moving Towards Irrigation as Business Process" is a significant line of analysis he has taken in his work. Veneracion and Reyes (1983) in their comprehensive study of irrigation associations with non-irrigation activities list a number of non-irrigation activities being undertaken by many ICs.

Apart from the diversification activities, Patel (1990) emphasizes that benefits of IC can be increased by increased utilization of irrigation potential (which is very important for the success of participatory irrigation management). The irrigation potential created can be optimally utilized if the O & M activities are adequately financed. The costs incurred by ICs can be classified into two types - Capital costs and O & M costs. The PIM policy of the Government of Gujarat, India (Development Support Centre, 1999) mentions that for meeting the major capital expenditure on rehabilitation of canals prior to transfer, the government will pay 90% of the cost and the farmers have to pay the remaining portion. The arrangement under PIM is the ICs collect the water charges and retain 20% for their administrative expenses, 30% for the maintenance of canals transferred, and the remaining 50% transferred to the government. If the cost of administration & maintenance exceeds the government grant the O & M cost has to be met by the IC themselves. The Task Force on PIM also recommends using the space available along the canals for plantation raising and hence augmenting the financial resources of the IC. Thus generating enough finances for covering the O & M costs is imperative for the viability of these canal WUAs.

2. Background and Rationale

In the backdrop of the PIM policy laid down by the Government of Gujarat (GoG) in 1995 (Development Support Centre, 1999), the government as well as voluntary agencies had initiated a number of WUAs registered as Irrigation Cooperatives (ICs). The success of these farmers' institutions depends on various factors social, administrative as well as financial. Though most of the ICs are still in their early stages, some can be identified as being financially strong, and some as weak. If we analyze the history of co-operatives, we will find that most of the failed co-operatives were weak in their financial position. Thus, financial viability and self-sufficiency is a must for a co-operative to be sustainable and meet the regular Operation & Maintenance expenses (including administrative expenses, salary of secretary, salary of operator, and maintenance & repairs of canals) and ensure proper maintenance & repairs of the canal. It thus becomes imperative to find out the various critical factors that ensure financial strength of the ICs, and the various steps taken by the co-operatives to increase their revenue and control costs for better financial management.. This exercise gains more importance in view of the proposed legislation of the GoG, which proposes to form ICs (WUAs) by legal mandate throughout the state of Gujarat. The role of subsidies and grant by the government in ensuring the financial soundness of the IC also has to be analyzed. The output of the research study can provide valuable inputs to the policy makers to enhance a conducive environment for successfully promoting the ICs by Government Organisations (GOs) and Non-Government Organisations (NGOs).

3. Objectives

The following are the main objectives of the study-

- Identify and analyse the critical factors for financial viability of irrigation cooperatives
- Elicit the conscious steps taken by the supporting agency and farmers for ensuring the financial strength of these ICs.
- Develop recommendations for fostering and enhancing financial viability of the ICs and ensuring proper and regular maintenance & repairs.

4. Methodology

For identifying the critical success factors, detailed study dealing with financial aspect of the selected co-operatives was carried out.

4.1 Sampling

PIM in Gujarat, though launched in 1995, has not made much progress in terms of numbers. However Gujarat government's serious intention of scaling up PIM is known from its appointment of a Task Force on PIM and the comprehensive report it has submitted to government in April 2003. In view of this scenario it was considered useful to make qualitative study by taking such a sample that will bring out the factors that impact the financial viability of WUAs and what policy measures may be appropriate for ensuring it when the law is enacted and a large number of WUAs are established.

Purposive Sampling was used in the study. The list of all the ICs that have been active for at least five years and had experience of irrigation for at least three years formed the sampling frame. The financially strong and weak co-operatives were identified after discussion with the senior staff of Development Support Centre (DSC), Aga Khan Rural Support Programme (AKRSP), NM Sadguru Water and Development Foundation (NMSWDF) and the Irrigation Department. Seven co-operatives were studied.

4.2 Data Collection

Secondary data was collected through the record of different supporting agencies. The Income-Expenditure Account and Balance Sheets of the various ICs were collected. Primary data was collected through focus group discussions (FGDs) with the Executive Committee (EC) of IC, personnel interviews with the field implementation unit staff and various policy level actors.

4.3 Tools used

Checklist and Observation were used as tool for primary data collection

4.4 Data Analysis

The account books of the various ICs were analyzed for assessing the trend of revenue generated, operation & maintenance costs, and reserves & surpluses. As well as the various steps taken for improving its financial strength were studied. Findly, the factors affecting the financial viability were elicited through discussion with the members of ICs, supporting agency and policy level actors.

4.5 Limitations of the study

The following are the limitations of the study which also explain the variation in the findings to a certain extent-

- Since all the canal irrigation cooperatives studied are based on the principle of flow irrigation, the command area per unit length of canal is different in all the cases.
- The geographical area, and hence topography varies from one IC to another.
- There would be difference between expenses on lined and unlined canals.

5. Findings and Analysis

The study findings are presented as following –

- Presented status of Financial Viability
 - Analysis of Expenditure
 - Analysis of Income
- Situation in drought years
- Comparison of water charges
- Scope of diversification

Note: The profile of sample Irrigation Cooperative is attached as *Annexure 1 (Page 57)*

5.1 Present status of Financial Viability

Analysis of Expenditure-

- Maintenance & Repairs expenditure
- Salary of secretary, operator and other staff
- Administrative expenditure
- Minimising expenditure through voluntary labour

Analysis of Income-

- Government assistance for-
 - Maintenance
 - Management
- Additional water rate collection
- Interest from balance at bank Income from additional services
- Others- such as penalty

Other factors which affect income are-

- Quantum of water available
- Area irrigated
- Recovery

5.1.1 Analysis of Expenditure

Maintenance & Repairs Expenditure-

The average figures of various components in O & M expenditure (including expenditure on maintenance & repairs of canals, salary and administrative expenditure) show that all the ICs are spending a large portion of their expenditure in the salary and administrative component (detailed IC wise information on income & expenditure given in *Annexure 3 on page 50*). The Irrigation Department gives subsidy for O & M in the form of rebate on timely payment of water charges (50% of water charges levied by the government-30% points for M & R which includes operators' salary and 20% points for other administrative expenses). The table below compares the actual subsidy given by the government & actual expenditure incurred by the IC.

Table 5.1.1: Comparative analysis of M & R funds subsidy and expenses for canal ICs (average)

IC	Subsidy given by the government for M & R (Rs.)	M & R expenses incurred by the IC (Rs.)
Kakdiamba	7464	28699
Chopadvav	7744	21240
Rangpur	16049	32660
Thalota	8644	15838

Note: Bhetasi was not included as data not available

M & R here includes canal maintenance & repairs, operator's salary and voluntary labour

Average for subsidy has been calculated by taking only the years when subsidy was given

A sudden rise in administrative cost in 2001-02 in Kakdiamba IC was observed. When this was probed, the IC members offered no plausible explanation. Operator's salary was also very high this year as three operators were engaged though less area was irrigated this year.

In Chopadvav, secretary's salary was increased to Rs. 2000/ month in 1997-98 which was later reduced to Rs. 1300/ month.

Kakdiamba has received subsidy for four years of the total five irrigation years till 2003, in which the expenditure incurred on M & R expenses as well as administrative expenses is higher than the government subsidy. Similarly in Chopadvav which has received subsidy for only three years (because of late payment of water charges) though it has distributed water in eight years, the administrative expenses are higher than the subsidy

in all the three years while the M & R expenses are less than the subsidy received for one year only. Thdota also has similar results. Of the four irrigation years, it has spent higher on M&R as well as administrative expenses as compared to subsidy received for the same for all the four years. The only case of exception is Rangpur IC where though the M & R expenses incurred are higher than the subsidy received in all the three irrigation years, the IC has managed to curb its administrative expenses which are lower than the subsidy received in each year.

Spending in M & R of main canal falling outside the per-view of IC

A very interesting finding is related to the maintenance & repairs of Chapadvav irrigation scheme. This is a medium irrigation scheme and consists of 19 villages. Since the area is hilly and the topography undulating, each year in the rainy season a substantial portion of the main canal is breached. Though only the canal below the outlets have been transferred to the IC for management, the need for repairing the main canal is essential and urgent before distribution of water, otherwise water can not reach the tail-end. Since the government has shortage of funds and it takes considerable time for the government to react to the situation, the IC incurs all the expenditure for the maintenance of the main canal and hence it is forced to neglect the M & R needs below the outlets. The rebate of 30% is not sufficient since the main canal is also maintained by the IC. This is important and shows a sense of responsibility and priority in the management and maintenance of canals for smooth and equitable distribution of water.

Are the GoG norms for maintenance and repairs applied in reality?

Though the government norms have been set for ensuring optimum investment in M & R of canals, in reality the procedure for arriving at the M & R needs is very different. In the areas where PIM has not been implemented and ICs not formed to manage water distribution, the officials from the irrigation department ascertain the requirements and needs for maintenance & repairs of the canals. This is done by taking in view the existing situation in canals. It has no relation to the quantum of area planned to be irrigated and the unutilized potential. Such an estimate is prepared and submitted to the

irrigation department by different divisions. The department, because of financial crunch, releases grant for only for the requirements which it considers important and urgent. In the drought years, expenditure is seldom incurred by the irrigation department as there is no water distribution planned. This procedure is not relevant in the PIM areas where the irrigation co-operatives have been formed as grant is provided by the government for meeting the M & R expenses. This grant is in the form of 50% rebate on timely payment of water charges. In drought years therefore, there is no grant for repair & maintenance of canals in the PIM areas as well.

Optimum Maintenance & Repairs Expenditure required-

An exercise was undertaken by DSC in four ICs (Kakdiamba, Chopadvav, Rangpur and Thdota) to find out the what is the "optimum level of expenditure" according to the IC functionaries which should be undertaken by the ICs for ensuring proper M & R of the canals. The exercise was undertaken as a focus group discussion along with the executive committee members of the ICs, and the supporting agency field level staff. As per the farmers of the respective ICs, the optimum average yearly expenditure required for ensuring proper water distribution as well as taking care of the long term physical infrastructure need of the canals is around Rs. 60000 in Kakdiamba, Rs. 75000 in Chopadvav, Rs. 40000 in Rangpur and Rs. 10000 in Thdota. The optimum average yearly expenditure required per hectare of CCA is Rs. 65 in Kakdiamba, Rs. 51 in Chopadvav as well as Rangpur, and Rs. 60 in Rangpur. In reality however, the ICs only undertake expenditure only on the urgent needs of M & R which will ensure proper distribution of water. While the expenditure needed for long term canal infrastructure needs are not being undertaken because of paucity of funds as well as no evident short term gains.

Management of income and expenditure in PIM areas facing shortage of water collection in Dam- A case of Guhai Irrigation Scheme.

DSC has supported the formation of 14 ICs in the command of this irrigation scheme of which four are in their initial stages. Nine ICs of those that are registered have not undertaken water distribution because of shortage of water in the dam. Parbada IC has experience of water distribution for one year only while no water has been distributed in the last five years.

Of all these ICs, three spend some amount on miscellaneous expenditures (around Rs. 1000/ annum), which include exposure visits, AGBM, etc. The only source of income is interest from cash at bank. Parbada has around Rs. 20000, while the other two (Ladpur & Katwad) have around Rs. 8000 in their account. No IC incurs expenditure on salary of secretary. Minimum expenditure is incurred as administrative costs, which is negligible in most of the cases. Thus the IC understand the fact that they have no income and hence have managed to curb their expenditure. But the ICs which incur some miscellaneous expenditure and don't have sufficient income from interest are spending some money from their share capital. If for some coming years, there is no substantial income, then the share capital would decrease substantially. This can be negative for the IC in the long run and can even pose a threat to its financial viability.

A substantial portion of the expenditure incurred by the ICs is spent in paying the salaries of the operators & secretary, neglecting the M & R of canals. The average salary paid to the secretaries in the normal years is Rs. 1000/ month (for all the 12 months), and Rs. 2000 in the case of Chopalvav. The villagers feel that there should be a person who should be responsible and accountable for the working of the IC, and as there is paper work for all the days in a year, the secretary should be paid. As per the supporting agency, that is AKRSP, there are few villagers who can take the responsibilities as a secretary. In Mehsana, where DSC is promoting PIM, its view is that in the initial years when the financial situation of the ICs is not strong, the secretaries should not to take salaries during the months when there is no water distribution and

hence less work. But as soon as the IC becomes strong, the secretary can take regular monthly salary.

What is the 20% and 30% rebate for?

There was the confusion in all the cand ICs studied. The members of the ICs are not sure which expenditures items could be undertaken from 20% grant and which from 30% grant.

Another misconception, which is prevalent amongst the supporting staff as well is that their understanding is that operator's salary has to be met through 20% rebate (which is for administrative expenses) while as per the government guidelines, it falls under the 30% rebate which is meant for maintenance & repairs. The secretary's salary though has to be met from the 20% rebate.

Operator's salary takes a major portion of the grant for M & R, and hence inadequate investment is undertaken in M & R of canals done. Since there is no separate allocation of funds for M & R of canals, this can be detrimental to the canal infrastructure in the long run.

Administrative Expenditure-

Except Rangpur and Bhetasi, all the ICs are spending a substantial portion on the administrative expenses. These include expenditure on meetings, transportation, postage, audit fee, etc. Almost 40% of the total expenditure is incurred on administrative expenses in all the cases except Rangpur & Bhetasi.

Voluntary Labour-

Voluntary labour was found to be the most effective cost-cutting measure. But only Rangpur and Kaktamba employ this method for saving expenses. In Rangpur, the initial two years of water distribution managed by the IC witnesses a voluntary contribution of approximately Rs. 10,000, which increased up to the level of Rs. 20,000 when another minor came under the management of the IC. The IC enforces a rule according to

which each member farmer has to contribute to desilting and canal cleaning activities every time during water distribution, and hence the O & M costs are reduced. Kakkilamba IC also uses this method for desilting and jungle cutting before water distribution every year. Through voluntary labour, desilting & jungle cutting is also done on the main canal which falls outside the purview of this IC. In the other ICs studied, this cost saving measure was not found to be used very effectively. Though there are instances of contribution through voluntary labour, this is not a formal exercise and as planned as in the case of Rangpur. In case of LI cooperatives, most of the work needed to be done for proper maintenance of pipelines is of technical nature, and hence the scope of cost cutting through voluntary labour is limited.

5.1.2 Analysis of Income-

Surplus income -

Surplus income for individual WUAs was calculated by subtracting the total O & M cost from the total revenue (sum total of income from water charges, interest from bank and income from diversification). Surplus income is highest for Chopadvav (Rs. 41587) followed by Rangpur (Rs. 31112). Degawada and Thdota have surplus of around Rs. 20000. Kakdiamba (Rs. 8333) and Jetpur (Rs. 3253) have low surplus. Per hectare figures were also calculated which vary from Rs. 294 for Degawada to Around Rs. 20 for Jetpur. Chopadvav, Rangpur, and Thdota have a surplus of around Rs. 125 per hectare. Kakdiamba has a surplus of only Rs. 16 per hectare. The detailed calculations for individual ICs are attached as *Annexure 6*. Averages were calculated for a comparative analysis between different ICs. Figures were calculated only for years in which water was distributed. *Calculations for drought years have been given later.*

Interest from Balance at Bank-

In all the cases except Thdota, interest from cash at bank was found to be the only source of revenue in the drought years. Even in the normal years, this money keeps on adding to the amount at bank which is very useful during emergency needs and for building reserves. Per hectare interest is high for Degawada (Rs. 38), Thdota (Rs. 28) and Rangpur (Rs. 24), while it is very low for Kakdiamba (Rs. 7) Chopadvav (Rs. 4), and negligible for Jetpur.

Quantity of water available and the area irrigated -

The extent of command area under the WUA and area actually irrigated also affects the total profit of the IC. The higher is the command, the higher will be the extent of area irrigated and hence higher will be the water charge collection. Thus the total potential of profit of the LICs gets drastically reduced since their command areas are low as compared to the canal cooperatives. E.g. Degawada has a culturable command area of 158 Ha. Thus even if 150 Ha is irrigated and water charge income per hectare is Rs. 50, total income realized is $150 * 50 = \text{Rs. } 7500$. While the CCA of Kakdiamba is 891 Ha. Even if 400 Ha is irrigated and water charge income per hectare is Rs. 40, total income realized is $400 * 40 = \text{Rs. } 16000$.

The quantity of water available for irrigation is very important as *additional water rates are gained per additional unit of water delivered*. Thus more the water available, more is the possibility of larger area being irrigated. The trend of area irrigated and hence water availability shows that water available in the canal WUAs is not sufficient for irrigating a substantial portion of the command area. Whereas in the lift-irrigation (LI) cooperatives, since water is lifted directly from the river (in more than 90% cases) quantity of water available is more and sufficient.

Calculations show that water availability and the command area irrigated affect the finances of the WUAs. Hence, effective and efficient distribution of irrigation water to maximise the area irrigated has a financial dimension along with the widely recognised social dimension.

Recovery Problems -

The study revealed that the worst problem, which has the threatening potential of rendering any WUA unviable, was non-recovery. The only cooperative (Jetpur LIC) which was almost defunct was because of miserable recovery of water charges. Chopardvav IC, which was once very strong, is now facing difficult times because of low-recovery situation. Kokdiamba IC also faced problem of high non-recovery of water rates, but the institution has managed to enforce rules strictly and the financial situation has thus improved. In Bhetasi, the IC has a separate committee to ensure that the water charges are recovered completely and on time. Rest of the three WUAs have faced only negligible problems of non-recovery and hence their cash at bank as well as income from interest from bank is also high.

Non-recovery is a problem having its roots in institutional failure. This is a problem which may be attributed to the socio-economic scenario of the area. This problem can only be removed after the institution becomes strong. Simple mechanisms like advance water charge collection, if implemented, can be very effective. This will lead to improved canal maintenance and better irrigation water management.

5.1.3 Comparative Analysis-

Comparative analysis between different WUAs was carried out to find the relative scenario of revenue and expenditure (Table 5.1.3). Per hectare figures were also calculated for various years. The figures given in bracket are the per hectare average figures for the WUAs. The surplus per Ha irrigated area varies widely. But high surplus per Ha irrigated area does not mean high profit for the IC since total profit is also dependent on total irrigated area. e.g. though Degawada has a very high profit per Ha irrigated area (Rs. 295), since its command is small (158 Ha out of which 110 Ha is average irrigated area per year) total profit is not much higher than that of a canal IC like Rangpur where though average surplus per hectare per year is less than half of that of Degawada (Rs. 127), having a higher command (617 Ha out of which 230 Ha has been irrigated per year on an average) increases the total average yearly profit to Rs 31,112 which is 50% higher than that of Degawada. In the drought years, the interest earned on the bank deposit is the only source of revenue for six out of seven ICs (analysis for drought years given separately). Interest in normal years is also important as it keeps on adding to the reserves and surplus. Thus income from water charges, including additional water charges as well as government subsidy, was found to be affecting the financial viability

Table 5.1.3: Average figures of per Ha income & expenditure for various ICs

IC Name (CCA in Ha)		Kakdiamba (891)	Chopadvav (1460)	Degawada (158)	Jetpur (180)	Rangpur (617)	Thalota (251)	Bhetasi (1000)
No. of watering years (till 2002)		5	8	7	3	3	4	8
Avg. Irrigated area (Ha)		290	339	110	142	230	152	734
Income								
1. Avg. Water charge income (Rs.)		74755 (238.58)	82810 (259.22)	133818 (1226.21)	21257 (140.58)	50101 (203.46)	32802 (205.51)	Data not available
a)	Government Subsidy for Administrative expenses (Rs.)	7507 (21.43)	13768 (34.01)			10705 (43.70)	5890 (35.76)	Data not available
b)	Government Subsidy for M & R (Rs.)	12440 (34.91)	20650 (51.02)			16049 (65.52)	8644 (52.51)	Data not available
c)	Additional water charges (Rs.)	61285 (200.61)	69903 (227.33)			23346 (94.22)	18267 (117.23)	No add. charge
2. Avg. Income from diversification activity (Rs.)		0 (0)	2684 (6.44)	0 (0)	0 (0)	0 (0)	9763 (58.1)	(0)
3. Bank Interest (Rs.)		2605 (7.1)	918 (4.08)	3474 (38.82)	48 (< .5)	6279 (24.24)	4711 (28.81)	NA
4. Voluntary Labour (Rs.)		1770 (6.41)	2175 (5.85)	0	0	13333 (57.02)	0	0
Total Income (Rs.) [1+2+3+4] (Rs.)		79130 (252.23)	88587 (275.6)	120966 (1413.59)	21305 (140.92)	69713 (284.68)	47276 (292.41)	NA

Note : The figures in bracket are per hectare of irrigated area equivalents of the corresponding figures outside the bracket
Average subsidy has been calculated only for the actual years when subsidy has been given.

* This figure includes secretary's as well as operator's salary

Table 5.1.3 contd...

IC Name (CCA in Ha)		Kakdiamba (891)	Chopadvav (1460)	Degawada (158)	Jetpur (180)	Rangpur (617)	Thalota (251)	Bhetasi (1000)
Avg. Irrigated area (Ha)		290	339	110	142	230	152	734
Expenditure								
5. Administrative Expenses (Rs.)		42102 (143.85)	25760 (71.96)	90336 (987.55)	14763 (82.96)	5941 (21.33)	11499 (73.61)	15813 (96.28)
<i>i.</i>	<i>Administrative cost (Rs.)</i>	31748 (106.82)	13535 (36.36)	41903 (457.9)	6063 (19.13)	1941 (8.83)	5449 (36.52)	2613 (14.29)
<i>ii.</i>	<i>Secretary's salary (Rs.)</i>	10350 (37.03)	12225 (35.6)	48433* (529.65)	8700* (63.83)	4000 (12.5)	6050 (36.09)	13200* (81.99)
6. Maintenance & Repairs Expenses (Rs.)		28699 (92.23)	21240 (69.33)	15087 (131)	3290 (19.13)	32660 (136.63)	15838 (95.76)	21848 (47.84)
<i>i.</i>	<i>Canal Maintenance & Repairs (Rs.)</i>	3536 (13.75)	8896 (30.95)	15087(131)	3290 (19.13)	3410* (14.83)	6680 (40.08)	21848 (47.84)
<i>ii.</i>	<i>Voluntary Labour (Rs.)</i>	1770 (6.41)	2175 (5.85)	0	0	13333 (57.02)	0	0
<i>iii.</i>	<i>Operators' Salary (Rs.)</i>	23393 (72.06)	10169 (32.51)			15917 (69.77)	9158 (55.67)	
Total Expenditure (Rs.) [5+ 6]		70797 (236.10)	47000 (141.29)	105413 (1118.75)	18053 (119.61)	38601 (157.96)	27336 (168.37)	37650 (143.86)
Annual Surplus/ Deficit (Rs.) [Income-Expenditure]		8333 (16.13)	41587 (127.6)	22393 (294.91)	3253 (21.31)	31112 (126.75)	19940 (124.03)	NA

Note: The figures in bracket are per hectare of irrigated area equivalents of the corresponding figures outside the bracket

5.1.4 Comparison of present situation: Indicators of Financial Strength of ICs

The financial analysis for the different ICs has already been done. Various attributes have been analysed for getting a good idea of the various factors affecting the financial situation of the IC. The discussions would be enriched only if the present financial situation of the ICs are kept in view. The two ICs Jetpur and Chopadvav are facing very high level of problem because of extremely low recovery. This is also because of the socio-economic profile of the area. Most of the farmers of these areas are poor. Low recovery problems also existed in Kakdiamba, but the institution has managed to curb it by ensuring conformance to rules.

Table 5.1.4: Comparison of present situation: Indicators of Financial Strength of ICs (as on March 31, 2002)

	Kakdiamba	Chopadvav	Degawada	Jetpur *	Rangpur	Thalota
1) Cash at bank (Rs)	220445	6827	79124	73	223943	82348
2) Payables (Rs)	205910	474919	0	1300	0	0
3) Receivables (Rs)	139742	567259	84424**	0	40000	0
4) Share Capital (Rs)	102700	69802	1900	3410	13400	22200
5) Excess amount for investment [1+3-2-4] Rs)	51577	29365	161648	-4637	250543	60148

* The figures for this IC are as on year ending March 31, 2000. It is now almost defunct because of extremely high non-recovery problem.

** Recovery low last year because of consecutive droughts, but according to the EC and the PIA, members will pay this year.

Low recovery implies that the cash at bank of the IC will be reduced to a great extent. Thus the IC may need to borrow. This results in high receivables and payables. The reserve fund is also affected adversely. This is a complete lose-lose situation for the IC and its member farmers. The risk associated with this situation is very high and it may lead to the failure of a financially well-performing institution.

5.2 Analysis for drought years

Analysis was conducted separately for drought years as the scenario is very much different from that of the normal years of water distribution. When water is not distributed, the IC gets nothing in form of additional water charge. But it still incurs expenditure in terms of administrative expenses and salary of the employees (Table 5.2). No grant is also available to the IC in drought years for meeting its expenses. In the non-PIM areas also, the irrigation department rarely incurs expenditure on M & R of canals.

Kakdiamba and Chopadvav have incurred heavy losses during drought years. While Rangpur and Thdota have earned income in these years. This is because Kakdiamba has incurred heavy administrative expenses of around Rs. 25000 in drought year. This includes expenditure on Travel & Conveyance (more than Rs. 9000), and expenses on stationary and annual general body meeting (each around Rs. 5500). The secretary's salary is though half of that of Chopadvav where it accounts for around 80% of the expenses. This has resulted in heavy losses to both these ICs. In all the WUAs except Thdota, *interest from bank has been the only source of income in the drought years.*

Thdota has earned money from *the diversified activities*, which have not been undertaken by any other IC. Though the income from bank interest is high for Kakdiamba as well as Rangpur, the latter has managed to curb its administrative as well as salary expenses and has thus gained. But in Kakdiamba, Chopadvav, Rangpur, and Thdota the expense incurred on M & R is nil. Except Rangpur, all the WUAs have incurred substantial expense on salary in the drought years also.

Table: 5.2: Analysis for drought years

IC Name (CCA)		Kakdiamba (891)	Chopadvav (1460)	Degawada (158)	Jetpur* (180)	Rangpur (617)			Thalota (251)			Bhetasi (1000)
Year →		2000-01	2000-01	No drought year, but acute water shortage in 2000-01 and hence huge losses incurred by the LIC.	2000-01	1999-2000 ** (249 Ha)	2000-01	Average	1999-2000	2000-01	Average	No drought year but very less area irrigated (36 Ha) in 2000-01 due to excessive water shortage.
O & M Expenditure (Rs.)	Secretary's Salary	12000 (13.46)	24000 (16.43)		0	0	0	0	9600 (38.24)	7200 (28.8)	8400 (33.52)	
	Administrative	24480 (27.47)	6838 (4.68)		20 (11.11)	706 (2.83)	500 (.81)	603 (1.82)	5124 (20.41)	4241 (16.89)	4682 (18.65)	
	Canal M & R	0	0		1800 (10)	0	0	0	0	0	0	
	Total Expenditure (1)	36480 (40.94)	30838 (21.12)		1820 (10.11)	706 (2.83)	500 (.81)	603 (1.82)	14724 (58.66)	11441 (45.58)	13082 (52.12)	
Income from regular source (Rs.)	Bank Interest	13829 (15.52)	92 (.06)		0	7343 (29.48)	4181 (6.77)	5762 (18.12)	7318 (29.15)	4313 (17.18)	5815 (23.16)	
	Diversification	0	0		0	0	0	0	13100 (52.19)	8346 (33.25)	10723 (42.72)	
	Other source	0	0		0	0	0	0	0	0	0	
	Total Income (2)	13829 (15.51)	92 (.06)		0	7343 (29.48)	4181 (6.77)	5762 (8.12)	20418 (81.34)	12659 (50.43)	16538 (65.88)	
Profit/ Loss (Rs.)	2-1	-22651 (-25.42)	-30746 (-21.05)		-1820 (-10.11)	6637 (26.65)	3681 (5.96)	5159 (6.52)	5694 (22.68)	1218 (4.85)	3456 (13.76)	

Note- Figures in bracket are Rupees per hectare of CCA

* This year water was not distributed in this IC though it was not a drought year.

** Rangpur had only 249 Ha of CCA under management for water distribution till this year which increased to 617 Ha.

Only Rangpur IC has managed to minimise its expenditure by not taking full time services of employees in the drought years. It is evident from the analysis of accounts of normal years as well as drought years that a substantial portion of the expenses is incurred for giving salary to the employees. Though in Thalota secretary is paid as he looks after diversification activities as well, in Rangpur and Jetpur, no salary expenses have been incurred during the drought years. While in Kakdiamba and Chopadvav, secretaries have been paid salaries, and this has resulted in losses to the ICs.

5.3 Water Charges

Additional water charge is the only flexible source of revenue. Different WUAs use different method of charging water rates above government rates. The comparative details are given in Table 5.3

Table 5.3: Comparison of water charges

S.No	IC Name	Water Charge basis	Implication
1.	Kakdiamba	Flat rate for all crops. Water charge on / acre/ watering basis. Government charges different for different crops	Total Water charge higher for crops needing higher no. of watering. This leads to gain for the IC from some crops, while loss from some others *
2.	Chopadavav	Flat rate for all crops. Water charge on / acre/ watering basis. Government charges different for different crops	Water rate higher for crops needing higher no. of watering. This leads to gain for the IC from some crops, while loss from some others
3.	Degawada	Flat rate for all crops / acre/ season. If high water consuming crop, then rate higher.	Gain for the IC from different crops not significantly different.
4.	Jetpur	Flat rate for all crops. Water distributed on hourly basis now, earlier it was distributed on area basis.	Crops needing greater amount of water give higher returns to the IC
5.	Rangpur	Different rates for all crops. Higher margins for cash crops and less for subsistence crops. Charged on crop-area basis.	Percentage margin same for all the crops. Better income of IC from cash crops. **
6.	Thadota	Different rates for all crops. Not a very high difference in margin for different crops . Charged on crop-area basis.	Cash crops give higher margins as compared other crops but the difference not very high.
7.	Bhetasi	Government charges on volumetric basis, while the IC charges from the farmers on crop-area basis. Volumetric rates are different for different seasons. IC rates different for different crops.	Profit for the IC, but no formal or informal exercise to decide the amount of revenue needed and level of profit gained.

For 2002-

* E.g.- Flat rate for all crops (IC)- Rs. 80/ acre/watering. For Cotton- $80 \times 2.5 \text{ acre} \times 2 \text{ watering} = \text{Rs. } 400/\text{Ha}/\text{Season}$. Govt. rates- Rs. 290 /Ha/Season ; while for Wheat- $80 \times 2.5 \text{ acre} \times 5 \text{ watering} = \text{Rs. } 1000/\text{Ha}/\text{Season}$. Govt. rates- Rs. 317/ Ha/ Season. For Tuar- $80 \times 2.5 \text{ acre} \times 1 \text{ watering} = \text{Rs. } 200/\text{Ha}/\text{Season}$. Govt. rates- 436 / Ha/ Season.

** For Wheat- IC rate/ Ha = Rs. 450, govt. rate = Rs. 365 i.e. Margin = Rs. 85/ Ha. For Mustard & Castor- IC rate Ha = Rs. 800, govt. rate = Rs. 657 i.e. Margin = Rs. 143/ Ha.

Gain in one season offset by loss in another -

The ICs of Chopadvav & Kakkidamba medium schemes promoted by AKRSP face a peculiar problem. In the months of Kharif irrigation, the government charges on a season basis while the IC obtains water charges for only one or two support watering. This leads to heavy losses to the IC in the Kharif season which offsets the gain from water charges in the rabi season.

This loss is due to wrong method of water charging by the government. A GoG Order (Resolution No. WTR.1081-30-P dated 20.5.82) specifically mentions that for up to two support watering, the government can charge only 15% per watering and not the charge for the whole season. This should be brought to the attention of the irrigation cooperative, supporting agency as well as the government. Otherwise the IC will continue to suffer undue losses in the future also. In areas of DSCs interventions also, the government charges 50% of the water rates decided for the whole season and not 15%.

The additional water charges (AWC) over and above water charges are fixed after a budgeting exercise in which the yearly expenditure of the IC is projected. This projection is primarily on the basis of expenditure incurred in the previous year. If the subsidy is not able to meet the expenditure requirement, then AWC is levied. For the years for which subsidy is disbursed, Kakkidamba has levied 167% of government water charges over government rates, Chopadvav has levied 101% over government rates, while Rangpur & Thdota have levied 43% and 66% of government water charges respectively over government rates. If the requirement is not very high, then the IC can levy on crop-area basis, per unit area charge fixed for a season (like Rangpur and Thdota). But if higher amount is required to be raised from AWC, then equity issues come into consideration. In such cases, it should be ascertained that the farmers who use higher amount of water should pay higher and this can be only done by charging on per watering basis, until volumetric method of water pricing is implemented, as done by Kakkidamba and Chopadvav.

5.4 Scope of Diversification

The study revealed that all the supporting agencies except Sadguru (which is working in Lift Irrigation Systems) emphasized the importance of diversification for income generation. Sadguru promotes diversification through the federation of ICs, which has been formed in one of the blocks. The supporting agency staff in all the cases (except Sadguru) wanted to diversify the activities after the IC has worked for some time and has acquired some stability. Diversification has also been discussed by the Task Force on PIM, which recommends augmenting reserves by avenue plantation on canal bunds, aquaculture, and input supply activities. It was found that high emphasis on diversification could lead to problems in the future for the ICs. The scope for diversification is limited and the following issues are associated with diversification-

- Diversification should be done only in commodities that are very important for the farmers, like agricultural inputs i.e. seeds and fertilizers.
- Diversification in risky areas like marketing of agricultural produce of the member farmers should not be undertaken since it requires technical knowledge, and may lead to substantial losses to the IC.
- Diversification in equipment and machines like tractors and threshes should be avoided since they have a high probability of conflicts within the member farmers and high overhead costs.
- In the ICs, where recovery of charges is already a problem, diversification "*should not*" be undertaken until the institution becomes strong.

Thus, only a few ICs (where there is no pre-existing arrangement of input supply and no recovery problems) have a potential for diversification and hence this policy should not be over-emphasised and generalised. Diversification should only be undertaken after sound planning for long-term effects and effective management.

6. Discussion and Conclusion

6.1 Factors affecting Financial Viability

- **Command area per unit length of canal-** As all the canal irrigation schemes are based on the principle of gravity flow, the ratio of command area per unit length of canal is different in all the cases. Since income is directly proportional to the command area and expenditure is directly proportional to the canal length, the difference in this ratio affects the financial viability. e.g. total length of canals in Kakdiamba is 23.82 kms and the CCA is 891 Ha, so area per unit km of canal is 37.40 Ha while in Chopadvav, the canal length (total) is 48 km and the CCA is 1460 Ha, hence area per km of canal is 30.41 Ha. Whereas in one canal in Rangpur (MBLA), which is 6.14 km long and caters to a CCA of 386 Ha, area per km of canal is 62.86 Ha.
- **Canal section & structure (no. of minors etc.)-** If the canal structure is complex, then the number of operators required during water distribution will be higher (increasing the amount spent in salary considerably). Where as this expenditure will be substantially lower in case of a simpler network having a low number of minors or sub-minors. Similarly greater section implies higher expenditure as the surface area increases substantially and the expenditure on jungle cutting, etc increases.
- **Lined and unlined canals-** In unlined canals, the seepage losses are immense along with the expenditure incurred in jungle cutting, etc. which is reduced considerably when the canal is lined. For instance, the canals of Kakdiamba and Chopadvav are unlined and hence the expenditure needed to ensure minimum wastage of water is higher as compared to lined canals in Dharoi Irrigation Scheme.
- **Water availability-** Scarcity of water means less area irrigated and hence less revenue for the IC.
- **Efficient water distribution-** Since the additional water charge gained is on per hectare basis, efficient water distribution will mean higher command irrigated, and hence higher total profit.
- **Subsidy / Rebate-** The M & R of canal is very important and necessary for the interest of the farmers as well as the IC. Subsidy or rebate on water charges is hence very necessary for the IC to carry out its responsibilities.
- **Average additional water charges gained per hectare-** Water charge being the only reliable and substantial source of revenue, is the single most important component for increasing the revenue of the IC. E.g. Kakdiamba has even charged 200% additional water charge over the government charges once on

one crop. On an average, the ICs charge around 15-20% additional water charges though the range may vary from 10% to 50%

- **Number of shareholders-** As the group size increases, the transaction cost increases. Fixed costs per head decrease up to a certain optimum group size after which it increases. Hence group size affects the operation & maintenance cost incurred by an institution.
- **Voluntary Labour-** Annual voluntary labour by the farmer members of IC can save a high amount of annual expenditure incurred by the IC, and at the same time ensure better and sustained M & R of canals.
- **Recovery Problems-** It may be a case that an IC is financially strong on papers, but its actual financial condition is not good because of low-recovery problems. This is a major problem and can lead to the complete failure of an institution and can only be tackled by a strong institution.
- **Diversification Activity-** Diversification activity has the potential of negative as well as positive effects. If the activity is chosen after proper planning and managed effectively, it can definitely give good returns. But the risks associated may also be high. Thalota IC has a positive experience with respect to diversification and the activity of input supply undertaken by the co-operative has yielded substantial returns to members, while on the other hand, Chopadvav IC has faced losses due to diversification in the marketing of cotton. Similarly Kakkalamba IC has also suffered some losses due to non-recovery of money from diversification activity like input supply.
- **Interest from cash at bank-** If the cash at bank is high, then the IC can reap good interest which can form a source of revenue in the drought years as well. E.g. Rangpur has earned an average yearly interest of above Rs. 6000 which is reflected in its bank balance of about Rs. 1,70,000. High bank balance implies high interest returns while Chopadvav earns an interest of just below Rs. 1000 per year and its bank balance is also below Rs. 10000. Low bank balance again leads to low interest and negative effect on the financial health of the institutions.
- **Administrative Expenditure-** Minimising administrative expenditure is very necessary. Salary of secretary constitutes a major component of the administrative expenditure. The WUAs pay the secretaries even in the drought years. In the months when no water distribution takes place, the secretary has little work to do. Salary is not related to the work actually done and hence this leads to heavy expenditure. Other administrative expenditure also has to be curbed for efficient financial management.

6.2 Discussions regarding factors affecting financial viability

The factors affecting financial viability fall under different categories- technical, institutional/social or managerial. There are different ways to deal with these factors for ensuring better financial viability. This has been discussed below and given in the form of a table.

Table 6.2: Factors effecting financial viability

Factor	Component Type	Comments
Command area per unit length of canal	Technical Component	Cannot be altered
Canal section & structure	Technical Component	Cannot be altered
Lined and unlined canals	Technical Component	Lining the unlined canals is the obvious option as it will greatly reduce the running costs as well as huge seepage losses and other environmental costs.
Water availability	Technical Component	Not in ICs control
Interest from cash at bank	Financial Component	The ICs can deposit some portion of money (e.g.) share capital as fixed deposit to ensure a higher interest
Subsidy for Maintenance and Repairs	Financial Component	As the water rates levied by the government will increase, the subsidy will automatically increase. But a major portion of the subsidy is spent on operators' salary and the issue of proper and adequate maintenance & repairs is neglected. Hence norms should be evolved for ensuring adequate investment specifically for M & R of canals.
Avg. Additional Water Charges gained/Ha	Financial Component	Margin should be higher for high value crops and lower for low value crops. For ensuring that farmers using higher quantity of water pay higher, charges should be on per watering basis.
Number of shareholders	Social Component	Cannot be altered
Voluntary Labour	Institutional / Social Component	Should be institutionalised. Either member farmers should contribute physically or pay equivalent labour wage at the time of annual M & R of the canal and channels. Its value should be entered in the books of accounts.
Recovery Problems	Institutional/ Social Component	This problem can only be addressed by making the institution strong and strictly ensuring rule conformance.
Efficient water distribution	Managerial Component	Better management of irrigation water to ensure effective and efficient service delivery and hence increasing the command area irrigated.
Diversification Activity	Managerial Component	If the diversification activity undertaken is technical or the risk involved is high, then either the activity should be promoted by federation if it is capable of hiring technical expert, or it should not be taken up at all.
Administrative Expenditure	Financial Component	Secretary's salary should be linked with actual work done. It should be minimum during low-work months. In drought years, no salary should be paid. Other administrative expenditure should be regularly monitored by the IC.

6.3 Maintenance and Repairs-Linking financial viability with proper maintenance

(This section draws heavily from the research study – ‘Sustainable Irrigation Turnover: Guidelines for Irrigation System Maintenance’, undertaken by International Development Group at HR Wallingford, the Department of Irrigation, HMG Nepal and Matt MacDonald, and discussions with Shri Anil C. Shah, Chairman, DSC)

“Maintenance means the regular repair of an irrigation system so that it can continue to operate in the future. ”

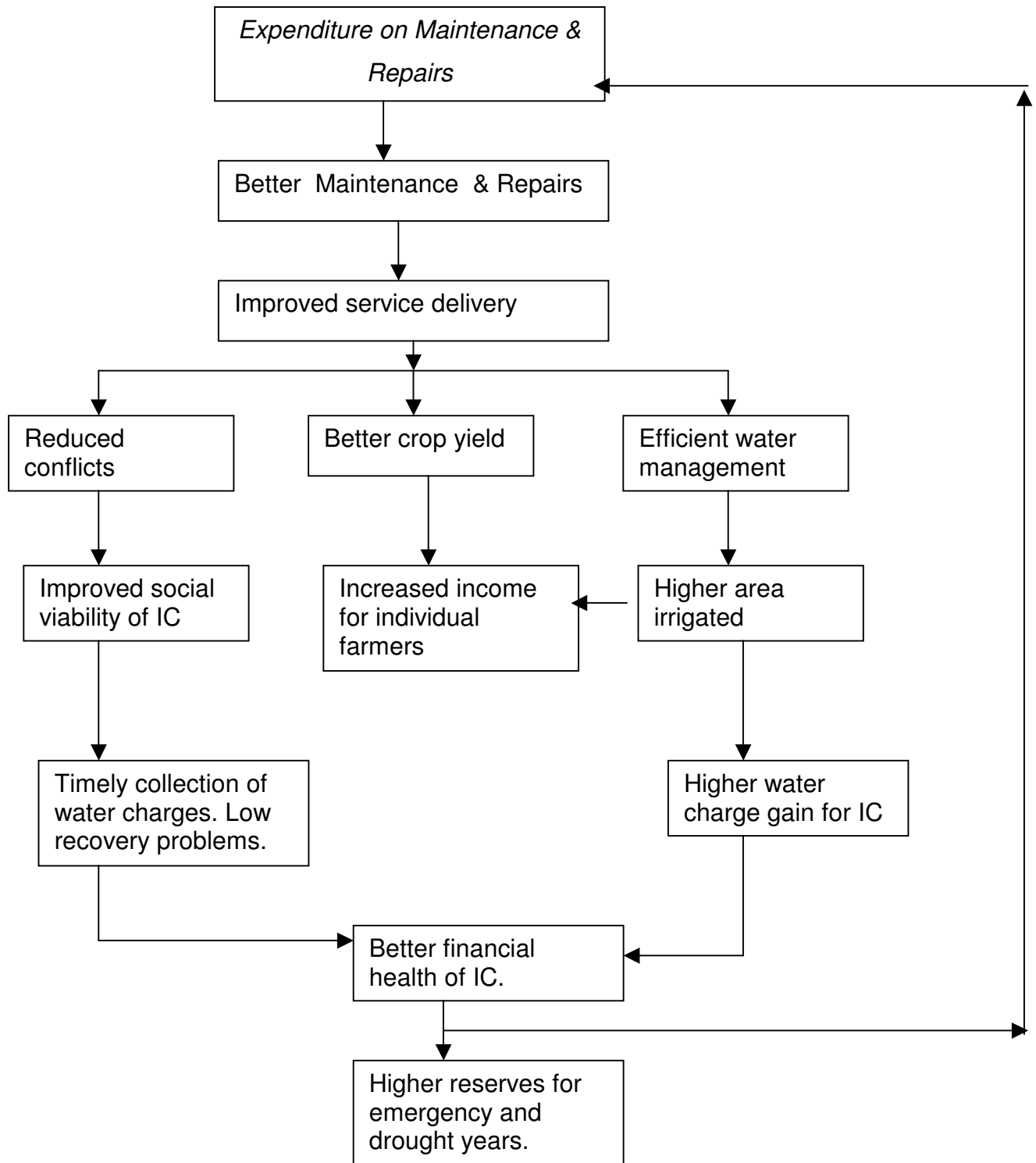
Thus for the regular and proper repair of the canals, the IC has to incur expenditure on regular basis. If the IC ignores this necessary expenditure on maintenance and repairs of the canal, it can lead to – inefficient and inequitable water supply, conflicts, loss of income to farmers as a result of decrease in yield, opposition to the WUA, and increasing and continuous loss of income to the WUA.

If the IC incurs necessary expenditure on this item, it will in lead to better service delivery, which will in turn ensure better management, member satisfaction and improved finances for the IC. Better financial health of the institution will again ensure that more money is being allocated for continuous M & R and higher reserves are being built up for maintaining reserves for meeting emergency expenses and fixed expenses during the drought years.

This is explained with the help of figure on ‘Positive Cycle of Financial Viability with Maintenance and Repairs’.

Better financial health of the institution will lead to improved maintenance & repairs as well as higher incomes for the member farmers, leading to an increase in the standard of living of the farmers and labour community living in the rural areas and dependent on agriculture for their livelihoods.

Positive Cycle of Financial Viability and Maintenance & Repairs



6.4 Steps taken by individual ICs for better financial status-

The ICs have taken some conscious steps to decrease their costs and increase their revenue. Learning can be derived from these actions of the individual ICs-

- Rangpur and Kokdiamba have institutionalised voluntary labour at the time of annual repair & maintenance of canals before watering.
- Kokdiamba has ensured strict rule conformance for recovery of outstanding water charges and thus its financial condition is improving.
- Bhetasi has a separate committee which ensures recovery of water charges on time.
- Thdota has undertaken input supply activity, primarily for better service delivery to the member farmers, and also financial gains.
- Rangpur and Thdota charge water rates on crop-area basis with higher profit margin for cash crops and lower for subsistence crops.
- Rangpur uses the services of secretary during water distribution only
- All the ICs try to manage water distribution with the minimum number of operators required.

Some efforts for diversification have also backfired, resulting in high non-recovery rates and consequently losses to the farmers. Thus, though the ICs have initiated steps for financial gains, some have benefited substantially while some have faced losses. The intensive analysis and practical knowledge of the supporting agency field staff and IC members leads to the conclusion that there are steps which can lead to better financial strength of an IC. The learning from the research study can provide useful information for ensuring that the ICs, which have been constituted for better irrigation water management and empowerment and capacity building of local communities, enjoy good financial position. The learning should be used for starting a prosperous cycle of financial viability and M & R for the ICs.

7. Suggestions

- Of the 30% rebate given by the government on timely payment of water charges (for M & R expenses including Operators' salary), the government must fix some portion specifically for M & R of canals (excluding operators' salary) and the ICs should ensure that this is strictly followed. Hence norms should be evolved for ensuring adequate investment specifically for M & R of canals. The related by-laws of the ICs should be modified.
- Voluntary labour should be institutionalised. Either member farmers should contribute physically or pay equivalent labour wage at the time of annual M & R of the canal and channels. This contribution should be mentioned separately in the books of accounts as income as well as expenditure.
- Margin on water charge should be higher for high value crops than that of low value crops. Charging on per watering basis should be done for ensuring that users of higher quantity of water should pay higher.
- Emphasis should be laid by the Irrigation Cooperative on increasing the command area irrigated by minimizing the distributional efficiency losses.
- The ICs must deposit a portion of money (e.g. share capital) as fixed deposit to ensure a fixed stream of interest even during drought years.
- There should be separate entries for secretary's and operators' salary in the books of accounts instead of a single entry of total salary.
- Since low-recovery of water charges may result in an IC becoming unviable, the institution should strictly ensure rule conformance for avoiding this grave problem.
- Diversification should be undertaken only after long-term planning. If the diversification activity undertaken is technical or the risk involved is high, then either the activity should be promoted by federation if it is capable of hiring technical expert, or it should not be taken up at all.
- In the schemes where the government has charged higher rates for one or two support watering in Kharif season (e.g. Kakalamba, Chopalav and ICs in Dharoi irrigation scheme), the charges should be taken back by the loser ICs in retrospect. Supporting agencies like AKRSP (I) and DSC should facilitate this process.
- Secretary's salary should be linked with the amount of work done. During drought years, no salary should be paid to the staff. The IC should monitor its administrative expenses.

- Bi-annual performance review of the irrigation cooperatives as recommended by the Task Force on PIM in Gujarat has to be ensured.
- The study points to the need of a new research studies on – ‘Consequence of non-maintenance of canals’, ‘maintenance needs for long term canal infrastructure health’, and ‘procedure for proposing grant requirement for maintenance and repairs of irrigation system’

References

- BAPPENAS/DGWRD. 1988. Risdah Pertemuan Pembahasan Irrigation Sub-sector Project (ISSP), Jakarta, 10 - 11 Agustus 1988. *as quoted in* Helmi. 2000. "Transition of Irrigation System Management in Indonesia: Challenges and Opportunities for Sustainability". Prepared for a panel on 'Asian Irrigation in Transition' in the conference of international association for the study of common property resources Bloomington campus of Indiana University, Indiana, USA. May 30 - June 4, 2000
- Chaturvedi, V. 2002. "Social and Financial Viability of Institutional management of Irrigation Systems". Research Report undertaken for Development Support Centre, Ahmedabad and Indian Institute of Forest Management, Bhopal.
- Development Support Centre. 1999. "Participatory Irrigation Management – Compilation of Orders of Government of Gujarat". Ahmedabad: Development Support Centre.
- Development Support Centre. "Participatory Irrigation Management- Irrigation Cooperatives By-laws". Ahmedabad: Development Support Centre
- Government of Gujarat (Water Resource Department). 1988. "Revised norms for sanction of grants for operation and maintenance of major and medium irrigation projects". Gandhinagar: GoG resolution No. WMU- 1087(3) P. 2.
- Government of Gujarat (Narmada and Water Resource Department). 1992. "Revised norms for sanction of grants for maintenance and repairs of minor irrigation works". Gandhinagar: GoG resolution No. MIS/1092/142/1
- Helmi. 2000. "Transition of Irrigation System Management in Indonesia: Challenges and Opportunities for Sustainability". Prepared for a panel on 'Asian Irrigation in Transition' in the conference of international association for the study of common property resources Bloomington Campus of Indiana University, Indiana, USA. May 30 - June 4, 2000.
- Hoja, R., Pangare, G., and Raju, K.V. (eds.). 2002. *Users in Water Management*. New Delhi : Rawat Publications. (IndiaNPIIM, New Delhi)
- INPIM. 2001. "Proceedings of National Workshop on Participatory Irrigation Management- Farmers' Organisation and Turn Over Experiences in Tamil Nadu" held at Madurai from Aug 6-8, 2001". Organised and conducted by Water Resource Organisation(Tamil Nadu, India), World Bank Institute(Washington DC, USA), and IndiaNPIIM(New Delhi, India).
- International Development Group- HR Wallingford, the Department of Irrigation-HMG Nepd and Mott MacDonold. "Sustainable Irrigation Turnover: Guidelines for

Irrigation System Maintenance". HR Wallingford, HMG Nepal and Mott MacDonald

- Joshi, L.K. (ed.). 1997. *Management of Irrigation : A New Paradigm Participatory Irrigation Management*. New Delhi: Water and Power Consultancy Services India Ltd.
- Kapoor, R. 1999. "Process Documentation Research: Chopadvav and Pingut – April 1998 to May 1999". AKRSP(I) and COHESION.
- Meinzen-Dick, R., Mendoza, M., Sabulet, L., Abiad-Shields, G., and Subramanian, A. 1994. "Sustainable Water Users' Associations: Lessons From A Literature Review". (Paper presented at World Bank Water Resource Seminar Lansdowne, Virginia December 13-15 1994)
- Obitas, K. and Peter, J.R. 1999. "Transferring Irrigation Management to Farmers in Andhra Pradesh, India". World Bank Technical Paper No. 449.
- Parthasarthy, R. 2003, "Objects and Accomplishments of Participatory Irrigation Management Programme in India: An Open Pair of Scissors". Ahmedabad: GIDR. Paper presented at ff-GIDR held at Ahmedabad, from March 4-6 2003.
- Patel, H. 1990. "Financial Working of Irrigation Projects- A Case Study of Four Projects in Gujarat". A Study prepared for Narmada Planning Group, Government of Gujarat, Gandhinagar.
- Perera, J. 2002. "The Role of Water -User Associations in Irrigation Operation and Maintenance: A Case Study in Pakistan". Working Paper/ Monograph Series of IndiaNPIIM.
- Perry, C. J. 2001. "Charging for irrigation water: The issues and options, with a case study from Iran". Research Report 52. Colombo: International Water Management Institute.
- Perry, C. J., Rock, M., and Seckler, D. 1997. "Water as an economic good: A solution, or a problem?". Research Report 14. Colombo: International Irrigation Management Institute.
- Saini, H. 1998. "Moving Ahead: A Study of Well Managed Irrigation Cooperatives". Dahod: N. M. Sadguru Water and Development Foundation.
- Saini, H. 1999. "Why Irrigation Cooperatives Succeed or Fail: A Comparative Analysis". Dahod: N. M. Sadguru Water and Development Foundation.
- Saini, H. and Shankar, R. 2001. "Genesis, Development and Diversification in Natural Resources Management based Village Institutions". Dahod: N. M. Sadguru Water and Development Foundation.

- Sdeth, R. M. 1996. *Water Institutions in India* New Delhi: Institute of Economic Growth.
- Veneracion, C.C. and Reyes, R.P. d. I. 1983. "Irrigators Associations with Non-irrigation Activities: Eight Case Studies". Report submitted to the National Irrigation Administration, Development Academy of the Philippines, Pasig, Metro Manila.

Annexure

Annexure 1 - Profile of the studied Irrigation Cooperatives-

Table 1: Profile of the studied ICs

S. No	Name of IC	Type of Scheme	CCA (Ha) of WUA	District	Starting Year	No. of Watering years	No. of Share holders	Supporting Agency
1.	Kakdiamba	Minor	891	Narmada	1995	5	550	AKRSP
2.	Chopadvav	Minor	1460	Narmada	1993	8	444	AKRSP
3.	Degawada	Lift	158	Panchmahals	1995	6	190	Sadguru
4.	Jetpur	Lift	180	Panchmahals	1995	3	147	Sadguru
5.	Rangpur	Major	617	Mehsana	1997	3	248	DSC
6.	Thalota	Major	251	Mehsana	1994	4	212	DSC
7.	Bhetasi	Major	1000	Nadiad	1993	6	789	Irrigation Department

As per Government of India Classification-

Minor Irrigation Scheme- < 2000 Ha of Gross Command Area

Medium Irrigation Scheme- 2000-10000 Ha of Gross Command Area

Major Irrigation Scheme- > 10000 Ha of Gross Command Area

Annexure 2- Checklist for Executive Committee of IC and PIA staff

(No. of members, potential no. of members, No. of villages, & no. of minors)

1. Is profit important for the IC, or water distribution is the only important thing.
2. What efforts have been undertaken by the IC to increase the revenue and decrease the costs. When did they start?
3. In the initial stages of formation of the IC, how was the financial position of the IC?
4. How and by whom is the budget formulated? What are its components?
5. Is the budgeting exercise important or the IC can be managed even effectively without it? Are there any other better options? What are the problems associated with the budgeting process?
6. Is the budget compared with the actual expenses at the end of the financial year?
7. How are the ad-hoc rehabilitation expenses met out which are not planned in the budget?
8. Is there any need to have a separate head of reserves and surplus.
9. What is the benefit of shares and their details. Can there be any other options ?
10. How are the water charges decided? Can't they be increased for more revenue generation? Charges of different crop.
11. How are the water charges collected and what are the problems associated with their collection?
12. How much are the subsidies and grants important? When are they needed?
13. Loss earlier only or now also?
14. Grant from the NGO.

15. Rank the various phases of cooperative-
i. Initial Stage ii. 3 years after that iii. 3 years earlier iv. Currently,
Into four classifiers-
i. Very bad ii. Bad iii. Average iv. Good v. Very good

16. Fixed and regular O & M Expenses. Is the actual amount needed in Maintenance invested or only the minimum amount needed is invested.
17. In diversification efforts, who gave the idea and technical help.
18. Characteristic of non-payment specific to a certain section.
19. Year wise irrigated command area.

Checklist for supporting agency staff-

1. How frequently is grant given and how much by the NGO?
2. Is profit important? What specific activities does the NGO encourage to ensure financial viability?
3. Before handing over any project to the community, is financial viability assessment necessary?
4. View over grant and subsidies.
5. Major reason for some being successful and some not.
6. Importance of reserve and surplus.
7. Can IC be managed as financial firm.
8. Till what level can the water rates be increased?
9. View w.r.t government' s style of charging water rates.
10. Fixed and regular O & M expenses and how is this incorporated in the budget?

Annexure 3- Detailed calculations for individual irrigation cooperatives-

(i) Kakdiamba (promoted by AKRSP)-

		96-97	97-98	98-99	99-2000	2001-02	Average
1.	Area Irrigated- (Ha)	123	324	480	236	287	290
Income							
2.	Water charge income (Rs.)	20230 (164.47)	88550 (273.3)	150240 (313)	57058 (241.77)	57697 (201.03)	74755 (238.71)
a)	Government Subsidy for Administrative expenses (Rs.)	0	5149 (15.89)	14083 (29.34)	3826 (16.21)	6971 (24.29)	7507 (21.43)
b)	Government Subsidy for M & R(Rs.)	0	0	21126 (44.01)	5738 (24.31)	10457 (36.42)	12440 (34.91)
c)	Additional water charges (Rs.)	20230 (164.47)	83401 (257.41)	115031 (239.65)	47494 (201.24)	40269 (140.31)	61285 (200.61)
3.	Bank Interest (Rs.)	305 (2.47)	748 (2.31)	8673 (18.07)	1538 (6.52)	1762 (6.14)	2605.2 (7.1)
4.	Income from diversification activity (Rs.)	0	0	0	0	0	0
5.	Voluntary Labour (Rs.)	0	0	0	1650 (6.99)	7200 (25.09)	1770 (6.41)
Total Income (2+3+4+5) (Rs.)		20535 (166.95)	89298 (275.61)	158913 (331.07)	60246 (255.28)	66659 (232.26)	79130 (252.23)
Expenditure							
6.	Administrative Expenses (Rs.)	9062 (73.64)	46755 (144.3)	48343 (100.71)	40007 (169.52)	66325 (231.1)	42102 (143.85)
i.	Administrative cost (Rs.)	5312 (43.18)	34755 (107.27)	36343 (75.71)	28007 (118.67)	54325 (189.28)	31748.4 (106.82)
ii.	Secretary's salary (Rs.)	3750 (30.48)	12000 (37.04)	12000 (25)	12000 (50.85)	12000 (41.81)	10350 (37.03)
7.	Maintenance & Repairs Expenses (Rs.)	4335 (35.24)	25620 (79.07)	43859 (91.37)	16895 (71.59)	52785 (183.92)	28699 (92.23)
i.	Canal M & Repairs (Rs.)	3375 (27.43)	10500 (32.41)	3334 * (6.94)	470 (1.99)	0	3535.8 (13.75)
ii.	Voluntary Labour (Rs.)	0	0	0	1650 (6.99)	7200 (25.09)	1770 (6.41)
iii.	Operators' Salary (Rs.)	960 (7.8)	15120 (46.67)	40525 (84.43)	14775 (62.6)	45585 (158.83)	23393 (72.06)
Total Expenditure (Rs.) [6 + 7]		13397 (108.91)	72375 (223.38)	92202 (192.09)	56902 (241.11)	119110 (415.02)	70797 (236.1)
Annual Surplus/ Deficit [Income-Expenditure] (Rs.)		7138 (58.03)	16923 (52.23)	66711 (138.98)	3344 (14.17)	-52451 (-182.76)	8333 (43.92)

Note: The figures in bracket are per hectare of irrigated area equivalents of the corresponding figures outside the bracket

(ii) Chopadvav (promoted by AKRSP)-

		93-94	94-95	95-96	96-97	97-98	98-99	99-2000	2001-02	Average
1.	Area Irrigated- (Ha)	38	321	417	531	299	275	275	557	339.12
Income										
2.	Water Charge Income (Rs.)	2804 (73.79)	25907 (80.71)	53325 (127.88)	108958 (205.19)	125725 (420.48)	158298 (575.63)	137723 (500.81)	49739 (89.30)	82809.87 (259.22)
a)	Government Subsidy for Administrative expenses (Rs.)	0	0	0	0	0	9108 (33.12)	6048 (21.99)	26148 (46.94)	13768 (34.01)
b)	Government Subsidy for M & R (Rs.)	0	0	0	0	0	13663 (48.59)	9068 (32.97)	39220 (70.41)	20650.3 (51.02)
c)	Additional water charges (Rs.)	2804 (73.79)	25907 (80.71)	53325 (127.88)	108958 (205.19)	125725 (420.48)	135527 (492.82)	122607 (445.84)	-15629 (-28.06)	69903 (227.33)
3.	Bank Interest (Rs.)	375 (9.87)	363 (1.13)	1045 (2.50)	82 (.15)	2140 (7.16)	432 (1.57)	2751 (10)	154 (.28)	917.75 (4.08)
4.	Income from diversification activity (Rs.)	0	2020 (6.29)	5423 (13)	10020 (18.87)	4008 (13.40)	0	0	0	2683.87 (6.44)
5.	Voluntary Labour (Rs.)	0	0	0	2400 (4.52)	4000 (13.38)	0	5000 (18.18)	6000 (10.77)	2175 (5.85)
Total Income [2+3+4+5] (Rs.)		3179 (83.66)	28290 (88.13)	59793 (143.39)	121460 (228.74)	135873 (454.42)	158730 (577.2)	145474 (528.99)	55893 (100.35)	88587 (275.6)

Note: The figures in bracket are per hectare of irrigated area equivalents of the corresponding figures outside the bracket

Chopadvav (promoted by AKRSP) contd...

		93-94	94-95	95-96	96-97	97-98	98-99	99-2000	2001-02	Average
1.	Area Irrigated- (Ha)	38	321	417	531	299	275	275	557	339.12
Expenditure										
6. Administrative Expenses (Rs.)		33 (.87)	8814 (27.46)	20652 (49.52)	36175 (68.13)	35599 (119.06)	34393 (125.06)	32158 (116.94)	38257 (68.68)	25760 (71.96)
<i>i.</i>	<i>Administrative cost (Rs.)</i>	33 (.87)	3414 (10.63)	9852 (23.62)	25375 (47.79)	11599 (38.79)	18793 (68.34)	16558 (60.21)	22657 (40.68)	13535.12 (36.36)
<i>ii.</i>	<i>Secretary's salary (Rs.)</i>	0	5400 (16.82)	10800 (25.9)	10800 (20.34)	24000 (80.27)	15600 (56.73)	15600 (56.73)	15600 (28.01)	12225 (35.6)
7. Maintenance & Repairs Expenses (Rs.)		1350 (35.53)	9600 (29.9)	17685 (42.41)	13650 (25.79)	15200 (50.84)	66410 (241.49)	25061 (91.13)	20960 (37.63)	21240 (69.34)
<i>i.</i>	<i>Canal Maintenance & Repairs (Rs.)</i>	0	0	8085 (19.39)	50 (.09)	0 *	54410 (197.85)	8061 (29.31)	560 (1.005)	8895.75 (30.95)
<i>ii.</i>	<i>Voluntary Labour (Rs.)</i>	0	0	0	2400 (4.52)	4000 (13.38)	0	5000 (18.18)	6000 (10.77)	2175 (5.85)
<i>iii.</i>	<i>Operators' Salary (Rs.)</i>	1350 (35.53)	9600 (29.9)	9600 (23.02)	11200 (21.09)	11200 (37.46)	12000 (43.64)	12000 (43.64)	14400 (25.85)	10169 (32.51)
Total Expenditure (Rs.) [6 + 7]		1383 (36.39)	18414 (57.36)	38337 (91.93)	49825 (93.83)	50799 (169.90)	100803 (366.56)	57219 (208.07)	59217 (106.31)	47000 (141.29)
Annual Surplus/ Deficit (Rs.) [Income-Expenditure]		1796 (47.26)	9876 (30.77)	21456 (51.45)	71635 (134.9)	85074 (284.53)	57927 (210.64)	88255 (320.93)	-3324 (-59.68)	41587 (127.6)

Note: The figures in bracket are per hectare of irrigated area equivalents of the corresponding figures outside the bracket

(iii) Degawada (Lift Irrigation scheme promoted by Sadguru) -

		95-96	96-97	97-98	98-99	99-2000	2000-01	2001-02	Average
1.	Area Irrigated- (Ha)	127	88	156	158	80	Data unavaila ble	54	110.5
Income									
2.	Water Charge Income (Rs.)	125795 (99.17)	12399 6 (1409. 4)	156327 (1002.1)	163447 (103.47)	84513 (1056.4 1)	21460	148829 (2756.09)	133817.83 (1226.21)
3.	Bank Interest (Rs.)	128 (1.01)	1650 (18.75)	3445 (22.08)	5245 (33.20)	5698 (71.22)	1551 ()	4680 (86.67)	3474.33 (38.82)
4.	Income from diversification activity (Rs.)	0	0	0	0	0	0	0	0
5.	Voluntary Labour (Rs.)	0	0	0	0	0	0	0	0
Total Income [2+3+4+5] (Rs.)		125923 (991.52)	12564 6 (1427. 80)	159772 (1024.18)	168692 (1067.67)	90211 (1127.6 4)	23011 ()	153509 (2842.76)	120966 (1413.59)

Note: The figures in bracket are per hectare of irrigated area equivalents of the corresponding figures outside the bracket

Degawada (Lift Irrigation scheme promoted by Sadguru) contd...

		95-96	96-97	97-98	98-99	99-2000	2000-01	2001-02	Average
1.	Area Irrigated- (Ha)	127	88	156	158	80	Data unavailable	54	110.5
Expenditure									
	6. Administrative Expenses (Rs.)	33031 (260.09)	29922 (340.02)	41188 (264.02)	49766 (314.97)	39451 (493.14)	7353 ()	58061 (1075.20)	41903.16 (457.9)
	7. Maintenance & Repairs Expenses (Rs.)	7828 (61.64)	7243 (82.31)	45405 (291.06)	13741 (86.97)	6305 (78.81)	29355 (DNA)	10002 (185.22)	15087.33 (131)
	8. Salary	34388 (270.77)	43885 (498.69)	38355 (245.86)	59347 (375.61)	55470 (693.37)	20825	59090 (1094.26)	48422.5 (529.65)
	Total Expenditure (Rs.) [6 + 7 + 8]	75247 (592.5)	81050 (921.02)	124948 (800.95)	122854 (777.56)	101226 (1265.32)	57533 ()	127153 (2354.68)	105413 (1118.75)
	Annual Surplus/ Deficit (Rs.) [Income- Expenditure]	50676 (399.02)	44596 (506.77)	34824 (223.23)	45838 (290.11)	-11015 (- 137.69)	-34522	26356 (488.07)	22393.28 (294.91)

Note: The figures in bracket are per hectare of irrigated area equivalents of the corresponding figures outside the bracket

(iv) Jetpur (Lift Irrigation scheme promoted by Sadguru) -

		96-97	97-98	98-99	Average
1.	Area Irrigated- (Ha)	200	125	100	141.66
Income					
2.	Water Charge Income (Rs.)	34794 (173.97)	21000 (168)	7978 (79.78)	21257.33 (140.58)
3.	Bank Interest (Rs.)	58 (.29)	60 (.48)	26 (.26)	48 (.34)
4.	Income from diversification activity (Rs.)	0	0	0	0
5.	Voluntary Labour (Rs.)	0	0	0	0
Total Income [2+3+4+5] (Rs.)		34852 (174.26)	21060 (168.48)	8004 (80.04)	21305 (140.92)
Expenditure					
6.	Salary (Rs.)	6900 (34.5)	17500 (140)	1700 (17)	8700 (63.83)
7.	Administrative cost Rs.)	13765 (68.82)	1550 (12.4)	2873 (28.73)	6062.67 (19.13)
8.	M & Repairs (Rs.)	7906 (39.53)	890 (7.12)	1074 (10.74)	3290 (19.13)
Total Expenditure (Rs.) [6 + 7 + 8]		28571 (142.85)	19940 (159.52)	5647 (56.47)	18052.66 (119.61)
Annual Surplus/ Deficit (Rs.) [Income-Expenditure]		6281 (31.4)	1120 (8.96)	2357 (23.57)	3252.66 (21.31)

Note: The figures in bracket are per hectare of irrigated area equivalents of the corresponding figures outside the bracket

(v) Rangpur(promoted by DSC)-

		97-98	98-99	2001-2002	Average
1.	Area Irrigated- (Ha)	201	170	320	230.33
Income					
2.	Water Charge Income (Rs.)	39812 (198.07)	24308 (142.99)	86182 (269.33)	50101 (203.46)
a)	Government Subsidy for Administrative expenses (Rs.)	8129 (40.44)	5702 (33.54)	18284 (57.14)	10705 (43.70)
b)	Government Subsidy for M & R (Rs.)	12169 (60.54)	8553 (50.31)	27426 (85.71)	16049 (65.52)
c)	Additional water charges (Rs.)	19514 (97.08)	10053 (59.13)	40472 (126.47)	23346 (94.22)
3.	Bank Interest (Rs.)	2541 (12.64)	3321 (19.53)	12975 (40.55)	6279 (24.24)
4.	Income from diversification activity (Rs.)	0	0	0	0
5.	Voluntary Labour (Rs.)	10000 (49.75)	10000 (58.82)	20000 (62.5)	13333 (57.02)
Total Income (2+3+4+5) (Rs.)		52353 (260.46)	37629 (221.34)	119157 (372.26)	69713 (284.68)
Expenditure					
6.	Administrative Expenses (Rs.)	1556 (7.74)	1965 (11.56)	14302 (44.69)	5941 (21.33)
i.	Administrative cost (Rs.)	1556 (7.74)	1965 (11.56)	2302 (7.19)	1941 (8.83)
ii.	Secretary's salary (Rs.)	0	0	12000 (37.5)	4000 (12.5)
7.	Maintenance & Repairs Expenses (Rs.)	23960 (119.20)	21540 (126.7)	52480 (164)	32660 (136.63)
i.	Canal Maintenance & Repairs (Rs.)	0	4550 (26.76)	5680 (17.75)	3410 (14.83)
ii.	Voluntary Labour (Rs.)	10000 (49.75)	10000 (58.82)	20000 (62.5)	13333 (57.02)
iii.	Operators' Salary (Rs.)	13960 (69.45)	6990 (41.12)	26800 (83.75)	15917 (69.77)
Total Expenditure (Rs.) [6 + 7]		25516 (126.94)	23505 (138.26)	66782 (208.69)	38601 (157.96)
Annual Surplus/ Deficit [Income-Expenditure] (Rs.)		26837 (133.52)	14124 (83.08)	52375 (163.67)	31112 (126.75)

Note: The figures in bracket are per hectare of irrigated area equivalents of the corresponding figures outside the bracket

(vi) Thalota (promoted by DSC)-

		96-97	97-98	98-99	2001-02	Average
1.	Area Irrigated- (Ha)	109	163	168	170	152.5
Income						
2.	Water Charge Income (Rs.)	11172 (102.49)	44923 (275.6)	30261 (180.12)	44852 (263.83)	32802 (164.4)
a)	Government Subsidy for Administrative expenses (Rs.)	627 (5.75)	8171 (50.13)	4630 (27.56)	10134 (59.61)	5890 (35.76)
b)	Government Subsidy for M & R (Rs.)	939 (.61)	12258 (75.2)	6945 (41.34)	14434 (84.9)	8644 (52.51)
c)	Additional water charges (Rs.)	9606 (88.13)	24494 (150.27)	18686 (111.23)	20284 (119.32)	18267 (117.23)
3.	Bank Interest (Rs.)	636 (5.83)	6849 (42.09)	7272 (43.28)	4087 (24.04)	4711 (28.81)
4.	Income from diversification activity (Rs.)	-115 (-1.05)	7975 (48.93)	15079 (89.75)	16113 (94.78)	9763 (58.10)
5.	Voluntary Labour (Rs.)	0	0	0	0	0
Total Income (2+3+4+5) (Rs.)		11693 (107.27)	59747 (366.55)	52612 (313.17)	65052 (382.66)	47276 (292.41)
Expenditure						
6.	Administrative Expenses (Rs.)	5005 (45.92)	8755 (57.71)	17078 (101.65)	15157 (89.16)	11499 (73.61)
i.	Administrative cost	5005 (45.92)	3355 (20.58)	7878 (46.89)	5557 (32.69)	5448.75 (36.52)
ii.	Secretary's salary	0	5400 (33.13)	9200 (54.76)	9600 (56.47)	6050 (36.09)
7.	Maintenance & Repairs Expenses	1265 (11.6)	22409 (137.48)	8460 (50.36)	31216 (183.62)	15838 (95.76)
i.	Canal Maintenance & Repairs (Rs.)	25 (.23)	12259 (75.21)	0	14436 (84.92)	6680 (40.09)
ii.	Voluntary Labour (Rs.)	0	0	0	0	0
iii.	Operators' Salary (Rs.)	1240 (11.38)	10150 (62.27)	8460 (50.36)	16780 (98.70)	9158 (55.67)
Total Expenditure (Rs.) [6 + 7]		6270 (57.52)	31164 (191.19)	25538 (152.01)	46373 (272.78)	27336 (168.37)
Annual Surplus/ Deficit [Income-Expenditure] (Rs.)		5423 (49.75)	28583 (175.35)	27074(161. 15)	18679 (109.88)	19940 (124.03)

Note: The figures in bracket are per hectare of irrigated area equivalents of the corresponding figures outside the bracket

* The diversification activity was agriculture input supply

(vii) Bhetasi (promoted by Irrigation Department)-

		94-95	95-96	96-97	97-98	98-99	99-2000	2000-01	2001-02	Average
1.	Area Irrigated- (Ha)	1027	1245	1275	755	1040	369	36	125	734
Income										
2	Water charge income (Rs.)	Data Insuff.	Data Insuff.	Data Insuff.	Data Insuff.	Data Insuff.	Data Insuff.	Data Insuff.	Data Insuff.	Data Insuff.
3	Bank Interest (Rs.)	Data Insuff.	Data Insuff.	Data Insuff.	Data Insuff.	Data Insuff.	Data Insuff.	Data Insuff.	Data Insuff.	Data Insuff.
4	Income from diversification activity (Rs.)	0	0	0	0	0	0	0	0	0
5	Voluntary Activity	0	0	0	0	0	0	0	0	0
Total Income [2+3+4+5] (Rs.)		Data Insuff.	Data Insuff.	Data Insuff.	Data Insuff.	Data Insuff.	Data Insuff.	Data Insuff.	Data Insuff.	Data Insuff.
Expenditure										
6	Salary (Rs.)	12900 (12.56)	0	14700 (11.53)	12000 (15.89)	24000 (23.08)	15000 (40.65)	17000 (472.22)	10000 (80)	13200 (81.99)
7	Administrative cost (Rs.)	1646 (1.6)	6896 (5.54)	1360 (1.07)	700 (.93)	3981 (3.83)	2560 (6.94)	3253 (90.36)	510 (4.08)	2613 (14.29)
8	M & Repairs (Rs.)	82870 (80.69)	9240 (7.42)	14169 (11.11)	19775 (26.19)	2500 (2.40)	38658 (104.76)	4530 (125.83)	3040 (24.32)	21848 (47.84)
Total Expenditure (Rs.) [6 + 7+8]		97326 (94.77)	16136 (12.96)	30229 (23.71)	32475 (43.01)	30481 (29.31)	56218 (152.35)	24783 (688.42)	13550 (108.4)	37658 (144.11)
Annual Surplus/ Deficit (2+3+4-5) (Rs.)		Data Insuff.	Data Insuff.	Data Insuff.	Data Insuff.	Data Insuff.	Data Insuff.	Data Insuff.	Data Insuff.	Data Insuff.

Note: The figures in bracket are per hectare of irrigated area equivalents of the corresponding figures outside the bracket

