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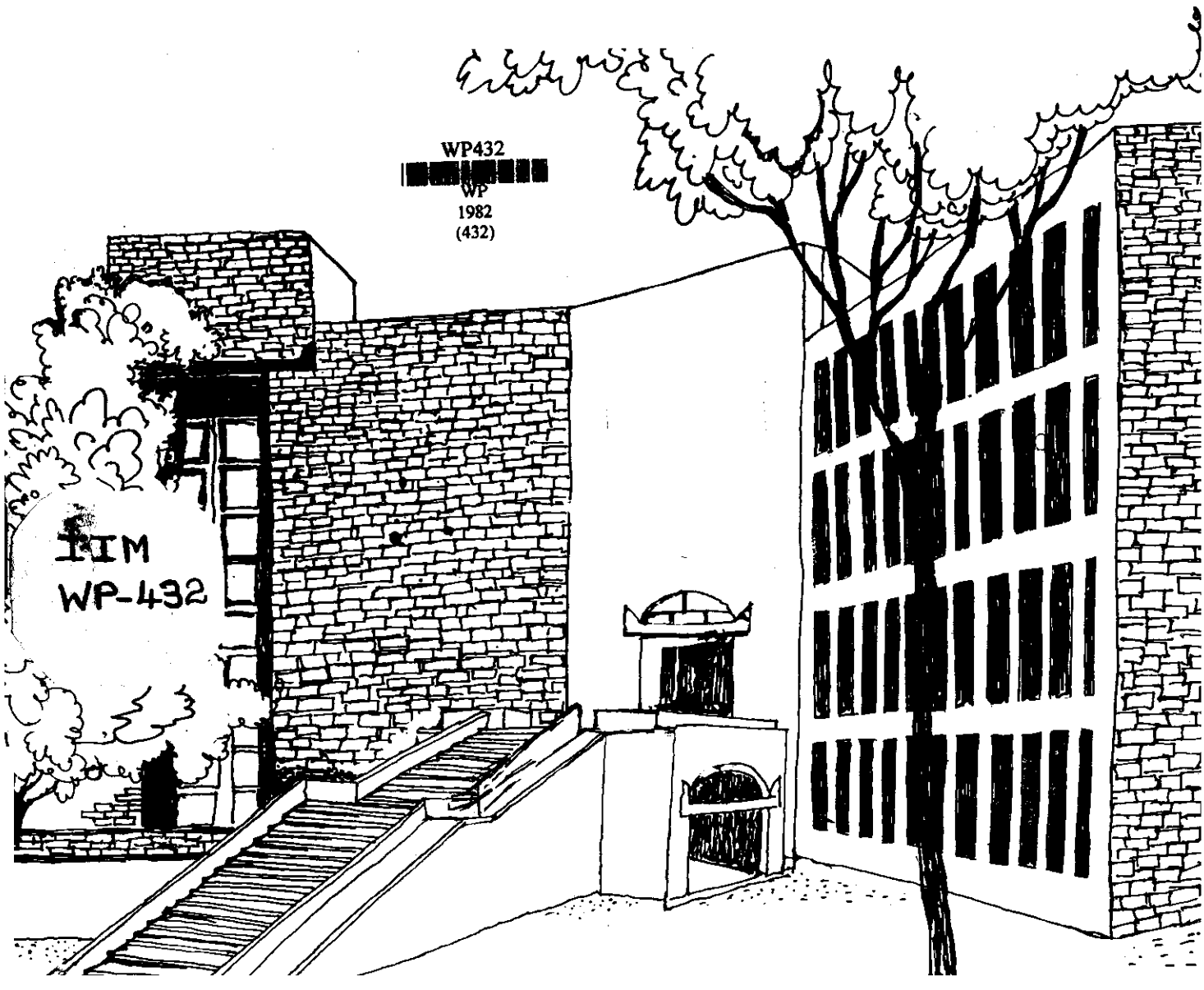

SURFACE IRRIGATION COOPERATIVE: A CASE STUDY

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INTRODUCTION

Distribution of any scarce commodity is fraught with problems. This is equally true in the case of a productive input, say, like water for agriculture. The most common institutional choice (to ensure equitable distribution) in the irrigation project areas has been to set up a state machinery for delivering it to the farmers.

This arrangement of managing the water delivery system up to the level of the beneficiary is expected to ensure the system's neutrality to the socio-economic forces that operate at the faction-ridden village level. Experience shows, not without reasons, that these expectations are misplaced. The task of planning, organizing, and controlling a large irrigation distribution network is in itself a difficult proposition and the irrigation department does not have adequate skilled human resources to do it. The cost of retail network, when organized by the state, becomes expensive. More importantly, the agency, in its anxiety to ensure equality among the beneficiaries, tends to rely on rules and regulations, turning itself into a highly bureaucratic organization completely alienated from the people for whom it is meant.

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An improved version of the state agency for distribution is the one where at the lower level, people's participation is sought to be ensured through local group participation. Rotational water supply, known as Warabandi is one such attempt[1]. The idea behind such an attempt is to render the bureaucracy responsive to Irrigators' problems and also to share the responsibilities of management, of distribution within them[2].

Another innovative arrangement for the distribution of water at the field level could be the use of private sector. But in India there is no experience of distribution of water by private agency. Irrigation cooperative movement started with lift irrigation societies in Maharashtra. Tube well irrigation cooperatives have been formed in different states. In the case of surface irrigation, cooperative effort is of recent origin. India's first and the only irrigation cooperative was registered in 1978. Since then even in the state where the first cooperative sprang up new ones have not been formed. If the first was a success it should have had the spread effect and if it was not it would be useful to know the causes for its failure. With a view to understand the working of this first venture, a study was taken.

Organization of the Study

This paper is organized into three sections. The first section deals with the circumstances leading to the formation of the water distribution cooperative and explains in brief its working. Certain indicators to test the efficiency of any water distributing system

at the field level are spelt out. The sampling design adopted for testing the indicators are explained in this section. The second presents the findings. The third examines in detail the problems in forming water cooperatives.

Section 1 : Selected Region, Criteria for Efficiency & Sampling Design

Efficient use of water at the farm level is the touchstone of success of any irrigation project. In the case of major as well as minor irrigation projects, the complex problems of construction of dams and building, of irrigation canals are generally achieved with relative case whereas the distribution of water at field level proves to be the "Achilles heel". This is because at the end point of irrigation system, matching the water requirement of different crops with the availability of water in the canal calls for ' very fine tuning ' of the distribution machinery.

In Surat (Gujarat State, India), due to the combined efforts of the Command Area Development Authority and an elected member of the Legislative Assembly, who was also a wellknown cooperator, India's first surface irrigation water distribution cooperative was established at Mohani village served by three outlets 3L, 4L and 5L in Bhestan Minor of Ukai Kakrapar Irrigation Project.

The formation of the cooperative society was facilitated by (a) the state government's readiness to write-off any loss in the first three years of the society's functioning, (b) to meet the administrative cost of the society up to Rs.26,000 per year in the first two years and (c) the irrigation department's willingness to supply water in bulk to the society at 25 paise per 10,000 litres. The society in turn undertook the task of providing water

to the farmers at the rates charged by the state government for different crops and to non-members as well, within the command area.

The mohani Water Cooperative Society (hereinafter referred to as the society) came into being on 15th September 1978. Water measuring devices were installed at all the three outlets.* Water was released on 4th May 1979. The command area of the Society comprised of about 1000 hectares. It increased its membership from 102 in 1978 to 151 in 1982 and is managed by an elected Managing Committee which includes a co-opted member and an engineer from the irrigation department to provide technical help. The functions of the Society are as follows:

(i) to collect, at the beginning of each year applications indicating the crops proposed to be grown;
(ii) to work out from the individual cropwise demand for water the annual water needs of the Society and submit the same to the irrigation department;
(iii) to prepare a detailed water distribution schedule and implement it with the help of the canal staff employed by the Society**;
(iv) to undertake tasks like maintenance of field water channels, exercise vigilance on use, of wastage and pilferage of water and report to the Managing Committee for suitable action;
(v) to collect water charges from the farmers as per the per acre tariff fixed by the Gujarat government for different crops;
(vi) to meet administrative cost from the savings between the payments to the irrigation department (calculated at the bulk rate) and the charges collected from the farmers; and
(vii) to provide any other service needed by the members.

In the rest of the Bhestan command area, the irrigation department managed the distribution of water up to field level and the farmers looked after the maintenance of the field channels. All tasks relating to the receipt of applications for water, collection of revenue, settling of disputes, etc. were discharged by the canal authorities.

** Since 1981, the Society has repatriated the deputationists from the Irrigation department and recruited its own staff.

* This is perhaps the first attempt to distribute water to farmers on the basis of quantity supplied.

Before undertaking a comparative study of effectiveness between the cooperative and government water distribution system, it would be necessary to spell out certain objective criteria for measuring the efficiency of distribution of water. Efficient distribution of water would result in the following:

(i) Other things remaining the same, the cropping pattern of the farmers in the head, middle and tail of the canal in a given command area would be identical.

(ii) There would be a decrease in private investment or irrigation

(iii) The socio-economic background of the beneficiaries would not influence their access to water.

(iv) The time and effort spent by farmers in respect of routine tasks like placing of demand for water, maintenance of channel, payment of water charges and settlement of disputes would be considerably reduced.

(v) The overall satisfaction from the water distribution system's performance would be high, if it resolves conflicts among farmers while ensuring timely and adequate supply of water to them.

(vi) Optimal use of water would be promoted reflecting an increase in the recovery of water charges.

Selection of Region and Farmers for Study

We selected the 1,000 hectares covered by the Society through the three outlets 3L, 4L and 5L located on the Bhestan Minor and the next outlet 6L with a command area of 1,000 hectares, administered by the irrigation department. The command area under 6L was selected for comparison as (a) the agro-climate soil conditions are similar, (b) the supporting structure from the agriculture and the other departments are the same and (c) the water release in the canal for is alike. both the command areas. Further both the command areas fall within the jurisdiction of the Cooperative Sugar Factory located at Chalthan and hence the external factor that could affect the cropping pattern is the same.

Any field's access to water would depend on its location and so for the purpose of selecting cultivators, the command area from the minor was divided into three segments namely head, middle, and tail, and the command area from the outlet was further subdivided as head, middle and tail (see table 1).

Table 1: Selection of Cultivators

From Outlet	Minor	Head	Middle	Tail	Total
		COOPERATIVE COMMAND AREA			
Head		4	4	4	12
Middle		4	4	4	12
Tail		4	4	4	12
		NON-COOPERATIVE COMMAND AREA			
Head		4	4	4	12
Middle		4	4	4	12
Tail		4	4	4	12
		24	24	24	72

From each ofthe nine segments, four survey numbers were selected at random and thus in all 36 survey numbers were selected from the Cooperative Commands Area (CCA) and 36 from the Non-Cooperative Command Area (NCCA). The land owners of the selected survey numbers were interviewed with a questionnaire.

It needs to be reiterated that since location of land from the minor and outlet would determine the access to and the quantum of water, the selection of cultivators was made on the basis of location.

Section 2: FINDINGS OF THE STUDY

Criteria 1 : Assured supply of Irrigation would ensure Identical Cropping pattern in the entire Command Area

The cropping pattern in the selected region is classified into high and low value crops. The high value crops include sugarcane, banana, paddy, vegetable, wheat, cotton and groundnut. The low value crops are jowar, bajri, pulses, fodder and green manure. Certain parennial crops like mango, chikku and guva,. though grown by the sample farmers in 1.3 hectares, are not included for the purpose of analysis because more than irrigation, other factors like investment capacity would influence the decision-making in area allocation to these crops. In all other crops, other factors remaining the same, the availability of irrigation is expected to play a crucial role. The cropping pattern in the survey numbers from the minor and out-let in the CCA and NCCA is shown in Table 2. If one looks at cropping pattern from minor alone it can be seen that the overall area under high value crops is greater in the CCA compared to NCCA. Further the area under high value crops is the same in the head and the tail and in the Middle of CCA, and only 19 percent area is under low value crops. Whereas in the NCCA, tailenders are better-off in respect of irrigation/compared to those in the head to minor. (rudged by share of high value crops)
This finding of large share of high value crop in NCCA show that the popular assumption that farmers at the head to the minor are generally well placed in respect of irrigation seems to be wrong. To ascertain whether this is an 'irrational noise' in the data the cropping pattern is redistributed, keeping outlet as the basis and this data is also presented in the same Table 2. It shows that in the CCA as well as in the NCCA, the farmers located in the tail to minor and outlet are worse off compared to all others. However in

Table 2: Cropping Pattern in the Sample Fields on the Basis of its Location to Minor and Outlet

(Area in Ha.)

Crops	From Minor			From Outlet		
	High value	Low value	Total	High value	Low value	Total
Cooperative Command Area						
Head	22.6 (100)*	-	22.6 (100)	18.4 (100)	-	18.4 (100)
Middle	14.7 (81)	3.3 (19)	18.0 (100)	13.3 (100)	-	13.3 (100)
Tail	11.8 (100)	-	11.8 (100)	17.4 (84)	3.3 (16)	20.7 (100)
Total	49.1 (93.7)	3.3 (6.3)	52.4 (100)	49.1	3.3 (6.3)	52.4 (100)
Non-Cooperative Command Area						
Head	7.5 (42)	10.5 (58)	18.0 (100)	13.0 (62)	8.0 (38)	21.0 (100)
Middle	5.4 (32)	11.6 (68)	17.0 (100)	12.0 (70)	5.1 (30)	17.1 (100)
Tail	26.6 (81)	6.0 (19)	32.6 (100)	14.5 (49)	15.0 (51)	29.5 (100)
Total	39.5 (58)	28.1 (42)	67.6 (100)	39.5 (58)	28.1 (42)	67.6 (100)

* Figures in Parenthesis are percentages.

minor are not better placed compared to the others. So one can conclude from Table 2 that in the matter of access to water advantageous locations are closer to out let and not to minor. This fact is further confirmed from the data shown in Table 3, where area under high and low value crops is shown in locations head-head, middle-middle, and tail-tail to minor and outlet. In the CCA, the cropping pattern of the fields located at the most advantageous position namely, head-head, is similar to that of the most disadvantageous position namely at the tail-tail. Whereas in the NCCA, fields at the tail-tail are not getting adequate supply of water as reflected in the higher proportion of area under low value crops.

Table 3: Cropping Pattern in the Sample Fields in the Area Under Minor and Outlets

Area in Ha.( ) Percentage

Status	From Minor and Outlet		
	High Value	Low Value	Total
	Co-operative Command Area		
Head-Head	10.2 (100)	-	10.2 (100)
Middle-Middle	6.8 (100)	-	6.8 (100)
Tail-Tail	5.9 (100)	-	5.9 (100)
Total	22.9 (100)	-	22.9 (100)
	Non-Cooperative Command Area		
Head-Head	2.2 (76)	0.7 (24)	2.3 (100)
Middle-Middle	4.6 (100)	-	4.6 (100)
Tail-Tail	14.5 (70.7)	6,0 (29.3)	20.5 (100)
Total	22.8 (81)	5.2 (19)	28.0 (100)

Criteria 2: Reliable Supply of Water Would Tend to Decrease Investment on Own Irrigation Arrangements

To understand the factor responsible for the allocation of greater area to high value crops in the tail-tail portion, the impact of private irrigation is interposed (see Table 4). It could be seen that farmers in the CCA have not invested in private wells for supplementary irrigation whereas in the NCCA private investment in wells has taken place. Supportive irrigation has played a significant role in the tail-tail portion to minor as well as outlet. This data clearly show that in the NCCA the fields located away from minor and outlet have resorted to well irrigation due to lack of assured supply of water.

Table 4: Source of Irrigation for the Farms of Different Location Minor and Outlet

(Area in Ha.)

Status from Minor and Outlet	Source of Irrigation	Crope grown		
		High value	Low value	Total
		Co-operative Command Area		
Head-Head	1. Canal	10.2	-	10.2
	2. Canal with well	-	-	-
Middle-Middle	1. Canal	6.8	-	6.8
	2. Canal with well	-	-	-
Tail-Tail	1. Canal	5.9	-	5.9
	2. Canal with well	-	-	-
Total	1. Canal	22.9	-	22.9
	2. Canal with well	-	-	-
		Non-Cooperative Command Area		
Head-Head	1. Canal	2.2	0.7	2.9
	2. Canal with well	-	-	-
Middle-Middle	1. Canal	4.6	-	4.6
	2. Canal with well	-	-	-
Tail-Tail	1. Canal	8.1	6.0	14.1
	2. Canal with well	6.4	-	6.4
Total	1. Canal	14.9	6.7	21.6
	2. Canal with well	6.4	-	6.4

Criteria 3: Impact of Socio-Economic Status on Access to Canal Water

The effect of social status on access to canal irrigation is shown in Table 5.

Table 5: Effect of Social Status on Access to Water

(Area in Ha.)

Status to Minor	Caste	High value	Low value	Total	High value	Low value	Total
		Cooperative Command Area			Non-Cooperative Command Area		
Head	1. High castes(a)	19.8	-	19.8	7.5	8.0	15.5
	2. Tribes (b)	2.8	-	2.8	-	1.1	1.1
	3. Low castes (c)	-	-	-	-	1.4	1.4
Middle	1. High castes	14.7	3.3	18.0	5.4	11.6	17.0
	2. Tribes	-	-	-	-	-	-
	3. Low castes	-	-	-	-	-	-
Tail	1. High castes	10.2	-	10.2	26.6	6.0	32.6
	2. Tribes	-	-	-	-	-	-
	3. Low castes	1.6	-	1.6	-	-	-
Total	1. High castes	44.7	3.3	48.0	39.5	25.6	65.1
	2. Tribes	2.8	-	2.8	-	1.1	1.1
	3. Low castes	1.6	-	1.6	-	1.4	1.4

a) High castes include Brahmins, Patels, Banyas and Ksahtriyas.

b) Notified tribes

c) All other castes

The data in the CCA show that caste was not a factor that influenced access to irrigation. In the NCCA also there was not enough evidence to show that caste was a barrier in getting access to water.

The data from the sample (see Table 6) farms was found insufficient to draw any definite conclusion that economic status affected access to water.

Table 6: Effect of Economic Status on Access to Water

(Area in Ha.)

Status to Minor	Size of Holding	High value	Low value	Total	High value	Low value	Total
		Cooperative Command Area			Non-cooperative Command Area		
Head	Small	1.1	-	1.1	4.1	1.9	6.0
	others	21.5	-	21.5	3.4	8.6	12.0
Middle	Small	-	-	-	-	7.6	7.6
	others	14.7	3.3	18.0	5.4	4.0	9.4
Tail	Small	-	-	-	1.7	-	1.7
	others	11.8	-	11.8	24.9	6.0	30.9
Total	Small	1.1	-	1.1	5.8	9.5	15.3
	others	48.0	3.3	51.3	33.7	18.6	52.3

In the NCCA small farmers in the middle area are unable to go in for high value crops.

Critaria 4: Efforts Spent by Farmers for Routine Tasks should be Less

In the NCCA, farmers are expected to submit applications for supply of water to the officials of the irrigation department before the commencement of the season. Further, any special request for water for special crops and complaints regarding maintenance of channel or settlement of disputes should also have to be addressed to them. Payment of water charges is expected to be made to the village revenue official, namely Talati. In case of any change in the cropping pattern the same is to be communicated to the irrigation officials. The number of visits that farmers have to make to these officials would depend on their availability. When problems are not resolved at lower levels the farmers may have to approach officials at the higher echelons of the department. Consequently, farmers in the NCCA, would have to incur not only expenditure on transport but also spend enormous time. In the case of CCA all these functions are carried out by the officials of the society, located within the village, and the number of visits by the farmers would be far less and inexpensive (Table 7).

The conclusions that emerge from the data are summarized:

a) Submitting forms: In the CCA area, all farmers deliver their applications personally to the society. In the NCCA, data show that in several cases the farmers had to travel about 10 Km to meet the canal inspector.

Table 7: NUMBER OF VISITS BY FARMERS IN COOPERATIVE AND NON-COOPERATIVE COMMAND AREA FOR PURPOSE RELATED TO IRRIGATION

Purpose	Location	Visited Officers	Status from Minor			
			Head	Middle	Tail	Total
Submitting forms	C.C.A.	Society Staff	12	12	12	36
	N.C.C.A.	Canal Inspector	4	6	7	17
	"	Section Officer	—	—	1	1
	"	Chowkidar	3	1	—	4
	"	Total	7	7	8	22
Request for Water	C.C.A.	Society Staff	14	12	12	38
	N.C.C.A.	Canal Inspector	7	4	—	11
	"	Section Officer	—	—	3	3
	"	Chowkidar	6	4	14	24
	"	Total	13	8	17	38
Maintenance & Complaints	C.C.A.	Society Staff	1	2	4	7
	N.C.C.A.	Canal Inspector	—	—	—	—
	"	Section Officer	3	3	—	6
	"	Chowkidar	17	15	2	34
	"	Total	20	18	2	40
Settlements of disputes	C.C.A.	Society Staff	—	—	—	—
	N.C.C.A.	Canal Inspector	—	—	—	—
	"	Section Officer	—	3	4	7
	"	Chowkidar	2	—	1	3
	"	Total	2	3	5	10
Payments of Water Charges	C.C.A.	Society Staff	17	14	13	44
	N.C.C.A.	Talati	7	4	9	20
	"	Total	7	4	9	20
Information for crop charges	C.C.A.	Society Staff	—	—	—	—
	N.C.C.A.	Chawkidar	1	—	—	1
	"	Section Offcer	—	—	1	1
	"	Total	1	—	1	2

B) Request for water: In addition to the normal water scheduling, there are always special requirements for water. For instance surgarcane cultivators are given intimation about the date of harvesting a few days in advance and the last irrigation is allowed 30 days before harvesting. In such cases farmers would have to make special request for irrigation. In the CCA, the members approach the Society for this purpose whereas in the NCCA, farmers with lands closer to head of the minor are able to sort out their problems with the canal inspector and the chowkidar, whereas in the case of tail-enders, they have to approach even the section officer of irrigation department. In other words the tail-enders get water on special occasions only through the intervention and support of higher officers.

C) Maintenance and complaints: In the CCA, members take their complaints to the society's chairman or the manager. All problems relating to adequacy, timeliness, and maintenance of field channels are sorted out by the manager/chairman. In case of conflicts, the problem is referred to the managing committee for decision. For instance during 1980-81 some field channels were not properly maintained which resulted in problems to the tail-enders. The managing committee convened a meeting of all the farmers in the particular outlet and after obtaining their collective consent got the field channel repaired. The charges were later recovered from the farmers. Any farmer found wasting water is penalised by the society. In the NCCA, the chowkidar was approached in most cases and in exceptional cases the section officer. Farmers reported that the help was not satisfactory.

d) Settlement of disputes: In the CCA, no dispute was observed during 1980-81. In the NCCA, there were a number of disputes, and most of them originated from the tail-enders. The farmers had taken the disputes up to the section officer level for settlement.

e) Payment of water charges: In the CCA, the society encouraged the farmers to pay water charges in advance or in instalments. In the NCCA the farmers paid the charges to Talatis and generally at the time of submitting application for water for the next year so that they could obtain the ' no dues ' certificate.

f) Information for crop charges: There could always be variations between the intended and actual crops cultivated due to a variety of reasons like delay in monsoon or too much of rainfall. Since water rates are levied on the basis of the first applications, any change in crop needs communication. No such case was reported in CCA during the period under reference of field study though two such cases were reported in the NCCA.

From the data one could say that in the CCA with the decision centre located in the village, farmers could sort out most of the problems in the village itself, atleast cost and time.

Criteria 5: Success of System Depends on its Adaptability, Simplicity and Ability to Resolve Conflicts

An important but often neglected aspect at the farm level irrigation is the distribution system's (a) adaptability to farmers' needs, (b) simplicity in its formalities, (c) usefulness, and (d) ability

to resolve conflict. When an organization gets bureaucratized, it loses its sensitivity to the needs of users. Rules and regulations become a limiting factor affecting the efficiency of the organization. Further, it is often observed that the operation of the system often creates conflicts among the beneficiaries. Data on these aspects are shown in Table 8, which is self expl natory.

Table: 8 Opinion on System's Process

Region Rating	Cooperative Command Area						Non Cooperative Command Area					
	Poor	Satis-fied	Good	Very good	No Opi-nion	Total	Poor	Satis-fied	Good	Very good	No Opi nion	Total
Adaptab-ility	-	-	28 (78)	8 (22)	-	36 (100)	13 (36)	10 (28)	3 (8)	-	10 (28)	36 (100)
Simplic-ity	-	-	24 (66)	12 (34)	-	36 (100)	12 (33)	11 (32)	3 (8)	-	10 (28)	36 (100)
Usefuln-ess	-	-	25 (69)	11 (31)	-	36 (100)	11 (31)	12 (33)	3 (8)	-	10 (28)	36 (100)
Resolving conflicts	-	-	23 (64)	13 (36)	-	36 (100)	17 (48)	12 (33)	3 (8)	-	4 (11)	36 (100)

(Figures in brackets denote percentages)

In the CCA, the farmers were satisfied with the functioning of the system. In the NCCA, a large number of farmers had no opinion and among those who expressed opinion, a substantial number were dissatisfied with the arrangements.

The other indicator of success of farm level irrigation system is its ability to supply the required quantity of water at the right time to farmers.

Regularity and control are the two other critical factors that affect the Farmers' interests. The views of farmers in the CCA and the NCCA are shown in Table 9. It shows that in the CCA the farmers are mostly satisfied with the supply of water except in the case of one tail-ender. Among to four aspects satisfaction of farmers is found to be less in the case of quantity of water supplied and regularity in supply. The farmer is under to control of the corporative where as the later is under control of Canal authorities. In the NCCA a majority of the farmers refrained from giving any definite views. With the cultivators in NCCA also, dissatisfaction was found to be more in respect of quantity and regularity, in supply of water.

Table 9: Satisfaction to water Distribution in terms of Quantity, Timeliness, Regularity and Control

Area	Co-operative Command Area						Non-Cooperative Command Area					
	Poor	Satis-fied	Good	Very good	No Opi-nion	Total	Poor	Satis-fied	Good	Very good	No Opi-nion	Total
Quantity	-	-	21 (58)	15 (42)	-	36 (100)	6 (17)	10 (28)	4 (11)	-	16 (44)	36 (100)
Timeliness	-	-	27 (75)	9 (25)	-	36 (100)	10 (28)	8 (22)	1 (3)	1 (3)	16 (44)	36 (100)
Regularity	-	-	20 (56)	16 (44)	-	36 (100)	12 (33)	6 (17)	-	2 (6)	16 (44)	36 (100)
Control	1 (3)	-	23 (64)	12 (33)	-	36 (100)	10 (28)	10 (28)	1 (3)	-	15 (41)	36 (100)

Table 10 presents the overall impression of the farmers about the water distribution system. In the CCA 69% per cent stated that the arrangements were very good. Even all the tail-enders were fully satisfied with the system, in the CCA. The picture is altogether different in the NCCA. Dissatisfaction level increases in proportion to the distance in farmer's land is located to the Canal.

Table 10: Overall Opinion on the Distribution System

Area	Cooperative Command Area						Non-cooperative Command Area					
Status from Minor	Poor	Satis-fied	Good	Very good	No Opi-nion	Total	Poor	Satis-fied	Good	Very good	No Opi-nion	Total
Head	-	-	10 (83)	2 (17)	-	12 (100)	1 (8)	4 (34)	-	2 (17)	5 (41)	12 (100)
Middle	-	-	1 (8)	11 (92)	-	12 (100)	5 (42)	1 (8)	1 (8)	-	5 (42)	12 (100)
Tail	-	-	-	12 (100)	-	12 (100)	8 (67)	3 (25)	1 (8)	-	-	12 (100)
Total	-	-	11 (31)	25 (69)	-	36 (100)	1 (39)	8 (22)	2 (6)	2 (6)	10 (27)	36 (100)

Criteria 6: Promote Optimal Use of Water and Increase Revenue

Water being a scarce resource, a good distribution system should ensure that it is not wasted. The data from the rest of the Bhestan Minor and the CCA, regarding area cultivated in different seasons, water used per hectare and the demand raised for two years are shown in Table 11.

The area irrigated in the CCA increased substantially in 1980-81, over 1979-80, compared to the rest of the Bhestan Minor command area. The per hectare water used in both the years in all the seasons in the CCA was far below the quantity of water used in the rest of the Bhestan Minor command area. This implies that in the CCA there is an effective vigilence on the use of water by the society. It could also be inferred that in the rest of the Bhestan command area, water was either wasted or used without proper record of the exact area irrigated. The society as stated earlier, paid the irrigation department at the rate of 25 paise per 10,000 litres whereas in the rest of the Bhestan Minor area, the demand was raised on the basis of the crops grown.

Table 11: Area cultivated, quantity of Water used per Hectare, and Demand Raised in Cooperative Command Area and the Rest of the Bhestan Minor

Year		Mohini Co-op.Soc.				The rest in the Bhestan Minor			
		Hot	Kha-riff	Rabi	Total	Hot	Kha-riff	Rabi	Total
1979-80	Area Cultivated(Hect.)	178	173	242	593	220	418	423	1061
	% to Bhestan Minor	45	29	36	36	55	71	64	64
	Water released(100 cus)	3	3	2	8	33	58	17	108
	Water released/ha.	0.02	0.02	0.01	0.01	0.15	0.14	0.04	0.10
	% to Bhestan Minor	8	5	11	7	92	95	89	93
	Demand Raised(inRs.1000)	21	22	16	59	12	33	170	215
	Demand Raised/ha.	0.12	0.13	0.07	0.10	0.05	0.08	0.40	0.20
	% to Bhestan Minor	63	40	9	21	37	60	91	79
1980-81	Area Cultivated(Hect.)	226	301	280	807	330	440	479	1249
	% to Bhestan Minor	41	41	37	39	59	59	63	61
	Water released(100 cus)	8	9	5	22	45	58	24	127
	Water released/ha.	0.03	0.03	0.02	0.03	0.14	0.13	0.05	0.10
	% to Bhestan Minor	15	13	16	14	85	87	84	86
	Demand Raised(inRs.1000)	56	66	34	155	48	75	150	274
	Demand Raised/ha.	0,25	0.22	0.12	0.19	0.15	0.17	0.32	0.22
	% of Bhestan Minor	54	47	18	36	46	53	82	64

The quantity of water used and the demand raised for water in the CCA was far more than compared to the rest of the Bhestan Minor. This clearly indicates loss of Water and revenue to the irrigation department.

Section 3: PROBLEMS AND PRECONDITIONS FOR FORMATION OF WATER COOPERATIVES

Judged from the six point indicators of efficiency spelt out in Section 1, the findings of the field study clearly reveal that the society is better managed than the irrigation department's field water distribution system.

The society has been in existence for the last three years and the farmers in the adjacent villages knew about its working. But the farmers, even in the neighbouring villages of Mohani, have not followed the example. A few panchayat leaders and chairman of the village primary cooperatives in the neighbouring villages were interviewed. All of them felt that forming a water cooperative would be to their advantage. It came to our notice that village leaders approached the irrigation department to provide exclusive outlet from minor covering the area of one or two village as in the case of Mohani. Mohani is one village with about 1,000 hectares and it is served exclusively by three outlets, whereas one outlet (6L) serves a number of villages. The village leaders attributed the success of Mohani Society to social cohesiveness of one village leading to a single community feeling.

As part of the Government efforts to replicate the Mohani's success elsewhere, a group of farmers from the command area of Mahi-Kandana

Project were sent to Mohani Society for a first hand appraisal. The leader of the group Mr.Bhikabhai Patel returned with the impression that the formation of a society in the Mahi-Kandana command area at the present irrigation rate structure, would not be economically viable. His argument was that the soil at the Mahi-Kandana region was mostly sandy and loamy and the consumption of water would be higher per acre than in the Mohani area where the soil was black with good moisture retention capacity. Therefore, any cooperative in Mahi-Kandana area will have to pay a higher amount to the Government and hence he argued that the margin will be much less and may perhaps result in loss.

In Gujarat, the irrigation charges for different crops are fixed for the whole state irrespective of soil conditions or the irrigation project costs. Mr.Bhikabai Patel could clearly perceive that if the water rate was collected at 25 paise for 10,000 litres at Mahi-Kandana, it would work against the farmers interest,

In the Mohani village the society just managed to meet the expenses out of its income. The society got additional income from a tractor by providing custom hiring facilities to farmers. The farmers from Mahi-Kandana felt that the single important reason for the success of Mohani society was the appointment of Canal supervisory staff by the society to ensure proper allocation of water.

On the basis of the above discussions two pre-conditions for forming water cooperatives can be listed:

a) Social cohesiveness (as reflected in a single village) based on a limited community is important; and

b) Effective supervision through appointment of field staff to ensure proper distribution of water, is necessary

Conclusion: The two preconditions, throw up certain points for policy considerations. The first precondition implies, that the irrigation department while planning the course of the minor and the location of outlets could explore the possibility of providing outlets exclusively for a single village, or for a group of villages where the people are willing to come together.

Before encouraging the formation of new societies, an exercise needs to be carried out to find out the viable size of a surface irrigation cooperative and specify the minimum area needed to make a society function efficiently. Where ever the area in a single village is inadequate to form a viable cooperative, extensive cooperative extension education would be needed to persuade the villagers in the proposed command area to come together. Another related problem is one of handling recalcitrant farmers who are unwilling to join the cooperative. Even within a village all the farmers may not be willing to join the irrigation cooperative. For instance, even in Mohani water Cooperative, all the farmers in the village became its members only after three years. What happens if a few refuse to join the cooperative ? Who would ensure that they do not become a nuisance to the members or vice-cersa ? In this

context it may be relevant to draw on the experience of the legal provisions in cooperative law meant to tackle recalcitrant members in a lift irrigation cooperative Command Area or in a joint farming cooperative area. If the majority of farmers in the command area are members of the cooperative, the law provides for making the others members by compulsion

The second precondition for success of an irrigation cooperative relates to the adequacy of revenue required to meet the cost of supervision. At present, the irrigation department is carrying out all the tasks in respect of field distribution of water and the consequent administration cost. When the tasks are to be handed over to the cooperative, it is but natural to expect that the government would provide for the administrative cost to the society. It is assumed that the present water rates include administrative cost for distrubution of water at field level.

The government could consider several alternative to provide for the administrative cost of the cooperatives. If the present policy of uniform water rates for different crops for the whole state is to be continued, each project area could work out bulk rate for different soil zones, ensuring in the process a reasonable margin for the irrigation cooperative. The second alternative could be, that the government could decide a uniform bulk-rate for water for the whole state and leave the cooperatives to decide the irrigation charge for different crops/seasons. This would be resented by farmers in all those areas where they would have to pay more. In the new Command Area this problem could be avoided . The third alternative could be to fix region specific bulk water rate as well as crop rates. In this method apart from farmers resentment the

cooperatives would also be under pressure to meet its cost within the margin allowed. The last alternative could be to fix region specific bulk rate depending on the soil and allow the cooperatives to decide the crop/season irrigation rates. As per this alternative, in a project like Mahi-Kadana, the bulk rate in a clayish Soil would be different from the sandy loamy area. The project authorities while determing the bulk price for water could adopt suitable pricing strategy where by the water rates decrease when water consumption goes up so that the cost of irrigation for an acre in sandy loamy soil is made more or less the same as in the case of moisture retaining soil. Since the society determines the crop rates, the over head cost could be equitably spread among members on the basis of quantity of water used. This would also eliminate the problem of arriving at margins for societies. Where ever margins are determined by the government there is bound to be endless (and bitter) negotiations between the cooperative and the government. In the case of fertiliser distribution, forest labour contract/cooperatives and essential commodities distribution through cooperatives, on several occasions due to changes in the cost structure, cooperatives have suffered severe losses.

The success of the Mohani cooperative should not be considered only through its achievements in the six point indicators. One of the biggest achievement which is not explicity mentioned in the study is the consciousness created among the members on the use of water.

Since the society pays on quantity basis wastages have been minimised. Water logging is completely eliminated. Further, the committee members

have become quite conscious about the proper use of water for different crops. Water is and would be a scarce resource. In a country of small farmers, providing measuring equipments at each farm is neither feasible nor desirable. A water cooperative serving say 1000 hectares seems to be the ideal level where the quantity concept of consumption could be effectively actualised. The real success of Mohani Cooperative lies in this fact. However, in the given policy environment, it appears that Mohani would survive as a rare species !

References:

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