CHAPTER IV

Study of the Impact of Shri Kedarling Bhairavnath Co-operative Water Supply Society Ltd., Bachani on the Member Farmers

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4.1 Introduction

In chapter III of the study an attempt was made to analyse the working of the cooperative water supply society under study. In this chapter an attempt is made to study the impact of the cooperative society on the member farmers. Increase in agricultural production, use of fertilizers, change in cropping pattern, income generation, use of increased farm income, savings of the member, and other economic effects of the society are the major variable which are studied. Increase in water supply, has increased the irrigation facility in the village. This has resulted in more farmers shifting over to cash crop cultivation more so sugarcane. Better farming methods, increased use of fertilisers has resulted in more production and farm productivity increase. This has also resulted in generation of more farm incomes which has improved the farmers economic, social and educational background. With more income, other allied activities are also undertaken by farmers which has again led to better incomes. All these changes and the impact of the cooperative water supply society on member and non members of the village Bachani are studied here. To analyse the impact, Questionnaire Method was used and the impact study made on the sample size selected for study. The major findings of the field survey are as below :

4.2 Socio Economic Background of the Farmers :

Education of Farmers

Table No. 4.1

Educational Background

Below S.S.C.	S.S.C. to H.S.C.	Graduate	P.G.	Total
49	18	13	0	80
(61.25)	(22.5)	(16.25)	(0.0)	(100)

Figures in brackets indicate percentage to total.

Of the Eighty farmers surveyed it was found that 49 farmers members, that is 6.25 percent of the sample size, were having education upto below S.S.C. level. 18 farmers members that is 22.5 percent of the sample size has education upto H.S.C. level and 13 member farmers (16.25 percent) had graduate level education. None of the farmers surveyed had Post-graduate or other technical education. Thus the sample size surveyed had a majority of respondants who had education level below S.S.C. level.

Table No. 4.2

Family Size

1 to 3	4 to 6	7 to 9	10 and above	Total
10	45	19	6	80
(12.5)	(56.25)	(23.75)	(7.5)	(100%)

Figures in bracket indicate percentage to total.

The Table No.4.2 gives details of family size of the respondents. By and large it is found that the average size is large. Small family size (1 to 3 member per family) is low, only 10 respondents belong to this family size while 45 farmers constituting 56.25 percent of the sample size had a family size between 4 to 6 members. 19 farmers had a family size of 7 to 9 and six farmers surveyed had a family of above 10 members. Majority of farmer respondents had large family size 4-9 members.

Table No.4.3

Age of Farmers

18-25 Years	25-50 Years	50 & above years	Total
3 (3.75)	50 (62.50)	27 (33.75)	80 (100)

Figures in bracket indicate percentage to total.

Age wise classification of the farmers surveyed reveals that three farmers (3.75 percent) of the sample size were below 25 years, 50 farmers that is 62.50 percent were in the age category of 25 to 50 years and 27 respondants belonged to the age group of above 50 years. Thus bulk of the beneficiary farmers are in relative younger age.

Educational Profile of Children of Farmers

The educational profile of the children of farmers surveyed displays a better trend and children are found to be better educated than farmers. Of the 80 farmers surveyed children of 40 farmers had education upto primary level.

4.3 Economic Profile of the farmers

In the following section, analysis is made pertaining to the economic background of the farmers surveyed. In this, the size of farm

holdings, sources of irrigation, crops cultivated, use of fertilisers etc. is analysed. Such a study helps to identify the nature and type of farmers who are beneficiaries of the cooperative water supply society under study.

4.3.1 Farm Size of Farmers

Classification of farmer surveyed according to size of holdings is shown in Table No. 4.4 of the eighty farmers surveyed, it is found that 46 of the farmers, that is 57.60 percent farmers had land holding below 2 acres and were small farmers, thus proving that majority of farmers taking benefit of the water supply of the society belonged to small farmer size. 29 of the respondents had land holdings of size upto 2-5 acres. Thus our study reveals that majority of the farmer member surveyed had land holdings below 5 acres (93.75 percent) and thus we can say that the cooperative water supply established in the village has provided the much needed irrigation water to small sized farmers and in the process has made their land holdings economic in size, became with use of available irrigation facilities the farmers could grow cash crops like sugarcane and also cultivate two croprs a year. Only 5 farmer respondents had size of land holdings between 5 to 10 acrea snd none had land holdings above 10 acres. Thus the sample size adequately represents the small farmer size prepondarantly.

Table No. 4.4

Farm Size

Upto 2 acres	2 to 5 acres	5 to 10 acres	above 10 acres	Total
46	29	5	-	80
(57.50)	(36.25)	(6.25)	-	(100%)

Figures in bracket are percentage to total.

4.3.2 Source of Irrigation

Table No. 4.5 gives the source of irrigation used by member cultivators for their cultivation. Of the farmers surveyed all farmers made use of the lift irrigation as the mean of irrigation. In addition to use of the cooperative water supply scheme, 9 farmers had used well irrigationa and 8 other also made use of other source of irrigation and had their own irrigation scheme (borewells). Thus all respondents made use of water supply from the cooperative lift irrigation under study.

Table No. 4.5

Source of Irrigation

Well	Lift irrigation society	Private/others
9	80	8
(11.25)	(100)	(10)

Figures in brackets are percentate to total.

4.3.3 Cropping Pattern

Table No.4.6 gives details of the cropping pattern of the respondents. All the farmers surveyed have been cultivation sugarcane in their farms. Thus the availability of irrigation water through the cooperative water supply scheme has enabled the farmers in the village to cultivate sugarcane and thus make their farm economically remunerative. The cooperative lift irrigation scheme has brought about this cropping pattern change. In addition to surgarcane, 68 respondents that is 85 percent farmers in addition to sugarcane also undertake foodgrain cultivation and 15 (18.75 percent) farmers also cultivated oil seeds and 11 farmers cultivated other crops. Thus we can say that the cooperative water supply society has helped farmers in the village to undertake sugarcane cultivation alongwith mixed cropping pattern and foodgrain and oilseeds cultivation too. Cultivation of cash crop like

sugarcane ensured that the member farmers could get better farm incomes and with more water availability even foodgrains and Rabi crop and Summer crop oilseeds especially ground nuts also were cultivated by the farmers.

Table No.4.6

Cropping Pattern

Foodgrains	Sugarcane	Oilseeds	Other
68	80	15	11
(85)	(100)	(18.75)	(13.75)

Figures in bracket are percentage to total.

4.3.4 Use of Fertilisers

With assured availability of water supply, the member farmers of the cooperative lift irrigation society under study have undertaken cultivation of sugarcane as a cash crop cultivation. For this they also have to make increased use of fertilisers to increase farm production. Our survey reveals that the farmers have been by and large using more chemical fertilisers than manure or other fertilisers. Of the 80 farmers surveyed it was found that all of them made use of chemical fertilisers mainly Composte was used by 33 farmers (41.25 percent) and 21 farmers used other fertilisers.

Table No.4.7

Use of Fertilisers

Chemical	Compost	Others
80 (100)	33 (41.25)	21 (26.25)

Figures in bracket are percentage to total.

4.3.5 Types of Chemical Fertilisers used.

With increased use of chemical fertilisers it becomes important to understand the types of chemical fertilisers used. This is important because excess use of these have their bad effect on the soil fertility and also lead to degradation of the soil and water logging may give rise to problem of soil salanity. Our survey reveals the following types of fertilisers used.

Table No. 4.8

Types of Chemical Fertiliser used

Urea	Super Pottash	Pottash	Other
80 (100)	80 (100)	80 (100)	80 (100)

Figures in bracket are percentage to total.

The above data reveals that all the farmers surveyed were using chemical fertilisers. And all used Urea, Super Pottash, Pottash and other chemical fertilisers. Thus with increased sugarcane cultivation due to water availability from the cooperative water supply society the farmers in the village have started increased use of chemical fertilisers which is an impact of water supply by a cooperative water supply society. This is a trend noticeable in Kolhapur District where development of Lift Irrigation Schemes - Cooperative , Private and Sugar Cooperatives sponsored have led to farmers undertaking sugarcane cultivation with increased use of chemical fertilisers.

4.3.6 Per acre use of fertilisers (In monetary value)

With assured water supply, farmers have turned more to sugarcane cultivation with increased fertilisers use. Alongwith this we also find that per acre use of fertiliser has also increased. The findings of our survey, as regards per acre fertilise use is given in Table No. 4.9. The data reveals that for sugarcane cultivation per acre 26 farmers out of 80 surveyed spent upto Rs. 2,000/- on fertiliser per acre sugarcane grown and 9 farmers spend upto Rs. 3,000/- on fertiliser use per acre of sugarcane cultivation. 15 farmers spent Rs. 4,000/- per acre and as much as 30 farmers (37.50 percent) of the surveyed farmers spent upto Rs. 5,000/- on fertiliser use per acre of sugarcane cultivation. Thus more farmers spent more money on fertiliser use per acre of sugarcane cultivation. This indicates that availability of assumed water has led to member farmers undertaking sugarcane cultivation which necessitates more finance for fertiliser use. Thus this type of cropping pattern in the village means that sugarcane cultivation is at higher and rising costs.

Thus cash crop cultivation has increased as a result of water supply but this cropping pattern is of high cost based on more use of chemical fertilisers which have adverse impact on soil fertility with recurring use.

Table No. 4.9

Fertiliser Use : Per Acre

Crops	Upto Rs. 1000	Upto Rs.2000	Upto Rs. 3000	Upto Rs. 4000	Upto Rs.5000 & above
Sugarcane	-	26 (32.50)	9 (11.25)	15 (18.75)	30 (37.50)
Foodgrains	-	80 (100)	-	-	-
Oilseeds & Others	- -	80 (100)	-	-	-

Figures in bracket are percentage to total.

4.3.7 Total Expenditure on Fertilisers

With increased fertiliser use per acre it is quite obvious that the total expenditure on fertilisers by farmers will increase and this aspect was also surveyed. Table No.4.10 gives the details of the Total Expenditure made by farmers survyed on fertiliser use year. Of the

80 farmers surveyed we found that 3 farmers spend upto Rs. 1,000/- on chemical fertilisers and 21 that is 26.25 percent of the total spend additional Rs. 1,000/- on compost fertiliser as 20 farmers farming 25 percent of the total spent another Rs. 1,000/- on other fertilisers. 16 farmers constituting 20 percent of the sample size spent between Rs. 1,000/- to Rs. 5,000/- on fertilisers. 20 farmers spent Rs. 5,000./- to Rs. 10,000/- per year on fertiliser use and 18 farmers spent above Rs. 20,000/- on fertilisers. The farmers with relative larger holdings no doubt spent more on fertiliser use. Thus cost of fertilisers has increased and this has raised the cost of cultivation of sugarcane.

Table No. 4.10

Total Expenditure on Fertilisers

Rupees	Chemical	Composte	Others
Upto 1	3 (3.75)	21 (26.25)	20 (25.00)
1 to 5	16 (20.00)	2 (2.50)	-
5 to 10	20 (25.00)	-	-
10 to 15	13 16.35)	-	-
15 to 20	10 (12.5)	-	-
above 20	18 (22.50)	-	-
Total	80 (100)	-	-

Figures in bracket are percentage to total.

4.3.8 Increased use of Fertilisers

As a impact of more water supply, our survey reveals that with assumed water supply and shift over to sugarcane cultivation, the farmers of the village have adopted a cropping pattern wherein the shift in cultivation practice has led to increased use of fertilisers more, so chemical fertilisers.

Table No.4.11

Increased Fertiliser Use

Yes	No	Total
57	23	80
(71.25)	(28.75)	(100.0)

Figures in bracket are percentage to total.

The above table adequately reveals that after the availability of assumed water from the cooperative water supply society, 57 farmers farming 71.25 percent of the sample size did make increased use of fertilisers this indicating that they shifted over to sugarcane cultivation and also increased acreage under sugarcane and also used more fertilisers for other crops production. Increased fertiliser use does lead to more output. This impact of the water supply on the pattern of land use is significant.

4.4 Impact Analysis

In this section of the chapter an attempt is made to study what betterment, improvements, changes have occured in the pattern of land cultivation and in the livelihood of the member farmers - after availing of the water got from the cooperative lift irrigation society under study. The following are the main responses derived from the farmers surveyed.

1. Benefits from the use of water

Of the Eighty farmers surveyed 41 farmers that is 51.25 percent of the total did increase their size of irrigated area under cultivation and could cultivate cash crops. Thus availability of irrigation water did help them to increase acreage under cash crop cultivation. 39 farmers did not increase acreage under irrigated cash crop farming. Thus the availability of water has led to increase in acreage under cash crop cultivation in the village.

Table No. 4.12

Increase in Land Use under Irrigation

Increased Land under Irrigation	No Increase	Total
41	39	80
(51.25)	(48.76)	(100)

Figures in bracket are percentage to total.

2. Change in Cropping Pattern

The most important impact of the inception of a cooperative water supply society in the village under study has been the shift in the cropping pattern of the village. Change from food crops like Rice, Maize, Jowar and Pulses, Chilli cultivation to Sugarcane cultivation is noticed in the village due to availability of assured irrigation water. Thus the cropping pattern has moved to 12 months sugarcane crop and reduction in mixed corpping pattern based on rainfed cultivation. Today our survey reveals that in the village Jowar, Green Peas, Pulses are not grown and alongwith sugarcane in the fields Maize and Sunflower are grown. Thus the change in cropping pattern has taken place from

(a) Food Crops Cereals and Pulses to Sugarcane cultivation.

(b) Sugarcane is grown all round the year and in the cane farms, Maize and Sunflower oilseed crop is taken. This is the major impact of the availability of assured irrigation water due to the working of a cooperative water supply society in the village.

Table 4.13

Change in Cropping Pattern

Yes	No	Total	Yes	No	Total
69	11	80	73	7	80
(86.25)	(13.75)	(100)	(91.25)	(8.75)	(100)

Figures in bracket indicate percentage to total.

Of the 80 farmers surveyed 69 farmers (86.25 percent) revealed that they had changed their cropping pattern after the availability of assured irrigation water from the cooperative society. 73 of the 80 farmers stated that they shifted over from Cereal and Pulses to Sugarcane production. Thus the survey data adequately reveals a shift in the cropping pattern towards cash crop cultivation.

3. Increase in Agricultural Production

Due to availability of assured water, the farmers in the village shifted to cash crop cultivation - Sugarcane and this has resulted in increased agricultural production in term of monetary value. In addition with water availability even farm productivity increased and hence even Cerels and Pulses cultivated did lead to more production. Hence water supply of the cooperative soceity has increased farm production and therefore farm incomes of the farmers. 72 (90.0 percent) of the 80 farmers have stated that their per acre production has increased after making use of the water provided by the cooperative society.

Table 4.14

Increase in Per Acre Farm Production

Yes	No	Total
72	8	80
(90.0)	(10.0)	(100)

Figures in bracket indicate percentage to total.

4. Extent of Increase in Agricultural Prodcution Per Acre

In value of increased agricultural production per acre in monetary terms reveals that 34 farmers (42.5 percent) of the sample surveyed indicated that per acre value of Agricultural Production increased by Rs. 2,000/- to Rs. 5,000/- per year. 11 farmers (13.75 percent) got Rs. 5,000/- to Rs. 10,000/- more due to increase in farm production and equal number of farmers reported that per acre production increased to the extent of Rs. 10,000/-. Thus our survey reveals that farmers in the village got increased farm income per acre due to more production of cash crops with assured water supply.

Table No. 4.15

(Rs. 000)

Extent of Increase in Value of Agricultural Production Per Acre

Rs. 1 to 2	Rs. 2 to 5	Rs. 5 to 10	above Rs. 10	Total
24	34	11	11	30
(30.0)	(42.5)	(13.75)	(13.75)	(100)

Figures in bracket indicate percentage to total.

5. End Use of Increased Farm Income

With shift to cash crop cultivation in the farm of sugarcane, the farmers got better incomes and this has led to more spending capacity of the farmers. The economic income rise of the farmers has led to more purchasing power being pumped into the village and this has

led to increased consumption pattern as well as increase extent of rural savings in the village. Our survey reveals that the farmers surveyed have spent the increase in farm income in the following pattern.

i) 32 of the eight farmers built new or renovated their old houses with more income earned.

ii) 26 farmers used the money for consumption expenditure to defray marriage expenses.

iii) Fifteen bought new lands and Eleven bought Tractors which has led to Asset Creation.

iv) Eleven farmers bought weapors for crop and life protection.

v) 25 farmers spent increased income on educating their children leading to human capital development.

vi) 32 farmers used income to meet emergency medical expenses.

Table No.4.16

End Use of Farm Incomes

House	Marriage	Tractor	Land Purchase	Weapons	Education	Medical	SS1	Total
39	26	11	11	11	25	32	7	80

Thus our survey reveals that increased income earned by farmers due to cash crop cultivation made possible due to water supply by the cooperative society has led to Capital and human asset formation as well to meet marriage and medical expenses of the farmers.

6. Dairy and Allied Activity Development

Along with increased farm income, increase in economic well being of small farmer's also leads to development of allied activities - Cattle, Poulty farming and other allied activities. In the village surveyed however it was found that there was no appreciable growth in the Cattle population nor much growth in the number of milk animals. Of the milk animals buffolos were more nearly 86.12 percent of milk animals. In the village in all there were 155 Buffalos. Other cattles like Sheeps, Goats were less. Bullocks and Cows too were lesser. This indicates that no appreciably increase in dairy, sheep and goat rearing has taken place. Thus the village represents a case of extensive sugarcane cultivation which has made the farmers economically viable and hence perhaps no need for additional form increase through development of allied activities.

However the village has ample availability of green grass as animal fodder. Of the farmers surveyed 69 farmers (86.25 percent of total) revealed that they have availibity of green fodder from their own fields and hence the problem of availability of fodder is not there, the farmers can rear cattles and increase milk production and earn more incomes.

Table No.4.17

Availability of Green Fodder

From own Farms	From others	Total
69	11	80
(86.25)	(13.75)	(100)

Figures in bracket indicate percentage to total.

7. Milk Production in the village

As the farmers had buffalos with them and availability of fodder year round has led to milk production which is used for sale and consumption. Farmers sell the milk and earn additional farm income. The survey of the farmers revealed that

i) 13 (16.25 percent) farmers did not have any income earned from sale of milk.

ii) 20 farmers of the 80 surveyed did earn annual income to the extent of Rs. 4,000/- to Rs. 6,000/- from sale of milk and 15 farmers could manage to earn more than Rs. 10,000/- per year from sale of milk. Thus the survey reveals that in Sugarcane growing village rearing of milk animals does generate additional income to farmers and the farmers should develop this allied activity.

Table No.4.18

Income from Milk production

(Rs. 000)

No Income	Rs. 1 to 2	Rs. 2 to 4	Rs. 4 to 6	Rs. 6 to 8	Rs. 8 to 10	above Rs.10	Total
13 (16.25)	4 (5.0)	9 (11.25)	20 (25.0)	14 (17.25)	5 (6.25)	15 (18.75)	80 (100)

Figures in bracket indicate percentage to total.

4.5 Other Impacts

i) Over all Impact on Farm Activity

The farmers in the survey were asked to give their reactions and assessment of the positive and negative aspects of increased water supply. Their reactions were as follows :

As regards overall impact of water supply on their farms 78 of the 80 farmers surveyed opined that use of water did lead to increase in agricultural production and 65 farmers felt that by and large there was no bad effects on agricultural production and land use. However 15 farmers felt that excessive water use, use of chemical fertilisers and constant sugarcane cultivation was having adverse effects on the fertility of land.

Table No. 4.19

Overall Impact on Land Use

Production		Land Use	
Increase in Production	Decrease in Production	No Bad Effect	Bad Effect
78 (97.5)	2 (2.5)	65 (81.25)	15 (18.75)

Figures in bracket indicate percentage to total.

ii) Excess Use of Water

Flow irrigation in the form of lift irrigation water supply to lands often leads to excess use of water and farmers have the tendency not to use measured required water. When their turn comes to lift water they just let the water flow into the fields, often in excess of what is optimally needed. Excess water supply leads to more water logging of fields which does have adverse effects on soil quality. This is one aspect of water supply that can have adverse effects on soil fertility and develop of problem of salinity. Our survey had revealed that the farmer members of the cooperative water supply society have been using excess water, more than what is optimally needed, thus leading to improper and wastage use of water. 56 of the 80 farmers surveyed (70.0 percent) stated that they make excess use of water mor than needed. This type of situation has to be avoided and calls for better water supply management by the cooperative society.

Table No.4.20

Excess Use of Water

Yes	No	Total
56	24	80
(70.0)	(30.0)	(100)

Figures in bracket indicate percentage to total.

iii) Problem of Land Salinity

Land salinity and decreasing soil fertility of land often in long run leading to farms becoming non usable is a major problem that Sugarcane grovers are facing in some villages of Kolhapur and Sangli Districts of Maharashtra in particular. Excess water logging, excess water use and more than optimum use of chemical fertilisers, constant sugarcane growing leads to the problem of soil salinity. Mixed cropping pattern, keep land non cultivated for some time, draining of excess water is what is needed, often sugarcane cultivators do not do this. Our survey reveals that this problem is there in the village under survey and 76(95 percent) of the farmers surveyed did agree that they face this problem. This calls for quick action by the farmers, Gram Panchayat, as well as the cooperative water supply society to educate and guide the farmers regarding optimum use of water, fertilisers and sugarcane cultivation.

Table No. 4.21

Problem of Salinity

Yes	No	Total
76	4	80
(95.0)	(5.0)	(100.0)

Figures in bracket indicate percentage to total.

4.6 Farmer's Assessment of the Working of the Cooperative Water Supply Society

The following are the reactions of the member farmers surveyed regarding working of society, Mode of Water Bill Payment, Problem of Over dues in water bill payment etc.

i) Our survey of the farmers reveal that 65 of the farmers surveyed (81.25 percent of total) were satisfied and felt that the workign of the society was good. 15 farmers felt that the work was satisfactory and more had any complaints. Thus we can say that the farmers are satisfied and happy with the performance of the cooperative society and its functioning.

ii) The link between Cooperative Marketing and Cooperative Credit Societies was a major reason for proper water bill recovery and absence of overdues in bill payment. The

Cooperative Sugar Factory in the region deducted the payments due from the farmers of the cooperative lift irrigation society. All the farmers surveyed had no overdues payment and had not defaulted in their water bill payments to the society. The water charges of all the farmers was deducted by the coperative sugar factory from the bill payments of the farmers and this ensured full recovery of dues from the farmers. Hence prompt payment of water bills was done to the cooperative water supply society. This has led to proper recovery made by the water society which has led to financial viability of the society.