

**CHAPTER - VIII**  
**FUNCTIONING AND IMPACT**

**8.1 Functioning of WUAs**

**Range of Functions Performed**

8.1.1 The WUAs performed a diverse range of functions which varied not only from state to state but sometimes also from association to association even within a state. The associations in Tamilnadu worked mainly as pressure groups for release of water in adequate quantity to their members from government canals whose operation remained in the hands of the government. These associations did not fix or collect water rates which continued to be the responsibility of the Revenue Department. Some contributions, however were made by them for maintenance of field channels. Interest on capital fund kept in fixed deposits was another source of their income. One gets the impression as if the chief motive for forming the associations was to avail of the one time grant from the government agencies. But even in Tamilnadu one of the associations (North Kodai Melazhian) had functions which went beyond irrigation. These included marketing of produce, informing revenue officials regarding damages to the crops either by flood or by drought etc. The WUAs in Maharashtra, however, performed a wide range of functions which included not only maintenance of field channels but also delivery of water to members and collection of charges. These worked as WUAs in the real sense of the term. In Bihar, functions varied from association to association. Paliganj had several functions while Asarganj very few. Vaishali was a class by itself. It undertook functions which went even beyond irrigation also.

**Management**

8.1.2 Election to the management committee was either unanimous or through consensus. In Paliganj election was through an informal process bordering on nomination of generally acceptable persons by local leaders/ founder of the association. Such a consensus is expected in the initial stages when there is much enthusiasm, little scope for personal gain and need for sacrifice on the part of office bearers, Politics tends to enter later on and some evidence of this had started emerging in some of the associations. A disturbing trend was the tendency of the management committee members to continue even after their term was over. For example, the management committee of Asarganj continued beyond the stipulated period of 3 years and in Vaishali, elections were not held regularly, while the same Dalpatis continued for years. In Anaikupam also, the management committee elected in 1990 continued even though

its term ended in 1993. While continuance of a few key persons in any voluntary organisation may be needed to provide stability, continuance beyond a long period goes against the interest of generating self renewing leadership. There is, therefore, need for ensuring that elections are held at regular intervals.

- 8.1.3 Members of the associations were more or less satisfied with the manner in which the respective associations were being managed. They felt that they has adequate voice in running the affairs of the associations. Decisions were taken through consensus. They had no grouse except in the case of Loni in Maharashtra which could be treated as an exception. This can be viewed as an important achievement since it is a basic condition for the success of any community based effort.
- 8.1.4 Some of the WUAs functioned from separate office premises acquired for the purpose. But many of them worked from the residences of President or Secretary a Treasurer. Most of the associations were maintaining accounts. Some of them had paid employees for keeping record of decisions in meetings and maintenance of accounts. In other associations, the WUA took the help of office bearers or some few members for the purpose.

### **Financial Aspects**

- 8.1.5 In order to be sustainable, WUA must become financially viable. Their revenue from supply of water to member farmers as well as from other sources must be higher than their expenses including payments made to government as charges for water bought or as irrigation rates. Not all WUAs, however, performed the revenue collection function. In Asarganj distributory in Bihar, irrigation charges were not collected due to a pending court case. In karzon project in Gujarat, MOU had not been signed. Hence WUA had no hand in collection of water charges which were paid directly to Irrigation Department. In Kodai project also, water charges were collected directly by the Irrigation Department. But in a majority of cases studied in this report, WUAs were engaged in collection of water charges. There were different models. In Paliganj in Bihar, WUA collected the government prescribed water rates from farmers. Of this, 70 percent was to be retained for meeting expenses and the remaining 30 percent was to be handed over to the government. Collection was better than that in the earlier system but much less than the amount demanded. The Association was not financially viable, Far from generating a surplus, the association was not even able to meet the 30 percent payment obligation to the government. Elsewhere, specially in Gujarat and Maharashtra, a different model was in vogue. In these cases WUAs bought irrigation water on a wholesale volumetric basis from the government and supplied it to farmers on crop area

season basis. In most cases in Gujarat and Maharashtra, water charges received from farmers were higher than those paid to government, thereby resulting in surplus because of which the associations were financially viable. In Vaishali in Bihar, there was full cost recovery from farmers but there was no surplus. Hence the association had to depend on outside sources for replacement of tubewells.

- 8.1.6 In order to encourage timely payment of water charges by WUAs to government, states of Maharashtra and Gujarat had prescribed rebates and penalties. In Maharashtra, 10 percent extra charge was levied in case water charges were not paid in time whereas for timely payment a rebate of 5 percent was allowed. In Gujarat a rebate of 20 percent was allowed on full payment of water charges within the stipulated date. As a result, there were limited cases of default in these associations. In Kodai, arrears were collected by Executive Committee members having same social profile.
- 8.1.7 Some of the associations permitted supply of water to non-members but at higher rates e.g. in Parunde in Maharashtra and Vaishali in Bihar. The extra charges were as high as 30 percent in Palkhed.
- 8.1.8 Water charges collected from farmers were the principal source of revenue for the WUAs. Interest on accumulated funds was a supplementary source for some of them. These funds had two sources. First several associations had been given initial grant by the government e.g. a grant of Rs.26000/- per year for two years in Mohini, or a grant of Rs. 100 per acre of ICA for three years in Parunde and Loni, or a one time grant of Rs 450/- per hectare of ICA in Thindal and Rs. 250/- per hectare in Anialkupam. In one of the associations namely Anaikupam detailed rules on utilisation of this amount as well as of the interest income had been laid down. Second, associations in Maharashtra and Gujarat had accumulated some surplus out of annual savings from their operations and interest from it was a source of Income. Some associations also derived income from additional activities undertaken by them like marketing services provided.
- 8.1.9 The model prevailing in Maharashtra and Gujarat was found to be the best from the point of view of financial viability and we would like to recommend the same. The rates prescribed and concessions and rebates should, of course, vary from area to area depending on local conditions. This model implied giving freedom to WUA to determine rates of water charges to be collected from farmers. These rates might be different from or higher than the rates prescribed by the government or the rates paid by them to the government. This is in contrast to what prevailed in Paliganj where the rates to be charged by WUA from farmers were the

rates prescribed by the government. At the same time, the recovery rates must be cent percent or quite high. WUA must devise suitable mechanisms to ensure high recovery rates. In addition, the expenses to be incurred on repair and maintenance as well as running of the office must be kept under control. The willingness of farmers to pay their dues in time and to agree for higher water rates would depend on their own financial viability related to use of irrigation water. For this purpose, their income from water must be higher than their expenditure on it. Improvements in cropping patterns and crop yields are necessary for this to happen. Such an outcome is indeed a basic condition for financial viability of WUAs. This may also imply freedom in using saved water of one season to another specially in summer as was the case in Maharashtra. Finally, financial viability of WUAs would also depend on their ability to take profitable non-irrigation activities.

### **Training**

- 8.1.10 Training is supposed to be an important component of better water management and improved agricultural practices. Training is also useful for better management of any association. Assumption of the responsibility of managing irrigation system by farmers themselves, therefore, requires proper training in water management so as to derive optimum benefit out of available water. Most of the WUAs, however, did not give much importance to training. Very few of the sample respondents across all the 13 experiments had got an opportunity for training. It is rather surprising that not a single respondent from Lakhigam association went for training despite the association's claim that 40 farmers were sent for training in 1997. On the other hand 25 percent of the selected respondents of Palkhed association 17 percent of Parunde had attended training. The number of trainees claimed by WUAs or by officials were few e.g. 7 in Paliganj, 5 in Mohini, 2 in Karjon over a period of 3 to 5 years. Most of them were Executive Committee members or some selected farmers presumably close to the management. Since training involved free trips to distant places, it might have been treated as source of patronage. In several associations as in Mohini, Thindal, karjon and Kodai, concerned irrigation officials were also sent on training.
- 8.1.11 The respondents who had attended training reportedly derived benefits like reduction of water loss, increase in area under irrigation, better water management, improved agricultural practices, higher yields etc. This was as per perception of the farmers trained. The actual data collected at the beneficiary level, however did not indicate any difference between practices followed by farmers trained and those not trained.
- 8.1.12 The subjects and methodology of training varied from association to association. Subjects

included optimum use of water, importance of timely irrigation, better water management, prevention of water losses, improved agricultural practices, drip and sprinkler irrigation, formation of WUA, judicious distribution of water, management practices including accounts keeping etc. Most of the training programmes involved attending formal courses for 2 to 4 days in training institutions like WALMI. Training also included visits to successful experiments in PIM either within the state or even outside and farmers meetings in the villages.

- 8.1.13 It can be seen from the above that training so far has been taken in a casual manner even though most of the respondents have suggested that it should be treated as important. Appropriate training modules for farmers, executive committee members and officials be evolved. Our suggestions in this respect are given later on.

### **Water Scheduling**

- 8.1.14 There were no set rules for delivery of water to different farmers and different crops. Each association worked out guidelines by consensus among members to suit local requirements. In Mohini, water was released to farmers in accordance with a scheme of priority. Vegetable crops were accorded top most priority. Sugarcane also received a high priority. Water was released first to farmers in the middle followed by those in the tail-end and lastly to those at the head reach. In Palkhed in Maharashtra, the first priority in the delivery of water was given to tailenders, followed by those in the middle reach and then to those in the head reach. In Anaikuppam scheduling of water was worked out by Irrigation wing in consultation with farmers and as per needs of the area. More water was released at the time preparation of nurseries. The scheduling of water was a very important item for discussion in meetings of the managing committees in all WUAs. The objective was to meet the water requirements of all the members as far as possible.

### **Maintenance**

- 8.1.15 Diverse practices prevailed with respect to maintenance of the distributaries and field channels. In Kodai WUA associated itself with repair and maintenance of field channels below 10 hect. limit. This work was undertaken on payment by a members of the Executive Committee. Repair and Maintenance of main canal was, however, done by the I.D. through contractors. In associations where MOU had been signed as in Palkhed and Parunde in Maharashtra, the WUA was responsible for maintenance. In others, maintenance was done by I.D. In Palkhed member farmers were responsible for maintaining field channel alongside their respective plots. On the whole maintenance by members was more satisfactory. The physical condition of the distributaries and channels improved in such cases.

8.1.16 Inadequacy of funds provided by government was a major constraint in proper maintenance. In Maharashtra, for example, for maintenance of main channel, I.D. provided funds at the rate of Rs. 20 per hect. of ICA every year. to the association whose responsibility was to undertake repair work including extration of grass and sand. As can be seen from paras 5.2.4.14, 5.3.4.8 and 5.3.4.9 expenditure incurred by WUA on maintenance was more than that provided by government. The excess expenditure was met out of excess water charges received by these WUAs from members. In Thindal in Tamilnadu the field channels were maintained and repaired by the WUA from the interest earned from the deposited amount. But the interest amount was not sufficient. Hence the remaining funds were collected from members. In Asarganj, the Irrigation Department spent only Rs. 2 lakhs during the last three years on maintenance as against got the estimated requirement of Rs. 6 lakhs. The quality of maintenance of irrigation system could well be well with such meagre amount.

### **Opinion on Overall Performance**

8.1.17 With regard to members' perception of performance of the associations, there was overall satisfaction in Paliganj, Asarganj, Vaishali, Karzon, Baldeva, Lakhigam, Palkhed, Parunde, Kodai, and Anaikupam. They were getting adequate and timely supply of water which is what they needed. Decisions taken regarding delivery of water were enforced presumably because there was no problem in getting adequate supply of water. They were saved from the hassle of approaching I.D staff which they were doing before. Loni, however, was an exception. Most of the farmer members of this WUA were dissatisfied. Reaction was mixed in Mohini and Thindal. Loni was the case where the problem of water scarcity was the most acute.

8.1.18 The perception of non-members towards overall performance of WUAs was quite positive. Members of several control groups expressed their willingness to form WUAs even though they were getting adequate water as in Karjan, Baldeva and Lakhigam in Gujarat. They hoped that WUA would further improve their position.

## **8.2 Socio Economic Impact**

8.2.1 Successful WUAs produce direct and indirect impacts on social and economic life in rural areas. The most significant direct effect is rise in agricultural production due to improvement in water availability. This was the combined result of increase in area under irrigation, improvement in quality of irrigation indicated by its adequacy and timeless, better cropping pattern including introduction of new crops and higher yields. Most of these effects are quantifiable and can be

attributed to better water management brought about by successful WUAs. Higher production resulting in rise in income may bring about indirect and secondary effects like development of rural infrastructure, establishment of processing industries, increase in tertiary services, changes in education, health care and other aspects of quality of life, higher social consciousness etc. The occurrence of these effects, however, is quite problematic. These may or may not happen. Besides, most of these elements are affected also by other factors which work simultaneously in rural areas because of several programmes of the government and other agencies. Hence, it is almost impossible to identify the precise effect of WUAs on them specially in the short run. In view of this consideration, the study analysed only those impacts of WUAs which could be attributed as directly to their influence.

### **Social Impact**

- 8.2.2 Most of the WUAs studied helped in the promotion of social equity which is an important national objective. This had several facets. One was the more equitable distribution of water between head, middle and tailenders. Thus in Paliganj, farmers appreciated the problems of tail enders and the deliveries to lower reaches of the canal improved over time. In Palkhed and Parunde, distribution of water started with tailenders. In Kodai, special rules for meeting the requirements of tail-enders had been made. Another facet was distribution of water within a reach itself. Distribution was more equitable in the case also. Most of the farmers expressed satisfaction over delivery schedules worked out by members of WUA through common consent. WUAs had been specially helpful to small and marginal farmers who generally constitute the majority in most of the associations and who thereby got adequate and timely supply of water. In VASFA in Bihar, small and marginal farmers were the only beneficiaries. This is not to say that the problem of inequitable distribution of water was solved entirely in all WUAs. As stated in the text, it still persisted as in Paliganj. But even here, it was better than before.
- 8.2.3 Provision of assured water to members brought about a change in social environment. It reduced social tension in the villages. Tension persisted only in those few WUAs like Karjon in Gujarat or Loni in Maharashtra which were facing acute problem of water scarcity. The settlement of disputes related to water at the local level through formal or informal consultations and discussions among the members of a WUA also contributed to reduction in social tension and in generating an atmosphere of social harmony and mutual cooperation. If continued for a long period, the above trend might result in a more cohesive social order in rural areas.

- 8.2.4 Functioning of WUAs also helped in increasing farmers' capability in managing irrigation system which aspect was altogether new for them. This also increased their self confidence. This should be viewed as an important gain from social point of view because of the emerging national commitment to empower village community as self governing institutions under the Panchayati. Raj. It was observed that most of the WUAs studied in this report functioned in the true democratic spirit, without dominance by any group.
- 8.2.5 Finally, the transfer of management responsibilities to WUAs reduced the scope for corruption which reportedly prevailed in the earlier system. Most of the farmer respondents of this study mentioned this as a factor which facilitated their acceptance of the new system.

### **Economic Impact**

- 8.2.6 Assessment of economic impact was made on the basis of data related to area under irrigation, quality of irrigation, yield per hectare, changes in cropping pattern, and value of produce at constant prices. For this purpose both 'before' and 'after' as well as 'with' and 'without' methodologies were used. Application of both the methodologies however, encountered problems in some cases. There was a long time gap between 'before' and 'after' in a few cases as in Mohini (20 years). Moreover the time gap was different in different cases as for example, it was only 3 years in Paliganj as against 20 years in Mohini. This aspect, therefore, was also taken into account while judging the inter se performance of different associations. As regards 'with' and 'without' methodology, the problem in a few cases was one of finding a suitable control group in the vicinity of the project area, because in some cases surrounding areas were also irrigated and were having Water Users Associations. Such problems, however, are not peculiar to this study alone. These are usually faced in any impact study. Because of this reason, a combination of both the methodologies was used to assess the impact.
- 8.2.7 Subject to the observations made above, we may compare the performance of different WUAs. Table 7.2 to 7.6 give the data. The performance was a mixed one. It was excellent in the case of Palkhed and Parunde associations in Maharashtra. Mohini in Gujarat, and poor in Loni in Maharashtra, Karjon in Gujarat and Paliganj in Bihar and somewhat satisfactory in Lakhigam in Gujarat and the three associations of Tamilnadu. Impact was a mixed one even within a state. PIM is thus not a magic wand which could automatically bring about a change in irrigated agricultural scenario. Much would depend on how it is brought about and how it functions and whether the rules governing its operations are satisfactory. This study identified some of these



rules and conditions and these would be discussed subsequently.

### Area Irrigated

8.2.8 One way in which PIM affected the economy of farmers was in terms of increase in area under irrigation. In successful associations, increased efficiency of water use due to better delivery of water to farmers' fields as well as better maintenance of the irrigation system resulted in saving of water. In some cases, WUA prevailed upon ID to release more water. As a result additional crop area was brought under irrigation, the extent of which varied from association to association as well as from crop to crop as can be seen from the details provided in chapter III, IV, V and VI. Table 8.1 gives comparative picture of per respondent irrigated area.

**Table 8.1 Average Irrigated Area Per Respondent**

		<u>Before</u>		<u>After</u>	
		Members	Non Members	Members	Non Members
<b>Bihar</b>	i) Paliganj	2.1	3.43	2.20	3.43
	ii) Assarganj	1.75	1.25	1.81	1.29
	iii) Vaishali	0.00	1.26	1.54	1.51
<b>Gujarat</b>	i) Mhini	2.28	3.43	3.93	3.43
	ii) Karjan	2.44	1.20	2.44	1.43
	iii) Baldeva	5.41	5.20	5.0	5.20
	iv) Lakhigam	1.11	0.00	1.11	2.29
<b>Maharashtra</b>	i) Palkhed	1.44	1.25	2.17	1.41
	ii) Parunde	0.71	0.70	0.78	0.86
	iii) Ioni	1.67	2.78	0.49	2.76
<b>Tamilnadu</b>	i) Thindal	3.85	1.76	4.85	1.76
	ii) North Kodai	3.08	1.13	3.29	1.32
	iii) Anaikuppam	9.89	5.75	10.68	5.75

### Number of Beneficiaries

8.2.9 Increase availability of water due to saving of water and increased supply enabled larger number of farmers to avail the benefit of irrigation. Another reason for increase in number of beneficiaries was the policy of more equitable distribution of water adopted by most of WUAs either through amendment of water distribution rules as in Maharashtra or in Anaikuppam in Tamilnadu or through decisions of the managing committee. Table 8.2 gives data on this aspect.

**Table 8.2 Percentage of Respondents Having Irrigation**

		Respondents Having Irrigation				
		Total No. of respondents	Before		After	
			No.	% to total	No.	% to total
Bihar	i) Paliganj	40	40	100.0	40	100.0
	ii) Asarganj	40	40	100.0	40	100.0
	iii) Vaishali	40	NIL	00.0	40	100.0
Gujrat	i) Mohini	50	36	72.0	50	100.0
	ii) Karjan	50	50	100.0	50	100.0
	iii) Baldeva	40	30	75.0	40	100.0
	iv) Lakhigam	30	30	100.0	30	100.0
Maharashtra						
	i) Palkhed	40	39	97.5	40	100.0
	ii) Parunde	40	40	100.0	40	100.0
	iii) Ioni	40	24	60.0	40	100.0
Tamilnadu						
	i) Thindal	50	50	100.0	50	100.0
	ii) North Kodai	30	30	100.0	30	100.0
	iii) Anaikuppam	40	40	100.0	40	100.0

### Quality of Irrigation

8.2.10 As can be seen from Table 8.1, the increase in per respondent area under irrigation was quite modest in many cases. Much more significant was the improvement in the quality of irrigation in terms of both adequacy and timeliness of water supplies as can be seen from Table 8.3 given below. Assured irrigation motivated farmers to adopt better agricultural practices including use of moderate inputs of fertilisers, chemicals etc. resulting in better cropping pattern and higher yields.

Table 8.3 Quality of Irrigation

Percentage of Respondents Having Adequate and Timely Irrigation

		Before		After	
		Adequate	Timely	Adequate	Timely
		Irrigation	Irrigation	Irrigation	Irrigation
Bihar	1) Paliganj	15.0	10.0	57.5	62.5
	ii) Asarganj	00.00	00.00	42.5	00.00
	iii) Vaishali	00.00	00.00	100.0	100.0
Gujrat	i) M chini	58.0	58.0	100.0	100.0
	ii) Karjan	86.0	14.0	100.0	100.0
	iii) Baldeva	68.0	68.0	90.0	90.0
	iv) Lakhigam	13.3	13.3	93.3	93.3
Maharashtra	i) Palkhed	100.0	100.0	100.0	100.0
	ii) Parunde	55.0	50.0	100.0	100.0
	iii) Loni	60.0	75.0	20.0	20.0
Tamilnadu	i) Thindal	34.0	62.0	72.0	72.0
	ii) North Kodai	100.0	100.0	100.0	100.0
	iii) Anaikuppam	72.5	67.5	75.0	75.0

**Cropping Pattern**

8.2.11 Freedom to grow crops of one's own choice was an important factor motivating farmers to form WUAs. As a result, there were changes in cropping pattern brought about by farmer members of the successful associations. This was an important factor in increase in value of produce. Such changes, however, were not seen in the case of unsuccessful associations or in control areas. Examples from our case studies are given below. In Mohini, there were marked changes in cropping pattern over the period. Paddy and fruits were introduced as new crops while cultivation of cotton was discontinued. In the case of sugarcane, the number of farmers as well as the average cultivated area per respondent farmer increased substantially in the command area while the average area per respondent farmer in the control area declined by 21 percent. In Karzon, however, cropping pattern remained the same. The increase in value of produce

was mainly due to increase in per hectare yield. In Baldeva, area under wheat and sugarcane declined while cotton and arhar were introduced as new crops. But, in control area the cropping pattern remained the same. In Lakhigam, there was no change in cropping pattern, the increase in value of produce was mainly due to increase in per hectare yield. Palkhed project area witnessed substantial changes in cropping pattern after the formation of WUA. Onion, Potato, grape and sugarcane were introduced as new crops at the cost of bajra and wheat, area under which declined. The substantial increase in value of produce that took place here was contributed by all the three elements e.g. change in cropping pattern, increase in yield and increase in area under irrigation. Cropping pattern in the control area, however, remained more or less the same. And there was not much change in other relevant variables including average value of produce. Parunde area also witnessed substantial changes in cropping pattern which included introduction of new crops of onion, potato and rabi vegetables. This happened despite the fact that the yield of the earlier crops of wheat and gram increased. Cultivation of the new crops was obviously more profitable by the farmers. Here also, the average value of produce increased substantially. In the case of all the three Tamilnadu experiments, there were only moderate changes in cropping pattern without introduction of any new crop. The growth in average value of produce was also moderate.

### **Crop Yields**

8.2.12 Increased availability of water in terms of adequacy and timeliness alongwith improved agricultural practices led to rise in crop yields the figures on which are presented in table 8.4 below. The crops grown varied from association to association. Hence a uniform table could not be made. Instead yield figures important crops of each association have been given. In some cases a particular crop grown in 'before' period was not grown in 'after' period.

**Table 8.4 Average Yield Per Hect. (q/ha)**

<b>Bihar</b>	<u>Before</u>		<u>After</u>	
	<b>Paddy</b>	<b>Wheat</b>	<b>Paddy</b>	<b>Wheat</b>
<b>Paliganj</b>				
Memb.	27.6	22.2	31.4	26.5
Non. Memb.	33.7	21.9	38.5	23.9
<b>Asarganj</b>				
Memb.	24.1	20.7	29.7	23.2
Non Memb.	28.1	–	30.2	–
<b>Vaishali</b>				
Memb.	9.43	11.03	29.35	27.87
Non Memb.	18.20	10.0	25.80	40.0
<b>Gujarat</b>	<b>Sugarcane</b>	<b>Groundnut</b>	<b>Sugarcane</b>	<b>Groundnut</b>
<b>Mhini</b>				
Memb.	617.3	–	924.2	–
Non Memb	837.86	–	964.66	–
<b>Karjan</b>				
Memb.	–	20.81		29.94
Non Memb.	(castor) 15.45		(Castor)17.78	–
<b>Baldeva</b>				
Memb.	607.7	18.6	905.0	26.7
Non Memb.	546.6	21.0	735.4	26.0
<b>Lakhigan</b>				
Memb.	–	18.7	–	27.3
Non Memb (No irrigation)	–	–	618.3	27.4
<b>Maharashtra</b>	<b>Sugarcane</b>	<b>Wheat</b>	<b>Sugarcane</b>	<b>Wheat</b>
<b>Palkhed</b>				
Memb.	–	19.04	–	24.8

Non Memb.	-	18.0	-	20.0
Parunde				
Memb.	-	12.38	-	25.17
Non Memb.	1246	-	1213	-
Iri				
Memb.	448.0	16.86	562.90	22.45
Non Memb.				
<b>Tamilnadu</b>		<b>Paddy I</b>	<b>PaddyII</b>	<b>PaddyI</b>
				<b>PaddyII</b>
Thirudal				
Mem.	41.9	-	50.5	-
Non Memb.	20.0	-	30.0	-
North Kodai				
Memb.	23.4	24.3	28.6	32.7
Non Memb.	31.6	28.8	40.1	38.3
Anaitppam				
Memb.	21.2	24.0	28.9	27.5
Non Memb.	36.3	31.3	42.1	37.5

Note : Memb. - Members of W UA

Non Memb. - Non members from control area.

- denotes that the commodity was not produced

### Value of Produce

8.2.13 Value of produce grown by farmers increased substantially due to combined effect of increase in area under irrigation, improvement in quality of irrigation, adoption of better cropping pattern and higher crop yields. Table 8.5 gives the details. The figures are at constant prices so that these indicate growth in real output.

**TABLE 8.5 Average Value of Produce per Respondent (Rs.)**  
(at Constant Prices)

	<u>Before</u>		<u>After</u>	
	<u>Memb.</u>	<u>Non Memb.</u>	<u>Memb.</u>	<u>Non Memb.</u>
<b><u>Bihar</u></b>				
i) Paliganj	23,853	17763	28,377	19,766
ii) Asarganj	17846	23676	22,210	25,633
iii) Vaishali	8,807	8,405	22680	19,503
<b><u>Gujarat</u></b>				
i) Mohini	1,26337	1,82,646	246,569	214,479
ii) Karjan	1,65,918	31,302	2,13,581	149,230
iii) Baldeva	1,08508	138937	219,221	189,765
iv) Lakhigam	9659	24816	13575	40240
<b><u>Maharashtra</u></b>				
i) Palkhed	14,754	6610	65,253	6701
ii) Parunde	6,438	39,111	19,967	93280
iii) Ioni	15,893	37,733	10,525	50,933
<b><u>Tamilnadu</u></b>				
i) Thindal	60169	21240	83564	26376
ii) Nerkkodai	112878	15322	174024	50039
iii) Anaikuppam	87207	55629	118089	70448

8.2.14 In addition, sample farmers also reported another advantage in terms of less dependence on mercy of lower level bureaucracy of Irrigation Department and less hassle in going to its offices. As a result, there was a saving of time and money in running after officials.

#### **Impact on Irrigation Structure and Water Loss**

8.2.15 Maintenance by WUA resulted in improvement in the physical condition of distributaries / field channels in some cases as reported in Karjan and Baldeva but not in all. One reason for this was the keen interest in maintenance taken by some of the members who also pursued the matter with officials of the Irrigation Department. There was another reason as in Paliganj. Because of their involvement in management, farmers persuaded the fellow farmers not to breach the canal banks. This, according to association office bearers helped in preventing waterloss to the extent of 40 percent. However, this claim was not supported by any factual data. In our survey 68 percent of Paliganj respondents reported waterloss due to damaged structure and unauthorised outlets. In some cases as in Baldeva, marked improvement took place with respect to water loss. However, there was no change in this problem in most of the WUAs. Thus in Mohini as well as in Karjan all the 50 respondents reported water loss. This percentage was 92 in Thindal and 87 percent in Anaikuppam, mostly due to unauthorised outlets and damaged structures.