CHAPTER VI

TAMILNADU EXPERIMENT

6.1 Introduction

6.1.1 In Tamilnadu, management of irrigation system was the responsibility of Public Works Department (PWD). Besides irrigation canals, PWD also looked after tanks with command area exceeding 40 hectares, while Rural Development Department looked after irrigation from tanks having less command area. The command area development was the responsibility of a special wing of Agricultural Engineering Department (AED). To give fillip to farmers participation in irrigation management, the state government provided Rs. 265 per hectare towards operation and maintenance to farmers at the distributary level.

6.1.2 The Agricultural Engineering Department experimented with several models of farmers participation in irrigation management such as (i) Thindal Model of Lower Bhavani Project, ii) Saliperi Model propounded by Irrigation Management Training Institute (IMTI) Tiruchy and iii) Anna University Model. Details of the projects being taken up under each model have been given in Chapter II.

6.1.3 In Tamilnadu three projects, one major from Lower Bhavani Project namely Thindal distributary, one from medium i.e. North Kodai Mela zhahian channel and one minor viz. Anaikuppam Vokkal Girama Pasana Tharar Sangam were selected for the study.

6.2 Keel Bhavani WUA - Lower Bhavani Project (Major)

6.2.1 Background

6.2.1.1 Keel Bhavani WUA was an important WUA in the Thindal distributary of Lower Bhavani Project which was one of the Command Area Development Projects operated by the Agricultural Engineering Department of Tamilnadu since 1982. The cultural command area of Lower Bhavani Project was 83,770 hectares. During the year 1987-88 the participation and involvement of farmers was given a thrust and the concept of farmers associations for each sluice was piloted. There were some initial troubles due to the reluctance of head reach farmers. But when the concept of equitable distribution was explained to them, their reluctance disappeared and they agreed to form associations. Another difficulty in organising the farmers for a "Group Action" was the prevailing internal conflicts arising out of sharing water and other social problems which are usually found in villages like inter group conflicts, social tension etc. Resolving these problems needed a different approach. The success came through the process of catalisation for which fresh Diploma Engineers in Civil Engineering were recruited trained and were posted as Irrigation Community Organisers. They stayed in villages and got themselves integrated with farmers. This brought the farmers together for group action in organising water management programmes. The complete strategy on water management was evolved in consultation with farmers giving full consideration to their views and suggestions. This helped in creating an awareness among farmers and a binding to the implementation of the strategy.

6.2.1.2 Salient features of Lower Bhavani Project- Normal Irrigation Season

	Extent of Irrigation
a) Ist Turn 15th August to 15th December	96,734 hectares
b) 2nd Turn 15th December to March 15th	94,406 hectares

Irrigation was permitted through the authorised source only and during the period when water is allowed in the channel for irrigation to the registered ayacut fields within the permitted ayacut. In lower Bhavani, main canal distributaries were not lined.

Thindal Distributary

6.2.1.3 Thindal distributary of the Lower Bhavani Project was selected for the study, as this provided considerable experience for the purpose. It was one of the better managed associations. The distributory

takes off at mileage 60-4-500 of Lower Bhavani Main canal traversing through Erode district. This distributary and its four branches irrigated 823.33 hectares of land in the first turn and 841.67 hectares of land in the 2nd turn in a particular year

Details of the Thindal Distributary and its Branches

Name	Length in kms	Ayacut in hect.	
		Ist turn	2nd turn
Main Thindal Distributary	9.90	267.86	414.53
Branches			
Moolak Karai	0.90	154.40	—
Vannan Kattu Valasu	1.10	—	150.02
Valli Purathani Palayam	4.70	400.97	—
Nanjana Puram	2.90	—	277.12
		823.23	841.67

The above canals were designed with a duty of 60 acres or 24.29 hectares / cusec and regulated with a maximum discharge of 34 cusec at head sluice. The bedfall of canal was 2 ft / mile and a Ayacut area 62 sluices had been provided to control the flow of irrigation water in the fields. Water management was done with the help of lashkars under the direct supervision of Assistant Engineers. Normally paddy was grown in the Ist turn during August to December and dry crops such as groundnut or gingelly during January to April.

6.2.1.4 Irrigation encountered certain problems as detailed below.

i. The canal system was extensively silted which caused a reduction in carrying capacity of canals and ultimately affected the tail end farmers.

ii. Embankment reaches had become weak and distressed and needed to be rehabilitated.

iii. Due to the non- modernisation of the canals and damaged structures, a loss of 20 to 30 percent of water took place through seepage.

iv. Due to the increased number of wells in the non Ayacut areas, water was recharged through canals, and thus there was loss of water in the registered ayacuts.

v. About 60 shutters had become old and worn out and a tight closure of sluice was becoming impossible. Irrigation Department was reported to be taking emergent steps to regulate water by repairing the shutters using the available funds.

vi. There was illegal tapping of water using hoses by farmers belonging to non- ayacut areas or belonging to non turn ayacuts. They either syphoned water from canals or connected the nearby wells with canals and thus indulged in unruly activities which ultimately caused shortage of water to the tail enders.

vii.When the people committing crimes were caught, political pressure or interference was resorted to and they escaped without getting penalised.

viii. It was also pointed out that farmers were not cooperating for turn-system during lean periods.

6.2.2 Formation of WUA

6.2.2.1 The formation of WUA in the Thindal distributary was inspired by a visit to Philippines in 1987 by the then Chief Engineer of Agricultural Engineering Department, The structuring of the farmers organisation was conceived at three levels, namely Farmers Association at the sluice level, Farmers Council at the level of distributary with an area of command of 2000 hectares and an Apex Council for the command area as a whole. In the process of forming farmers organisation, the farmers were consulted many times by the specially appointed Irrigation Community Organisers (ICO) who were posted in villages to work with farmers. The ICOs met the farmers many times as they could and in many cases became part of their every day life. The problems posed by farmers were identified and the Agricultural Engineering Department took up on farm development work for which estimates were prepared and rectifications were carried out. The ICOs were the moving force and their involvement motivated the farmers to form Farmers Organisation.

6.2.2.2 The formation of WUA was greatly facilitated by financial support in the form of managerial subsidy given by the government to the Farmers' Councils. This was a one time grant at the rate of Rs. 450 per hectare of total irrigated land from the government (Rs. 225 each from

the centre and Rs. 225 from the state). This was subject to farmers contributing Rs. 50 per hectare This amount was deposited in a nationalised bank under fixed deposit jointly in the names of Chief Engineer (Agricultural Engineering) and the Farmers Council. The interest amount accruing out of fixed deposit could only be drawn and utilised for the operation and maintenance of system below distributary level and for running of the Council.

6.2.2.3 The farmers' association named as Keel Bhavani Muraineer Pasana Vivaisgal Sabai was registered on 11th May 1988. Memorandum of Understanding, however, could not be signed as yet since the entire Cauvery command of which Bhavani river was also a part was under river water dispute. Water charges continued to be levied and collected by Revenue Department and not by WUA.

6.2.2.4 There were 1075 members in the Water Users Association. These belonged to the 28 villages coming under the command of the distributary. All the farmers having irrigation from the Thindal distributary had joined the association. 362 members were from Head, 298 from Middle and remaining 315 from the Tail end. Information on their socio-economic status is given below.

Table 6.2.1 : Distribution of Farmers by Size Group of Holdings

	All	Executive Committee
Upto 1 hectare	643 (59.8)	NIL
1-2 hectares	286 (26.6)	"
2-5 hectares	126 (11.7)	7 (36.8)
5 hectares and above	20 (1.9)	12 (63.2)
Total	1075	19

Distribution of Farmers by Social Classifications

Classification		Executive Members
SC/ST	NIL	—
OBC	1075 (100.0)	19 (100.0)
Others	NIL	—
Total	1075	19

6.2.2.5 44 (88%) of the respondents accepted the new system because it would ensure adequate and timely supply of water. Nearly 100 percent of the respondents expected that it would save time and money in running after officials and that it would ensure equitable distribution

of water. 92 percent stated that it would eliminate or minimise corruption. 60 percent of the respondents considered that it would ensure reasonable irrigation charges, proper maintenance of irrigation channels (62%) and 70 percent of the respondents considered that it would minimise or eliminate tension among water users (between head and tail enders). The responses were multiple.

6.2.3 Selection of Sample Households

6.2.3.1 In order to obtain data on functioning and impact of the WUA on the farming community, a household survey was conducted in the concerned villages. For this purpose 50 households were selected randomly of which 17 were from Head reach, 19 from Middle and 14 from Tail end. Information and impact of WUA, collected from these farmers is discussed below.

6.2.3.2 During field visits to the area, it was discovered that association of farmers whose lands were coming in the Ayacut had been found throughout the length of the main canal of Lower Bhavani Project. It was, therefore, with great difficulty that 12 farmers were contacted along the Thindal distributary whose lands were being irrigated by own source i.e. wells. These farmers informed that they too had to pay irrigation charges for the water drawn from their own wells as these came under the command area of the Thindal distributary. These wells were being charged from the seepage of water of the Thindal distributary. The 'with' and 'without' coparison in this case, therefore, is not very useful because farmers in the 'control' areas had no access to canal irrigation. Hence the difference between the two situations is not a difference of association alone but of technology also.

6.2.4 Functioning of WUA

6.2.4.1 For maintaining the OFD works and distributing irrigation water equitably among the farmers according to the Warabandi schedule, a three tier "Water Users Associations or Farmers' Associations were formed with the assistance of the Irrigation Community Organisers. All these reported to be performing their duties with full involvement and cooperation of farmers. The three tier associations were as follows. i) Sluice Association, ii) Farmers' Council at the distributary level & iii) Apex Body or Farmers' Federation. 43 Farmers Councils and one Apex Body were formed and registered under Societies Registration Act covering almost all reaches of the Lower Bhavani Project.

Sluice Committee

6.2.4.2 All the farmers of a sluice were members of the Association at the sluice level. Its day to day affairs were managed by a 8 member elected executive committee consisting of President, Vice President, Secretary, Joint Secretary Treasurer and three members representing one each from Head, Middle and Tail of the sluice command.

6.2.4.3 The main functions of the farmers associations at the sluice level were i) to get proportionate discharge of water from the sluice head, ii) to distribute water among member farmers equitably based on rotational supply schedule prepared by Irrigation Department, iii) to maintain the system below the sluice in coordination with farmers and iv) to help in amicable settlement of conflicts amongst farmers within the sluice command.

Farmers Council

6.2.4.4 All the farmers associations at the sluice levels formed Farmers Council at distributary level . One member each from the Sluice level farmers association preferably the President became a member of the executive committee of the Farmers Council. The executive committee of the Farmers Council consisted of President, Vice President, Secretary, Joint Secretary and Treasurer and one member each from the sluice committees.

6.2.4.5 The area of operation of this Council was from distributary head to the sluices. It was the main responsibility of the Council to negotiate for the agreed quantum of water from Irrigation Department and to distribute the same up to sluice level in proportion to the respective command areas. The operation of the system below the distributary head and maintenance of the channels and structures was also the responsibility of the Council. Conflicts among farmers associations were solved by the Council.

Apex Body

6.2.4.6 All the Farmers Councils within the Lower Bhavani Project federated to form Apex body at the Project level. One representative from each Farmers' Council formed the executive committee of the Apex body. The entire project command was the area of operation of this supreme body.

6.2.4.7 The main role of this body was to take policy decisions like date of release and closing of water, duration of supply, cropping pattern etc. in consultation with the government departments, to arrange visits and training of the farmers in improved water management techniques, functioning of associations etc.

6.2.4.8 As can be seen from the above, WUA was not concerned with collection of water charges, this function continued to be performed by Revenue Department. Water release was a function of Irrigation Department. But the WUA interacted with ID for timely release of water in adequate quantity. Another function was to maintain field channels in good conditions.

Irrigation Charges

6.2.4.9 Irrigation charges were different for wet lands, and dry lands. Brief details are given below:

i. The basic assessment pertaining to wet fields was levied in accordance with taram and classification as notified in the re-settlement register, as follows :

	Rate per Acre	Rate per hectare
For single crop, wet lands	Rs. 15.00	Rs. 37.50
For compound double crop wet lands	Rs. 20.00	Rs. 49.40
Doule crop wet lands	Rs. 22.50	Rs. 55.50

ii. There would be charge for the second and third crop raised in the lands classified as "double crop wet lands".

Rates for dry lands varied with respect to class of irrigation. For example, rates for first class irrigation were as below.

Sl. No.	Long term crops	Irrigation source	Rate per acre
1.	Crop on ground for more than 10 (ten) months	Ist Class	Rs. 28.00
2.	Crop on ground exceeding six months but within 10 months	— do —	Rs. 24.00

Rates were lower for IInd, IIIrd, IVth and Vth class irrigation. For example, the respective figures for crops on ground exceeding 10 months were Rs. 21, Rs. 15, Rs. 12 and Rs. 9 respectively.

Training

6.2.4.10 USAID and World Bank emphasised the need for training the staff off line agencies involved in the distribution of irrigation water. In Tamilnadu, Irrigation Management Training Institute (IMTI) and Centre for Water Resources, Anna University were involved in water resource management and training.

6.2.4.11 11 Officers of Bhavani Basin Circle were also imparted training at Irrigation Management Training Institute (IMTI). Tiruchy. The subjects covered were :

i) Operation and maintenance of irrigation system under WRCP.
ii) Diagnostic and maintenance problem in distribution network using IUD.
iii) Application of computers in irrigation management level - 1
iv) Diagnostic analysis of an irrigation system.
v) Training programme on Amravati Irrigation command.
vi) Operation and maintenance of irrigation system.
vii) On farm water budgeting.
viii) Training programme on modern irrigation methods.
ix) Need based large irrigation training course.

6.2.4.12 Five (10%) of the respondents attended training programmes in water management. Training was conducted at Erode taluka town itself. It was conducted by the officials of Irrigation Department. All the five respondents stated that training benefited them. However, all of them felt that additional training was necessary. Subjects for training should include introduction of new technology in improved agricultural practices. They were also of the view that exposure visits to some of the successful experiments in the state as well as outside the state be arranged by the government.

Water Management

6.2.4.13 25 (50%) of the respondents reported problems in water management. 24 (96%) of them mentioned about not getting adequate and timely supply of water while 3 (12%) stated that water charges were levied on irrigation done by own wells also. 24 (96%) mentioned about structures not being properly maintained. Regarding suggestions for improvement, all the respondents underlined the importance of timely release of water and proper repair and maintenance of structures.

6.2.4.14 46 (92%) of the respondents reported that there was water loss in the distributaries during the last three years. 31 (67.4%) attributed this to non provision of gauge measuring device in the distributaries, 45 (97.8%) to siltation and damaged structures, 25 (54.3%) to paucity of water in sub-distributaries, 16 (34.8%) to unauthorised outlets in some of distributaries. The responses were multiple.

6.2.5 Impact of the Programme

(A) Before and After Approach

Area Irrigated

6.2.5.1 Information on number of respondents availing of irrigation facilities and crop area irrigated per respondent for both before and after periods is given in the table below.

Thindal Distributary

Table 6.2.2 : Average Irrigated Area (in hectare) per Respondent.

	Before 1987-88		After 1996-97		
Crops	No. reported	Average irrigated area	No. reported	Average irrigated area	
Paddy	50	1.85	50	2.29	(23.75)
Groundnut	46	1.62	47	1.90	(17.28)
Gingelly	19	1.34	23	1.39	(3.73)
Turmertic	—	—	4	1.75	—
Total per respondent	50	3.85	50	4.85	(25.97)

Figs. in brackets are indices of growth

It can be seen from the above table that all the respondents were practising irrigated farming in both the periods. But the area under irrigation registered an increase in Thindal distributary. The average area irrigated for paddy crop was 1.85 hectares per respondent before the formation of WUA in 1987-88. It increased to 2.29 hectares in 1996-97. The increase in area was 23.75 percent. Similarly, for groundnut, the average area irrigated before was 1.62 hectares which increased to 1.90 hectares afterwards indicating an increase of 17.28 percent. The average area under gingelly was 1.34 hectare (before) and 1.39 hects. (after) showing a modest increase of 3.73 percent. Taking all crops together, total area under irrigation which was 3.85 hectare per respondent 'before' increased to 4.85

hectares 'after' registering a growth of 25.97 percent. Increase in irrigation was reported by 25 respondents. The area increased from 88.4 hectares before the formation of WUA in Thindal distributary to 179.00 hectares. For the remaining 25 respondents there was no change over the period

Quality of Irrigation

6.2.5.2 Regarding quality of irrigation, 17 (34%) respondents reported that they were getting adequate quantity of water for irrigation before (1987-88). This number increased to 36 (72%) during (1996-97). Regarding timely supply of water, 31 (62%) reported that they were getting timely water before. During 1996-97 the number reporting timely supply increased to 36 (22%). The main reason for this increase was attributed to formation of WUA.

Yield of Crops

6.2.5.3 There was an increase in per hectare yield of crops grown during the two periods as can be seen from the table below.

Table 6.2.3 : Average Yield of Major Crops (Quintls. per hectare)

Crop	Before	After	
Paddy	41.9	50.5	(20.58)
Groundnut	21.4	21.9	(2.34)
Gingelly	4.7	6.7	(42.55)
Turmeri	—	15.0	

Figs. in brackets the indices of growth

Value of Produce

6.2.5.4 The value of produce per respondent was calculated at constant prices prevailing during 1996-97. The details are given as under

Table 6.2.4 : Value of Produce per Respondent (Rs.)
(at constant prices)

Crop	Before		After		
	No. Reported	Average value of produce	No. Reported	Average value of produce	
Paddy	50	31,020	50	46134	(48.72)
Groundnut	46	29,138	47	35079	(20.39)
Gingelly	19	6,167	23	9042	(46.62)
Turmeric	—	—	4	3700	–
Total per respondent	50	60169	50	83564	(38.88)

Figs. in bracket are indices of growth.

Value of produce per respondent increased during the period. Value of paddy increased from Rs. 31020 before to Rs. 46135 after i.e. a growth of 48.72 percent. For groundnut it was a growth of 20.39 percent, for gingelly a growth of 46.62 percent and for all commodities a growth of 38.88 percent. This was the result of increase in area as well as yield as already explained.

Introduction of New Crops

6.2.5.5 After the formation of WUA in Thindal distributary four selected respondents also started growing turmeric in their field.

6.2.6 Impact of the Programme

(B) With and Without Approach

Area Irrigated

6.2.6.1 Information on number of respondents availing of irrigation facilities and crop area irrigated per respondent for both 'before' and 'after' periods was collected from the control group of farmers. The details are presented in table below.

Table 6.2.5 : Average Area Irrigated in Hectare per Respondent (0.00 hect)

	Before		After	
Crop	No. reported	Average irrigated area	No. reported	Average irrigated area
1. Paddy	1	0.60	1	0.60
2. Groundnut	7	1.38	7	1.38
3. Tobacco	3	0.83	3	0.83
4. Sorgham	4	1.76	4	1.76
5. Gingelly	1	0.10	1	0.10
6. Turmeric	2	0.40	2	0.40
7. Cotton	1	0.38	1	0.38
Total	12	1.76	12	1.76

It can be seen from the above table that all the selected farmers were practising irrigated farming in both the periods. There was no growth in the irrigated area over the years as their wells were more than 20-25 years old and were not depending on irrigation from

canals.

Quality of Irrigation

6.2.6.2 Since all the farmers were using their own sources, the quality of irrigation remained adequate and timely.

Yield of Crops

6.2.6.3 There was increase in yield per hectare in almost all the crops grown by the selected farmers. The details of the yield per hectare are as under.

Table 6.2.6 : Yield of Major Crops (Quntls./per hect.)

Crop	Before	After	
Paddy	20.00	30.00	(50.00)
Groundnut	18.6	23.9	(28.49)
Tobacco	11.6	13.7	(18.10)
Sorgham	10.9	12.4	(13.76)
gingelly	6.0	8.0	(33.33)
Turmeric	14.4	18.7	(29.86)
Cotton	13.2	15.8	(19.70)

Figs. in brackets are indices of growth.

The yield per hectare registered a growth of 50 percent in paddy over the two periods groundnut registered an increase of 28.49 percent, tobacco registered a growth of 18.10 percent. The increase in case of sorgham was 13.76 percent, for gingelly it was 33.33 percent, turmeric registered an increase of 29.86 percent. In case of cotton it was 19.70 percent.

Value of Produce

6.2.6.4 The value of produce per respondent was calculated at constant prices prevailing during 1996-97. The details are as under.

Table 6.2.7 : Average Value of Produce per Respondent (Rs.)

(at constant prices)

Crop	Before		After		
	No. reported	Average value of produce	No. reported	Average value of produce	
Paddy	1	5400	1	8100	(50.00)
Groundnut	7	15506	7	19868	(28.13)
Tobacco	3	19167	3	22600	(17.91)
Sorgham	4	9587	4	10937	(14.08)
Ginguelly	1	588	1	784	(33.33)
Turmeric	2	17250	2	22500	(30.43)
Cotton	1	10000	1	12000	(20.0)
Total per respondent	12	21,240	12	26376	(24.18)

Figures in bracket are indices of growth.

Value of produce per respondent increased during the period for all the crops. The increase ranged between 14.08 for Sorgham to 50.00 for Paddy. The increase was as a result of better use of inputs and judicious use of water as it was from own source. Even then the average value of produce from all crops at Rs. 26,376 was much lower than the that of Rs. 83564 for the beneficiary households of WUA.

Awareness

6.2.6.5 All the 12 respondents were aware of the FPIM in their area. All of them had stated that WUAs have been formed in the entire Lower Bhawani Area. All of them were willing to join the WUA provided they started getting water from the distributaries by raising the water level in, distributaries.

6.2.6.6 All the 12 respondents stated that there was water loss in distributaries Silting, damaged

structures and seepage were the main reasons cited for the water loss.

6.2.7 Overview

6.2.7.1 In this World Bank Project, Irrigation Community Organiser (ICO) engaged by ID on part time basis played an active role in motivating farmers to go for participatory irrigation management. The experiment resulted in about 26 percent increase in irrigated area for the selected respondents and yield of main crop paddy increased by about 21 percent after formation of farmers' association. Farmers took active interest in maintenance of field channels below distributary level out of the returns on one time grant provided by ID alongwith farmers' constribution at the rate of Rs. 50/- per hect. The repairs to field channels resulted in better irrigation under close supervision of the farmers' association.

VADAKKU KODAI MELAZHAHIAN CHANNEL LAND HOLDERS ASSOCIATION

Thambraparani Irrigation System (Medium)

6.3.1 Background

6.3.1.1 Tambraparani irrigation system was a medium irrigation project completed in 1943 on the river Thanbraparani. A water users association functioning within the command area of this project was selected for study. The association known as Vadakku Kodai Melazhahian Channel Land Holders Association covered Vahaikulam and six other villages of the Vadakku Kodai Melazhahian Channel which was a distributary of this irrigation system. The channel was 18.86 km long with a command area of 924.46 hect. in the Ambasamudram taluka of Tirunelveli district of Tamilnadu. The area managed by WUA was, however, 240 hect. only. The canal from this system feeded the tanks as well as provided irrigation directly. The Vadakku Kodai Melazhahian channel feeded 20 such tanks and had as many as 61 sluices.

6.3.2 Formation of WUA

6.3.2.1 This was a very old WUA which had been formed as early as in December 1959 and registered in 1960. A Memorandum of Understanding, however, was yet to be signed even though the association had been in existence for the last 40 years. The concept of MOU, however, was not in vogue during the period when this association was formed. Signing of MOU was a recent development. It was understood that this was proposed to be done after improving the channel.

6.3.2.2 This WUA was formed at a time when forming such an association was quite uncommon. What led the farmers at that time to make such a move was the hope of securing more water through group pressure - a task in which they succeeded. Farmers belonged to the tail end of the irrigation system. Hence they were getting inadequate and untimely supply of water for irrigating their crops. This prompted some of the more imaginative and revolutionary among the farmers to form a farmers' organisation mainly for pressurising the concerned government agency to improve the supply of water. The organisation succeeded in its objective when the government passed regulations providing water to tailenders of this area. Such a provision continued since then and was still in vogue at the time of this study.

6.3.2.3 The objectives of the WUA were the following. Of these only the first four directly related to irrigation management.

i) To arrange irrigation supply through the Irrigation Department

ii) To furnish the details of maintenance works to be taken up to Irrigation Department

iii) To remove plants, weeds etc. from the channel through Kudimaramathu (voluntary work)

iv) To settle the disputes among the farmers in releasing supply from the channel.

v) To arrange for sale of produce from the field to Government Dept. (i.e. through regulated market)

vi) To approach the Agriculture and Revenue Departments regarding the damages caused to the crops (either by flood / or by pests etc.) and to get suitable remedial measures.

vii) To attend monthly meetings at the District Collectorate and to attend the difficulties faced by the farmers.

6.3.2.4 WUA had a membership of 300. Most of the members were marginal and small farmers. The executive committee of the association had also a dominance of marginal and small farmers as can be seen from the profile of members given below.

Socio-Economic Profile of Members of WUA

	General Body		Executive Committee
i)	Upto one hectare	200	9
ii)	1 to 2 hect.	80	5
iii)	2 to 5 hect.	15	1
iv)	5 to 10 hect.	5	–
	Total	300	15
	SC	85	2
	OBC	208	12
	Others	7	1
		300	15

6.3.2.5 All the selected 30 respondents reported that the main considerations for acceptance of the new system were that it would ensure adequate and timely supply of irrigation water, save time and money in running after officials, eliminate or minimise corruption, help proper maintenance of irrigation channels, and eliminate or minimise tension among water users. Twenty one (70%) stated that it would ensure equitable distribution of irrigation water while 27 (90%) stated that it would ensure reasonable irrigation charges.

6.3.3 Selection of Sample Households

6.3.3.1 Thirty farmers were selected randomly from members of WUA for evaluating functioning and impact of the associations. 15 non user farmers were selected from the area. In this area also many farmers were having irrigation since last 40 years or so. Farmers were selected from amongst those who were not members of any WUA. Most of them belonged to head reach where availability of water was not a problem.

6.3.4 Functioning of WUA

6.3.4.1 After the attainment of its primary objective and with the passage of time having a new generation of members, the involvement of farmers in the association as well as the range and intensity of the activities of the association declined. A revival took place about a decade ago when a team from the Centre of Water Resources (CWR) of Anna University, Chennai assisted by the Irrigation Support Project for Asia and the Near East (ISPAN) Project adopted it as part of their programme of promoting WUAs in Tamilnadu. The experience gained by CWR in organising farmers organisation in four tanks under a project assisted by the Ford Foundation was utilised for the purpose. The approach gave importance to working directly with farmers, giving priority to their concerns rather than implementing a preconceived action plan. Farmers were asked to identify their own priorities and concerns which were an integral part of the implementation machinery.

6.3.4.2 The WUA had its own office and a separate bank account which was operated jointly by the Secretary and Treasurer of the association. Accounts were prepared by a clerk and not by any qualified accountant. Accounts were reported to be audited annually by chartered accountant. However, a copy of the audited account could not be made available for

inspection by the study team.

6.3.4.3 The management of the association and its activities was in the hands of an Executive Committee having 15 members including the office bearers having a tenure of one year. Members of the Executive Committee were elected by consensus while the decisions taken were based on majority. The frequency of meetings of the Executive Committee was at the interval of every three months.

6.3.4.4 Questions related to distribution of water and collection of water charges were discussed in the meetings of the Executive Committee. Other matters discussed included problems of repair and maintenance and desilting to be taken up with the Irrigation Department. The forum of the Executive Committee was also utilised for amicable settlement of disputes between members. WUA associated itself with repair and maintenance of field channels below 10 hect limit. This work was undertaken on payment by a member of the Executive Committee. Field channels of a length of about 4 km. per year were repaired by WUA during last three years. Silting and weed growth were major problems since the canals were more than 100 years old. Hence the association had to make considerable efforts for desilting. The association also took part in patrolling the channel.

6.3.4.5 As regards distribution of water, there were no predetermined rules. Depending upon the availability of water, the Executive Committee decided on the quantum of water and the area to be irrigated every year. As mentioned earlier, in order to take care of the problem of the tail-enders, the state had already made laws according to which it had notified the period of operation of various sluices and tanks which served the tail enders and issued other instructions some of which were quite detailed. Even then, it was found that farmers in the head reaches took more water than those at the tail ends.

6.3.4.6 Repair and maintenance of the main canal was done by government through contractors. For this purpose, the government spent Rs. 60,000 during 1995-96, Rs. 40,000 during 1996-97 and Rs. 40,000/- duirng 1997-98. Fund for repair and maintenance of field channels was obtained partly through collection of water charges from farmers. Members paid water charges at the rate of Rs. 37/50 per hectare which was usually collected before supply of water. Payment in instalments was allowed. As regards collection of arrears of water charges, this task was entrusted to the Executive Committee members having the

same social profile. Members contributed Rs. 30/ per hectare as membership fee. The WUA got a part of funds raised from auction of fish. Duck fee was also collected from owners of ducks who were allowed to let them loose in the fields after harvesting.

Training

6.3.4.7 The project training centre was formed under New Water Management Policy (NWMP) during 1993 by the inter disciplinary team of Officers viz. Assistant Executive Engineer (PWD), Assistant Engineer PWD, Assistant Engineer (Agriculture) and Agricultural Officers. The technical Officers had undergone training at Irrigation Management Training Institute, Triuchi.

6.3.4.8 Farmers meetings were being conducted at villages to create an awareness among them about Water Resources Consolidation Project (WRCP) and its benefits. Farmers were also taught about agricultural and agricultural engineering activities. 10 farmers meetings were held during 1997-98 which were attended by 224 farmers. During the three year period 1993 to 1995 the Institute at Tiruchi conducted 9 training programmes for farmers leaders and 40 training programmes for farmers during village visits.

6.3.4.9 Subjects taught to farmers included need for water management, Thambraparani system details and water potential, soil-water-crop relationship, ground water potential and water management, conjunctive use of ground water and surface water, on farm development works, crop water requirement,forming of Farmers' Council etc.

Views on Management

6.3.4.10 Offering their views on the functioning of the Executive Committee, all the 30 respondents stated that they got adequate chance to participate and deliberate in the decision making process. They further stated that the meetings were generally held after every three months, the agenda being distribution of water. Twenty eight (93.3%) reported that the decisions were taken by majority voting while the remaining 2 (6.7%) reported that the decisions were taken by consensus. However, all of them reported that there was no group dominance in the managing committee. Twenty three (76.6%) respondents offered their views on the functioning of village distributary committees. Twenty two (95.65%) reported that the main problem was that field channels / sub - distributaries were not repaired and maintained

in time. Fifteen (65.22%) reported that these ensured judicious distribution of water to all of the members. However, all the respondents were of the view that for effective and judicious distribution of water, the distributary / field channels etc. should be repaired in time and desiltation work should be taken up in right earnest as there was a great problem of siltation in the canal and sub-distributary of the tanks.

6.3.5 Impact of the Programme

(A) Before and After Approach

6.3.5.1 With respect to 'before' and 'after' methodology, it is worth mentioning that the 'before' period was about 40 years ago. It was almost impossible to obtain the 'before' data in view of the well known problem of 'memory loss' However, there was not much change in the agricultural situation for several years in the past after the initial success with respect to water availability was achieved. Hence it was considered appropriate to obtain data of about a decade ago which roughly coincided with the period before the recently formulated Anna University model was applied to revitalise the association. The results of the survey are given below.

Area Irrigated

6.3.5.2 Paddy was grown in both Kharif and rabi seasons. This is denoted below as Paddy I and II respectively. Banana was another crop grown. The table below gives the extent of irrigated area under major crops.

Table 6.3.1 : Average Area Irrigated per Respondent

Crop	Before		After (1996-97)		
	No. reported	Average per respondent	No. reported	Average per respondent	
Paddy I	24	1.58	24	1.80	(13.9)
Paddy II	24	1.44	24	1.39	(–3.47)
Banana	11	1.82	13	1.72	(–5.50)
Total	30	3.08	30	3.29	(6.82)

Figures in brackets are indices of growth

The above table reveals that there was increase in area under paddy I from 1.58 hect. per respondent to 1.80 hect. i.e. a growth of 13.9 percent over the years. However, the

irrigated area under paddy in the second season showed a slight decrease from 1.44 hect. to 1.39 hect. i.e. decline of 3.47 percent. Banana crop which was being grown by the farmers at the head reach also showed a decline from 1.82 to 1.72 (-5.50 percent) Overall increase in area under irrigation was only 6.82 percent which is quite low. Three farmers reported increase in irrigation. Total area irrigated of these three farmers increased from 15 hectares to 22 hectares. For the rest of the 27 farmers there was no increase in irrigated area over the period.

Quality of Irrigation

6.3.5.3 Out of 30 respondents, 24, (80%) reported getting adequate and timely supply of water before the formation of WUA. This number increased to 29 (96.7%) by 1996-97. Here too, the gain was only marginal.

Yield

6.3.5.4 Figures on yields of main crops grown in irrigated area for "before" and "after" periods are give below :

Table 6.3.2 : Yield per Hectare in Quintals

	Before		After		
Crop	No. reported	Average yield per hectare	No. reported	Average yield per hectare	
Paddy I	24	23.4	24	28.6	(22.22)
Paddy II	24	24.3	24	32.7	(34.57)
Banana	11	481.2	13	687.4	(42.85)

The above table shows that the yield of paddy in the first season increased from 23.4 quintals per hectare to 28.4 quintals i.e. a growth of 22.22 percent. The yield of paddy in the second season increased from 24.3 to 32.7 qtls. i.e. a growth of 34.57 percent. Banana crop also registered a substantial increase from 481.2 qtls. to 687.4 qtls. i.e. by about 92.85 percent. The increase was attributed to better availability of irrigation resulting in optimum use of water and other inputs.

Value of Produce

6.3.5.5 Value of produce of crops grown was calculated at constant prices for which 1996-97 year's prices were used.

Table 6.3.3 : Average Value of Produce per Respondent (at constant prices)

Crop	Before		After		
	No. reported	Average value of produce (Rs.)	No. reported	Average value of produce (Rs.)	
Paddy I	24	13973	24	18167	(30.01)
Paddy II	24	14833	24	20513	(38.29)
Banana	11	245000	13	330185	(34.77)
Total	30	112878	30	174024	(54.17)

Value of produce per respondent for paddy in the first season which was Rs. 13,973 before the formation of WUA increased to Rs. 18,167, an increase of 30 percent. For paddy in the second season, the increase was 38.29 percent and for banana it was 34.77 percent. However, the average value of produce for all respondents for all crops was Rs. 1,12,878 before the WUA, which increased to Rs. 1,74,024 after the WUA showing an increase of 54.17 percent.

Water Loss

6.3.5.6 Fifteen (50%) farmers reported that there was water loss in the distributary / field channels during last three years. The most frequently cited reasons for this were siltation and damaged structure (15 farmers) as well as seepage from unlined canals and distributaries (12 farmers). Other reasons mentioned by a few farmers were non-provision of gauge measuring device/ sluices, (3 farmers) and unauthorised outlets in the system (5 farmers). The replies were multiple.

6.3.6 Impact of the Programme

(B) With and Without Approach

Area Irrigated

6.3.6.1 Information on number of farmers availing irrigation facilities and crops grown were collected. The details of area irrigated at two points of time are given below.

Table 6.3.4 : Average Irrigated Area per Respondent (0.00 hect.)

Crop	Before		After		
	No. reported	Average Irrigated area (Hectares)	No. reported	Average Irrigated area (Hectares)	
Paddy I	15	0.56	15	0.54	(– 3.57)
Paddy II	15	0.56	15	0.54	(– 3.57)
Banana	—	—	3	1.25	—
Total	15	1.13	15	1.32	(16.81)

The above table shows that area decreased from 0.56 hectares to 0.54 hectares in both Paddy I and Paddy II crops. However Banana which was introduced as a new crop was cultivated by three farmers during the later years and average area under banana was 1.25 hectares. As a result the irrigated area per respondent increased from 1.13 hectares to 1.32 hectares indicating an increase of 16.81 percent.

Quality of Irrigation

6.3.6.2 There was no change in the quality of irrigation as all of them stated that they faced no difficulty in getting adequate water and that too timely in both the periods.

Yield of Crops

6.3.6.3 There was increase in the yield of crops grown by the selected respondents. The details are as under.

Table 6.3.5 : Average Yield per Hectare in Quintals

Crop	Before Average Yield per	After Average Yield per	Index of Growth
Paddy I	31.6	40.1	(26.90)
Paddy II	28.8	38.3	(33.00)
Banana	—	622.1	—

Average yield per respondent increased from 31.6 quintals to 40.1 quintals registering an increase of 26.90 percent for Paddy I. For Paddy II, the increase was from 28.8 quintals per respondent to 38.3 quintals registering an increase of 33 percent. Banana was introduced by the three selected farmers after the formation of WUA.

Value of Produce

6.3.6.4 Value of produce per respondent increased during the period for all the crops. The details are as under.

Table 6.3.6 : Average Value of Produce per Respondent (Rs.)
(at constant price)

Crop	Before		After		
	No. reported	Value of produce	No. reported	Value of produce	Index of growth
Paddy I	15	8017.5	15	9693.0	(20.90)
Paddy II	15	7305.0	15	9240.0	(26.49)
Banana	—	—	3	155533	—
Total	15	15322	15	50039	226.58

Value of produce per respondent for Paddy I increased from Rs.8017 to 9693 during the two points of time registering an increase of 20.90 percent. Similarly for Paddy II the increase was 26.49 percent. The value of produce for bananas which was introduced as a new crop, was Rs. 1,55,533 per respondent. The total value of produce for all the crops increased from Rs. 15, 322 to Rs. 50,039 registering an increase of 226.58 percent. Average value of produce per selected beneficiary at Rs. 1,74,024 was about 248 percent more than the average value of produce of non-members at Rs. 50029. The increase was attributed mainly to banana cultivation.

Awareness

6.3.6.5 All the 15 respondents stated that they were aware of WUA functioning in their village. All of them stated that those who joined FPIM had been able to negotiate better deals with Irrigation Department for priority alongwith quality of water and timely supply of water in their fields. All of them were willing to form WUA in their area. Regarding the reasons for

not forming the associations so far, all of them stated that since they were getting irrigation in adequate quantity they did not feel the necessity of forming an association. However, now they felt that by forming the association, they could have better dealing with the ID.

Repair and Maintenance and Water Loss

6.3.6.7 All of them stated that the channel was very old and its required repairs and maintenance. The channel be also linked to avoid seepage. There was problem of siltation due to its terrain.

6.3.6.8 All of them stated that there was water loss in the distributaries as well as main canal. The water loss was due to silting and damaged structures.

6.3.7 Overview

6.3.7.1 A comparison between agricultural scenario of members and non-members (control group) revealed that while average irrigated holding for members for both points of time was more than twice that of the non-member respondents, growth in irrigated area per respondent was much less for the former group of respondents, vis-a-vis the latter group. The reason for this was that the land of selected non-members was mostly located near head reach of the irrigation system and they reportedly improved their situation over the period due to availability of adequate water. Consequently, growth in yield per hect. for the non-members was slightly more for paddy variety I, as compared to growth in yield rate of same crop for selected members. That average value of produce per respondent and its growth over the period was much less for the non-members, vis-a-vis members of the association was mainly due to higher holding size for them.

6.4 Anaikuppam Village Water Users Association, Volappar Anaikuppam V.G.P. Sangam (Minor)

6.4.1 Formation of Water Users Association

6.4.1.1 Anaikupam Village Water Users Association located in Village Anaikuppam of Nannilam Taluka of Thiruvarur district was another WUA in Tamilnadu selected for the study. The association covered an area of 200 hect. within the command area of a minor irrigation project namely Valappar Anaikuppam Voikkal Girama Pasanatharar Sangam.

6.4.1.2 Cauvery delta is a well known rice growing area of Tamilnadu which was also called the Rice-Bowl of the state. Farmers of the Cauvery delta as of several other places needed proper guidance to increase food production. For this purpose, Irrigation Management Training Institute (IMTI) located at Tiruvarur, the district headquarter, undertook an Action Research Programme in about 2000 hectares of the tail end area of Cauvery delta. Meetings with farmers were organised by the experts of IMTI. Farmers were also brought to the Institute for training. It was found out in this process that the irrigation channels from which fields got water were not properly maintained due to lack of understanding and unity among the farmers as well as due to inadequacy of funds. A 'Save the Channel Campaign' was launched under which farmers were asked to clean up channels in their villages reviving the traditional practice of Kudimaramath (i.e. maintenance of field channels etc. by self help).

6.4.1.3 To overcome the above problems IMTI perceived the need for forming water users associations and also took up the work of forming such associations and getting them registered under Societies Registration Act of 1975. Youths of villages were involved in motivating the farmers for forming their associations. IMTI decided to form a corpus fund for which it contributed Rs. 250/- per hectare provided the farmers also contributed at this rate to the fund. The total amount was under fixed deposit and the interest accrued was utilised for the channel maintenance etc. So far (by the end of 1998) 46 farmers organisations each covering small areas had been formed. The association being studied was one of them.

6.4.1.4 All the landowners were members of the WUA. There were 164 members in the Association. The details of the members were as below

		Holdings of			
		(a) Members		(b)	Managing Committee
i)	Upto one hectare	148	(90.3)	9	(60.0)
ii)	One to two hectare	10	(6.1)	3	(20.0)
iii)	2 to 5 hectare	4	(2.4)	2	(13.3)
iv)	5 to 10 hectare	2	(1.2)	1	(6.7)
		164	(100.0)	15	

(b)	Social classifications		
i)	SC	23	(14.0)
ii)	ST	–	
iii)	OBC	36	(21.9)
iv)	Others	105	(64.1)
		164	

6.4.1.5 35 (87.5%) of the selected respondents stated that the new system was accepted as it ensured adequacy and timeliness of irrigation. Only 5 (12.5%) from middle reach stated that water level in the canal / distributary being low did not ensure adequacy of water in their fields. All the respondents stated that the new system ensured equitable distribution of irrigation water, eliminated and minimised corrupt practices. Further irrigation channels were properly maintained and tension among water users was minimised. Only 45 percent stated that it also saved time and money in running after officials.

6.4.2 Objectives of WUAs in the District

6.4.2.1 The objectives for which WUAs were set up were quite comprehensive and covered aspects other than irrigation management alone as can be seen from the details given below.

i) Undertaking repair and maintenance of irrigation channels with government and farmers contribution under 'Kudimaramath'

ii) Maintenance of 'Kudimarmath' permanent fund and utilisation.

iii) Managing water distribution and maintaining equity and for this purpose introducing rotational water supply.

iv) Representing to the government departments about the defects noted in the head sluices and irrigation structures in the A class channels.

v) Representing to the government to take action on the irrigation and social problems observed in the village and bridge government farmers relationship,

vi) Settling irrigation disputes arising among the farmers due to reasons like cutting down canal bunds, cross bunding etc.

vii) Protecting the standing crops from damages caused by cattles and goats. Also offering security from theft and safeguarding channels and tanks from unauthorised encroachments.

viii) Applying for government tenders called for works like irrigation channels maintenance, drainage channels maintenance, formation of farm roads and construction of thrashing flows, irrigation structures and drainage channels.

ix) To affiliate the society with the Valappar A Channel Committee and with Valappar River Irrigation Committee and to coordinate works like water distribution and irrigation system maintenance with these committees.

x) To help farmers to increase agricultural production by adopting modern crop production techniques and to facilitate delivery of inputs like seeds, fertilisers, pesticides and agricultural implements in time from the Agriculture Department.

xi) To help farmers in village development without any caste or communal distinction.

xii) To help farmers to get legal, medical, educational aids and also educate farmers through entertainments and functions for their personal development.

6.4.3 Selection of Sample Households

6.4.3.1 For studying the functioning and impact of the WUA, 40 farmers were selected at random of whom 9 were from head, 11 from middle and 20 from tail end. Information was obtained

from farmer members on different aspects of irrigated crop production for two years one, 'before' and another 'after' the formation of the association. The year 1990-91 was taken for the former and the year 1996-97 for the latter. The field study indicated that the impact of farmers participation in irrigation management was more or less uniform on all selected farmers in the village. Hence reach wise analysis was not attempted in this case.

6.4.3.2 15 farmers from the nearby Moolankudi village were selected at random as a control group. This village also fell in the Cauvery command. The main crops of the area were paddy and pulses.

6.4.4 Functioning of WUA

6.4.4.1 The WUA was registered on 7th November 1990 under the Societies Registration Act and had been functioning since then. It had however, no office of its own, but was functioning from the residence of the President. The society had a bank account which was operated jointly by the President and the Treasurer. The accounts were prepared by a qualified accountant and audited by a Chartered Accountant if the annual transactions exceeded Rs. 10000/- otherwise by a Member and Treasurer alongwith two witnesses.

6.4.4.2 In accordance with the approved guidelines for WUAs in the district, all the landowners contributed Rs. 250/- per hectare as donation. Matching grant (i.e. equal amount) at Rs. 250/- per hectare was provided by the Irrigation Management Training Institute/ Government. This amount was to be deposited in a nationalised bank as follows. (a) Term deposit I-75% of the total amount and (b) Term deposit - II. 25% of the total amount collected. Interest accrued annually or once in 6 months was taken from the T D R - (I) to be deposited in the savings bank account opened for the WUA while interest accrued once in five years from TDR (II) was to be added to TDR (I) to meet the escalation cost on labour. Interest from TDR (II) was to be spent for maintenance of drainage and irrigation channels. T D R (I) and (II) were not to be withdrawn on any account. Expenditure accounts were audited and presented to the District Registrar annually. Office bearers to be elected once in three years. Two members from each village Water Users Association would constitute Channel Committee while River Committee was to consist of two members from each Channel Committee.

6.4.4.3 As there was a dispute in sharing of water between Tamilnadu and Karnataka, Water

Resources Consolidation Project (WRCP) was not implemented in Cauvery command. Hence MOU was not signed. No water charges were collected. Water Tax was not levied in Cauvery delta.

Managing Committee

6.4.4.4 There were 15 members in the Managing Committee. Though there was provision for election every three years, but the present Managing Committee which was elected in November 1990, was still continuing in 1998. Elite and influential members were elected by consensus. On an average 4 meetings were held per year during the last three years. Water was distributed to members through general consensus among the members of WUA. Disputes among members were resolved in the general body meetings. For ensuring equitable distribution of water one person was employed by the water users association.

Maintenance of Distributary and Channels

6.4.4.5 Since handing over was not done in the Cauvery delta the distributaries were maintained by Irrigation Department. The channels, however, were maintained and repaired by the WUA itself from the interest earned from the deposited amount. On an average, Rs. 8000 were utilised yearly for cleaning field channels. The interest amount was not sufficient. Hence the remaining funds were collected from members.

Training Aspect

6.4.4.6 Usually once in a year the executive committee members participated in the seminars conducted by IMTI. In the seminar water management techniques were taught. The members generally adopted the water management techniques. The members of the WUA were also taken on study tours to different commands where they interacted with the farmers of those associations.

6.4.4.7 18 (45%) selected farmers attended training in water management. All of them attended training at Irrigation Management Training Institute (IMTI) at Tiruchy. Training was of two weeks duration. Subjects covered were irrigation management and optimum use of water. All the 18 selected respondents reported that they derived benefits from the training course attended by them, e.g. knowledge gained about proper maintenance of channels, and judicious use of water.

6.4.4.8 Training imparted to both irrigation field staff as well as farmers increased their capability and increased the productively of crops to some extent. It also helped in controlling seepage of water, minimising wastage of water and release of water to tail end farmers subsequently.

Irrigation Aspect

6.4.4.9 Irrigation wing of Public Works Department maintained the canals and was responsible for the release of water. Supply schedule was prepared by the Irrigation wing according to the needs of the area / crops. More water was released at the time of preparation of nurseries. The Irrigation staff consulted the farmers for their requirements and inspected their fields. Water regulators were used for controlling the supply of water.

Views on Managing Committee

6.4.4.10 32 (80%) of the repondents reported that they got adequate chance to participate in the decision making, 27 (67%) reported that decisions were generally taken through consensus while 13 (32%) reported that decisions were taken through majority voting. All of them also stated that there was no group dominance in the managing committee. 27 (67%) respondents reported their views on the performance of village committee and distributary committee. Of these 24 (89%) opined that field channels and distributaries were not being maintained properly. 21 (78%) mentioned that after the formation of WUA, judicious distribution of water was being done by the WUA. All of them suggested that repair works and desilting of the canal be done regularly. Some farmers also favoured reconstitution of the present managing committee which had been working since inception. They also opined that those on the committee not be allowed to function for more than three years at a stretch. Each hamlet of the village be represented in the village committee.

6.4.5 Impact of the Programme

(A) Before and After Approach

Irrigated Area

6.4.5.1 Paddy was the only crop grown in the entire area covered under this project. This crop was grown throughout the year in three seasons kharif, rabi and summer which are described below as Paddy I, II and III. Irrigated area per respondent under each is given in table below.

Table 6.4.1 Average Irrigated Area per Respondent.

Crop		Before		After		
		No. reported	Average Irrigated Area (hect.)	No. reported	Average Irrigated Area (hect.)	
Paddy	I	40	5.08	40	5.08	(0.0)
"	II	40	4.30	40	5.09	(18.37)
"	III	11	1.87	11	1.87	(0.0)
Total per respondent		40	9.89	40	10.68	(7.99)

Figures in brackets are indices of growth

There was no increase in area under paddy in the first season. However, in the second season the increase in area was 18.37 percent. In the third season again there was no increase in paddy area under irrigation. The total area irrigated registered a growth of 8 percent over the years. There was no increase in area uder irrigation the formation of WUA. None of the farmers reported increase in irrigation over the years. There was no increase in area under irrigation after the formation of WUA. None of the farmers reported increase in irrigation over the years.

Quality of Irrigation

6.4.5.2 29 (92%) of the respondents reported that they were getting adequate water for irrigating their fields. 11 (27%) who were mainly from middle and tail end reported that they did not receive adequate quantity of water before the formation of WUA. After the formation of WUA in November 1990 the system was somewhat streamlined. During 1996-97, 30 (75%) respondents reported that they were getting adequate irrigation. Regarding timeliness 27 (62%) reported that they received timely supply of water before the formation of WUA. During 1996-97, 30 (75%) respondents reported that the irrigation was timely. Those who reported untimely supply of water were mostly from middle and tail end.

Yield per Hectare

6.4.5.3 In Anaikupam distributary only paddy was grown by farmers in all the three seasons.

Yields per hectare for the three seasons were as under.

Table 6.4.2 Average Yield of Major Crops (Quintal per hects.)

Crop	Before Average Yield per hectare	After Average yield per hectare	
Paddy I	21.2	28.9	(36.3)
Paddy II	24.0	27.3	(13.75)
Paddy III	14.0	18.7	(33.57)

Figures in brackets are indices of growth

Average yield per hectare for all the three seasons taken together which was around 21 quintals per hectare increased to 28 quintals giving an increase of over 33 percent after the formation of WUA in the Anaikuppam village. It was also found that some of the selected farmers were getting the same yield which they were getting before the formation of WUA. They were not fully following the recommendations given by the Agricultural Department.

Value of Produce

6.4.5.4 The details of the average value of produce per respondent for the three seasons are given below. The average value of produce was calculated at constant prices at both points of time. For this purpose, 1996-97 prices were used.

Table 6.4.3 : Average Value of Produce per Respondent

(at constant prices) **(Rs.)**

Crop	Before		After		
	No. reported	Average Value of Produce	No. reported	Average Value of Produce	
Paddy I	40	43110	40	58630	(36.00)
Paddy II	40	41213	40	55599	(34.91)
Paddy III	11	10487	11	14036	(33.84)
Total per respondent	40	87207	40	118089	(35.41)

Figures in brackets are indices of growth

Average value of produce increased from Rs. 87207 per respondent to Rs. 118089 a

growth of 35.41 percent over the years.

Water Loss

6.4.5.5 35 (87%) of the selected respondents reported water loss during the last three years. 16 (46%) stated non-provision of gauge measuring devices, 100 percent stated siltation and damaged structures, 19 (54%) stated unauthorised outlets in some of the distribuatries. Seepage due to non lining of the canals was also reported by 23 (66%) respondents. The responses were multiple

6.4.6 Impact of the Programme

(B) With and Without Approach

Area Irrigated

6.4.6.1 The entire area of the village was having irrigated land. Being a low lying area, the village was flooded at times due to heavy rainfall in the area or from the overflow of the canal at times. The details of the irrigated area per respondent are given below.

Table : 6.4.4 Average Irrigated Area Per Respondent (0.00 hect.)

	Before (1989-90)		After (1996-97)		
Crop	Number reported	Average irrigated area (hect.)per respondent	Number reported	Average irrigated area (hect.)per respondent	
Paddy I	15	1.49	15	1.49	—
Paddy II	15	1.49	15	1.49	—
Pulses (Black gram)	15	2.77	15	2.77	—
Total Per respondent	15	5.75	15	5.75	—

As may be seen from the above table, the average area irrigated remained the same over the years.

Quality of Irrigation

6.4.6.2 There was no change in quality of irrigation. All the farmers stated that the irrigation was timely and as per their requirement and that too in time.

Yield per Hectare

Table 6.4.5: Average Yield (Quintals Per Hectare)

Crop	Before Yield	After Yield	
Paddy I	36.3	42.1	16.0
Paddy II	31.3	37.5	19.8
Pulses	6.1	7.2	18.0

6.4.6.3 The yield per hectare increased from 36.3 quintals to 42.1 for Paddy I an increase of 16 percent. Similarly Paddy II registered as increase of 19.8 percent. For Pulses, the yield which was 6.1 quintals per hectare increased to 7.2 quintals thereby registering an increase of 18 percent over the years.

Value of Produce

6.4.6.4 For calculating the value of produce the constant prices prevailing during 1996-97 were taken into considerate. The details are as under.

Table 6.4.6 : Average Value of Produce Per Respondent (at constant prices)

Crop	Before		After		
	No. Reported	Average Value of produce (Rs.)	No. Reported	Average Value of produce (Rs.)	
Paddy I	15	24390	15	28320	(16.1)
Paddy II	15	20095	15	24080	(19.8)
Pulses	15	15144	15	18048	(19.2)
Total per respondent	15	55629	15	70448	(26.6)

Figs. in brackets are indices of growth

The value of produce per respondent for Paddy I increased from Rs. 24,390 to Rs. 28,320, registering an increase of 16.1 percent. Similarly for Paddy II the value of produce increased from Rs. 20, 095 to Rs. 24, 080, an increase of 19.8 percent. For Pulses the value of produce increase from Rs. 15144 to Rs. 18048, an increase of 19.2 percent. The total value of produce increased from Rs. 55,629 to Rs. 70,448 registerting an increase of 26.6 percent. Average value of produce per selected beneficiary at Rs. 118089 was more than the average value of produce of Rs. 70,448 for the non-members. This increase was attributed to more irrigated area available to the selected farmers of WUA.

Awareness

6.4.6.5 All the 15 respondents were aware of the FPIM in their area. All of them had stated that IMTI had been adopting villages for FPIM in their district since 1988. The system was working well. However, all of them stated that they had no problem in getting irrigation in adequate quantity as well as in time.

6.4.6.6 All of them also stated that they wanted to form the WUA in their area. Even during the last year, they collected some money as per the stipulation of the IMTI as their share. But the money was spent for some other purpose. The farmers wanted to form WUA as it would

help them in solving the internal disputes and also to pressurise the state government to provide drainage facilities in their village.

Repair & Maintenance & Water Loss

6.4.6.7 All of them stated that Irrigation Department was not maintaining the canal / distributaries properly. Their village which was in the low lying area was often flooded by rain water. They needed proper drainage facilities.

6.4.6.8 All the 15 respondents stated that there was water loss from distributary as well as from the main canal, the main reasons being silting and damaged structures.

Comparison

6.4.6.9 A comparison between two groups of respondents tends to indicate that average irrigated area per member of the farmers' association which was about 70 percent higher than average irrigated holding per non-member, registered 8 percent growth between two points of time, vis-a-vis no growth in irrigated area in case of the non-member respondents during the same period. That the farmer members reaped allround improvement in their agricultural status after the new experiment with farmers participation in irrigation management is evident from the fact that yield per hect. of different varieties of paddy grown by them registered about 28 percent average growth "after" as against 18 percent average growth reported by non-members. Consequently, average value of produce increased by more than one-third over the same period for the former group of respondents as against 27 percent for the latter group.

6.4.7 Panchayati Raj

6.4.7.1 There was cordial relationship between WUA and village Panchayat. The president of the Panchayat took part in the welfare of WUA. The Panchayati Raj Department also provided a small fund for desiltation and minor repairs.

6.4.8 Overview

6.4.8.1 The genesis of the society was due to the efforts made by Irrigation Management Training Institute (IMTI) in the state to organise farmers in the Cauvery delta to motivate them to clean up field channels in their villages to revive the traditional practice of "Kudimaramath" i.e. inspiring farmers to maintain field channels through self help. The Institute also provided initial fund to the society at the rate of Rs. 250/- per hect. of command area and farmers also contributed at the same rate. Although ID was responsible for maintenance of canal / distributary channels this was a glaring example of self help by farmers with regard to maintenance of field channels, major part of expenses on which came from interest of the money thus contributed and kept separately in a bank account.

6.4.8.2 Although the new experiment resulted in about 8 percent increase in irrigated area per respondent "after", yield of major crop paddy grown in different seasons registered increase by about 28 percent after the new experiment. Average value of produce grown by the respondents also increased by about one-third over the same period. The agricultural status of control group of respondents also increased between two points of time, but the rate of increase was less than that of members of the association.

6.5 An overview of the Selected Projects in Tamilnadu State

6.5.1 The three WUAs in Tamilnadu, which were quite representative of the average situation prevailing in the state performed reasonably well in terms of impact on agricultural situation. Their financial health was more or less satisfactory. They also performed well as organisational entities. The associations came into being due to a combination of several favourable factors like the monetary incentive in the form of grant or subsidy per hectare provided by government by government or other outside agencies, the initiative taken by IMIT, Anna University, USAID etc., and the traditional practice of Kudirmaramath. In addition there was the expectations that the new system would ensure adequate and timely supply of water, provided for the equitable distribution, save time and money in running after officials, minimise corruption and help proper maintenance of irrigation channels. One of the associations namely Vadakku Kodai was formed as early as 1959 and registered in 1960 when forming such an association was quite uncommon. The motivating factor was the hope of securing more water through group pressure a task in which they succeeded. But it was not replicated elsewhere presumbly because the impact was not that powerful to disturb the prevailing equilibrium.