

Kedar Tank: A Case Study on the Turnover of Tanks to Farmers

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ABSTRACT

MANAGEMENT OF RAINFED tank systems in Tamil Nadu is the joint responsibility of the agency and the farmers as per statute. The agency is expected to maintain the tank system as well as the supply source. The user is expected to maintain the distribution network and field channels including water regulation under the Kudimaramath System. In reality, the expectations are hardly fulfilled.

The government agencies are unable to maintain the system efficiently by carrying out periodic, special repairs because of the innumerable number of tanks (more than 39,000 in number), and paucity of fund allocation. The farmers are unable to maintain the system due to a variety of reasons like fragmented landholdings, poor economic status, no approach to tank assets, and lack of a sound institutional framework to take care of the managerial functions.

The paper discusses the experiences gained in the initiation of the Irrigation Management Transfer Process set forth in the Kedar Tank of Ramasamy Padayachiar District in Tamil Nadu by the Centre for Water Resources (CWR) of Anna University, as part of their field-based action research study on Participatory Management Approach in four rainfed tank systems in Tamil Nadu.

These tanks are being modernized by the State Public Works Department (PWD) under the ongoing tank modernization program through an EEC grant. The research study is being supported by the Ford Foundation, New Delhi.

INTRODUCTION

Farming in Tamil Nadu relies heavily on Irrigation. Canals, tanks and wells are the three principal sources sharing the net irrigated area of 2.9 million hectares (Mha), more or less equally. A tank is a small storage reservoir used to impound the runoff from the monsoon rains which occur during a few months of the year and to regulate the supply of water, mainly for agricultural use. Tanks in Tamil Nadu numbering over 39,000 have a very long history. They are ingenious devices constructed to capture rain water not only to support farming but also to serve a multiplicity of community water needs over space and time. In recent times, tanks have come to attract much greater attention than ever before because of their spread over a large extent of area and their contribution for sustained growth of agriculture, benefitting a large segment of the rural community. These are small irrigation systems capable of yielding quick benefits and are managed by the farming community.

However, many tank irrigation systems over the years have slowly and steadily lost their functional efficiency while some have become extinct due to encroachment, urbanization and neglect. Specifically, the catchment areas have suffered immense damage due to deforestation, over-grazing, soil erosion and encroachment. In most cases, they are denuded of vegetative cover, degraded and exposed to hazards of soil erosion, resulting in sedimentation. In short, the water use efficiency has dipped as low as 25 to 35 percent in many cases, and they have lost their efficiency to effectively serve as good and reliable water sources.

ROLE OF THE UNIVERSITY

As part of its research program the CWR of Anna University undertook a pilot study to rehabilitate the Pandianallur Tank near Red Hills in the Chengai MGR District.

RESEARCH RESULTS

The study undertaken in the Pillaipakkam Tank by the State Public Works Department (PWD) indicated that the major benefit of tank modernization lay in minimizing the conveyance loss of the precious irrigation water by 21 percent

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through the lining of main and field channels. The CWR, Anna University, Madras embarked upon one other research study in the Pandianallur Tank with a view to clearly understanding its problems and prospects.

The main lesson learnt from the Pandianallur pilot study was that adequate attention was not being paid to an intimate understanding of farmers, their concepts on water rights and water distribution practices, and their perception on modernization programs, etc.

In short, it became well recognized that tank rehabilitation and management did not lie within the domain of the irrigation engineers but much beyond that, encompassing the socioeconomic institutional matrix of the rural society. This brought out the need to internalize the farmer beneficiaries' commitment to planning, designing, implementing, operating, maintaining and managing tank irrigation systems. The concept of the participatory approach for modernization of these small irrigation systems traditionally managed by farmers has the potential to mobilize not only indigenous wisdom, experience and ingenuity but also the much needed manpower, materials and resources.

DEVELOPING AN EXPERIMENT

The CWR, Anna University, diligently planned to launch an experiment with a view to learn and develop methodologies for enlisting farmer participation in tank rehabilitation and management on a sustainable basis besides educating the farmers on scientific water management practices. The experiment is conceived to be a comprehensive design to capture the socio-cultural, institutional, economic, political and technological parameters to build and strengthen the process of development in tank rehabilitation and management. The research study is guided by a state-level steering committee chaired by the Secretary, Public Works Department with representation from other government departments who are associated with the development of the tank in one way or the other. Such an experiment is currently being carried out for promoting farmer participation in the following four rainfed tank systems in Tamil Nadu which are being modernized by the State Public Works Department.

STUDY AREA

As stated above, the research study was undertaken by Anna University in June 1988 in the following four tanks, in two phases:

- | | | | |
|------|--|---|----------|
| i) | Kattiampandal Tank in Chengai MGR District |) | Phase I |
| ii) | Kedar Tank in Ramasamy Padyachiar District |) | |
| iii) | Sowdapatty Tank in Madurai District |) | Phase II |
| iv) | Kannangudy Tank in Pudukottai District |) | |

KEDAR

Kedar is a semi-urban village in Villupuran Taluk of Ramasamy Padayachiar District. It is a fairly well-developed village with good infrastructural facilities in terms of transport and communication, education, banking, medical and health care, farm input supply centres and such other services. Sellankuppam is the only hamlet of the main village. Kedar village has a large population of 3,889 and a significantly high portion is engaged in agriculture. Handloom weaving, mat making, pottery, agricultural processing and other small business are the other occupations. Grounder account for nearly 60 percent of the population, more or less equally distributed, followed by the scheduled castes with about 20 percent.

DISTRIBUTION OF LANDHOLDINGS

There are 294 farm holdings in the command area, and people of the Mudaliar caste are the most predominant in terms of numbers as well as area owned. Out of the 294 farms, 88.44 percent are less than one hectare (ha) in extent, accounting for 56.29 percent of the cultivated area. Only 4 farms are above 2 ha. Nearly 50 percent of the farms are less than 0.20 ha in extent and cover 12.35 percent of the area.

SOURCES OF IRRIGATION

The Kedar Tank has both free and intercepted catchments. The average annual rainfall is 1,047.20 millimeters (mm). Rain is fairly heavy during the northeast monsoon, amounting to 514.00 mm. The tank provides irrigation for 116.73 ha. Field-to-field system of irrigation by flooding is the most common practice. There are 59 functioning wells to

supplement any irrigation needs. The wells are more or less evenly distributed in the head, middle and tail reaches of the tank command.

CROPPING PATTERN

Out of the total irrigable area of 116.73 ha, the area sown with rice in the first season exceeded 90 percent in 4 out of 8 years. Rice occupies the entire area in the first crop season which is followed by a second crop of rice, if adequate water becomes available. Cotton, groundnut, ragi and other oil seeds are also grown in the second season. Here again, inadequate water yield due to poor and erratic rainfall and the neglected condition of supply channels, storage and regulatory structures have seriously affected irrigated farming.

FIELD TEAM

The study is one of the Philippines models wherein an Institutional Organizer had been placed to play the role of catalyst involved in all facets of the rehabilitation and management activities, like planning, execution, operation, and maintenance of this rainfed tank system. The Institutional Organizer, has been ably supported by a Technical Assistant. The day-to-day processes and crucial activities are being documented by a Process Documenter. In short, the field research team comprises one Institutional Organizer, one Technical Assistant and one Process Documenter.

PROGRESS MADE

The interaction of the research team with the village community had enabled the farmers to accomplish the following:

- * A Water Users' Association was formed at Kedar and is registered under the Tamil Nadu Society's Registration Act of 1976 on 26.07.89.
- * The rehabilitation estimate for the Tank was prepared based on the needs of the farmers.
- * The government in PWD (GO Ms. No. 1464 dated 16.7.1990) had complied with the request of the farmers of this place in awarding the work contract to the farmers organization (FO), and granting a loan of Rs 50,000 (US\$1,600) as seed money to take up the rehabilitation works at an annual interest of 12 percent.
- * The FO had taken up the execution work during November 1990 and the entire work costing over Rs 20 lakhs (US\$64,000) had been successfully completed by the FO during August 1993. The quality of work turned out by the FO is one of high order and acclaimed by all visitors.
- * Convinced with the interest and involvement of the farmers of this place, the Fisheries Department had readily responded to the requirement of the farmers and issued an order wherein the FO of this place had been permitted to enjoy the usufructs of the tank water (vide GO No. D2 dated 13.02.1992). This GO enables the Association to have a replenishable annual resource base to carry out operation and maintenance functions of the tank which is being modernized at heavy cost.

FARMER RESPONSE

Rehabilitation work of the tank undertaken by the FO has already developed the necessary skill and confidence among the farmers to manage their affairs efficiently.

AGENCY RESPONSE

Sensing the attitudinal change of the farmers, the research team initiated action on this "Turnover Process" by taking up the issue in the Steering Committee meeting held in August 1992. Dr. John Ambler, Program Officer, Ford Foundation, New Delhi Office supported the idea of making the farmers the owners of the tank, by "turning over the tank system" to them for its ultimate maintenance and management. Naturally, this may help promote better interest among the farming community for its sustained maintenance. Dr. John Ambler also felt that such a step, apart from providing a sense of ownership to the farmers about the tank, will also kindle interest in the community to tap resources better from this new asset base by exploring ways and means such as the following:

- * Planting trees along the tank bund.
- * Collecting a toll from the persons who have brick kilns inside the tank water spread during the off-season.
- * Collecting fines from the owners of the stray cattle which enter and destroy crops in the command area.

Such an agreement will also help implement a better "watch and ward" arrangement to protect the tank components from encroachment and to protect the crop from cattle.

The Chief Engineer, [Minor Irrigation (MI)] who is the present owner of the tank system as well as the farmer representatives of Kedar welcomed this suggestion. The Secretary PWD, as the Chairman of the Steering Committee, welcomed the suggestion and assured the Program Officer, Ford Foundation, that he on behalf of the government will favorably consider the suggestion. He also wanted the research team to go in to details about this concept of "turning over" the tank system to farmers, with suitable recommendations for consideration by the government.

FOLLOW-UP ACTION

The Kedar farmers were quite happy about the decision of the Steering Committee and convened a General Body Meeting during February 1993 to discuss further on the above issue. Before convening the General Body (GB) they had a number of sittings with different sections of farmers of the various hamlets as well as with the local government officials of PWD, Revenue and *Panchayat*. When their views were elicited, all of them responded positively towards taking over the tank from the government for its more efficient management by the community.

The GB of the FO convened on 06.02.1993, deliberated on this issue in detail and wanted to know whether the Association had the financial capability to shoulder the responsibility efficiently. The Secretary of the Association was able to convince the GB by providing details on the asset position of the Association. The GB then unanimously resolved to request the government to "turnover the Kedar System" to the FO.

The GB also made certain decisions to support the cause of "turnover" as follows:

- * In the tank system, the encroachers should be evicted by the government agency before it is handed over to the FO.
- * The tank system should be entrusted to the FO on lease for a minimum period of 25 years, to enable them to build up developmental activities.
- * The FO needs legal authority to take action against irrigation offenders.
- * The FO should have the legal rights towards the enjoyment of usufructs of the tank system and pisciculture rights of the tank water.
- * Right to collect and share a portion of the land revenue including water charges from tank farmers.
- * All emergency major repairs and special repair works should be done by the government.

The farmer's association at Kedar put forth an official request to the Chief Engineer (MI) during March 1993 to initiate action to effect the process of "Turnover," and also requested the Director, CWR to interact with the government to accelerate the process. The research team of CWR, after deliberation with the farmers and the agency officials like the District Collector, Executive Engineer, PWD *Vilupuram* and Deputy Chief Engineer (MI), finalized the Memorandum of Understanding (MOU) for this process and forwarded the same to the Chief Engineer (MI) during January 1994.

FARMER PERFORMANCE

In anticipation of approval of their request for management transfer by the government, the farmers had already swung into action to take care of the managerial functions of the tank systems.

The actions initiated by the FO to overview better managerial functions are as follows:

- * Clearing of the upper Paliandur tank supply channel which had helped them to have an additional quantity of about 13 mcft (0.368 mm³) of water during 1993.

- * Providing additional earthen field channels in the command area for a length of 2,400 meters, to facilitate better water flows to the tail end of the command.
- * Appointing two more *Nærkattis* (Water Guides) to take care of the internal water distribution based on the roster prepared by the Association.
- * Deciding that farmers with wells should not use tank water when the water level in the tank goes down below a certain level.
- * Active involvement and the disciplined behavior of the farmers during the 1993-94 crop season; which yielded better results both in the matter of area cultivated as well as on productivity, say 14.2 percent overall (Table II).

FARM FRONT

The performance at the farm front when the managerial functions were taken over by the Association during 1993-94 was much better than during the previous years when it was managed by individual farmers. The data available for the years 1991-92 to 1993-94 were analyzed. The following inferences can be drawn from them:

- * The crop coverage for the first and second crop during the year 1993-94 was better compared to 1992-92, even though the water yield to the tank was better during 1991-92. This is attributable to the organized behavior of the farmers during 1993-94 which was not so during 1991-92.
- * During 1991-92, the tank had surpluses for about a week. Even then, water shortages was felt by the farmers for crop maturity. No residuary storage of water was available in the tank after the first crop season to have a second crop. The well owning farmers alone were able to have a second crop.
- * During 1993-94, when the managerial functions were taken over by the Association, the position was different. There was an increase of 13.5 percent of area covered during the first crop than during 1991-92. The tank had a residuary storage of 6.654 mcf (0.188 mm³) at the end of the first crop season. The farmers were able to have a coverage of 233.76 acres (94.64 ha) during second crop season (Tables I and II).
- * Cognisable improvement has been noticed in water use efficiency as well. The tank system worked at a duty of 3.57 Ac.ft (1.09 ha.m) during 1991-92 and at 3.05 Ac.ft (0.93 ha.m) during 1993-94, registering about a 17 percent increase.

RESOURCE MOBILIZATION

Apart from these agricultural operations, the Association had also procured about 17,000 fish fingerlings and reared them in tank water during 1993-94. The expenditure towards fish rearing was Rs 8,000 (US\$256).³ They sold the fish during 1994 for Rs 75,000 (US\$2,400), excluding the expenses; the Association was able to get a profit of Rs 60,564 (US\$1,938).

The farmers of Kedar created a maintenance corpus fund by contributing Rs 247 (US\$7.90) per hectare from individual land owners. Thus, they collected a sum of Rs 28,800 (US\$921.61) under an ongoing farmers' subsidy program through farmer associations that create such corpus funds to qualify for an equal amount as subsidy from the government. The Kedar Farmers' Association also received a subsidy of Rs 28,800 (US\$921.61) from the Director, Irrigation Management Training Institute (IMTI), Trichy during December 1993 (Table III).

The Kedar Farmers' Association is thus well set for taking over the tank system from the government, and they eagerly await the turnover process to take place at the earliest, which may entrust them with additional powers than at present. They are:

- * To punish irrigation offenders.
- * To collect water charges and have their own water rates.

³US\$1.00 = Rs 31.25.

- * To collect tools from brick makers and other users of tank silt.
- * To plant and grow trees in the tank area to augment the resource base of the association.

The experience at Kedar demonstrates that farmers of any rainfed tank system where water availability is not that reliable can perform well, provided they are given adequate legal, financial and technical support.

LOOKING TO THE FUTURE

The future of such farmer association needs examination in the changed context of the amended Panchayat Act of the state government during April 1994.

As per the amended Panchayat Act, the village Panchayat enjoys absolute right over all village assets including the tank. It is made responsible to carry out the 28 functions listed under article 257 of the Appendix I of the said Act. Item 1,2,3,5,6, 28 and 29 of the Appendix are relevant to the tank and its management (see Appendix).

The Panchayat is an autonomous body elected by the people. The Panchayat president voted to office enjoys absolute power under this act. In the village administrative set up, the tank is one of the primary sources for augmentation of resources through the Panchayat as follows:

- * Social forestry in tank water spread.
- * Selling fish.
- * Auctioning trees growing on the tank bund, and so on.

The sustenance and success of the farmers association hinges on the linkage that is to be established between the Panchayat and the FOs in sharing the tank resources between these two.

It is considered essential that a select committee at the government level should go into the related aspects and to define:

- * The roles and responsibilities between a legally constituted farmers' association and democratically elected Panchayat body.
- * The legal support and autonomy of the farmers' association that should be allowed for its smooth functioning and to safeguard its interests.
- * Measures to pool and share the tank resources between the Panchayat and farmers' association.

The one possible alternative may be for the FO to enter into an agreement with the Panchayat President to perform its function as an Association. It must be made obligatory to the Panchayat to lease the enjoyment rights of the tank assets to the legally constituted farmers' association. The MOU to be entered into between the two may spell out the terms and conditions mutually acceptable to both.

CONCLUSION

The experience gained so far at Kedar Tank justifies the need to promote the cause for "irrigation management transfer (IMT) from the agency to the user beneficiary, which alone can pave the way for better productivity and sustainability in system maintenance over a period of time. The farmers have to be provided with adequate legal, financial and technical support during the early years of the IMT process by designing suitable irrigation support service activities like transferring the fishing rights to the Kedar Farmers' Organization. The creation of such an appropriate environment is a must to realize the ultimate objectives of the IMT.

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MAP

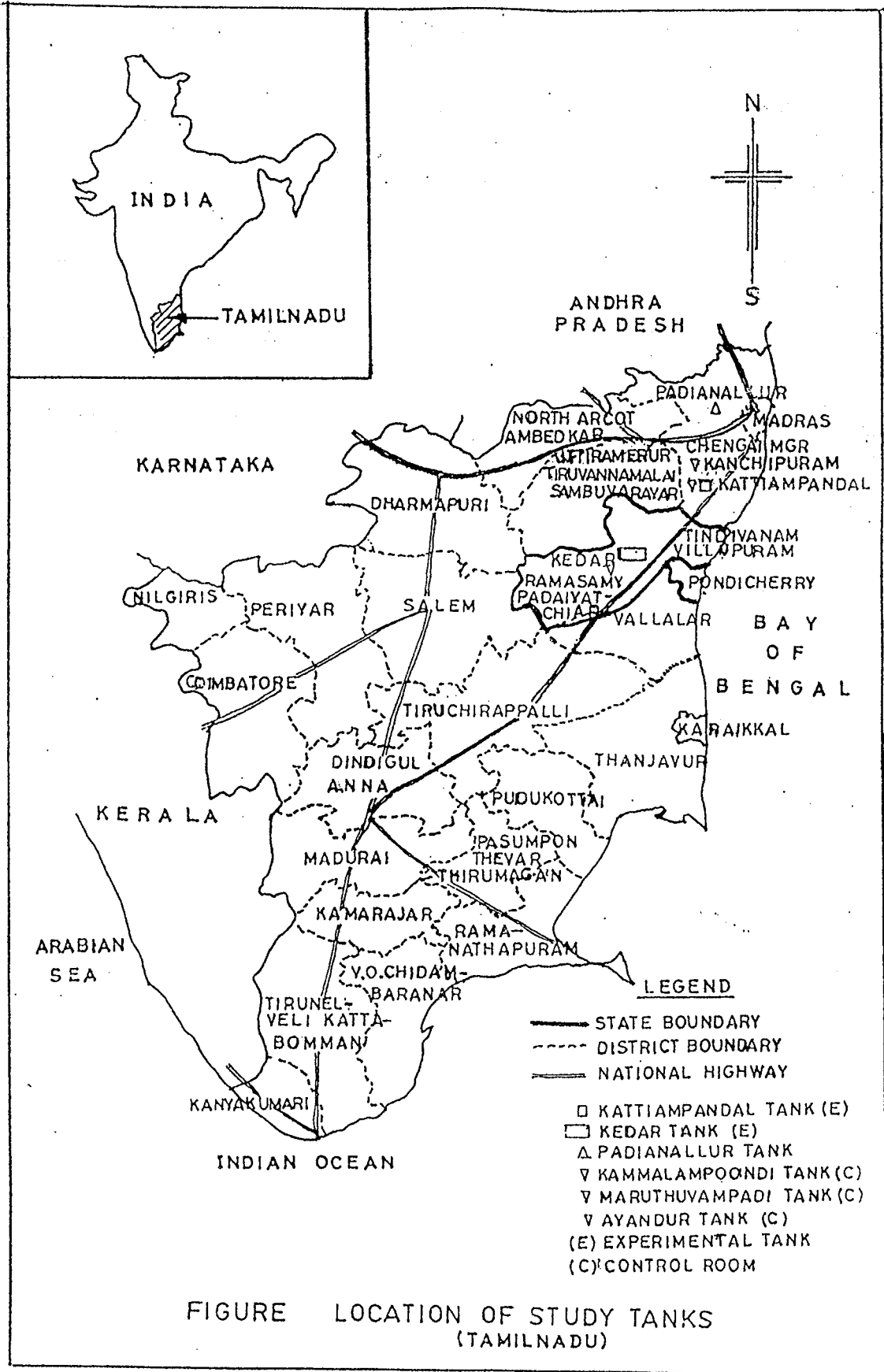


Table 1. Kedar Tank Command Crop coverage details.

From 1991-92 to 1993-94.

Sl Monsoon No. Year Rain in mm	First crop area cultivated			Second crop area cultivated		Remarks
	Crop	Extent ha.	Total ha.	Crop ha.	Extent ha.	
1. 1991-92 SWM	Paddy	*82.08		Paddy		
293 NEW 743	Sugarcane	14.05				
-----	Cotton	4.60		Cotton	2.23	
Total 1036	Oilseeds	1.62		Oilseeds	8.30	
	Plantain	1.21		Ragi	2.63	
	Blackgram	0.28		Kambu	4.05	
	Groundnut	3.04	106.88	Groundnut	7.04	25.06
2. 1992-93 SWM	Paddy	27.67		Paddy	1.21	
129 NEW	Sugarcane	14.71		Groundnut	7.04	Year of deficit Rainfall
-----	Plantain	1.14		Oilseeds	8.30	
Total 820	Cotton	13.12		Cotton	2.23	
=====	Oilseeds	37.56		Ragi	2.59	
	Grass	0.08		Cumbu	4.05	* Paddy area reduced by 63.3 %
	Blackgram	0.20				
	Millet	3.21				
	Cumbu	4.58	102.27			
3. 1993-94 SWM	Paddy	93.73		Paddy	2.87	
284 NEW	Sugarcane	16.60		Oilseeds	76.32	* Paddy area increased by 14.2 %
-----	Groundnut			Groundnut	15.45	
Total 1047	Cotton	2.72		Cotton		94.64
	Blackgram	0.81				
	Ragi	1.00	114.86			

Notes: NWM-South West Monsoon * The percentage of Paddy area cultivated has been worked out as 1991-92 as reference year. Total command area: 116.73 ha
 NEM - North East Monsoon Average Rainfall SWM 454 mm Average Rainfall NEW 514 mm
 968 mm

Table 2. Kedar Tank Command productivity analysis of sample farmers.

Water regulation carried out by individual farmers before farmers association had taken the responsibility		Water regulations carried out by Farmers' association by appointing water guides after appointing water guides by Farmers Association						
Year 1991 - 92		Year 1993 - 94						
Reaches								
No. of Samples area	Total Cultivable area	Total paddy area	Productivity in hectare	No. of Samples area	Total Cultivable area	Total paddy Cultivation	Productivity in hectare	
in hectare	in hectare	in kgs	in kgs/ha	in hectare	in hectare	in kgs/ha	in kgs/ha	
Head	15 17.07 [47] [34.87]	9.37*	47557	5075 [47]	15 17.07 [34.87]	8.00	41625**	52032.5
Middle	19 14.46 [68] [25.41]	9.34	40950	4384 [68]	19 14.46	11.21	56400	503114.8
Tail	31 23.60 [97] [56.45]	21.10	93986	4253 [97]	31 23.60	19.18	98025	511120.2
Total	65 56.35 [212] [116.73]	40.82	182495	4411 [212]	65 55.13 [116.73]	38.39	196050	510614.2

Paranthesis shows total ayacutdhars and their extent of cultivable land

Note: The displays the water use practices resorted by sample farmer during the years and its impact on productivity

* when they are unorganised

** when they are organised

Table 3. Kedar farmers association balance sheet as on 10.06.1994.

SL NO.	RECEIPTS	AMOUNT RS.	PAYMENT	BALANCE
1.	Contract Bill Receipts	99,654 (US\$ 3188.93)	Expenditure of Maintenance	12,600 (US\$ 403.20)
2.	Refund on Income Tax	25,000 (US\$ 800)	Administration	5,300 (US\$ 169.60)
3.	Subscription, Fish sales	1,18,764 (US\$ 3800.45)	Others	19,185 (US\$ 613.92)
	Income and Matching grant		(including Fish rearing)	29,870 (US\$ 955.84)
	Refund of loan to farmers		Refund of loan to farmers	
		Rs. 2,43,418 (US\$ 7789.38)		Rs. 1,76,463 (US\$ 5646.82)

ASSET POSITION AS ON 10.06.1994

Details	Amount	Total
I. Fixed Deposit Details		
(A) Association Funds		
1. Corporation Bank at Kedar F.D.R. No. 213102		
No. 213102 dated 30.11.93 (one year)	Rs. 28,800 (US\$ 921.6)	
II. Corporation Bank at Kedar F.D.R.		
No. 366906 dated 10.06.94 (one year)	Rs. 60,000 (US\$ 1920.00)	Rs. 88,800 (US\$ 2841.6)
(B) <u>Europus fund/Account</u>		
I. F.D.R./T.D.R No.1 327200 dated 21.1.94 (Five years)	Rs. 43,200 (US\$ 1382.40)	
II. F/D/R/T.D.R No. II dated 21.1.94 (Five years)	Rs. 14,400 (US\$ 460.80)	Rs. 57,600 (US\$ 1843.20)
II. Current Accounts		
I Saving Bank Account No. 4693 at Corporation Bank at Kedar	Rs. 25,463 (US\$ 814.82)	
II Current Account of State Bank of India at Villupuram	Rs. 4,600 (US\$ 147.2)	Rs. 30,063 (US\$ 962.02)
Total:	Rs. 1,76,463 (US\$ 5646.82)	

F.D.R. - Fixed Deposit Receipt, T.D.R. - Term Deposit Receipt

APPENDIX I

TAMILNADU AMENDED PANCHAYAT ACT OF APRIL 1994

SCHEDULE - IV (See Section - 257)

1. Agriculture, including agricultural extension.
2. Land improvement, implementation of landreforms, land consolidation and soil conservation.
3. Minor irrigation, water management and watershed development.
4. Animal husbandry, dairying and poultry.
5. Fisheries.
6. Social forestry and farm forestry.
7. Minor forest produce.
8. Small scale industries, including food processing industries.
9. Khadi, village and cottage industries.
10. Rural housing.
11. Drinking water.
12. Fuel and fodder.
13. Roads, culverts, bridges, waterways and other means of communication.
14. Rural electrification, including distribution of electricity.
15. Non-conventional energy sources
16. Poverty alleviation programme.
17. Education, including primary and secondary schools.
18. Technical training and vocational education.
19. Adult and non-formal education.
20. Libraries.
21. Cultural activities.
22. Market and fairs.
23. Health and sanitation, including hospitals, primary health centres and dispensaries.
24. Family welfare.
25. Women and child development.
26. Social welfare, including welfare of the handicapped and mentally retarded.
27. Welfare of the weaker sections, and in particular, of the Scheduled Castes and the Scheduled Tribes.
28. Public distribution system.
29. Maintenance of community assets.