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Status of Irrigation Management Transfer in India

**Water Users Association in XIth
Branch Canal Periyar Vaigai
Project : Farmers Experience**

N. Kannan

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**Indian Institute of Management,
Ahmedabad**

**International Irrigation Management
Institute, Colombo
December, 1995**

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Foreword

This booklet is one of the series of short narratives about farmers' efforts to create and manage water user associations. The purpose of the **series** is to provide other farmers in the **state** with succinct, readable, and interesting information about these efforts that might enable farmers to improve their access to the irrigation services. This study is being published in both Tamil and English. **See the** back cover for information about **the** other narratives in this series.

This narrative was written by N. Kannan under the guidance of IIMA and IIMI team members. He lived with the farmers described here from October, **1994** to April, 1995. While there, he interviewed and observed the farmers in order to document the water user association and irrigation management transfer process at this site. The information presented here reflects the ideas and opinions of the farmers themselves.

N. Kannan's effort was part of the study on Status of Irrigation management Transfer in India being carried out from 1993 to **1995** by the Indian Institute of Management, Ahmedabad, and the International Irrigation Management Institute, Colombo, with funding from the **Ford** Foundation. The study investigated and documented the policies and activities of agencies, non-governmental organizations, and **others** with regard to promoting irrigation management transfer **from the** government to farmers. The overall goal was to contribute to formulation of effective policies and programs with regard to irrigation management transfer in India. In addition to **this** series of short narratives, study results are reported in more traditional research **reports** and other forms.

The primary members of the IIMA/IIMI study team were Shashi Kolavalli, Amarlal Kalro, Gopal Naik, and **S.** Ramnarayan from IIMA, and Jeffrey D. Brewer, R. Sakthivadivel, and K.V. Raju from IIMI. **Editing** in Tamil was carried out by **S.** Subramanian. The edited first draft **was** translated into English and reviewed by the study team, particularly by Jeffrey D. Brewer and **K.V.** Raju.

The members of the study team, including N. Kannan, wish to thank the people of Village Dharmasanapatti, concerned government and non-governmental agencies who gave their hospitality and time to answer questions and explain how things work without expecting compensation. We sincerely hope that their experiences will be useful to others.

Jeffrey D. Brewer
IIMI

Gopal Naik
IIMA

Water Users Association in XIth Branch Canal Periyar Vaigai Project : Farmers Experience

River irrigation systems irrigates one third of the irrigated area in Tamil Nadu. The Periyar Vaigai is the largest system in Tamil Nadu, next only to the Cauvery system. The Periyar river originates in the Western Ghats and flows traverses westward before ending its journey in the Arabian Sea. Constructing a dam across the river and make it run eastward through a tunnel is an engineering marvel. The dry tracts of Madurai district benefitted by the diversion. The project ~~was~~ completed by 1896.

Periyar Irrigation System

Tamil Nadu is not widely endowed ~~with~~ water resources. Most parts ~~the~~ state are arid. The most important irrigation system is the river Cauvery having its origin in Karnataka. Water resources could **only** be improved by diverting west flowing rivers in Kerala towards Tamil Nadu.

The river Vaigai irrigates parts of Madurai district. Social and economical backwardness of the areas certain vulnerable segment of the Society ~~turn~~ to dacoity.

The work on diversion of the Periyar river towards east ~~was~~ initiated during the fag end of the nineteenth ~~century~~. The Madras Presidency took the dam site and the catchment area in Kerala on 999 year ~~lease at~~ Rs 2,57,789 per annum. The ~~dam~~ on the western side of the reservoir is **47m** high and **137m** long. Water is taken eastward through ~~a~~ 1539m long tunnel. The energy is converted into electric energy. Water is dropped 1500 m/ 150 m through four penstocks (pipes of 2m diam) each discharging **400** cusec, ~~to~~ generate electricity. The Periyar ~~water~~ joins ~~the~~ Surliyar and Theniyar rivers ~~before~~ its confluence with the Vaigai river at Andipatti.

The Periyar contour canal ~~runs~~ almost parallel to the ~~Vaigai~~ river on its left side ~~as~~ the Periyar main canal and on its right side ~~as the and~~ Thirumangalam main canal.

Sivagangai and Thirupathur taluks of Ramnad district were **dry and** experienced difficulty even in getting drinking water. The **Orani** tanks meant for household water supply remained dry during several months of **the** year. Underground water potential was poor. When the Vaigai dam **was** constructed, water scarcity in Ramnad district was taken into consideration. The extension of water supply to Thirupathur **and** Sivagangai was ordered by the then chief minister Kamaraj. **Also**, the Periyar Main Canal was extended to imgate additional area through a number of tanks.

During the Periyar main canal construction, chain tanks within **the** command area were linked **as** system tanks. The tanks were designed in such a way that the surplus and seepage of the first tank drained to **the** second, from the to the third, and so on finally draining into **the** Vaigai river. The topography is such that the surplus of the canal system drains into the Vaigai for reuse again and again. The tanks in the project area also collect rain water. Each **tank** imgates anywhere between **12** and **100** ha. **The** tanks can harness **105** mcm. According to PWD estimates seepage alone is 30 mcm.

Wells

There were 19,364 wells in the district during 1981, of which **955** are in the Periyar main canal area. During modernization of the Periyar main canal, branch canals and distributaries up to 10 ha level were lined. After modernization it is estimated that groundwater availability **has** come **down** from **280** mcm to **185** mcm.

Irrigation

The project area is divided into four zones and the government issued guidelines for release of water for each of the zones are **as** follows :

Periyar main canal double crop	:	June 1 to February 28 .
Periyar main canal single crop	:	August 15 to February 15 .
Thirumangalam main canal single crop	:	September 1 to December 15 .

Periyar extension area

: September 15 to February 15.

Water will be released for irrigation for double crop **area only** if the storage in **the** Periyar reservoir is 283 mcm. If the storage is less, **the** opening date will be postponed.

Irrigation Rights

As per imigation rights, in the case of water shortage double **will** get preference over other areas to make the crops. Only when **surplus** water is available single **crop** lands will get water. Surplus over and above **the** single crop area requirement alone will be given to the Extension **area**. In each one of these areas the first outlet farmer gets **first** preference during each imigation.

In addition **Land** revenue is collected at Rs. 119 per hectare. Water rate at Rs. **15** and modernization levy at Rs. **45** per ha. are also collected. This is a general rule **followed** in PVP due **to** monocrop. However rates will depend **on the** season and crop **and the** soil characteristic. **Water** is charged on the basis of crop grown and not on quantity of water supplied.

There are 65,000 land holders **and** 25,000 landless farm families in the Periyar Vaigai ayacut area. Agriculture is the prime source of income. Thirty **per** cent of the area is under tenancy cultivation. Even **though** Tamil Nadu Government Tenancy Act provides for **the** owner **and the** tenant sharing the produce at 40:60, in actual practice the produce is shared at 50:50 on unwritten arrangements.

Agricultural Associations for Water Distribution

Irrigation associations exist in **the** Cumbum valley which is **the** headreach beneficiary of Periyar water. During the past few years of the Agricultural Engineering Department (AED) **has** been forming imigation **councils at** distributary level **and** associations at sluice level. There are 32 councils **and** 800 sluice associations in the Periyar command. **AED** has plans to form five **more** councils to cover the entire project area.

Neeranickam: The **Veerapandy** branch canal in the **Cumbum Valley** irrigates two villages through **16** sluices. Each village has one **neeranickam** to supervise water distribution. The **neeranickam** **acts** in close **collaboration** with the irrigation assistants (**laskars**) of PWD and regulates **water** in **the** sluices. The **neeranickam** ascertains water **needs** in each **one** of **the** sluices **and** regulates **the** supply.

In each **one** of the sluices, a **neerkatti** distributes water to the fields. During scarcity **periods**, he has to distribute water delivered at the sluice. The head, mid and tail reaches equitably.

Water distribution through **neeranickam** and **neerkatti** is prevalent in the **Cumbum** valley ever since the **Periyar** reservoir was constructed. Water distribution through a common irrigator has reduced disputes between head, mid, and tail reach fanners. These farmers do not irrigate their fields **by** themselves or through their farm labour. The farmers join together **to** clean the **B.C.** The **neerkatti** maintains the field channels below the sluice point.

Water Supply

Water is released to the double crop land during the first **week** of June **and** for **the** single crop lands **by** August **15** in **PMC**. Area under irrigation in **PMC** was considerably lower during the last four years 1990 **to** 1994,

Problems in Dharmasanapatty

Dharmasanapatty a tank is named **Natchar Thirumal** tank, with **trees** all **around** it. There are 75 families in the village; **55** of them **are** **Kullars** and **25** **Moopanars**. Their **only** occupation is agriculture. The entire area of **the** hamlet is irrigated **by** the tank. This is a system **tank** and receives water through # the eleventh branch canal (11BC) on the **58th** km of **PMC**. 11BC has **31** sluices and the last sluice supplies water to the **Natchar Thirumal Tank**.

XI BC receives water from August 15 to January 31 only for single crop **rice**. However date of water release and quantum will depend on the storage level in the Periyar dam. During 1970 when the **Periyar** Vaigai modernization was taken up, irrigation **was** extended to parts of **Ramnad** district. Though wastage **was** reduced through modernization since the project **area was** extended, of the old ayacut did not get adequate water supply. Since **XI** BC is **at** the fag end, difficulties are many. There are **22** tanks along XI BC which **are** supposed to receive water supply. The canal also imgates **857** ha. The Natchar Thirumal tank will get supply only after meeting demands of the directly imgated area.

During times of scarcity, rotational water distribution compiled with reduced supplies in **PMC** and the BC are resorted to. Crop losses owing to drought and complete damage are not uncommon. There **are no** big landlords who could influence PWD to supply more water to the tank.

However the quantum and time of release have vowed. **Both** are dependent on the date of **rainfall** in the catchment area. A scrutiny of **24** years of flow data in shows that **12** years supply exceeded **18** TMC or more; in **5** years supply ranged **from** 12 to **18** TMC, and in **7** years supply was less **than** 12 TMC. **During** the sixteen year **period** 1979 through **1994**, water for the double crop area was released during first fortnight of June in only 7 years (water is **to** be released **by** June 1), during second fortnight of June in three years, and in July in 3 years. During **three** years water was not released for the double crop area. During the same **16** year **period**, water was released for single crop wet lands in August in **7** years, in September in 5 years, in October in 2 years, and in November in **2** years.

Soil

Soil in most part of the command is red sandy loam which hardens on drying. This affects germination. The topography is undulating and **tapers** towards the river. The Thirumangalam main canal area has black soils.

Rainfall

The catchment area of the Periyar river receives heavy **rainfall** especially during the south west monsoon (SWM). In the command **area**, rainfall is heavy during where the north east monsoon. Average rainfall in Madurai district is **728** m.m; the north east monsoon accounts for **346** mm and south west monsoon **mm** . October rainfall is dependable. Rainfall in other months varies considerably.

Wells

There are **40** wells in Dharmasanapatty. They are **25-35** feet (**8-10 m**) deep. The Water table rises when the branch canal gets water supply. Sugarcane banana and coconut are grown using groundwater. Since ground water supply is extracted from the top aquifer, the recharge is only from the canal and rain water. When canal supply after the north - east monsoon (NEM) is stopped, groundwater availability goes **down** and from April, **to** August; groundwater supply will **be** available just for **3-5** hours. Well digging is also expensive. The farmers have only **3-5** HP engines since supply is very limited.

Well Digging is Regulated as Follows

1. Wells should not be dug within 10m of **tank** or **the** BC bund.
2. Electrical connection will be provided only when **the** distance between adjacent wells is at least 800m.

Well and canal water are conjunctively used. At times of scarcity and non supply of canal water, well water is invariably used. Wells are primarily **used** to raise nurseries anticipating canal water. Transplanting will **be** done **soon** after canal water is received. Well water is not shared or hired. **The** villagers believe that **God** will be annoyed if water is sold or given **to** others.

Those who raise nurseries with well water prefer medium duration (135 days) rice varieties like Ponni and IR20. Farmers who **raise** nurseries with canal water opt for short duration (110 days) **rice** like ADT36 or J13.

Otthi, Eedu, Kuthagai, and **Varam** **are** the tenancy terms prevalent in **the** district. In Dharmasanapatty, tenant cultivators **are only** a few. Kuthagai is being practiced here and varies depending on land fertility. For fertile land, 10bags (650Kg) per acre is given **as** lease **and** moderate lands fetch 8 bags (520Kg) per acre. Kuthagai is **an** unwritten agreement.

Dharmasanapatty forms part the Thirkuthera panchayat. There is a representative from the village in the Panchayat. The village administration officer (**VAO**) is **the** primary government employee who is **supervised by** a revenue inspector. **An** association '26R, 25L Natchar Thirumal tank farmers Association' was formed during 1989.

Formation of Association in (1989), the command area development project (**CADP**) **was** introduced in Madurai district under Agricultural Engineering Department (AED) with Madurai **as** headquarters. **The** project **was** headed by an engineer who had training in the Philippines. Irrigation associations were formed in **the** command area, based on the **TINDEL** model. Irrigation community development organizers (ICDOs) went **round** in the villages of XI BC. Dharmasanapatty villagers after gaining the confidence of the **ICDOs** explained **the** need for group action on irrigation management.

They explained the AED programme of onfarm development wherein it **was** contemplated to provide field channels up to **5** acres (2ha).

Another point of discussion was **the** rehabilitation of the tank, council for 11BC (PS4) will earn management subsidy of on **farm** development **work**, Rs.100 during the first year; Rs.100 per ha during the second year, and Rs.75 per ha. during the third year. Interest **from** the subsidy could **be** used maintenance **and** water distribution. They also informed **the** villagers that after the formation of the council, the entire irrigation management of

11BC would be handed over to ~~the~~ council. After about six months of **sustained** persuasion, the association ~~was~~ registered in January 1990.

Objectives of the Association

1. Adequate water should be made available to the Natchar Thirumal ~~Tank~~ through IIBC sluice **25L** and **26R**.
2. **Bring** unity among fanners.
3. Supply adequate water to all farmers. Sufficient water **to be** stored in ~~the tank~~ and supply to be made taking into consideration the storage.
4. Adopt improved technologies for increasing crop production.
5. Take steps to get timely credit to farmers through cooperative and nationalized banks and ensure prompt repayment the loan.
6. **Bring** all crops under crop protection and arrange compensation during calamities through crop insurance.
7. **Ensure** availability of `agricultural inputs **and** subsidies ~~from~~ government departments.
8. **Settle** disputes between members through mutual consultation.
9. Safeguard the interest of members and through new regulations, improve their living conditions,
10. Establish **good** relation between agricultural labourers and tenants.
11. Ensure goodwill between landowners and tenants.

Water Acquisition

The first twenty of the 31 sluices of 11BC has shutters for regulating water supply. The irrigation assistant of the headreach was managing the supply equitably. The irrigation assistant of the remaining sluices was not so regular. He used to visit the sluices just once a week. During other periods the shutters would be kept open at or predetermined level.

The farmers themselves operated the sluices by plugging them with sugarcane trash dried banana leaves, and other wastes and opening them when needed. This led to a lot of wastage of water. Water supply to the last sluice which supplied water to the tank was not adequate. Consequently the paddy fields did not get enough water. The members represented to PWD that adequate water was not made available and that their irrigation assistant was not properly supervising. PWD ensured immediate water supply and the irrigation assistant was made to attend his duties regularly.

The association has contacted the section officer several times for adequate water supply. When water was stopped, some fields had unmaturing crops. The supply association represented to PWD and got one more supply.

PWD says that inadequate storage in Periyar is the main cause for short supply. However, the farmers are of the opinion that the extension area gets preferential treatment. Incidentally PWD minister is from the extension area.

Water Distribution

Irrigation starts only after the tank is filled. The farmers themselves take up distribution of water as and when needed. The tank has four outlets; the first has a pipeline without shutter. The others have shutter facility but do not have a shutter. Night irrigation is not avoided.

Water flows during night and day from field to field, there are thathumadai (raised outlets of 2"-3" high). Water high water flows to the

next field without deep pounding. However, regulation is lacking without shutters. This leads to wastage of water since farmers do not immediately plug the outlet.

During periods of regular irrigation, wastage is not much but during the ripening phase of crop when farmers take water to far-off fields wastage is high. The Association office bearers spend most of the time in water acquisition and less on water distribution. During the scarcity period in 1992, the association engaged irrigators and regulated distribution. The head and mid reach farmers on 11BC do not experience much difficulty in getting water. They do not initiate any action for water supply. Out of sheer necessity, the tail-reach farmers are compelled to take up this task.

The untiring efforts of the office bearers have avoided crop damages for want of water. An experiment was conducted by AED during 1989-90 with no rotational water supply and with rotational water supply during 1990-91 (RWS) cropping seasons to assess the benefits of rotational water supply. The study revealed increased water use efficiency by 33 per cent in the rotational water supply system mainly through lesser use of water.

Even though the association could not pay much attention to water distribution, there were no disputes on water sharing. Farmers themselves distribute the available water equitably. They are proud of the efforts made by the association in securing adequate water during periods of scarcity.

Maintenance

The Periyar main canal, branch canals, and field channels up to 10 ha level were lined in 1980. As such the system does not require great efforts on maintenance. PWD maintains the main canal, branch canals and the structures. At the first flush, the branch canals and field channel need clearing of debris this the farmers themselves do the cleaning. Two sluices of the tank were repaired by PWD. Still shutters have not been provided. The association is trying to provide shutters through the 11BC council.

AED has constructed a percolation pond. During its construction, AED desilted and strengthened the tank bund, for easy movement of carts, tractors, and trucks.

Finances

A membership fee of ~~Its.~~ 1 during association formation and an annual fee of Rs.10 acre are being collected by the association. A levy is imposed on sale of straw, paddy, etc. Auction is conducted for fishing rights in the tank, tea shop, duck feeding, etc. Revenue to the association during 1994 grossed Rs.14,858.

Funds are mainly used for contacting PWD officials, arranging meetings, etc.

PS.4 Irrigation Council

PS4 (11BC) has 27 sluice associations in 10 revenue villages. AED has released the management subsidy of Rs. 1,57,250 as the first instalment and Rs.1,57,250 as the second instalment. The third instalment of Rs.1,17,937 will be released soon.

The council purchased a piece of land in Soorakundu for Rs.19,000 and put up a building. World Bank assistance at a cost of Rs.2,45,000.

Effects and Benefits

The association has brought various benefits to the villagers. First the confidence the association has given them to talk to PWD, AED, and other departments. The villagers extended full co-operation in evicting encroachments on the land for two threshing floors and on the tank bund. Melur was linked to Dhannasanapatty through Nagalingapuram.

For improving groundwater potential and stabilization, AED constructed a percolation pond. It was damaged by floods on the following year and is yet to be rehabilitated.

The association has also taken up several welfare measures. It arranged an eye camp. Liquor was prohibited within the village construction of concrete structures and, desilting of field channels were undertaken by the association.

Changes

After the association was formed, the despondent attitude of the fanners has yielded place to fighting for their **rights**. Crop loss owing to drought has become a thing of the past. Since the association has taken over water acquisition, the villagers can concentrate on other agricultural activities. However, the villagers have not been able to appoint a neerkatti for water distribution.

The association has a bank balance of over Rs.10,000 (March 1995). The farmers are taking up large areas under sugarcane and vegetables. There had been no change in cropping in the tank fed area; rice is cultivated with stability without loss.

AED has close links with the association. Percolation pond, desilting of tank, strengthening and sectioning of tank bund, and construction of two threshing floors were the outcome of the closeness with AED.

The PS4 council has received Rs.80 **per** acre **as** management subsidy in two installments. A power tiller was provided at a cost of Rs.50,000 with Rs.12,000 as subsidy. The tiller has earned Rs.12,000 in the **first** year itself.

PWD is inclined to help the association in increasing water supply when approached. However there is no functional co-ordination between **PWD** and AED. Whole of the council **and** Associations are formed by AED; water supply is done by PWD, and land revenue and water tax are levied and collected by the revenue department. **Only** when these departments function in close collaboration can the turnover of irrigation management be successful.

It spent during 1992-93 **for** maintaining **11BC** owing. There is **no** improvement in total water supply but due to sustained **efforts by** the association **adequate** water is received in the **tank**. After the formation of the association, there had **been** considerable improvement in the village economy, transport facilities channel and **tank** management, etc. Underground water level has stabilized. The council and associations are prepared for a turnover of irrigation management.

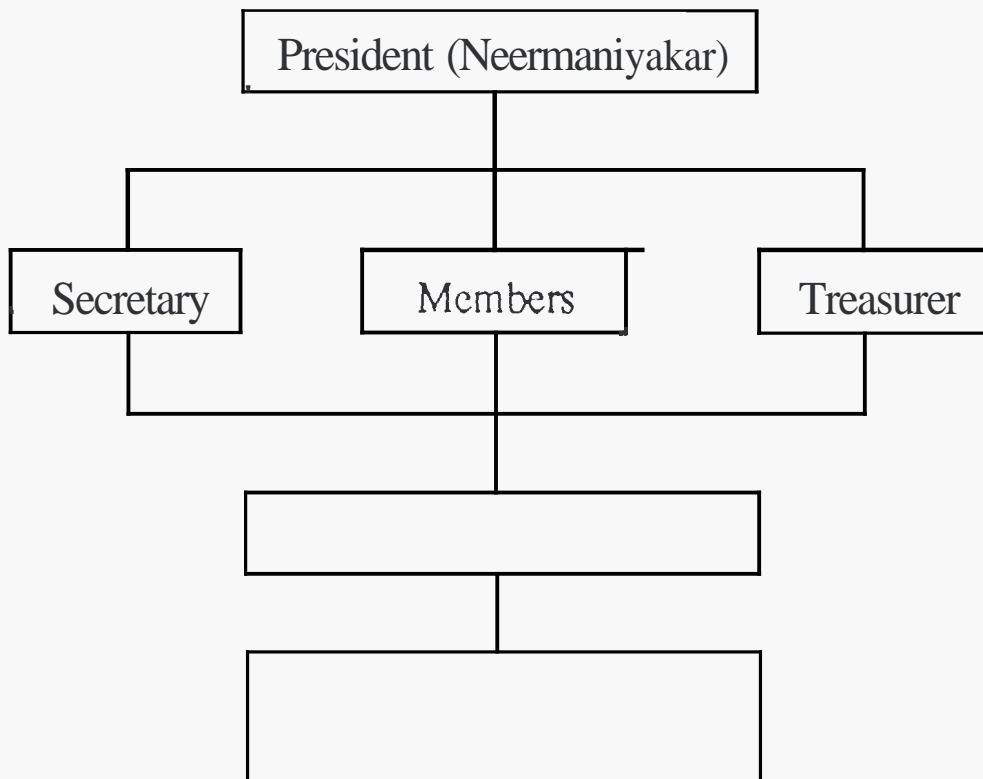
The association wants **the** irrigation management responsibility to **be handed over to the** council **at** branch canal level. The associations have **grown** in confidence **and** competence; better distribution to sluices is possible with infrastructure improvement. The associations feels they could now concentrate on water distribution below the sluice since the uncertain water supply position which is **a** bottleneck in irrigation can be handled by **the** council.

Neermaniyam

The neermaniyam is a water users association for effective distribution of irrigation water among the users. When the Periyar project was commissioned the Cumbum valley farmers formed an organization to share water amongst themselves; It is still functioning effectively.

In Veerapandy, Pillaimars and thevars are the main land holders. The neermaniyam has a president, secretary, treasurer and three other members. No elections are held. Only trustworthy people are selected and service is their motive. They are not paid. The association bears the travel expenses on official work.

Neermaniyam - Structure



The President takes decision in consultation with the secretary, treasurer and members.

The main **tasks** of the neeranickam are:

- * **During** scarcity **periods** meet PWD officials and release water supply in to **the** Veerapandy channel.
- * Undertake maintenance work.
- * Equitably distribution of the available water.
- * Solve disputes between water users.
- * Supervise the work of the neemanickam and the neerkatti.

There are two neermanickams, one to supervise the first 10 sluices and the other the rest. They ascertain water demand through the neerkatti **and** regulate supply in the sluices. No one of the sluices has a shutter. The neennanickams mix debris with soil and plug the sluice. No one should cross bund without the knowledge of the neemanickam. Under **his** supervision each one of the sluice has a neerkatti. Who distributes the water equitably to the head, mid, **and** tail reach farmers beginning from one end. **Rotational** supply is practiced.

The neerkatti's job is difficult during scarcity periods they have to be vigilant always **as they** are net aware when water will be supplied. During normal **days they open** the outlets **and** attend to other works. **The neeranickam** will have **to** liaise with irrigation assistants of PWD for adequate water. The key of the main regulator will be with the Neeranickam.

When the supply in the main channel is low or at times of problems, **the** neeranickam will appraise the neermaniyakar. The neermaniyakar will take appropriate steps by contacting **PWD** officials or ministers.

For meeting the association expenses, they raise funds through auctioning coconut and other **trees** on **the** channel bund, commission on sale of

agricultural produce, Fish auctioning, etc. The funds are used to maintain the channel.

For cleaning the channel, each water user should send one person or **bear** the **cost** of one. Through this cooperative effort the channel is maintained. The fanners need not bother about irrigation. They can concentrate on other **works**. This organization is functioning for the past one hundred years very effectively.

List of **case** studies published in local languages under Irrigation Management Transfer Project

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1. Water **Users'** Association in Anklay Subminor, Mahi Kadana Project: Farmers' Experience
2. Water **Users'** Association in Right Bank Canal of Pingot Medium Irrigation Project: Farmers' Experience
3. Water **Users'** Association in Left **Bank** Canal of Baldeva Medium Irrigation Project Farmers' Experience
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7. Water **Users'** Association in Minor 10, Bhima Project: Farmers' Experience

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2. Water Users' Association in Kedar **Tank**: Farmers' Experience
3. Water Users' Association in Dusi Mamandur **Tank**: Farmers' Experience
4. Water Users' Association in 28L and 29R Outlets of Mettupalayam distributary in Lower Bhavani Project: Farmers' Experience
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