

# Water, Households & Rural Livelihoods

## **Water, water, nowhere: a case study of Palayaseevaram village regarding sharing of water with the Chennai city and its impact on the village**

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Research promoting  
access of the poor  
to sustainable water  
supplies for domestic  
and productive uses  
in areas of water  
scarcity



### **WHIRL Project Working Paper 9**

Preliminary results of research for  
discussion and comment

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## **DEDICATION**

I wish to dedicate this case study to the people of Palayaseevaram and those elsewhere in other peri-urban areas, who suffer the same sort of adverse impact over their common property resources and are yet to find a solution.

## **ACKNOWLEDGMENTS**

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## **1 CORE ARGUMENT**

This case study documents how ground water exploitation in peri-urban area is affecting local population who are primarily dependent upon agriculture. Increasing urbanization and industrialization demands more water from surroundings. In Tamilnadu, as in some other states of India, surface water sources have been used to the optimum. There is an increasing dependency on ground water for irrigation as well as other needs, a reality reflected in Palar basin.

The water exported destabilizes livelihoods of millions of local people everywhere; production, productivity and crop pattern, agricultural employment, livestock rearing and local drinking water supply are seriously affected. Besides, local ecology is under severe threat. Competitive deepening of wells or inability to deepen further pauperizes the farmers.

While there is growing demand for water for urban domestic, industrial and other commercial activities, the efforts are more towards tapping whatever sources that are easily available in rural areas, than on measures such as recharging and recycling of used water, stopping activities such as illegal sand mining which have direct impact on reduction of recharge and reducing pollution through water treatment.

This study in particular focuses on implications of all these on rural poor and women. It tries to bring to the notice the increasing pressure on available water sources and the changing pattern of ownership and accessibility.

The study was carried out with particular reference to a village called Palayaseevaram, which is located at a distance of 56 km from Chennai city in India. The first part of the report provides a macro view of the Palar basin; the second part presents substantive details based on the village survey.

## **2 CONTEXT**

Over 70% Tamilnadu's irrigation requirements are met through ground water resources<sup>1</sup>. Since in many states, surface water sources have been utilised fully, there has been a massive expansion of the ground water irrigation. Ground water is a crucial productive resource in both Tamilnadu and India as a whole<sup>2</sup>. Similarly, we could find that the domestic water in general and drinking water in particular, is supplied from ground water sources<sup>3</sup>. Hence we need to seriously look at the ground water situation of the state.

The characteristics of well water usage both for irrigation and for human, animal and industrial consumption are influenced by a variety of environmental factors such as rainfall, topography, soil type, sediment formation, surface run off, and ground water recharge. The technology of lifting water and the influence one has also determines the amount of water one has access to and the ability to withstand the pressure of the other interested groups /

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<sup>1</sup> Rajagopal and Vaidyanthan, 1998

<sup>2</sup> S. Janakarajan and Marcus Moench, 1999.

<sup>3</sup> Gilbert Rodrigo, unpublished survey, 2003

individuals / stake holders. While small farmers have to limit their rights to lift water only to the limited horse power, the water supply stations and the private water sellers are found to have more powerful pumps that could deplete the sources at a much faster rate.

The Palar river basin is one of the major river basins in Tamilnadu, accounting for about ten percent of the total area of the state. The river originates in Nandhi Durg in Karnataka, passes through south western part of Andhra Pradesh and northern part of Tamilnadu before emptying into the Bay of Bengal<sup>4</sup>. The total area of the basin is about 18,300 sq. kms. of which, 3123 sq. kms. (17.1%) lies in Karnataka and 4267 sq. kms. (23.3%) in Andhra Pradesh.

A major portion (about 60 percent) of the basin thus falls within Tamillnadu, covering three districts, viz. Thriuvannaamalai, Vellore and Kancheepuram. However, the basin does not cover the entire stretch of all the districts. Table 1 provides details about the taluks covered by the basin in each of the district.

River Palar basin covers 17 Taluks of the three districts it passes through. They are: Vaniyampadi, Thirupathur, Gudiyatham, Walajapet, Arcot, Vellore and Chengam of Vellore District, Cheyyur, Vandawasi, Thiruvannmalai, Polur and Arani of Thiruvannamalai District and Kancheepuram, Uthiramerur, Chengalpattu, Maduranthagam and Sriperumpudur of Kancheepuram District.

Zone wise distribution of the area under Palar basin in Tamilnadu is given in Table 1. The total area of the basin is 10,880 sq.km. The lower Palar zone, where Palayaseevaram is located, is in the fourth place with 14.4% of the total area, with 1569 sq. km. as its total geographical region.

**Table 1. Extent of area falling under each zone in Palar basin**

No.	Name of the Zone	Area (sq.km.)	Percentage
01	Upper Palar	3058	28.4
02	Kamandala Naganadhi	824	7.6
03	Upper Cheyyar	1964	18.0
04	Lower Cheyyar	1151	10.6
05	Lower Palar	1569	14.4
06	Killyar Palar	2287	21.0
	Total	10,880	100.0

(source: Vaidyanathan et al, 2003 )

This region, as one could see from map 1, is something that enjoys the benefit of both the main rivers, Palar and Cheyyar and as such, is the most fertile region and with a good ground water aquifer. It is why this part of the river is selected to be the place for pumping water to the city, according to the opinion of the local people.

Kancheepuram District has 14.88% of the total PWD managed rain fed tanks which irrigate 17.03% of the irrigated area and is above the state average. This is thanks to the River Palar

<sup>4</sup> Vaidyanathan, et al., 2003

and its tributaries. Similarly, of all the river fed PWD tanks, Kancheepuram District has only 1.46%, but irrigates 4.95% land. In the case of Panchayat Union held tanks, however, Kancheepuram District has 8.03% of them and irrigates 6.32% of the cultivable lands<sup>5</sup>.

**Table 2: Table Ground water recharge, discharge and balance: provisional estimates**

No.	State / District	Gross Recharge	Utilisable recharge (70%)	Draft	Balance available	Ramarks	% of Balance
01	Tamilnadu	20,154	14,108	11,060	3,148	Do	22.31
02	National Total	4,58,252	3,20,754	1,34,450	1,86,304	Do	58.08
03	Chengalpattu Dt.	2,15,216	1,82,934	1,11,706	71,228	Ha.m.	38.94
04	Lower Palar (where Palayaseevaram is)	912	638.4	888	Over draft	Million M3	-39.1

Source: Er. A. Veerappan, M.E., 1991

Table 2 shows the gross recharge at national and state level, the utilisable recharge and the actual extraction of water. While there is a balance of utilisable recharge at the national level exceeding almost half of the reserve, Tamilnadu has only 22.31% balance. Chengalpattu district seems better than the Tamilnadu standards. But the lower Palar region has an overdraft to the level of -39.1%.

Table 3 compares the water availability - both at surface level and ground level - in Chennai, Palar and at state level. Water demand in 1995 and 1999 are compared with projections for 2004 and 2050. It is not surprising that the Chennai basin has deficiency. The pressure on the Palar basin is high owing to proximity to the city. From table 2, we could see that potentiality of lower Palar, being over exploited, has no water to offer. The chengalpattu district figures in Table 2 looks promising. But what is available includes polluted water of the industrial belt and saline water due to sea water seepage.

**Table 3: Basin wise water resource potential, demand and balance**

No.	Name of River Basin	Surface water potential	Ground water potential	Total water potential	Water demand 1994	Water demand 1999	Water demand 2004	Water demand 2050	Water Balance 1994	Water Balance 1999	Water Balance 2004	Water Balance 2050
01	Chennai	906	1,120	2,026	4,020	4,140	4,170	4,781	-1,994	-2,078	-1,739	-2,350
02	Palar	1,758	2,610	4,368	2,746	2,784	2,816	3,115	1,662	1,584	1,552	1,253
03	State Total	13,015	15,346	28,361	31,281	32,206	32,530	35,685	-3,460	-3,845	-3,763	-6,919

( Source : Er. R Nadimuthu, MSC (Engg.), 1991)

The wells in Palar basin may look less deep when compared to many other regions in Tamilnadu. The depth of wells in Palar region would increase if the depth of the bores drilled within dug wells would be included. 60% of the wells were less than 30 feet deep about 30

<sup>5</sup> Vaidyanathan et al, 2003

years ago and no wells were greater than 100 feet deep<sup>6</sup>. The average depth of the wells dug before 1960 was 30.2 feet, 35.8 feet for wells dug between 1961 and 1970, 41 feet for wells dug between 1971 and 1985 and has averaged 69 feet for all wells dug subsequently. Besides, now any new well digging farmer, has to dig deeper in the beginning itself, when compared to a period before 30 years.

The increasing urban and industrial demand affects the farmers and local communities in the Palar basin. Table 4 summarises the important role the Palar river bed aquifer plays in providing water to Chennai.

**Table 4: Madras Metropolitan Area: sources of Supply of water**

No.	Source	Availability MLD	Supply MLD	Areas Served
01	Rain fed Reservoirs Poondi, Cholavaram and Red Hills	236.00	195.00	Madras City, Ambattur, Avadi and HVF
02	Panjetty – Tamaraipakkam Ground water	148.00	148.00	Madras city and Manali Industries (See table 6)
03	South Madras Coastal Belt	10.00	05.00	Southern part of Chennai city
04	PALAR	25.50	25.50	Alandur, Pallavaram, Tambaram and MEPZ
05	Local Bore wells	6.50	6.50	Thiruvottriyur and Avadi
06	Total	406.00	231.00	

Note: For the period prior to November 1990  
(Source : Madras 2011: October 1991)

The requirement of water for the MMA (Madras Metropolitan Agglomeration) as a whole for the year 2001 is 911 mld @ 150 litre per capita per day and 683 mld @ 120 litre per capita per day of a expected population of 5.52 million. By the year 2011, with the projected population of 8.9 million, the required water need would be 1468 mld if the supply is at 165 litre per head per day and 1068, if the supply is 120 litre per head per day.

The requirement of water by 2001 for Chennai city is 1145 MLD and whereas the supply is only 426 MLD. It is still not possible to make an accurate estimate how much water is transported through lorries for potable and other uses from the suburbs to the city of Chennai. The ground water resources used by the people for other than drinking is expected to be around 60%.

The details of the projection of the demand is shown in Table 5.

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<sup>6</sup> Janakarajan 1997a

**Table 5: Madras Metropolitan Area Water Requirements: 1991 – 2011**

NO.	Area for population: in lakhs	1991	2001	2011
01	Madras City	40 Lakhs	49 Lakhs	60 laks
02	Rest of Madras Urban Agglomeration	15	21	29
03	Total	55	70	89
	Water Requirements			
04	Madras city @ 150 lpcd	600 MLD	735 MLD	900 MLD
05	Rest of MUA ( @ 100 lpcd )	150	210	290
06	Sub total	750	945	1190
07	Add: industrial Uses	160	200	250
	Total	910	1145	1440

(Source : Madras 2011: Madras Metropolitan Development Authority, October 1991)

The metro water has plans at present to treat about 100 MLD of sewage to generate 40 MLD of water for the use of industries at Manali. This project should be carefully monitored and improvement made in the treatment to expand this operation<sup>7</sup>.

*“In 1963, the area north and north west of the city was first taken up for an extensive hydrological study as part of the United Nation’s Development Programme (UNDP) aided project to assess the potential for development of a ground water source. Studies have identified a buried channel in Arniar Korailiyar basin which should have been the course of Palar river tens of thousands of years back. In this river course, a water bearing aquifer hydro logically suitable for the extraction of ground water has been identified extended to a stretch of 50 k.m. length and 5 k.m. average width<sup>8</sup>.*

The well fields development since then are listed in the table 6.

**Table 6: Bore well fields established as additional source**

Sl. No.	Well Fields	Year Established	No. of wells	yields (mld.)
01	Minjur	1965	12	25
02	Tamaraiipaakam	1979	22	32
03	Panjetty	1969	12	36
04	Flood Plains	1987	6	13
05	Kannigaiper	1987	8	15
06	Poondi	1987	15	27
07	Total		76	148

(Source: Water supply and sanitation for Madras : the 2011 context)

Water from Palar: this is the major water course about 60 k.m. south of the city. Drawal of surface water to the city is possible by tapping higher up from Palar anicut and the length of the canal would be around 150 k.m. Such a tapping would be detrimental to the irrigation rights lower down and in addition, affect the ground water table in lower reaches which serve presently as sources of protected water supply systems for many municipalities and major

<sup>7</sup> Water supply and sanitation for Madras the 2011 context, 1991

<sup>8</sup> ibid

industries.<sup>9</sup>

Palar drainage basin area is quite large and the aquifer is deeper at its tail end where ground water potential is considerable. As a result of extensive hydrological studies carried out in 87-89, five aquifer were located at Athipattu, Pullarambakkam, Pilapur, Manapakkam, and Voyalur. Out of these the first three are further away from the city and more suitable for the nearer local bodies. The remaining two aquifers are considered suitable for further exploitation and the net surplus potential over and above the present drawal has been assessed as 40 mld. This is a potential source to be considered for use of settlements in the southern limits of MMA like Tamabaram, Pallavapuram etc<sup>10</sup>.

Besides these, the authorities are seriously considering the possibility of bringing water from some other sources. The present and expected deficit is forcing them to look for alternatives. But how dependable are they is something to be investigated. The details can be found in Table 7.

**Table 7: Madras metropolitan area additional sources of supply**

No.	Source	Description	Quantity Mld.	Remarks
01	Neyveli	Underground water from lignite mining	40	There is demand for this water for agricultural purposes
02	Surface run off from MMA	Creating additional storage by deepening of tanks in MMA	90	Presently considered expensive
03	Palar	Exploitation of up stream aquifer	40	
04	Sewage recycling	Secondary treatment	100	Recycling of 260 mld of sewage for industries
05	Sea water or brackish water	Desalination	40	Only pilot plants

Source: MMDA October 1991

Besides these, The Tamilnadu government announced that it would be promoting the project of desalinisation of the sea water. The announcement was made during the one week long assembly session in November 2003. The government has called for tenders to take up the project and the Russian company which applied, seem to have the only qualified application. It is expected that the cost of each litre of water thus desalinated would be Rs.0.40.

The “up stream aquifer” is, as we have seen earlier, contains water that is contaminated by the industrial pollution, which cannot be used as envisaged.

<sup>9</sup> ibid

<sup>10</sup> Water supply and sanitation for Madras the 2011 context



### **3 OBJECTIVES OF THE STUDY**

The major objectives of the study were to:

- Assess the impact of water pumping for urban usage on the local communities.
- Identify the measures that the local communities have been taking to obtain the needed water for drinking and agriculture purpose and
- Examine the ways and means in which stake holders can address issues of water shortage.

### **4 METHODOLOGY**

Collection of data at the village level:

- Household survey of all HHs with a view to collecting some key variables
- Focus group discussions: basing on the data collected through HH survey, groups were identified such as women, men and youngsters within each category: that is, landless and people with other professions, marginal farmers, small farmers and medium farmers. Since each focus group had sub sections, as mentioned above, we held separate meeting for men, women and youngsters in their own geographical region.
- Case studies were taken from selected samples from each of these categories.
- Interviews with government officials, Panchayat leaders and local politicians were held to collect and verify on the information / opinion given by the focus groups.

### **5 WHY PALAYASEEVARAM VILLAGE?**

There are several spots at the River Palar from where water is pumped for supply to urban and peri urban areas. However, we selected Palayaseevaram for the following reasons:

- Of all the pumping stations, the pumping from Palayaseevaram is the closest to the Chennai metropolitan area. It is one of the pumping stations that have the highest capacity motor (50 HP). This pumping station delivers the highest level of output of groundwater compared to others.
- The village Palayaseevaram is a compact one, in the sense that it has one small main village and two colonies: one small and one somewhat bigger than the main village. The impact of such sharing of waters could be seen in the village.
- The issue is further aggravated by the fact that yet another industry has come up in the vicinity of the village, which needs heavy amount of sweet water per day.
- It is a village where GUIDE works among the scheduled caste women. This gives an easy access with them. Besides, it is a village where GUIDE ran a pre school a few years ago, which also provides access to the main village.

#### **5.1 Palayaseevaram village – an introduction**

The name Palayaseevaram means “old Seevaram”. The town called Walajabad, which lies about 6 kilometers west of this village was originally known as Seevaram.

Palayaseevaram is also placed in a location very auspicious. The village is on the eastern

bank of the river Palar, which meets with two more rivers around there which are its tributaries: Cheyyar and Vegawati. The meeting point of these rivers is considered sacred, especially on the day of *Maha Sivaratri*.

**Table 8: population details of the village**

	Details	Main village			SC colonies			Total		
		Tot	Mal	Fem	Tot	M	F	T	M	F
01	Households	310			402			712		
02	Population	878	435	443	1970	950	850	2848	1385	1293

Table 8 is intended to give an idea about the population of the village. The main village has families from various caste groups such as Mudaliars, Pandarams, Pandithars, Acharies, Brahmins, Naidus, Washermen, Pillais and Naickers

The people who had been living on the earnings from the temple, such as temple servants, the priests and the garland makers also lived in this village. They were given a “manyam” (assignments of land by the kings in those days), so that they can meet the costs of services to the Lord.

The infrastructure in the village is very limited. There is a branch post office and a middle school. The main village has five main streets all paved with tarr. The roads have street lights. At the very entrance of the village is the local school, which has a sizable play ground behind it. On the left side of the road is the pumping station for the city, which is at the foot of the hill on which there is an old Vishnu temple.

The village also has a ration shop. There is a separate water tank for the village, as we would see later and pipelines are laid to provide water for the house connections and for the public taps in the streets. There are a couple of more temples in side the village, much older than the one in the hillock and are in a bad shape so far. For catching a bus one has to come to the main road which is about 0.5 km away, but since it is on the Chengalpattu – Kancheepuram Road, the bus facility is quite good. There is a flour mill at the beginning of the village and also a branch of the South Indian Bank Ltd., a scheduled bank which has its head quarters at Thiruchur, Kerala.

The main colony (the place where the Scheduled Caste people live) is about one km away from the main village. It has three properly tarred road and a cement road of recent make. It has a separate middle school which has a new building. It has a small box room built for the public TV supplied by the government. The over head tank in the main village supplies water to this colony. Water is primarily available through the pipeline and the public taps provided. The Railway station for Palayaseevaram is on the way to the colony from the main road.

The colony is about 1 km away from the main road. The Hindu temple and the protestant church found in the village are about a decade old. The second colony, which is about 20 years old, is a branching out owing to out migration of the people caused by lack of space in the bigger colony. There are about 50 families and have only one tarred road. They have electricity and water supply but nothing else.

## 6 EXTENT OF PUMPING FROM THE PALAYASEEVARAM VILLAGE

The first pumping station was started on 24 January 1972, under the government order no. 122 / PWD at the cost of Rs. 17.332 Million. This is the pumping station established for supplying water to the city. (Please see map 1: Alandur and Palalvapuram CWSS). This headworks, together with the head works at Vengudi near Walajabad, is targeted to supply 22.5 mld by 1979. (It was expected to raise up to 31.5 mld per day over a period of time). The share of Palayaseevaram head works is 118.2 mld. The department is using 50 hp motor which could deliver 4,925 liters per minute.

Table 9 shows the plan of distribution of water to various urban places.

**Table 9: The estimated demand as of 1979 of all these urban consumer points are as follows:**

Pallavaram	5.4	ML
Alandur	9.0	ML
St. Thomas Mount (“Parangimalai”)	1.8	ML
Anakaputhur	1.01	ML
Pammal	0.9	ML
Chitlappakkam	0.99	ML
Thamabaram Air Force Township	1.8	ML
Vandalur Zoo	1.67	ML
Total	:	22.57 ML

The population by now (2003), is about twice more than the targeted population.

The technicians say that in the river Palar, it is not possible to extract a much as 22.5 MLD, at any given point. So the actual exploitation is lower than the quantity originally planned. The water pumped during this summer is only about 11.5 ML per day instead of the expected 22.5 ML per day. Hence the increasing demands cannot be met<sup>11</sup>.

At the Palayaseevaram point, there were 5 collection points on the river bed (wells) in the initial stage and another 6 wells were added in 1992. The motors at Palayaseevaram Head Works are capable of pumping out 4925 LL per day.

The staff of the distribution station at Alandur report that during the summer days they are able to get enough water only to distribute 3 to 5 days a week. This summer they are afraid that they would suffer more and will have to hold on to once every alternative day as their ideal supply capability.

The table 6 shows as if there is sufficient excess of ground water in River Palar. From Table 4 we know that the lower Palar region is over exploited. We also know that the upper reaches have water that cannot be used since they are contaminated by industrial pollution. Hence the figures available from government sources are not reliable. The deficit found at

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<sup>11</sup> Most of this information was made available by the staff at the Tamilnadu Water Supply and Drainage Board (TWAD Board) distribution center at Alanduar.

Palayaseevaram is more or less the same for everywhere on the River Palar.

## 7 IMPLICATIONS

The water supply for drinking purpose for the local communities has come down steadily. It used to be 24 hours supply in the initial days, when established 30 years ago. Table 9 gives the sad reflection of the people of all groups.

**Table 9: Status of drinking water (in hours of supply)**

Period	No. of hours of drinking water availability at an average per day
1972 -1975	All the 24 hours
1976 - 1979	About 18 hours
1980 – 1990	About 10 hours
Early 1990s	About 5 hours a day
Now: 2002	1.5 hours a day

As mentioned earlier, it has reduced from 24 hours supply in the late 70s, to steady 5 hours already by the 90s. It has further deteriorated in the past decade. The irony is that this village, while supplying water in millions of litres per day for millions of urban citizens, is distributing water to it's population lower than the permissible WHO standards.

Agriculture assumes second priority in the use of water. The people from all sections firmly believe that water pumping with powerful motors have resulted in the reduction of ground water in the region. The groundwater recharging is reduced. This could be seen from table 10. The wells have either been deepened and/or abandoned due to steady fall in the water table.

**Table 10: Agricultural wells: existing and functioning with average depth**

Period	No. of well	Wells functioning	Average depth
Early 1990s	18	14	28 feet
Now in 2002	14	04	46 feet

The average depth of the present wells in the Palar basin is found to be 69 feet. (Janakarajan, 2002). However, in this village, ground water was not available at lesser depths<sup>12</sup>.

The land under rain fed agriculture has increased recently. The people have taken recourse to it, as their wells have failed and the lake is no more able to provide for the needed irrigation. The cost of deepening the wells are far beyond the reach of the small and marginal farmers of this village in tune to the status in upper Palar region<sup>13</sup>.

The cropping pattern has changed substantially. Paddy had been the major crop and was

<sup>12</sup> As studies of Dr. Janakarajan (“wells and illfare”, 2002) and others have shown, the competitive exploitation of water from the ground water aquifers, when not properly recharged, results in depletion of ground water levels. This is seen all over the Palar basin and table 16 shows that it is true in the case of Palayaseevaram too.

<sup>13</sup> *ibid*: an individual farmer has spent Rs. 88,000 to get on hectare of net area irrigated by wells.

cultivated over 150 acres annually. During recent years, it is reduced to a mere 10 acres. Dry land (rainfed) crops have replaced them. This shows that the farmers were forced to take on to less water demanding crops, as the situation commands.

With the decrease of ground water as well as tank water for agricultural activities, the dependency on agriculture as the primary source of employment has come down. The table below is the reporting of the opinion of the people in this regards:

**Table 11: Change in number of days work available**

Period	Average Agricultural work			Average Non agricultural work		
	All	Men	Women	All	Men	Women
Early 1990s	180 days	160 days	200 days	60 days	90 days	30 days
Now in 2002	50 days	10 days	90 days	120 days	180 days	60 days

( All the figures are in number of days per year )

For men and women of this village, agriculture has become no more dependable for livelihood employment. Men have been the greater losers. Men have only 6.5% opportunity. From an average of 160 days it has reduced to a mere 10 days at an average. The women have a 45% reduction in agricultural labour opportunities.

While the number of days work available in agriculture has decreased over the decade, an increase is found in the labour available through non agricultural activities<sup>14</sup>. This is mainly due to the casual labour available in the new sugar mill. However, since the loss in agricultural work is so high, despite the non agricultural work, their work days have decreased from 250 to 190 (24% decrease). For women the reduction is from 190 to 150 (21%). In all, agricultural job opportunity has become a mirage.

The sugar mill provides seasonal labour opportunity on casual labour basis for the local people. They are employed to a maximum of 180 days. About 240 people are thus employed every year. Almost all of them are from the scheduled caste colony of the village. About 75% of those who are thus employed are men.

This reality is providing us the explanation as to why it is so difficult to organize the people against those who are depriving their common resources. The sand miners, are using the local youth who are deprived of agricultural labour, as their lorry loads men and thugs. The sugar mill uses the same people as their labour force. So those who could agitate are in some way bought off.

With regard to the irrigation water, the people have very many reasons attributed towards the depletion of it. Many of the respondents have chosen to give more than one reason. Table 12 gives the list of them in priority. Many groups mentioned lack of proper rain as one major reason. This could be very well understood with the failure of the monsoon in the past couple of years. Leaving that alone, it is quite interesting to note the other reasons attributed which are not natural.

<sup>14</sup> More details could be seen in the chapter “ coping mechanisms”

**Table 12: Why there is a decrease in the irrigation? Opinion of villagers**

<b>Reason mentioned in the groups</b>	<b>No. of answers</b>	<b>Rank</b>
Lack of proper rain	19	01
Water supply to the nearby sugar mill	15	02
Heavy and illegal sand mining in the river near the village	14	03
Water supplied to other areas from river of the village	11	04
The spring channel from the river to lake is blocked	07	05
The lake of the village is not properly maintained	04	06/1
Deforestation in the region	04	06/2
The pollution of the sugar mill	02	07/1
The ground water level has reduced sizably	02	07/2

Water supply to the nearby sugar mill and heavy / illegal sand mining are the two top standing reasons found by the people. The Alandur pumping station is only the next in their rating. Perhaps since the sugar mill is a recent water exploiter, adding to existing depletion has made people to decide so.

## **8 LONG TERM IMPLICATIONS**

**Table 13: People's projection of the future**

<b>Prediction of people's groups</b>	<b>Respondents</b>	<b>Rank</b>
The village will not exist	09	01
No comments: not able to predict	09	02
There will be no agriculture	03	03
The village will be affected in all manners	02	04
There will be no drinking water available	01	05
The village will be reduced to half	01	06
There will be starvation deaths	01	07

The focus group discussions show that the village would dismantle. They see that there is no scope for revival of the agricultural activities. They also see that the drinking water sources would also dry up. This, they predict, would leave a large population of the village to make a choice between finding an alternative job around or moving out towards the city. A lot of local people opine that with less and less basic water availability for domestic use and for irrigation, living in this village will become near impossibility for many present residents.

## **9 THE IMPACT ON WOMEN**

The most affected by the adverse impact are the women. This is happening both directly and indirectly. The large lists of adverse impact reported by the women in the specially held sittings are as follows:

## 9.1 Direct

Number of days work opportunity is reduced. This makes them fight for the little opportunity they have<sup>15</sup>. The payment, there fore, is not increasing in tune to the inflation. Women are not allowed to move out on their own and find alternatives. So they are faced with the need to manage with whatever available at the village. These women are forced to depend on their spouse<sup>16</sup>.

The income of the family is bound to reduce. The women will be expected to meet the expenses, somehow or other. They would cut down the costs. The health care of the women will become the first contingency. With family expenses to be reduced, women will give less importance to their health. The health condition is already found to be deteriorating. Separate health survey shows that diseases arising out of lack of nutrition among women and gynecological problems are on the increase<sup>17,18</sup>.

The women who had been helping one another around the traditional water sources such as wells and surface tanks, now stand in queue and pick up quarrel among themselves. This causes a communal disharmony, besides physical exertion and fatigue. More over, women were enjoying the benefits of the common lands, such as leaf, bark and fruits of trees, silt, clay, fish etc. Now some of these lands are taken away by these establishments. They are prohibited from entering and enjoying the benefits. The subsidiary income thus provided is lost.

## 9.2 Indirect

Men have not sufficient job in agriculture. So they find other employments. They leave the village temporarily or permanently. Women either have to move out or decide to stay back. In both cases, the women have to suffer a lot of adjustment. (see: 10.2.1)

The small and marginal farmers were working along with their wives in their own lands. They are not able to use their land properly owing to lack of water. The women of these families are generally able to get some work in the fields of other people, whereas men have no much offer. This creates tension within the families. The agony of men affects women.

Will people go back to agriculture if there was sufficient water as before?

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<sup>15</sup> This could be seen from table 14

<sup>16</sup> Study of Dr. Joan Mencher in early 80s shows that only a maximum of 40% of men's income reach the family, whereas more than 90% of women reaches home.

<sup>17</sup> sex ration as per 2001 census, is 975 for 1000 in Kancheepuram district, which ranks 4th from below. Number of diarrhea cases are 37074 out of a state total of 5,08,447, second worst district only next to Salem. 22.3% children under 5 years are severely and moderately malnourished in the district.(District atlas of Tamilnadu, UNICEF, May 2001)

<sup>18</sup> See June survey of the author, 2003. Also: Janakarajan: " The fluid Mosaic: the struggle of the people in Katmandu to have water from the City water supplies

**Table 14: Possibility of riveting back to agriculture**

<b>Answer by the sub group</b>	<b>No. of sub groups answered so</b>	<b>Rank</b>
Do not know / not very sure: this hypothetical exercise is a dream that cannot come true	11	01
Yes, but only our generation: they are already used to other ways of life	07	02
Yes, we will go back to farming happily	06	03
No, sorry, we will not: we have any hopes	01	04

44% of the respondents do not even want to consider the possibility of having sufficient water for agriculture. They are beyond hope. They only still hope that there will be sufficient water for them for their domestic purposes and so that they could continue to stay in the village. 28% think that their children will not go for agriculture, even if there is sufficient water. This may be also because the children have learnt to take on to life away from farming and now they will not find it any more useful or meaningful to take on to. So, if the situation continues, the village may remain, but only as a place of residence of people who have other activities to do.

This seem to go along with the finding that the rural communities are thinning in the recent past in Tamilnadu. If this could happen to a village on the bank of a river, where there is still believed potentiality to development, one could imagine what would be the case elsewhere.

## **10 COPING STRATEGY OF LOCAL PEOPLE**

Economic usage of water:

- People are forced to use less water and so they have given up the kitchen garden in their houses. This is mainly so, among the dalit families in the main colony of Palayaseevaram. About 150 families have thus lost their subsidiary income and food supplement.
- Others, especially those in the “main village” and those who have private water tap, have constructed ground level water saving tanks. They store water in them from the limited supply they get. This is illegal. This would also be considered socially unjust, since this deprives water for others, especially those who are dependent on the common taps of the streets. However, those who have private connections do so, since they either have no other water in their private well or the water is contaminated. They are forced to depend on the tap water for all water uses.

Switch over to less water intensive agriculture:

- New crops adopted for cultivation include cotton and gingili. These have replaced paddy. Table 15 demonstrated the changes.



**Table 15: Change in cropping pattern to lesser irrigation crops**

<b>Period</b>	<b>Paddy</b>	<b>Other crops</b>	<b>Sugar cane</b>	<b>Casuarinas</b>
Ten years ago: Early 90s	About 200 acres in the lake irrigated lands	Gingili, ground nut, cotton in 100 acres of other lands	50 acres in lake irrigated lands and another 50 acres in well irrigation	About 50 acres in the rain fed lands
Now: early 2000 s: in 2002 (this summer is excluded for the sake of right comparison)	Only 15 acres of well irrigated lands and no where else	Cotton, gingili, groundnut, cucumbers of various varieties: a total of about 225 acres well irrigated lands	Only 10 acres (actually it is cut down already now)	About 15 acres (mostly cut down by the end of the last year. Now there is virtually none)

Switch over to non agricultural usage:

- This includes activities such as casuarinas planting or leaving the fallow to let thorny bushes to grow. (Please see table 19). About 50 acres were planted until recently with casuarinas and about 100 acres are lying unused in the past five years at least. The thorny bushes are growing wild.
- The land owners are letting the women of the agricultural labour families to take them away. Ironically, the casuarinas provide labour only after 5 years in the form of cutting them. But, on the contrary, the thorny bushes are good supplementary income to women, as they could be cut every now and then.
- Find other alternative seasonal employments: brick making, wood cutting, sugar mill cleaning work, etc. Elsewhere in the River bed this could be seen. In the upper Palar, the people have turned to be the labourers of the very industry which has deprived their opportunity to be agricultural labourers<sup>19</sup>. About 185 people have moved to such seasonal employment.
- Move to other job opportunities permanently: mason, masonry assistant, carpentry, weaving, electrician, plumber, export zone works etc. .A good 202 people have to such new activities.
- Move to other businesses: pawn shop, finance companies, contract construction, taking up labour contract, vegetable vending, dry ginger coffee sales, parotta shop by the main road etc. Ninety seven families have taken over to such new ventures in the recent past.

Table 16 gives figurative details

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<sup>19</sup> Please see table 14.

**Table 16: Shift in employment and occupation**

Sl. No.	Seasonal employments	Permanent job opportunities	Switch over to other businesses
01	Centring workers: 40	Railway gang men: 70	Finance companies, shops and pawn brokers:(elsewhere) 20 families.
02	Assistants to construction: 20 women	Working in export companies: 20 women	Illegal sand transport through own carts: 60 men (women do not work in these families)
03	Sugar mill workers: 30 women and 60 men	Export and other companies: 40 men	Illegal arrack sales: 7 men (women also participate for the family)
04	Seasonal vegetable and fruit sellers: 25 women.	Sugar mill workers: 25 women and 15 men	Tea shops and petty shops around the sugar mill: 10 families
05	Seasonal charcoal sellers: 10 men	Working at MP Distilleries: 7 women and 32 men	
	Total 185 persons: 75 women and 110 men	Total 202 persons: 52 women and 150 men	Total 97 families (that is not less than 194 persons, half women).

Permanent out migration to the city to find other recourses:

About 10 families working as construction staff (men as brick layers, women as construction assistants) have permanently moved out and have settled down elsewhere. These are from the SC community.

More than 40 families have moved from among the caste Hindu families within the last 10 years. They have done so, since they have decided to run other businesses such as pawn shops, the so called finance companies, other shops such as cloth shops and a couple of them have become master weavers. These amount to 20 families.

The rest have gone away since the sons have found permanent jobs in companies in the city and it is difficult for them to travel every day from this village, where agriculture is no more a reason to stay behind.

We need to notice that this reduction of the population is not reflected in the details of the main village. This is because most of the houses of people thus migrated out, are been rented out to people from elsewhere who work in the sugar mill and the MP distilleries, which is a subsidiary unit of the sugar mill. Some times there are more than one family in the houses where the only one family of the owners lived. As for the Panchayat, what matters is the number of families live in the village. So we have even an increase the population among the main village caste Hindus.

With the decrease in labour possibility in agriculture, people have naturally taken recourse to other activities, thus developing many coping mechanisms. We have also seen that people may not come back fully to agriculture even if it has needed irrigation. This would mean that some of the coping mechanisms, though temporary, are meant to stay.

People still largely believe that economic usage of water could be a worth while coping mechanism. This shows the famous sense of “adjustability” of the local communities. While it is appreciable, it cannot extend beyond a certain limit. Especially when on the one side there is mindless and un sustainable exploitation of water, it is not useful to expect them to carry on tightening their belt, without having hope to improve the potentiality.

The local communities have shown their resistance to some extent, though not sufficiently. Thus the conflict between the “water sellers and purchasers”, found elsewhere in the basin of River Palar, could be seen in this region too<sup>20</sup>.

## **11 RESPONSE OF LOCAL PEOPLE, MEDIA AND CIVIL SOCIETY**

Local communities, residents of the main village and the colonies of Palayaseevaram, are fairly concerned about the issue. They are afraid that the village community would disintegrate if this situation continues. They have made petitions to the concerned officials repeatedly. However, with regard to the sharing of water for urban communities for drinking purpose, they fee that since it is an essential goods (and that too for the capital city), that their demand for more water for themselves may not yield good result.

In the case of the sugar mill, people want to take action, but since it is run by a powerful family, who has strong political nexus especially with the present ruling party, they are of the opinion that any objection may not be given any attention. More over, as seen earlier, a large number of local people work in the sugar factory as daily labour for a period of about 6 months. Those people are not keen to take action against the factory. Others who are willing to protest are facing the threat that their plan would be known to the company even before the plan was executed.

The civil society at large has been responsive to the issue at hand. They have shown interest to ensure that water was available in a sustainable way and that water should be saved reasonably for the sake of it.

When the members of the Tamilnadu Campaign for protection of water Resources, where the present author is a co convenor, decided to do a survey about sand mining in Tamilnadu in the beds of river and it’ s impact on the water availability, the people cooperated in all the places where we collected the primary data in the region of five major rivers: Palar, Pennar, Kaveri, Vaigai and Thamiraparani.

They were willing to share evidences of the efforts they have taken to stop such menace. It is such cooperation and willingness of the civil society at large that made us, the members of the campaign, to think of holding a public hearing.

With such determination to make the public hearing a valid one and of relevance, we decided to select the cases carefully. Thus we came up with 22 cases, where in every case there was proof beyond necessity for the violation by sand smuggling mafia and the efforts taken by the people. In many cases, there were proof for the civil society being threatened with dire consequences for the effort taken by it. On February 19th and 20th of 2002, a carefully selected jury panel consisting of experts of various fields who had great concern for the well

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<sup>20</sup> Marcus Moench et all: rethinking the mosaic

being of the community at large, spent two days and heard the cases. They made sufficient cross examination and then they came up with a jury statement. The eminent juries were: Renowned Justice Krishna Iyer, Justice Suresh (Retd. Justice of Maharashtra High Court), Dr. Markandeyan (Ex vice chancellor of Gandhi gram university ), Dr. Vasanthi Devi (Ex vice chancellor of Maniyam Sundaranar University, Tirunelveli), Dr. Sivanappan (Retd. Professor of Agricultural University) and Dr. Gopalakrishnan (Retd. Senior Director, Mines and Minerals Dept.).

The juries were overwhelmed by the proofs set before them. They unilaterally condemned the illegal sand mining. They suggested that the government create a special task force who would monitor the mining. They also suggested that the Government of Tamilnadu appoint a special committee that would assess the rate at which the damage is done and suggest the area still available for mining without violating the norms. Till then, which is about 6 months, the sand mining could be suspended, they said. Full detail of the jury verdict is available separately.

The media took this issue very seriously. Almost all the major TV channels covered the public hearing. They also took separate interviews of the responsible persons, including the author of this paper. The Sun TV had a special interview of Dr, Vasanthi Devi and the present author on the very next day. Ever since then, the media is providing a regular coverage on the issue of sand mining and the water depletion / excessive exploitation / scarce and inequitable supply of water. Some of the press clippings are enclosed.

It would be unjust if we do not mention the impact the public hearing had on the judiciary. On a case filed by an individual on the illegal sand mining at Kosathalai River, when the district collector did not take the instruction seriously, the court, on a move of contempt, ordered that the government form a committee of experts and come up with a realistic assessment of the damage caused by illegal sand mining. The Judge, Justice Sampath, has widely quoted the jury statement of the public hearing in his judgment. Later, he sent a letter to the campaign, mentioning his appreciation and showing how the statement of jury was very useful for him to know the truth and to come up with a proper judgment.

The media has given wide coverage to the issue at Palayaseevaram too. It has flashed the murder of the Revenue Inspector when he tried to stop illegal sand miners in the area of Palayaseevaram river bed. The issue of sand mining had good coverage around then. However, the issue of water scarcity in the given village was not given equal importance.

## **12 WAYS FORWARD: THE NEED FOR THE MSD**

The issue of water sharing is quite complicated, sensitive and intrinsic. On the one side, the need of the city has to be considered. However, local people feel that they have a right to be provided with water supply at the level as in the early days, as that was the promise made in the beginning. They claim so, also on the grounds of denial of the right to adequate safe drinking water.

With regards to the irrigation, the people feel that the drinking water scheme is only partially responsible. They feel that it is more to do with the sugar factory and it's ancillary, distillery. Hence they see the sugar factory as usurpers of their wealth. The reasons for people feeling that the sugar factory more detrimental than the water supply scheme, can be due to the

following factors:

The sugar factory is of latest origin (about 10 years ago) hence the damage is identified to the latest developments. The sugar factory has not kept its promise on giving jobs to the people. It is to be noted that till now, the pumping station is the greatest exploiter of water.

The sugar factory has practically covered the inlet canal of the Palayaseevaram Lake. This is major factor of reduced water availability in the lake. The channel is meant to take water to several lakes, up to that of Palur village. Hence it has contributed towards reduction of water in all these villages. The affluent of the sugar factory is let out some times in the area of agricultural fields of the village. The ash that flies around from the chimneys cost a dusty layer on everything. It is also believed to be capable of creating lung related diseases.

The relationship among some of the stake holders is worth paying attention to. The TWAD board which is a stake holder as water is pumped from the river bed. The PWD, by way of protecting the river bed, is another stake holder. Neither of them is taking any step towards stopping other water exploiters and sand smugglers. The revenue department, whose income from cultivation cess is reduced, is also a stake holder. These are the major governmental stake holders.

When the first one is over exploiting the water sources, the other two, being also part of the government, do not take any effort to regulate. They could at least stop the private entrepreneur (the sugar mill) from causing damage through over exploitation. They rather find it comfortable to work along with them in preventing the local people from protesting against it. The local administration, on the one hand, goes along with the bureaucracy as being part of it and ignores the Sugar mill, as it pays substantial tax to the administration. It is primarily the local people who are left to register their protest. Even them are split up, as those who are related to the enterprise in any form are either reluctant to protest or oppose the move itself, depending upon the degree of relationship.

The other stake holder one needs to be concerned about are the sand lobby. There is no legally recognised permission by way of license for them in this area. This is because the sand mining is recommended to be prohibited by a specially constituted committee of the PWD in 1987. The part of river in Palayaseevaram is, among others, is a banned area. So the sand taken in this region is illegal. Hence in this particular village, we cannot call the sand smugglers as stake holders. Unfortunately, the government departments who are affected by the illegal activity, been taking limited action against them. However, whatever action taken, is retaliated with violent behaviour. The murder of the Revenue Inspector who was trying to prevent sand smuggling in this very same village is a shocking example for the strength and ruthlessness that these violators have.

With such circumstance the involvement of some of the local men in illegal sand transportation and temporary employment in the sugar mills adds to the inability of the local people to raise their just concerns.

It may be important that the affected local communities are equipped with legal and practical knowledge to be able to confront it as a human rights issue, so that they become a stakeholder to be reckoned with. This would mean systematic preparation of them through empowerment education and also by providing technical knowledge and financial support for taking up means to increase the ground water potentiality, so that they can own the resources as stake

holders with confidence. GUIDE has promoted committees in 62 villages, which would promote the idea of stake holder forum as means of conflict resolution.

That they believe in economic use of water is one good indicator that the local community is willing to share the water with others to a great extent. They are not able to do so since they are not getting sufficient quantity. But they will be willing to take up water development projects with the sense of conservation if permitted and supported by the government.

The success in protecting the water resource through proper recharge and ensuring that it is available to all through justifiable distribution pattern, lies greatly in the emergence of the coming together of all stake holders under a platform created due to common concern. This would prevent us from reaching the inevitable stage of catastrophe. There is no other effective way to find a viable and sustainable solution.

### **13 POLICY INTERVENTION NEEDED**

Laws related to controlling and managing waters are diverse, leaving the rights over them in the hands of many departments, according to the need of the department. Since the British were keen to see that major water sources remained in their control as a means to ensure that the ryots paid the taxes, the major water bodies were brought under the control of the Public Works Department.

Rivers, lakes and canals remain in the control of the PWD. Even after half century of independence, the relationship remains the same. The sense ownership, and the sense of duty that goes with it, is been deprived among the local communities during the British period, is let to stay the same way.

The other departments that claim their stakes are Tamilnadu Water and Drainage Board due to it's need to supply water to the towns around and the cities, the pollution control board, the forest department, Department of mines and minerals, department of agriculture, department of industries and commerce and the like.

We see that the local communities are powerless and helpless in the case of decision making regarding protection and usage of water sources and water. This in deed an irony since the 73rd amendment to the constitution, which was introducing with the intention of divulgence of power, has, in the 11th schedule, very clearly earmarked water as one area to be under the control of the Panchayats.

The Tamilnadu Panchayat act, which is expected to carry down the power meant to be bestowed on the local bodies, did not do so. However, it leaves the duty of providing drinking water to the communities with the Panchayats, without giving a balancing rights over the water sources.

The major policy change that needs to be done is in this area: the TN Panchayat Act needs to be suitably amended and a new set of rules need to be worked out.

The agricultural policy, the industrial policy and the acts and schemes that reflect these policies also need to be suitably amended so that the decision making over the usage shall be with the local communities, while recognizing the role of the departments for the needed

technical input.

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