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**Salaiyur Model Watershed  
Coimbatore District  
Tamil Nadu**



**ICAR-Indian Institute of Soil & Water Conservation (IISWC)  
Ree's Corner, P.O. Fernhill, Udhamandalam  
The Nilgiris-643 004, Tamil Nadu**



# Salaiyur Model Watershed Coimbatore District Tamil Nadu

## Project Implementation Team

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## FOREWORD



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The ICAR-IISWC, Research Centre, Udhagamandalam, Chennai took up Kuruthukuli (KG-4-1) Salaiyur watershed in Avinashi Tehsil, District Coimbatore, Tamil Nadu during 1997 to 2003 covering three villages viz Onnakarasampalayam, Kurumbapalayam and Salaiyur. The watershed has 513 area with 602mm average rainfall. The major problems identified in the watershed are lack of water resources, low rainfall, ground water depletion, rapid runoff, gravelly & light red soils prone to erosion, poor vegetative ground cover, rainfed agriculture in major area, shallow soil depth, soils having low water holding capacity & low nutrient status. Significant part of population was landless labourers. Various entry point activities like community hall construction, distribution of iron ploughs, ceiling fans and steel bench to the primary school and hand pump on community land were carried out to built rapport with the residents in the watershed. Six check dams were constructed for stabilization of gullies along with vegetative measures under soil and water conservation interventions. Construction of seven new ponds and rejuvenation of five percolation ponds created a total storage capacity of 266 ha-cm in the watershed for water harvesting and augmenting groundwater recharge. Lining of ponds with HDPE sheet was demonstrated at three ponds to cut down seepage losses. Drip irrigation was introduced for the first time in the watershed for efficient utilization of harvested rainwater. Improved varieties of green gram, cotton, castor, cowpea, redgram and groundnut along with chemical fertilizers like urea/DAP, single super phosphate and muriate of potash and chemical fertilizers were distributed to farmers. Horticulture plantation as a pure crop or in agri-horti system was taken up in an area of 31.88 ha covering marginal/degraded lands with shallow gravelly soils falling under LCC IV and VI. Under Afforestation works, species like *Ailanthus excelsa*, *Albizia lebbek* and *Acacia leucophloea* were planted in common land as mixed plantation and under agro-forestry system in private agricultural lands. Alternative income generating activities were taken up through formation of Self Help Groups (SHGs) for the upliftment of landless poor and resource poor farming families in the watershed. Average Family Income of the farmers increased from 19% to 72% as a results of various interventions taken up by ICAR-IISWC, Ooty in the watershed

Dr M. Madhu  
Director  
ICAR-IISWC, Dehradun



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## 1.0 Watershed Details

- 1.1 Name: Salaiyur Watershed  
Villages covered: 3 (Onnakarasampalayam, Kurumbapalayam & Salaiyur)
- 1.2 Location: Latitude: 11°12'43" to 11°14'02"N  
Longitude: 77°02'46" to 77°03'55"E
- 1.3 State: Tamil Nadu District: Coimbatore  
Block/Tehsil: Avinashi taluk Annur block
- 1.4 Area (ha): 513 Average Annual Rainfall (mm):602  
Elevation range (m amsl): 370 to 472
- 1.5 Average slope (%): 3 – 15
- 1.6 Implementation Period: 1997-2003
- 1.7 Sponsored by: The Department of Land Resources,  
Ministry of Rural Development, GOI, New Delhi
- 1.8 Total Budget (in Rs lakh): Rs. 19.00
- 1.9 Problems identified for interventions: Lack of water resources, low rainfall, ground water depletion, rapid runoff, gravelly & light red soils prone to erosion, poor vegetative ground cover, rainfed agriculture in major area, shallow soil depth, soils having low water holding capacity & low nutrient status, no forest area, open pasture/vegetation, least productive soils, significant part of population were landless labourers.

## 2.0 Demographic Details

- 2.1 Total Population (number): 1314 SC/ST (%): 31  
Total number of families: 314  
Number of farm families: 176 Number of landless families: 120



## 2.2 General Socio-Economic Status: (Average landholding size, Major occupations, outmigration etc.)

S.No.	Socio-economic parameters	Values/details
1	Average family size (No.)	4.28
2	Literacy rate (%)	54
	Male	65
	Female	45
3	Major occupation (%)	
	Agriculture	56
	Landless labourers	38
4	Average landholding (ha)	1.8
5	Average annual income (Rs)	19837
6	Major livestock	Cows, buffaloes, bullocks, sheep & goats
7	Avg. annual milk production (l/family)	1146
8	Avg. annual fuel consumption/family	
	Fuel wood (q)	21.8
	Kerosene (l)	34.8
	LPG (Nos)	2
9	Number of metalled roads	2
10	Number of primary Schools	Since 1950
11	Nearest bank and post office	PACB, K. G. since Palayam (6Km)
12	Nearest veterinary dispensary	Pogallur (5Km)
13	Nearest market	Annur (7 Km)
14	Number of cottage industries	1 (spinning mill)
15	Number of petty/tea shops	3

### 2.3 General Agricultural Status: (Total cultivable area, Rainfed area, Irrigated area, Forest land, Other land uses)

Area under different land uses in Salaiyur watershed

Agriculture: 406.1 ha (79.2%)

Wastelands: 94.3 ha (18.4%)

Habitation: 12.6 ha (2.5%)

Current fallow: 29.6 ha

Total cultivated area: 435.7 ha

### 3.0 Technological Interventions (NRM and Livelihood Activities)

Entry point activities :

- 1.Community hall construction
- 2.Distribution of iron ploughs
- 3.Ceiling fans to the primary school
- 4.Steel bench to the school
- 5.Hand pump on community land
- 6.Burial ground land development

Three user groups were formed for construction of check dams & percolation ponds, desilting and deepening of percolation ponds and agroforestry respectively. Initially nine SHGs were formed. Watershed Association and one Watershed Committee were also formed.

**Vegetative barriers:** *Cymbopogon martini* (Palmarosa oil grass), *Eragrostis curvula* (weeping love grass) and *Tripsacum laxum* (Guatemala) grasses were raised in a demonstration plot as vegetative barrier in the watershed. Agave suckers were planted at a spacing of 0.75 m in double rows (staggered) for a length of 3.21 km all along paths, roads and gully sides as a vegetative measure for protection against erosion.

**Field bunding:** Field bunding on individual farmers' fields was taken up in an area of about 30 ha covering about 5000 running meters.

**Check dams & Percolation ponds:** Six check dams were constructed for stabilization of gullies along with vegetative measures. Rejuvenation of 5 percolation ponds (3 on private land and 2 on community land) was completed by desilting and reshaping of ponds to





increase their capacity along with repair of spillways. Five new percolation ponds were constructed on community as well as on private lands. In addition, two new percolation ponds were constructed through State Agricultural Engineering Department in the watershed as an example of convergence of development schemes in the watershed. In all, a total storage capacity of 266 ha-cm was created in the watershed for water harvesting and augmenting groundwater recharge.

S.No.	Name of pond	Total capacity (cum)
1	Ramasamy pond	1325
2	Sate Govt. Pond	2330
3	Thalai kuttai	3744
4	Thoppu kuttai	2660
5	Check dam – I	216
6	Check dam – II	306
7	Check dam – III	822
8	State Govt. pond near temple and main road	1950
9	Manian pond	480
10	Sivakumar pond	440
11	Thirumoorthy pond	450
12	Chinnan pond	680
13	Arumugam pond	4100
14	Mango Subramani pond	650
15	Oor Gownder pond	520
16	Palanisamy pond	1377
17	Gurusamy pond	130
18	Subbanna Gr. pond	340
19	Burrial ground pond	580
20	Pond near chairman's house	3500
Total		26600

**Water conservation through HDPE lining:** Lining of ponds with HDPE sheet was demonstrated at three ponds to cut down seepage losses. Average size of a pond was 21m × 12m × 0.6m.

**Water management through Drip irrigation:** Drip irrigation was introduced for the first time in the watershed for efficient utilization of harvested rainwater.

Crop	No. of Fields	Total area (ha)
Coconut	3	1.28
Banana	3	0.88
Sugarcane	2	0.80
Mango	3	1.00
Tamarind	1	0.40
Mulberry	5	2.00

**Instrumentation for Hydrological monitoring:** Three gauging stations were installed by fixing stage level recorders at three locations viz., two check dams, one percolation pond (Thopukuttai) and one at the outlet of the watershed to measure the runoff at three different points. For monitoring ground water levels, certain number of observation wells (dug wells) were identified besides installation of eleven piezometers in the influence zone of selected percolation ponds.

**Crop productivity improvement programme:** Improved crop varieties and chemical fertilizers were distributed to selected farmers for demonstration. The seeds of rainfed crops such as green gram, cotton, castor, cowpea, redgram and groundnut were distributed to the farmers along with chemical fertilizers like urea/DAP, single super phosphate and muriate of potash.

**Diversification to Horticulture:** Horticulture plantation as a pure crop or in agri-horti system was taken up in an area of 31.88 ha covering marginal/degraded lands with shallow gravelly soils falling under LCC IV and VI. Mango and Tamarind were planted in an area of 11.88 ha and 20.00 ha, respectively, mostly on private lands under rainfed condition with moisture conservation practices. Besides this, aonla, pomegranate, guava and sapota were introduced. Improved varieties of coconut grafts were also distributed to the farmers and landless people to raise them near their agricultural fields and houses. Improved micro site condition for soil working and planting by adopting 1 cum pit size,

back filling pit with gravel free soil mixed with pond silt and FYM, live mulch *etc.*, were demonstrated to a set of farmers in their fields. Most of the farmers in the watershed adopted improved practice of pitting and planting.

S.No.	Planting material	Seedlings distributed				Total (No.)
		1998	1999	2000	2001	
1	Tamarind (PKM-1)	1500	1200	300	125	3125
2	Mango (Neelam)	15050	1200	700	350	3300
3	Sapota (Co-2 & 3)	50	-	185	125	360
4	Pomegranate (Ganesh)	-	-	10	25	35
5	Guava (Lucknow -45)	-	25	80	30	135
6	Amla (BSR -1 & NA-7)	-	-	50	50	100
7	Coconut (Dwarf & Tall)		400	500	50	950
Total		2600	2825	1825	755	8005

**Improved micro-site condition demonstration plots:** Mango (Neelam) and tamarind (PKM-1) grafts were planted during 1997 in 1m × 1m × 1m pits at three sites (each having an area of about 0.20 ha) in the watershed on farmers' fields at a spacing of 6m × 6m and 8m × 8m, respectively with two treatments *viz-a-viz* pits filled with original sieved soil + FYM and pits filled with original sieved soil + good soil (tank silt) + FYM. During 1998, both mechanical pitting by JCB as well as manual pitting were adopted to take up planting of tamarind (PKM-1) grafts. In both the cases, pits were filled with gravel free original soil + FYM. During dry spells, watering was done for better establishment. During the same year, mango grafts were planted in pits made by JCB with two micro site improvement treatments *i.e.* pits filled with tank silt + FYM and pits filled with original gravel free soil. Supplemental irrigation was given up to 4 months after planting and then once in a month. In all the sites, at the time of planting, 30g of BHC (10%) was mixed with the soil to prevent attack of termites and other insects. Mango and tamarind plants were planted in sunken pits to conserve soil moisture and drainage was also provided during rainy season to prevent water logging. After 60 days of planting, 5 grams of Furadan was applied



around each plant 15-20 cm away from the plant to prevent attack of insects. Green leaves mulching and shade around each fruit plant was provided to conserve *in-situ* soil moisture after rainy season.

**Afforestation & Agro-forestry:** Under Afforestation works, species like *Ailanthus excelsa*, *Albizia lebbek* and *Acacia leucophloea* were planted in common land as mixed plantation. In private agricultural lands, these species were also planted under agro-forestry system. Apart from these species, teak (3900 numbers) was also planted on field bunds in private lands where irrigation facilities existed. On community land, an area of 8.5 ha was afforested with the above mentioned species at a spacing of 3m × 3m by following a pit size of 0.45 cum.

**Sericulture:** Mulberry was introduced in the watershed during 1999 and drip irrigation was installed in some of the mulberry plots. This was done partly with the support of sericulture scheme of the state department of sericulture, demonstrating convergence of schemes. The average survival per cent of mulberry was found to be 98 per cent which initiated silk worm rearing in the watershed.

**Fodder production:** Seeds of improved fodder sorghum varieties and fertilizers were distributed to selected farmers for demonstration during the project period. High yielding variety of hybrid Napier grass (CO-3) was introduced in the watershed during 2002 and planting materials were distributed to 12 farmers.

**Income generating activities:** Alternative income generating activities were taken up through formation of Self Help Groups (SHGs) for the upliftment of landless poor and resource poor farming families in the watershed. Initially nine SHGs were formed with an amount of Rs.44341. From the revolving fund, nineteen more new SHGs were formed.



S.No.	Name of SHG originally formed	Groups(No.)	Total (No.)	Initial grant (Rs)
1	Coir rope making	1	5	4800
2	Petty shop	2	2	2000
3	Coconut frond weaving	2	12	4000
4	Tailoring	2	12	5718
5	Fiber extraction from agave	1	10	23900
6	Power sprayer	1	1	3923
<b>Subtotal (Seed money)</b>		<b>9</b>	<b>42</b>	<b>44341</b>

S.No.	SHGs formed from revolving fund	Groups(No.)	Total (No.)	Initial grant (Rs)
1	Sheep rearing	1	1	1000
2	Vegetable selling	1	1	1000
3	Coconut selling	1	1	1000
4	Cattle feed selling	1	1	2000
5	Plastic wire bag knitting	3	3	816
6	Tailoring	1	6	2890
7	Thrift society	1	10	1000
8	Hand sprayer	1	1	880
9	Thrift society	2	20	10000
10	Thrift society	2	23	11500
11	Coconut frond weaving	2	12	3500
12	Vegetable selling	1	1	1000
13	Iron box	1	1	1000
14	Overlock machine	1	1	2500

## 4.0 Impacts

### 4.1 Productivity indicators

S. No	Indicators	Unit	Before (Year)	After (Year)	Change (%)
<b>1</b>	<b>Change in land use</b>				
<b>i</b>	Net sown area	ha	393.6	365.8	-7.06
<b>a.</b>	Rainfed	ha	338.6	296	-12.58
<b>b.</b>	Irrigated	ha	55.0	69.8	26.91
<b>ii</b>	Area sown more than once	ha			
<b>iii</b>	Gross cropped area	Ha	406.1		
<b>iv</b>	Current fallow	Ha	29.6		
<b>v</b>	Culturable waste land	Ha			
<b>vi</b>	Area covered under plantation (non arable land)	Ha			
<b>vii</b>	Area put under agroforestry (arable land)	Ha	8.5		
<b>viii</b>	Number of tube-wells	No	68.0		
<b>ix</b>	Number of functional dug/open wells	No	114.0		
<b>2</b>	<b>Area under crops</b>				
<b>i</b>	<i>Kharif</i>	Ha			
<b>ii</b>	<i>Rabi</i>	Ha			
<b>iii</b>	<b>Change in area under major crops</b>				
<b>a.</b>	Fodder sorghum	Ha	250.5	180.0	-28.1
<b>b.</b>	Maize	Ha	1.0	1.5	50.0
<b>c.</b>	Horse gram	Ha	35.1	45.0	28.2
<b>d.</b>	Cowpea	Ha	8.0	10.5	31.3
<b>e.</b>	Redgram	Ha	4.5	8.0	77.8
<b>f.</b>	Green gram	Ha	4.2	15.0	257.1
<b>g.</b>	Sesamum	Ha	15.2	35.0	130.3
<b>h.</b>	Groundnut	Ha	16.6	-	-
<b>I.</b>	Cotton	Ha	3.5	1.0	-71.4



<b>j.</b>	<b>Sugarcane</b>	<b>Ha</b>	<b>33.0</b>	<b>37.0</b>	<b>12.1</b>
<b>k.</b>	Banana	Ha	12.0	18.0	50.0
<b>l.</b>	Tomato	Ha	3.0	3.0	0.0
<b>m.</b>	Brinjal	Ha	3.0	6.3	110.0
<b>n.</b>	Lady's finger	Ha	4.0	5.5	37.5
<b>3.</b>	<b>Impact on yield of major crops</b>				
<b>i</b>	Fodder sorghum	q/ha	185.0	210.9	14.0
<b>ii</b>	Maize	q/ha	10.8	12.2	13.0
<b>iii</b>	Horse gram	q/ha	3.2	3.6	13.1
<b>iv</b>	Cowpea	q/ha	5.3	6.0	13.6
<b>v</b>	Redgram	q/ha	7.6	8.5	12.0
<b>vi</b>	Green gram	q/ha	5.4	6.1	12.0
<b>vii</b>	Sesamum	q/ha	2.9	3.3	13.8
<b>viii</b>	Groundnut	q/ha	6.7	-	-
<b>ix</b>	Cotton	q/ha	6.3	7.0	11.4
<b>x</b>	Sugarcane	q/ha	750.0	8513	13.5
<b>xi</b>	Banana	q/ha	250.0	281.8	12.7
<b>xii</b>	Tomato	q/ha	58.0	65.0	12.1
<b>xiii</b>	Brinjal	q/ha	98.9	115.0	16.3
<b>xiv</b>	Lady's finger	q/ha	79.5	86.50	8.8
<b>4.</b>	<b>Productivity indices</b>				
<b>i</b>	Crop Diversification Index (CDI) Or crops/cropping systems before & after CDI for Rainfed CDI for Irrigated	Index	0.47 0.59	0.71 0.76	50.7 29.2
<b>ii</b>	Water productivity	kg/cum kg/ha	2178 kg/ha	3898 kg/ha	79
<b>iii</b>	Change in area under cultivation Cultivated and Utilization Index (CLUI) Dry land Irrigated	Ha Index	0.33 0.84	0.46 0.88	13.0 4.0
<b>iv</b>	Cropping intensity	%			
<b>v</b>	Change in milk production	liters/yr	6564	6922	5.45

## 4.2 Environmental impact indicators

S.No.	Indicators	Unit	Before (Year)	After (Year)	Change (%)
<b>1</b>	<b>Hydrology and water resources</b>				
<b>i</b>	Surface runoff	%	4.5 to 7.2	1.3	
<b>ii</b>	Surface water storage	ha-cm	208	266	27.88
<b>iii</b>	Surface Water resources (Number of water bodies)				
<b>iv</b>	Perenniality of streams	%			
<b>v</b>	Water table depth in Well	m			0.5-1.0m
<b>vi</b>	Increase in ground water contribution	% or ha-m			38-45%
<b>vii</b>	Reduction in soil loss	tons/ha/year	1.7 to 8.9	0.5 to 1.6	
<b>2</b>	<b>Soil fertility improvement in the watershed</b>				
<b>i</b>	Organic carbon	%			
<b>ii</b>	Nitrogen	kg/ha			
<b>iii</b>	Phosphorus	kg/ha			
<b>iv</b>	Potash	kg/ha			

## 4.3 Socio-economic impact indicators

S.No.	Indicators	Unit	Before (Year)	After (Year)	Change
<b>1</b>	<b>Overall People's Participation Index</b>	%		61.7	
	<b>Total contribution (Rs) or percent of total budget expenditure (%)</b>	Rs or %		100	
<b>2</b>	<b>Av. Family Income</b>	(Rs/yr)	19837	28759	45.0
<b>i</b>	Large		40650	69925	72.0
<b>ii</b>	Medium		25950	31036	19.6
<b>iii</b>	Small		19455	28588	46.9
<b>iv</b>	Marginal		16560	23433	41.5
	Landless		14350	22888	59.5
<b>3</b>	<b>Av. Family Expenditure</b>	(Rs/yr)			
<b>i</b>	Large				
<b>ii</b>	Medium				
<b>iii</b>	Small				
<b>iv</b>	Marginal				
<b>4</b>	<b>Employment Generation</b>	Man days		10105	
<b>5</b>	<b>IGAs (Annual income per SHG)</b>	Rs.	276 to 10440	per member	
<b>6</b>	<b>Amount in WDF Account after financial withdrawal</b>	Rs.		120733	
<b>7</b>	<b>Economic Viability of the Project</b>				
<b>i</b>	BCR at Discount Rate 10% for period of analysis 20 years			Arable land (1.13) Non-arable land (9.78)	
<b>ii</b>	IRR (%)			Arable land (18.13) Non-arable land (62.91)	





## 5.0 Award/ Appreciation/ Recognition

## 6.0 Project Implementation Team

- AK Sikka
- M Madhu
- V Selvi
- DV Singh
- S Chand
- P Sundarambal
- K Jaavarathnam
- M Murgaiah

## 7.0 Photographs



Wall painting to create awareness about watershed programme resource map



Watershed people depicting



Community hall



Distribution of iron plough



**Boring for installing hand pump**



**Supervision of watershed works**



**Training- cum-awareness camp for women on health & hygiene and income generation activities**



**Discussion and approval of plan watershed association**



**Veterinary camp to create awareness about livestock care**



**Training for nursery technique**





**Field bunding**



**Check dams**



**Percolation pond**



**Lining of shallow water storage pond  
with HDPE sheet**



**Sugarcane field with drip irrigation for  
efficient use of water**



**Well grown ground nut crop**



**Good crop of vegetable cowpea & fodder sorghum**



**Ragi + Pulses in inter cropping system**



**Sieving of gravels for improving micro site condition**



**Teak and coconut in irrigated system**



**Teak on field boundaries**





**Improved hybrid napier grass**



**Trainees witnessing activities of coconut frond weaving**



**Tailoring**



**Piezometric wells for monitoring ground water recharge**



**Mango**



**Lined runoff collection pit**



**Pitcher Irrigation**



**Watering through PVC pipes**



**Watering through Bamboo poles**



**Tamarind**



**Silkworm rearing**





**For further details, please contact**

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