



TN – IAMWARM PROJECT

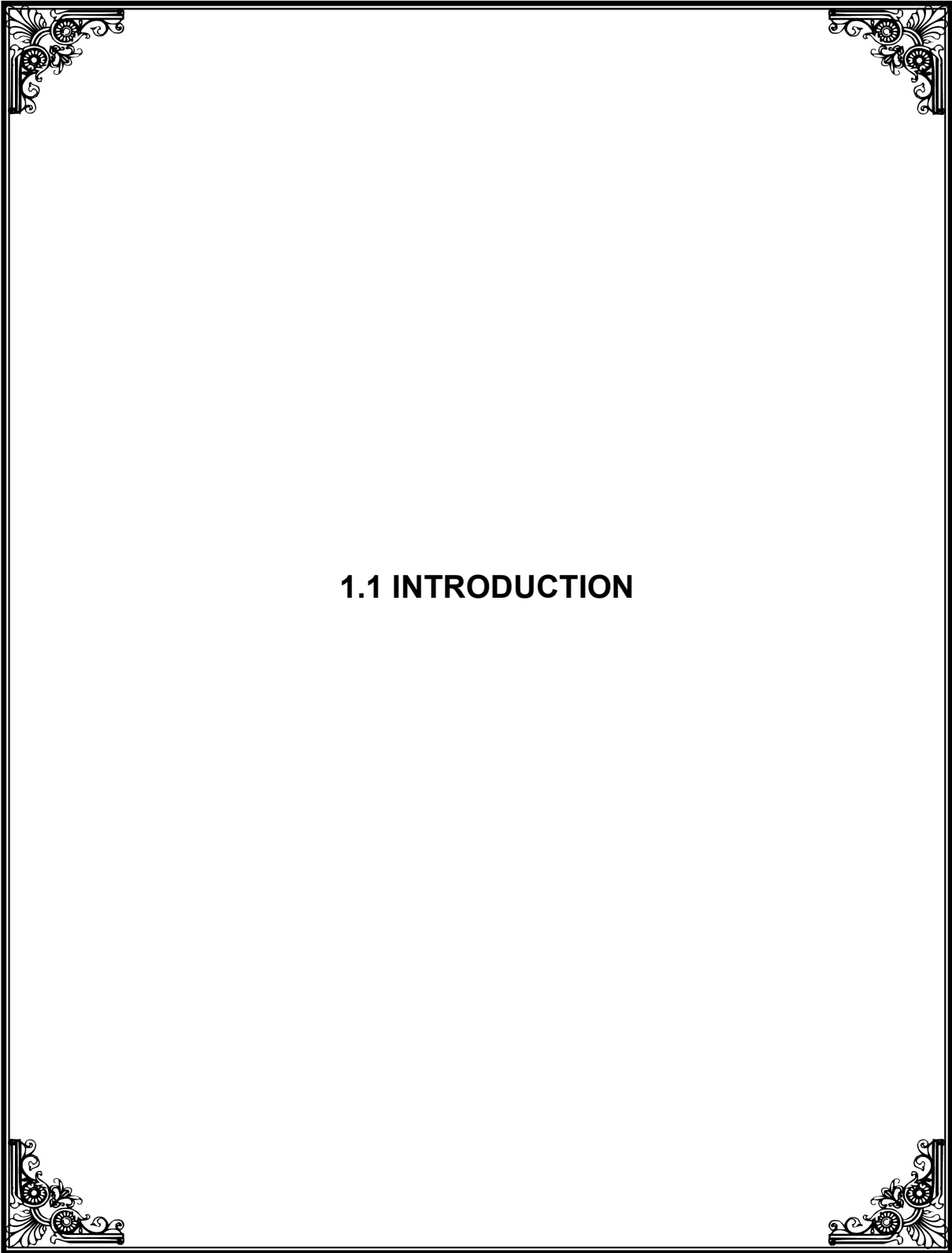
PAMBANAR AND VARATTAR SUB BASIN

WATER RESOURCE DEPARTMENT





1. WATER RESOURCES ORGANISATION



1.1 INTRODUCTION

1.1 INTRODUCTION

1.1.1 General

Agriculture is the dominant sector in the Indian economy. Tamil Nadu depends largely on the surface water irrigation as well as ground water irrigation. The state has used the surface and ground water potentials to the maximum limit and hence the future development and expansion depends only on the efficient and economical use of water potential and resources.

To achieve higher water use efficiency, it is necessary to improve and upgrade the existing conveyance system and also to introduce modern irrigation methods.

With the above objective, a comprehensive programme has been proposed with a Multi Disciplinary Approach.

1.1.2 Description of the Pennaiyar Basin

The main Pennaiyar Basin gets its name after the name of the river Pennaiyar. The Pennaiyar River has its origin in the South Eastern slopes of Chennakesava hills in Nandhidurg in Karnataka state and after traversing about 112km in Karnataka state it enters in Tamil Nadu in Hosur Taluk and flows through Hosur, Krishnagiri and Uthangarai Taluks of Krishnagiri District and Harur Taluk of Dharmapuri District for a length of 190.50km. After traversing in Dharmapuri District, the Pennaiyar river enters into Thiruvannamalai, Vilupuram, Cuddalore District and travels a distance of 139.50km. The Pennaiyar River finally empties into the Bay of Bengal near Cuddalore. The total drainage area of Pennaiyar including the area in Karnataka state is 15101 sq.km. The catchment area in Karnataka state itself is (931.06 sq.miles) 2384. sq.km. The total length of river is 432km. (i.e) 320km in Tamil Nadu and 112km in Karnataka state. The Pambanar and Varattar sub basin is located between latitude of 12° 00' 00" to 12° 07' 25" and longitude of 78° 45' 00" E to 78° 55' 20".

1.1.3 Description of the Pambar and Varattar Sub-Basin

There are 7 major Anicuts across Pennaiyar. In the Pennaiyar main basin there are 8 Reservoirs, such as Kelavarapalli Reservoir, Soolagiri Chinnar Reservoir, Krishnagiri Reservoir, Thumbalahalli Reservoir, Pambar Reservoir, Vaniar Reservoir, Varattar Reservoir and Sathanur Reservoir. Pennaiyar has 14 major Tributaries. The total actual dependable run –off is 45 T.Mcft. There is seasonal flow in the river during monsoon seasons. But there is flow through out the year upto Kelavarapalli Reservoir which is the drainages of Bangaluru City. The Maximum discharge of the river so far measured is 3,00,000 cusecs.

Pambar and Varattar Sub basin has a drainage area of 293.22 Sq.Km. The Taluk covered in the sub basin is Thandampattu of Tiruvannamalai District. It receives an annual average rainfall of 911 mm, with its major share during North-East Monsoon.

ABBREVIATIONS USED

- 1) G - Proposal for Groundnut
- 2) VC – Demo for Vermicompost
- 3) GM – Green Manure
- 4) SRI – System of Rice Intensification
- 5) M – Maize
- 6) P – Pulses
- 7) SHSM – Supply of Hybrid Seed Materials
- 8) SF – Supply of Fertilizers
- 9) TG – Technical Guidance
- 10)DIS – Drip Irrigation System
- 11) SIS – Sprinkler Irrigation System
- 12) FM – Form Mechanism
- 13) FP – Form Pond
- 14) SB – Fish Seed rearing in cages
- 15) AC – Aquaculture in form Ponds
- 16) FI – Fishing Implements
- 17) FCO3 – Fodder CO3 Development
- 18) IEC – Includes Training, Expert visits, Documentation, Fuel & Vehicle hire charges.
- 19) PD – Pulses Demonstration
- 20) GD – Groundnut Demonstration
- 21) SD – Sunflower Demonstration
- 22) CD – Cotton Demonstration
- 23) PS – Paddy SRI Demonstration

INFRASTRUCTURE WISE CONVERGENT TABLE

SI No	Name of cluster/infrastructure/ Village	Total Ayacut (Ha)			Total Ayacut (Ha)			WRO	Agriculture		TNAU		Horticulture		Agri marketing		AED		Fisheries		Animal husbandry			
		FI	PI	Gap	Wop	Wp	Gap		Act	No/Ha	Act	No/Ha	Act	No/Ha	Act	No/Ha	Act	No/Ha	Act	No/Ha	Act	No/Ha		
1	ATHIPADI CLUSTER																							
	Beemarapatti Anicut	5.515	4.735	10.250	10.250	20.500	-	Impts. To Anicut & Supply Chl.	SRI	2	PD	1	SHSM	4			DIS	1			FCO3	1		
									M	1			SF					SIS	3					
													TG					FM	1					
	Athipadi Anicut	13.680	13.150	19.430	26.830	46.260	-	Impts. To Anicut & Supply Chl.	G	1	PS	5	SHSM	8			DIS	2	SB	1	FCO3	1		
								SRI	2	PD	1	SF					SIS	2						
												TG					FM	2						
Murugesanar Anicut (Athipadi)	15.150	12.400	28.670	27.550	56.220	-	Impts. To Anicut & Supply Chl.	SRI	2	PS	1	SHSM	10			DIS	1	AC	1	FCO3	1			
								M	1	GD	1	TG					SIS	2	FI	1				
										SD	1						FM	2						
																	FP	1						
Murugesanar Anicut(Puliampatti)	4.280	4.200	7.925	8.480	16.405	-	Impts. To Anicut & Supply Chl.	SRI	2	PD	1	SHSM	3								FCO3	1		
												SF												
												TG												
Pudur chekkadi Eri	22.340	23.260	31.685	45.600	77.285	-	Impts. To Tank	SRI	5	PS	1	SHSM	14	IEC	1	DIS	1			FCO3	1			
								G	3	PD	1	SF							SIS	2				
										GD	1	TG							FM	2				
										SD	1								FP	1				
Arurangadu Anicut	18.200	14.800	24.885	33.000	57.885	-	Impts. To			PS	1	SHSM				SIS	2			FCO3	1			



1.2 HYDROLOGY

1.2.1 GENERAL

Varattar is the worth mentioning tributary of Pambanar River .During 1993 (Year) one reservoir namely Kelavarapalli Reservoir was constructed across the Pennaiyar River. Finally, Pennaiyar River confluences with Bay of Bengal near Cuddalore.

1.2.2 LOCATION

Pambanar and Varattar Sub basin has a drainage area of 293.22 Sq.Km. The Taluk covered in the sub basin is Thandarampattu of Tiruvannamalai District.

1.2.3 CATCHMENT AREA OF PAMBANAR AND VARATTAR SUB-BASIN

The Pambanar and Varattar Sub Basin has a typical climate, owing to the marginal catchments area in the Western Ghats and extensive major catchments area in plains. Pambanar and Varattar Sub Basin enjoys the benefits of mostly North East monsoon and South West Monsoon.

1.2.4 HYDRO METEOROLOGY

The Hydro Meteorology parameters include rainfall, temperature, humidity, wind velocity, evaporation and duration of sun shine which determine the climate of the basin.

1.2.5 RAIN FALL

Average annual rainfall of gauging stations influencing this sub basin is as follows:

Sl. No	Name of Rain gauge Station	North East Monsoon	Summer	Winter	South west monsoon	Annual
1.	Satthanur dam	359	98	18	361	837
2.	Pick up anicut	431	95	34	392	951
3.	Chengam	399	115	27	419	959

a. CLIMATE

The Pambanar and Varattar_Sub Basin lies in a low rainfall belt having an annual average weighted rainfall of 911 mm. Southwest monsoon contribute 391 mm, while NE monsoon contributes 396 mm . This basin receives a major share of its rainfall during

NE monsoon. This monsoon helps to build up storage in the reservoirs and tanks both system and Non system. This basin has Western Ghats on Western sides. For the measurement of Hydro meteorological parameters in the basin area, there is one weather station at Kilnachipattu near Tiruvannamalai; its data is taken for the study.

B .SOIL CLASSIFICATION

In this sub basin, due to different stages, Weathering & parent material, the soil types are met with in combination of Inceptisol, Alfisol and Vertisol. More prominent type is Inceptisol.

Inceptisol	Red or brown or grey soil with surface horizon more developed than sub surface. They are developing soils, moderately deep, coarse loamy to loam moderately drained to well drained	Suited for commonly grown crops with exceptions
Alfisol	The red or brown soils having accumulation of alleviated clay in sub surface horizon it well drained, poor water and nutrient holding capacity.	Annual crops with shallow roots systems cum up wells
Vertisols	Black soil	Suitable for cotton, Pulses etc

b.1 LAND HOLDINGS

The details of farm holdings and size classes prevalent in Pennaiyar upto Krishnagiri Reservoir Sub basin are given below:

Category	Size of holdings	Numbers	Percentage
Marginal	Below 1.00 Ha	2756	93.77%
Small	1.00 – 2.00 Ha	139	4.73%
Medium	2.00 – 5.00 Ha	36	1.23%
Big	5.0 ha & above	8	0.27%
Total		2939	100 %

The above table revealed that the marginal farmers alone accounted for 93.77 percent in the sub basin followed by small farmers. Developmental initiatives will need to take the fact into account.

1.2.6 DEMOGRAPHY

Name of Sub Basin	Total No. of Blocks	Total No. of Villages	Population in,m Million		
			2004	2010	2025
Pambanar and Varattar Sub basin	1	34	0.055	0.060	0.068

1.2.10 CROPPING PATTERN OF PAMBANAR AND VARATTAR SUB BASIN

SI No	Crop	Without project				With project				Increasing
		FI	PI	RF/G	TOTAL	FI	PI	RF/G	TOTAL	
I	Perinial crop									
1	Citronella	-	79.000	-	79.000	240.000	-	-	240.000	161.000
	Total	0.000	79.000	0.000	79.000	240.000	0.000	0.000	240.000	-
II	Annual crop									
1	Sugarcane	-	75.000	-	75.000	75.000	-	-	75.000	0.000
2	Tapioca	-	42.000	-	42.000	42.000	-	-	42.000	0.000
	Total	0.000	117.000	0.000	117.000	117.000	0.000	0.000	117.000	0.000
III	1st crop									
1.a	Paddy	349.300	-	-	349.300	-	-	-	0.000	-349.300
b	Paddy SRI	-	-	-	-	349.300	-	-	349.300	349.300
2	Maize	-	-	-	-	65.000	-	-	65.000	65.000
3	Pulses	-	-	-	-	45.000	-	-	45.000	45.000
4	Sunflower	-	-	-	-	70.000	-	-	70.000	70.000
5	Cotton	-	18.370	-	18.370	-	-	-	0.000	-18.370
6	Groundnut	-	51.000	-	51.000	156.865	-	-	156.865	105.865
7	Fodder chollam	-	45.000	-	45.000	75.000	-	-	75.000	30.000
8	Vegetables	-	-	-	-	-	-	-	0.000	0.000
	Tomoto	-	-	-	-	33.000	-	-	33.000	33.000
	Bhendi	-	-	-	-	30.000	-	-	30.000	30.000
	Brinjal	-	-	-	-	20.000	-	-	20.000	20.000
	Chillies	-	-	-	-	12.380	-	-	12.380	12.380
	Fallow	-	-	553.875	553.875	-	-	-	0.000	-553.875
	Total	349.300	114.370	553.875	1017.545	856.545	0.000	0.000	856.545	188.300
	Grand total	349.300	310.370	553.875	1213.545	1213.545	0.000	0.000	1213.545	0.000
IV	2st crop									
1.a	Paddy	75.000	-	-	75.000	-	-	-	0.000	-75.000

b	Paddy SRI	-	-	-	-	210.700	-	-	210.700	210.700
2	Groundnut	-	40.000	-	40.000	170.000	-	-	170.000	130.000
3	Pulses	-		-	-	60.000	-	-	60.000	60.000
	Total	75.000	40.000	-	115.000	440.700	-	-	440.700	325.700
V	3st crop									
		-	-	-	-	-	-	-		
		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	Great grand total	424.300	350.370	0.000	1328.545	1654.245	0.000	0.000	1654.245	325.700
	Cropping intensity				63.84				136.32	

1.2.11 LIVE STOCK - POPULATION

Name of Sub basin	Cattle	Buffalo	Sheep	Goats	Pigs	Dogs	Fowls
Pambanar and Varattar Sub basin	32304	3563	15882	13511	1780	4012	23819
Monthly requirement	4.390 Mcum						

1.2.12 INDUSTRIES & ANNUAL WATER DEMAND in Mcum

Sl.No.	Name of the Sub-Basin	Annual Water Demand in Mcum			
		2004	2010	2020	2045
1.	Pambanar and Varattar	0.94	1.32	2.07	3.96

1.2.13 CROP WATER REQUIREMENT (WITHOUT PROJECT)

Name of crop	Area in Ha	Crop water requirement in mm	Total water requirement in Mcm	Crop Irrigation water requirement at source n=0.53	Total irrigation requirement in Mcum
I Perennial crop					
1 Citronella	79.000	550	0.435	0.82	0.82
Sub total	79.000		0.43	0.82	0.82
II Annual crops					
1 Sugarcane	75.000	951	0.713	1.35	1.35
2 Tapiaco	42.000	538	0.226	0.43	0.43
Sub total	117.000		0.94	1.77	1.77
III 1st crop					
1 Paddy	349.300	612	2.138	4.03	4.03
2. Cotton	18.370	442	0.081	0.15	0.15
3. Groundnut	51.000	467	0.238	0.45	0.45
4. Fodder cholam	45.000	300	0.135	0.25	0.25
5. Vegetables					
Tomato		315	0.0000	0.0000	0.00
Bendhi		462	0.0000	0.0000	0.00
Brinjal		464	0.0000	0.0000	0.00
Chillies		370	0.0000	0.0000	0.00
Fallow		000	0.0000	0.0000	0.00
Sub total	463.67		2.59	4.890	4.89
Grand Total (I + II + III)	659.67		3.97	7.48	7.48
IV 2nd Crop					
1. Paddy	75.000	231	0.173	0.33	0.33
2. Groundnut	40.000	467	0.187	0.35	0.35
3. Pulses	0.000	382	0.00	0.00	0.00
Total	115.00		0.36	0.68	0.68
Great Grand Total	774.67		4.33	8.16	8.16

Water potential

Surface water potential (Mcum)	32.01
Ground water potential (Mcum)	32.82
Total potential in (Mcum)	64.83

Water demand without project

Domestic (Mcum)	1.52
Livestock (Mcum)	4.39
Industrial (Mcum)	0.94
Irrigation (WRO) (Mcum)	8.16
PU&GW	13.76
Total water demand (Mcum)	28.77

Water balance **36.06 Mcum**

1.2.14 CROP WATER REQUIREMENT (WITH PROJECT)

Name of crop	Area in Ha	Crop water requirement in mm	Total water requirement in Mcm	Crop Irrigation water requirement at source Eff.= 56%	Total irrigation requirement in Mcum
I Perennial crop					
1 Citronella	240.000	550	1.320	2.36	2.36
Sub total	240.000		1.320	2.36	2.36
II Annual crops					
1 Sugarcane	75.000	951	0.713	1.27	1.27
2 Topioco	42.000	538	0.226	0.40	0.40
Sub total	117.000		0.94	1.68	1.68
III 1st crop					
1 Paddy –SRI	349.300	428	1.496	2.67	2.67
2. Maize	65.000	329	0.214	0.38	0.38
3. Pulses	45.000	300	0.135	0.24	0.24
4. Sunflower	70.000	440	0.308	0.55	0.55
5. Cotton	0.000	442	0.000	0.00	0.00
6. Groundnut	156.865	467	0.733	1.31	1.31
7. Fodder cholam	75.000	300	0.225	0.40	0.40
8. Vegetables					
Tomato	33.000	315	0.104	0.19	0.19
Bendhi	30.000	462	0.139	0.25	0.25
Brinjal	20.000	464	0.093	0.17	0.17
Chillies	12.380	370	0.046	0.08	0.08
Fallow					
Sub total	856.55		3.490	6.24	6.24
Grand Total (I + II + III)	1213.55		5.75	10.27	10.27
IV 2nd Crop					
1. Paddy-SRI	210.700	162	0.341	0.61	0.61
2. Groundnut	170.000	467	0.794	1.42	1.42
3. Pulses	60.000	382	0.229	0.41	0.41
Total	440.70		1.36	2.44	2.44
Great Grand Total	1654.25		7.11	12.71	12.71

Water potential

Surface water potential (Mcum)	32.01
Ground water potential (Mcum)	32.82
Total potential in (Mcum)	64.83

Water demand without project

Domestic (Mcum)	1.52
Livestock (Mcum)	4.39
Industrial (Mcum)	0.94
Irrigation (WRO) (Mcum)	12.71
PU &GW	13.76
Total water demand (Mcum)	33.32

Water balance 31.51 Mcum



1.3 HYDRAULICS OF THE COMPONENTS

PAMBANAR AND VARATTAR SUB BASIN

HYDRAULIC PARTICULARS OF ANICUT

Sl.No	Name of Anicut	Village	Ayacut	Length of Anicut(M)	Crest level of Anicut (M)	Front (M)	Free Sq.km	Comb ined Sq.km	Maximum flood discharge Cumecs/ Cusecs	Head sluice Location	Vent(M)	Sill Level sluice (M)	Discharge cusecs	Length (m)	Bed width (M)	FSD (M)	Bed slope	Sluice	Remarks
	<u>PAMBANAR</u>																		
1	Bheemarapatti	Beemarapatti	20500	25.90	29.200		46.31	46.31	3420	1 No Left	0.3 x 0.3	28.450	1.52	457	1.2	0.3	1:1500		
2	Mudalaimadai	Malayanoor Chekaday	0.970	52.73	264.57	265.49	13.57	72.00	3790	1 No Right	0.75 x 0.9	263.820	4.45	1800	1.8	0.45	1:1700		
3	Malayanoor Chekaday	Malaiyanur Chekkaday	161.960	37.8	240.67	-	12.12	84.18	4174	1 No Right	1.05 x 0.45	240.070	11	5275	2.50	0.45	1: 1500		
4	Reddiyapalayam	Malayanoor Chekaday	49.180	83.00	30.50	-	6.14	90.31	4318	1 No Right`	1.2 x 0.90	29.870	3.65	3000	2.00	0.30	1:2000		
5	Chinniyampettai	Chinniyampettai	47.380	143.30	30.50	-	12.74	103.06	4760	1 No Right	0.90 x 0.45	29.870	3.51	2500 m	2.00	0.5	1:2000		
6	Thanipadi	Thanipadi	106.045	126.8	210.13	-	86.45	189.51	7582	1 No Right	0.90 x 0.45	209.280	7.42	1200	2.00	0.45	1:1500		
7	T. Velur Anicut	T. Velur	52.680	128.02	28.93	-	22.66	212.17	7683	1 No Left	0.90 x 0.45	28.330	3.90	3660	1.80	0.50	1 : 1500		
8	Andapattu	Andapattu	26.550	63.0	30.63	-	18.21	230.38	8078	1 No Left	0.90 x 0.45	29.880	2.00	1200	1.20	0.45	1:1500		
9	Thandavarayan	Malamajanur	30.235	32.5	187.42	-	24.19	254.57	8658	1 No Right	0.90 x 0.90	186.670	2.24	2200	1.2	0.45	1:2000		
10	Appunaikanpalaym	Narayanakuppam	36.225	47.25	30.50	-	22.04	276.63	9127	1 No Right	0.45 x 0.90	29.750	2.69	900	1.20	0.50	1:1500		
11	Narayanakuppam	Narayanakuppam	84.975	35.08	100.00	-	28.57	305.18	9768	1 No Right	0.45 x 0.90	99.250	5.30	940	1.20	0.30	1 in 1500		
12	Thiruvadathanur	Thiruvadathanur	67.495	52.40	100.00	-	96.53	401.71	12032	1 NoLeft	0.90 x 0.60	99.400	5.00	2050	1.50	0.45	1 in 2000		
13	PuthurChekkady	Puthur Chekkady	22.875	68.72	161.68	-	56.75	458.46	12879	1 No Right	0.90 x 0.30	160.930	1.71	4600	1.50	0.45	1 in 2000		
	<u>VARATTAR</u>																		
14	Athipadi	Puliampatti	46.260	19.00	30.50	-	46.18	46.18	3413	1 No Left	0.75 x 0.30	29.900	3.42	2500	2.00	0.30	1 in 2000		
15	Murugesanar	Sornanampatti	72.625	39.50	30.50	-	21.39	67.57	3716	1 No Right	0.90 x 0.30	29.900	5.39	1500	2.00	0.45	1 in 1500		
16	Keeranur	Chinnaiyanpettai	2.035	33.55	209.23	-	13.29	80.86	4078	1 No Right	0.30x 1.05	208.480	0.16	915	2.00	0.30	1 in 2000		
17	Varattar	Bondai Village	120.980	33.55	208.85	-	12.80	93.65	4482	1 No Left	0.60 x 1.10	208.250	8.96	2100	2.40	0.25	1 in 2000		
18	Bondai	Bondai	19.755	42.70	30.50	-	83.79	175.45	7216	1 No Right	0.70 x 0.30	29.900	1.47	1700	1.20	0.30	1 in 1700		
19	Narayanakuppam	Narayanakuppam	32.390	59.00	30.50	-	46.65	222.09	8062	1 No Left	0.90 x 0.30	29.900	2.20	1500	1.20	0.30	1 in 1500		
20	Aruvangadu	Puthur Chekkady	57.885	30.00	30.50	-	33.15	33.15	2736	1 No Right	0.70 x 0.30	29.900	4.28	3750	1.50	0.30	1 in 2000		

DIVISION : S.P.DIVISION (IAMWARM)
TIRUVANNAMALAI
DISTRICT : TIRUVANNAMALAI
TALUK : THANDARAMPATTU

HYDRAULIC PARTICULARS OF TANKS

Sl. No	District	Taluk	Name of Tank	Ayacut in Ha	Capacity in m cum	Number of Fillings	Free catchment in Sq.Km	Combined Catchment in Sq.Km	Water spread area(Sq.Km)	FTL in M	MWL in M	No.of Sluices	Nos and Length of weir (m)		Discharge in Cusecs	Length of bund (M)	Upper Tank	Lower Tank
													Nos	Length in m				
2			SYSTEM TANK Vijayappanur Tank	18.20.0	0.280	2	1.18	8.15	0.35	100.000	100.600	1	1	12.50	858	650	-	-
1.			NON - SYSTEM TANKS Mudalaimadai Tank	59.060	0.889	2	2.39	-	1	100.000	100.600	2	2	16.50 18.50	894	860	Pambaranar	Mudalamadai Sitheri
3.			Puthur Chekkadi Tank	77.285	0.751	2	2.37	2.37	0.94	100.000	100.600	1	1	10.60	459	1300	-	-

4. List of Supply Channels having direct Ayacut :

Sl.No.	Name of Supply Channel	Start Point		End Point		Length in m	Bed Width	Bed Slope	Side slope	MFD	Depth of Flow	Remarks
		Location	Sill Level	Location	Sill Level							
	<u>PAMBANAR</u>											
1.	Bheemarapatti	1 L	28.450	1 L	28.150	457	1.20	1:1500	1:1	0.60	0.30	
2.	Mudalaimadai	1R	263.820	1R	262.760	1800	1.80	1:1700	1:1	0.75	0.30	
3.	Malayanur Chekkady	1R	240.070	1R	236.550	5275	2.50	1:1500	1:1	0.75	0.30	
4.	Reddiyarpalayam	1R	29.870	1R	28.370	3000	2.00	1:2000	1:1	0.60	0.30	
5.	Chinnaiyanpettai	1R	29.870	1R	28.620	2500	2.00	1:2000	1:1	0.75	0.30	
6.	Tanipadi	1R	209.280	1R	208.480	1200	2.00	1:1500	1:1	0.75	0.30	
7.	T.Vellore	1L	28.330	1L	25.890	3660	1.80	1:1500	1:1	0.75	0.30	
8.	Anadapattu	1R	28.880	1R	28.080	1200	1.20	1:1500	1:1	0.75	0.30	
9.	Thandavarayan	1R	186.670	1R	185.570	2200	1.20	1:2000	1:1	0.75	0.30	
10.	Appunayakkanpalayam	1L	29.750	1L	29.150	2450	1.20	1:1500	1:1	0.75	0.30	
11.	Narayanakuppam	1R	99.250	1R	98.620	940	1.20	1:1500	1:1	0.60	0.30	
12.	Thiruvadathanur	1L	99.400	1L	98.370	2050	1.50	1:2000	1:1	0.75	0.30	
13.	PutthurChekkady	1L	160.930	1L	158.630	4600	1.50	1:2000	1:1	0.75	0.30	
	<u>VARATTAR</u>											
1.	Athipadi	1L	29.900	1L	28.650	2500	.2.00	1:2000	1:1	0.75	0.30	
2.	Murugesanar	1R	29.900	1R	28.900	1500	2.00	1:1500	1:1	0.75	0.30	
3.	Keeranur	1L	208.480	1L	208.020	915	2.00	1:2000	1:1	0.75	0.30	
4.	Varattar	1L	208.250	1L	207.200	2100	2.40	1:2000	1:1	0.75	0.30	
5.	Bondai	1R	29.900	1R	28.900	1700	1.20	1:1700	1:1	0.60	0.30	
6.	Narayanakuppam	1R	29.900	1R	28.900	1500	1.20	1:1500	1:1	0.60	0.30	
7.	Aruvanguadu	1R	29.900	1R	28.025	3750	1.50	1:2000	1:1	0.60	0.30	



1.4 PARTICIPATORY IRRIGATION MANAGEMENT (PIM)

1.1 SALIENT FEATURES OF IMPLEMENTATION OF PIM IN PAMBANAR AND

VARATTAR SUB-BASIN

1. **The Sub-Basin:** This is one of the Eighteen sub-basins of the Pennaiyar River Basin. Totally 3 irrigation tanks, 20 Anicuts are under the control of Water Resources Organization (WRO) of Public Works Department (PWD) in this sub-basin. The list of Infrastructures covered with more details is furnished in the **Annexure -1**. These Infrastructures are located within the Sub-Basin's hydraulic boundary spread over 34 villages of 1 Taluk in Tiruvannamalai District. The Total Command area under these Infrastructures works out to 1213.54.5 Ha. **(Annexure1)**.

2. Command area :

System tanks	: 18.20.0 Ha
Non system tanks	: 136.34.5 Ha
Anicuts	:1059.00.0 Ha
Total	:1213.54.5 Ha

3. An Assessment of number of WUAs.

1.	Associates proposed to be formed under IAMWARM Project covering 2 tanks, 20 Anicuts in 34 Villages only.	9 Nos. (1195.34.5) Hectare.
2.	The Total command area covered by the above (9) WUAs works out to	1195.34.5 Hectare.
3.	More details about formation of WUA's in the Sub-Basin are made available in the Annexure-1	

4. An account of “Awareness creation” among the farming community:

Activities undertaken and “Walkthrough Survey” carried out:

- i) There are 3 Tanks, 20 Anicuts in the Sub-Basin spread over 34 villages as detailed out in Annexure –01. All these Villages were visited by the WRO officials and awareness about various activities, contemplated under IAMWARM project has been created.
- ii) Details of villages covered, walkthrough surveys conducted, farmers attended, list of works suggested by the farmers, list of works analyzed and finalized by WRO officials, are all furnished in the Annexure -02 and Annexure -03:

5. Schedule for completion of delineation and preparation for WUA documents, comprising of :

- i) Form – I : Details to be notified by Districted Collectors (End of March -09)
- ii) Form – II :WUA document to be notified by District Collectors (End of April – 09)
- iii) Completion of preparatory works for the conduct of Elections for WUAs (End of May -09)

6. Schedule for conduct of Elections in the Sub-Basin for forming Management Committees (End of July – 2009)

7. Support Organization (SOs).

- i) Initiating and completing the process of publishing EOI to hire Support Organisation at Sub-Basin level (End of Feb'2009)
- ii) Short listing and Providing Request for Proposals (RFPs) p all the short listed agencies, and obtaining Technical and Cost Proposals (Middle of April'2009)
- iii) Selection and deployment of Support Organization to the Sub-Basin (End of May'2009)

8. Appointment and the Role of Competent Authorities:

- i) Section 26 of the Tamil Nadu Farmer’s Management of Irrigation Systems (TNFMIS) Act provides for the appointment of “Competent Authorities” to assist the respective Organisation (WUA, Distributory Committee and Project Committee), in the Implementation and execution of all decisions taken by such farmers organization. Similarly, every farmer’s organization shall extend such co-operation or assistance, as may be required by the competent

Authority, for carrying out all the tasks related to implementation of TNFMIS Act.

- ii) Appointment of Competent Authorities for the WUAs proposed to be formed under IAMWARM project is based on the “WRO section Officer wise” distribution as indicated below.

Name of the WRO Sub Divisional Officers working in the Pambanar and Varattar Sub-Basin:

- a. Special Project Sub Division- I, II & III WUAs 1 to 9

a.	Junior Engineer, Section 1,SP Sub Division I	WUAs 1 & 2
b.	Junior Engineer, Section 2,SP Sub Division I	WUA 3
c.	Assistant Engineer, Sec. 3,SP Sub Division I	WUA 4
d.	Junior Engineer, Section 4,SP Sub Division I	WUA 5
e.	Assistant Engineer, Sec.1,SP Sub Division II	WUA 6
f.	Assistant Engineer, Sec.3,SP Sub Division II	WUA 7
g.	Assistant Engineer, Sec.4,SP Sub Division II	WUA 8
h.	Junior Engineer, Section 2,SP Sub Division III	WUA 9
j.	Junior Engineer, Irrigation Section, Sankarapuram	WUA 10

9. Involvement of farmers in the preparation “Scheme Modernization Plans”.

- i) Based on the outcome of the “Awareness Creation Programme” and walkthrough survey carried out with the involvement of farmers, a list of tasks proposed to be taken up for “Modernization” under IAMWARM Project was discussed with 380 No. of farmers from 34 Villages. The final list of tasks was also prepared and exhibited in the Notice Board of the Village Administrative Officers Office and Panchayat Office. These details were also discussed with the farmers and the tasks to be taken up under scheme modernization finalized on 10.09.2008
- ii) During the meeting, the farmers present were also informed that soon after finalization of contract for carrying out “Modernization of Irrigation Systems” a

“Notice Board” with the details about the nature of works, its cost, period of contract and Name of the contractor will all be fixed at the site of work, as well as the Executive Engineer of WRO, who has been designated as the Nodal Officer for the Sub-Basin concerned.

- iii) The field Officers of WRO are all aware of the problems in handing over the operation and maintenance responsibilities to the farmers concerned, if the tasks as desired by the farmers in the command area are not included in the modernization of the system and also in case, some of the tasks already included and planned are not implemented due to some reasons or other.
- iv) The WRO officers were also informed that they are personally responsible for handing over the irrigation systems, under IAMWARM Project.

10. Current status of Recovery of water charges :

- i) An enquiry conducted with the “Village Administrative Officers” (VAOs) of randomly selected villages (10 numbers out of 34 Villages) located within the Sub-Basin the normal water charges recovery as informed by the VAO, works out to 40-50% only, about the expected percentage of 80-90%.
- ii) With the proposal to form new WUAs under IAMWARM in “Pambanar and varattar Sub-Basin” the Managing Committee will be trained to take up the responsibility of improving the water charges recovery percentage. These will be followed up, after completing the modernization tasks and handing over of the O & M responsibilities to WUAs.

11. “Capacity Building” of the WUA farmers:

- i) The “Support Organization Group” will prepare “Training Modules” required for building the capacity of the WUA farmers, based on a “Training Needs” Analysis. They will also organize various “Capacity Building” programs at suitable locations within the Sub-Basin command area, to benefit the farmers of the WUAs in the Sub-Basin.
- ii) The “Support Organization” will also arrange for organization the “Study Tours” both within and outside the state to enhance their knowledge and experiences which will help them to improve the crop productivity and thereby the farmer’s income.
- iii) The support Organization will also conduct necessary “Awareness programme” and impart training to educate the farmers of the WUAs in all aspects of the

TNFMIS Act, TNFMS Rules and Election procedures for constituting the “Managing Committee” of the WUAs.

- 12.** The “Component Authorities” appointed for the Sub-Basin will also be trained to effectively to interact with WUA farmers and maintain good report and relationship with the farming community in the Sub-Basin.

Annexure: 1

AN ASSESSMENT OF COMMAND AREA AND WUAs UNDER THE CONTROL OF WRO OF PWD IN PAMBANAR AND VARATTAR SUB - BASIN

WUA No	Name of Irrigation Systems and Tanks	Command Area in (Ha)	Location of the Command Area			Coverage of Command area under different projects (Ha)		Status of formation of WUAs in the Sub-Basin	
			Villages	Taluk	District	WRCP and Others	IAMWARM	Formed under WRCP	To be formed under IAMWARM
WUA - 1	Athipadi Anicut, Keeranur anicut, Murugesanar Anicut	120.92.0	Keeranur, Athipadi, Puliampatti	Tandarampattu	Tiruvannamalai	-	120.92.0	-	Yes
WUA - 2	Varattar Anicut	120.98.0	Thanipadi	Tandarampattu	Tiruvannamalai	-	120.98.0	-	Yes
WUA - 3	Pudhur chekkadi Eri, Aruvangadu Anicut	135.17.0	Pudhur chekkadi, Aruvangadu	Tandarampattu	Tiruvannamalai	-	135.17.0	-	Yes
WUA - 4	Bondai Anicut, Narayanakuppam (Varattar) Anicut	52.14.50	Bondai, Narayanakuppam	Tandarampattu	Tiruvannamalai	-	52.14.50	-	Yes
WUA - 5	Beemarpatti Anicut, Mudalamadai Anicut, Mudalamadai Eri,	80.53.0	Beemarpatti, Mudalamadai, Malayanur Chekkadi	Tandarampattu	Tiruvannamalai	-	80.53.0	-	Yes
WUA - 6	Malayanur Chekkadi Anicut	161.96.0	Malayanur Chekkadi	Tandarampattu	Tiruvannamalai	-	161.96.0	-	Yes
WUA	Reddiyarpalayam	202.60.5	Reddiyarpalayam,	Tandarampattu	Tiruvannamalai	-	202.60.5	-	Yes

- 7	Anicut, Chiniyampettai Anicut, Thanipadi Anicut		Chiniyampettai, Thanipadi						
WUA - 8	T.Velur Anicut, Andapattu Anicut, Thandavarayan Anicut, Appunayakkanpalayam Anicut	145.69.0	T.Velur , Malamanjanur pudhur, Andapattu , Appunayakkanpalayam	Tandarampattu	Tiruvannamalai	-	145.69.0	-	Yes
WUA - 9	Narayanakuppam Anicut, Thiruvadathanur Anicut, Puttur chekkadi Anicut	175.34.5	Narayanakuppam, Thiruvadathanur, Puttur chekkadi	Tandarampattu	Tiruvannamalai	-	175.34.5	-	Yes
WUA - 10	Vijappanur Tank	18.2.0.0	Vijappanur	Tandarampattu	Tiruvannamalai	18.20.0	-	Yes	-
		1213.54.5				18.20.0	1195.34.5		

ABSTRACT

1.	Command Area already covered under WRCP and other Project / Schemes	18.20 Ha.
2.	Command Area proposed to be covered under IAMWARM Project	1195.34.5 Ha.
3.	Total command area controlled by WRO of PWD in the Sub Basin	1213.54.5 Hectares
4.	Total No. of WUAs already formed under WRCP	1 Nos
5.	Total No. of WUAs proposed to be formed under IAMWARM	9 Nos.
6.	Total No. of WUAs that will cover the entire Sub-Basin	10Nos.

Annexure: 2

Details of "Awareness Creation Activities and Walk - Through Surveys"

Sl. No	Date of Visit	Names if the Villages Visited	Awareness Programme (No.of farmers attended) (Prepare the list of farmers with acknowledgement seperately and attach)	Walk - Through Survey (No.of farmers Participated) (Prepare the list of farmers with acknowledgement seperately and attach)	Remarks
(1)	(2)	(3)	(4)	(5)	(6)
1	10.9.08	<p><u>Team A</u> Beemarpatti, Chinnavlasai,.Periyavalasai, Athipady, Kurukkalampur, Mettupalayam, Malaiyanur chekkady, Mothakkal, Melpachar, Kilpachar, Reddiyarpalayam, Tanipadi, Chinnaiyanpettai, Andapattu, T.Vellore, Mottur, Malamanjanur,</p> <p><u>Team B</u> Narayanakuppam, Appunayakkanpalayam, Thiruvadatnanur, Pthur chekkady, Edathanur, Bondai, Aruvanguadu, Kalnattur pudur, Pudur chekkady, Athipadi, Puliampatti, Udayarkuppam, Sornalampatti, Jambodai, Neerkunni, Sagayapuram, Keeranur,</p>	25	4	
2	16.12.2008	Reddiyarpalayam, Beemarpatti, Chinnavlasai,.Periyavalasai, Athipady, Kurukkalampur, Mettupalayam, Malaiyanur chekkady, Mothakkal, Melpachar, Kilpachar, Reddiyarpalayam, Tanipadi, Chinnaiyanpettai	32	7	
3	17.12.08	Narayanakuppam, Andapattu, T.Vellore, Mottur,	58	10	

		Malamanjanur, Appunayakkanpalayam, Thiruvadatnanur, Pthur chekkady, Edathanur, Bondai,			
4	19.12.08	Kalnattur pudur, Aruvangadu, Kalnattur pudur, Pudur chekkady, Athipadi, Puliampatti, Udayarkuppam, Sornalampatti, Jambodai, Neerkunni, Sagayapuram, Keeranur,	55	9	

Annexure - 03

Details of Modernisation works as suggested by the Farmers and as finalized by the officials of WRO

Sl.No	Date of Visit	Names of the villages visited	Outcome of walk through survey and discussions with farmers		
			Works Suggested by Farmers	Works finalised by WRO Officials	Remarks
1	10.09.2008 Team A	Beemrapatti, Chinnavalasai, Periyavalasai, Athipadi, Kurkalampur, Mettipalayam, Malaiyanur Chekkady, Mothakkal, Melpachar, Kelpachar, Reddiyarpalayam, Thanipadi, Chinniampettai, Andapattu, T.Vellore, Vepur Chekkady, Mottur, Malamanjanur	<ol style="list-style-type: none"> 1. Lining of Cement Concrete to Supply Channel 2. Replacing and repairing to the Shutters 3. Construction of Head Sluice 4. Forming of Flood bank for arresting Erosion 5. Supply channel crossing with Culvert 6. Approach road to Anicut 	Rehabilitation and repairs to Anicut and supply channel included	Generally Full length of supply channel need not be lined. Only lining over Retaining wall is to be provided wherever necessary.
2	10.09.2008 Team B. Photo No.1	Narayanakuppam, Appunayakkanpalayam, Thiruvadathanur, Puthur Chekkady, Rayandapuram, Edathur, Bondai, Arangadu, Puthur Chekkady, Athipadi, Puliampatti, Udaiyarkuppam,	<ol style="list-style-type: none"> 1. Lining of Cement Concrete to Supply Channel 2. Replacing and repairing to the Shutters 3. Construction of Head Sluice 4. Forming of Flood bank for arresting Erosion 5. Supply channel crossing with Culvert 	Rehabilitation and repairs to Anicut and supply channel included	Generally Full length of supply channel need not be lined. Only lining over Retaining wall is to be provided wherever necessary.

		Sornampatti, Jambodai, Neerkunni, Sagajapuram, Keeranur.	6. Approach road to Anicut		
3	16.12.2008 Photo No. 2	Reddiyarpalayam, Beemarpatti, Sinnavalasai, Peryavalasai, Ahipadi, Kurukampalayam, Mettupalayam, Malayanur chekkady, Mothakkal, Melpachar, Kilpachar, Chinnaiyampettai, Thanipadi	1. Lining of Cement Concrete to Supply Channel 2. Replacing and repairing to the Shutters 3. Construction of Head Sluice 4. Forming of Flood bank for arresting Erosion 5. Supply channel crossing with Culvert 6. Approach road to Anicut	Rehabilitation and repairs to Anicut and supply channel included	Generally Full length of supply channel need not be lined. Only lining over Retaining wall is to be provided wherever necessary.

Sl.No	Date of Visit	Names of the villages visited	Outcome of walk through survey and discussions with farmers		
			Works Suggested by Farmers	Works finalised by WRO Officials	Remarks
4	17.12.2008 Photo No.3	Narayakuppam, Andapattu, T.veellore, Veppur chekkady, Mottur, Malamanjanur, Appunayakkanpalayam, Thirvadathanur, Puthur chekkady, , Edathur, Bondai,	1. Lining of Cement Concrete to Supply Channel 2. Replacing and repairing to the Shutters 3. Construction of Head Sluice 4. Forming of Flood bank for arresting Erosion 5. Supply channel crossing with Culvert 6. Approach road to Anicut	Rehabilitation and repairs to Anicut and supply channel included	Generally Full length of supply channel need not be lined. Only lining over Retaining wall is to be provided wherever necessary.
5.	19.12.2008 Photo No.4	Kalnatupudur, Aruvangadu Pudurchekkady, Puliampatti, Udaiyarkuppam, Sornampatti, Jambodai, Neerkunni, Sagajapuram, Keeranur,	1. Lining of Cement Concrete to Supply Channel 2. Replacing and repairing to the Shutters 3. Construction of Head Sluice 4. Forming of Flood bank for arresting Erosion 5. Supply channel crossing with Culvert 6. Approach road to Anicut	Rehabilitation and repairs to Anicut and supply channel included	Generally Full length of supply channel need not be lined. Only lining over Retaining wall is to be provided wherever necessary.

STATEMENT WITH DETAILS OF DATE OF WALK THROUGH SURVEY, LOCATION, FARMERS REQUEST, TECHNICAL SOLUTION, PROPOSED IN THE PLAN

Sl. No	Walk Through Survey		Farmers request	Technical Solution			
	Date	Location		WRO	Agriculture	TNAU	Horti culture
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1	10.09.2008 Team A	Beemarapatti, Chinnavalasai, Periyavalasai, Athipadi, Kurkalampur, Mettupalayam, Malaiyanur Chekkady, Mothakkal, Melpachar, Kelpachar, Reddiarpalayam, Thanipadi, Chinnampettai, Andapattu, T.Velur, Vepur Chekkady, Mottur, Malamanjanur	Lining of Cement Concrete to Supply Channel , Replacing and repairing to the Shutters Construction of Head Sluice, Forming of Flood bank for arresting Erosion , Supply channel crossing with Culvert, Approach road to Anicut, Conducting demonstration in farmers field, requesting hybrid vegetables seeds, Citronella grass with all inputs 100 % subsidy, harvester for Citronella grass, quality checking laboratories for Geranium content of Citronella grass, requesting for SIS, DIS, FP and FM, Green Fodder Seeds and Low yield in milk cows , FCO3 development, Fodder maize, construction of drying yards, technical guidance	Rehabilitation and repairs to Anicut and supply channel included	SRI 2 Maize Sunflower	SRI, Introduction of Alternate crops	Introduction of crop diversification with less water consuming horticultural crops
2	10.09.2008 Team B	Narayanakuppam, Appunayakkanpalayam, Thiruvadathanur, Puthur Chekkady, Rayandapuram, Edathur, Bondai, Arangadu, Puthur Chekkady, Athipadi, Puliampatti, Udaiyarkuppam, Sornampatti, Jambodai, Neerkunni, Sagajapuram, Keeranur,	Head Sluice, Forming of Flood bank for arresting Erosion , Supply channel crossing with Culvert, Preparation of field for vegetables, Conducting demonstration in farmers field, requesting hybrid vegetables seeds, Citronella grass with all inputs, harvester for Citronella grass, quality checking laboratories for Geranium content of Citronella grass, requesting for SIS, DIS, FP and FM, Green Fodder Seeds and Low yield in milk cows , Infertility in cows , FCO3 development, Fodder comdu napier, construction of drying yards, technical guidance.	Rehabilitation and repairs to Anicut and supply channel included	SRI 2 Maize Vegetables	SRI, Introduction of latest technologies in Sugarcane	Introduction of crop diversification with less water consuming horticultural crops
3	16.12.2008	Reddiarpalayam, Chinnaiyam pettai, Beemarapatti, Sinnavalasai, Peryavalasai, Ahipadi, Kurukampalayam, Mettupalayam, Malayanur chekkady, Mothakkal, Melpachar, Kilpachar,	Head Sluice, Forming of Flood bank for arresting Erosion , Supply channel crossing with Culvert, Approach road to Anicut, Conducting demonstration in farmers field, requesting hybrid vegetables seeds, Citronella grass with all inputs 100 % subsidy, harvester for Citronella grass, quality checking laboratories for Geranium content of Citronella grass, requesting for SIS, DIS, FP and FM, Green Fodder Seeds and Low yield in milk cows , Infertility in cows, Fodder comdu napier, construction of drying yards, technical guidance, requesting for alternative crops, community group formation, arrangements of buyers and sellers meeting	Rehabilitation and repairs to Anicut and supply channel included	SRI 2 Maize flower	SRI, Technical Guidance for Vegetable cultivation and Lemon grass cultivation techniques.	Introduction of crop diversification with less water consuming horticultural crops

4	17.12.2008	Narayakuppam, Andapattu, T.veellore, Veppur chekkady, Mottur, Malamanjanur, Appunayakkanpalayam, Thirvadathanur, Puthur chekkady, Rayandapuram, Edathur, Bondai,	Head Sluice, Forming of Flood bank for arresting Erosion , Supply channel crossing with Culvert, Approach road to Anicut, Conducting demonstration in farmers field, requesting hybrid vegetables seeds, Citronella grass with all inputs 100 % subsidy, harvester for Citronella grass, quality checking laboratories for Geranium content of Citronella grass, requesting for SIS, DIS, FP and FM, Artificial Insemination, Green Fodder Seeds and Low yield in milk cows, Infertility in cows, Fodder comdu napier, construction of drying yards, technical guidance.	Rehabilitation and repairs to Anicut and supply channel included	SRI 2 Maize Sunflower	Introduction of Alternate crops	Introduction of crop diversification with less water consuming horticultural crops
5.	19.12.2008	Kalnatupudur, Aruvangadu Pudurchekkady, Puliampatti, Udaiyarkuppam, Sornampatti, Jambodai, Neerkunni, Sagajapuram, Keeranur,	Head Sluice, Forming of Flood bank for arresting Erosion , Supply channel crossing with Culvert, Approach road to Anicut, Conducting demonstration in farmers field, requesting hybrid vegetables seeds, Citronella grass with all inputs 100 % subsidy, harvester for Citronella grass, quality checking laboratories for Geranium content of Citronella grass, requesting for SIS, DIS, FP and FM, Artificial Insemination , Green Fodder Seeds and Low yield in milk cows , Infertility in cows, construction of drying yards, technical guidance for enhancing crop production both in quantity and quality.	Rehabilitation and repairs to Anicut and supply channel included	SRI 2 Sunflower	SRI, Supply of inputs and technical guidance	Introduction of crop diversification with less water consuming horticultural crops

				Proposed in the Plan								Remarks
Agri Marketing	Agri. Engg	Fisheries	A.H	WRO	Agriculture	TNAU	Horticulture	Agri Marketing	Agri. Engg	Fisheries	A.H	
(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	
EVS, PET	SIS, DIS, FP, FM	Form ponds proposed in Patta lands	AI, FCO3, FC	1.Improvements to Weir, Sluice and Bund for all system and Non system Tanks 2. Improvements to Anicut, Supply Channels, Shutters, Pipe point, Flood Bank etc.	SRI, Vermicompost, Groundnut, Maize, Pulses, Green manure	SRI, Supply of inputs and technical guidance	Supply hybrid vegetable seeds and other inputs, providing technical guidance	EVS, PET	FP, FM, SIS, DIS	SB, AC, FI	FCO3, FM	1) Generally Full length of supply channel need not be lined. Only lining over Retaining wall is to be provided wherever necessary. 2) 25 % Gap area is to be covered under horticultural crops. 3) 10 % Gap area will be covered on Fodder Development. 4) More formers are willing to put MIS in their field, if 90 % subsidy is given for installing MIS, by which water can be economically used and the saved water could be used to raise crops in the subsequent season.
EVS, PET	SIS, DIS	Form ponds proposed in Patta lands	AI, FCO3, FC	1.Improvements to Weir, Sluice and Bund for all system and Non system Tanks 2. Improvements to Anicut, Supply Channels, Shutters, Pipe point, Flood Bank etc.	SRI, Vermicompost, Groundnut, Maize, Pulses, Green manure	SRI, Supply of inputs and technical guidance	Supply hybrid vegetable seeds and other inputs, providing technical guidance	EVS, PET	FP, FM, SIS, DIS	SB, AC, FI	FCO3, FM	1) Generally Full length of supply channel need not be lined. Only lining over Retaining wall is to be provided wherever necessary. 2) 25 % Gap area is to be covered under horticultural crops. 3) 10 % Gap area will be covered on Fodder Development. 4) More formers are willing to put MIS in their field, if 90 % subsidy is given for installing MIS, by which water can be economically used and the saved water could be used to raise crops in the subsequent season.
EVS, PET	SIS, DIS, FM	Form ponds proposed in Patta lands	AI, FCO3, FC	1.Improvements to Weir, Sluice and Bund for all system and Non system Tanks 2. Improvements to Anicut, Supply Channels, Shutters, Pipe point, Flood Bank etc.	SRI, Vermicompost, Groundnut, Maize, Pulses, Green manure	SRI, Pulses and technical guidance	Supply hybrid vegetable seeds and other inputs, providing technical guidance	EVS, PET	FP, FM, SIS, DIS	SB, AC, FI	FCO3, FM	1) Generally Full length of supply channel need not be lined. Only lining over Retaining wall is to be provided wherever necessary. 2) 25 % Gap area is to be covered under horticultural crops. 3) 10 % Gap area will be covered on Fodder Development. 4) More formers are willing to put MIS in their field, if 90 % subsidy is given for installing MIS, by which water can be

												economically used and the saved water could be used to raise crops in the subsequent season.
EVS, PET	SIS, DIS	Form ponds proposed in Patta lands	AI, FCO3	1.Improvements to Weir, Sluice and Bund for all system and Non system Tanks 2. Improvements to Anicut, Supply Channels, Shutters, Pipe point, Flood Bank etc.	SRI, Vermicompost, Groundnut, Maize, Pulses, Green manure	SRI, Sunflower and technical guidance	Supply hybrid vegetable seeds and other inputs, providing technical guidance	EVS, PET	FP, FM, SIS, DIS	SB, AC, FI	FCO3, FM	1) Generally Full length of supply channel need not be lined. Only lining over Retaining wall is to be provided wherever necessary. 2) 25 % Gap area is to be covered under horticultural crops. 3) 10 % Gap area will be covered on Fodder Development. 4) More formers are willing to put MIS in their field, if 90 % subsidy is given for installing MIS, by which water can be economically used and the saved water could be used to raise crops in the subsequent season.
EVS, PET	SIS, DIS	Form ponds proposed in Patta lands	AI, FCO3, FC	1.Improvements to Weir, Sluice and Bund for all system and Non system Tanks 2. Improvements to Anicut, Supply Channels, Shutters, Pipe point, Flood Bank etc.	SRI, Vermicompost, Groundnut, Maize, Pulses, Green manure	SRI, Pulses, Groundnut and technical guidance	Supply hybrid vegetable seeds and other inputs, providing technical guidance	EVS, PET	FP, FM, SIS, DIS	SB, AC, FI	FCO3, FM	1. Generally Full length of supply channel need not be lined. Only lining over Retaining wall is to be provided wherever necessary. 2. 25 % Gap area is to be covered under horticultural crops. 3) 10 % Gap area will be covered on Fodder Development. 4) More formers are willing to put MIS in their field, if 90 % subsidy is given for installing MIS, by which water can be economically used and the saved water could be used to raise crops in the subsequent season.



1.5 IRRIGATION INFRASTRUCTURE

1. List of Anicuts with details of Villages, Block, Taluk, District, Direct Ayacut Area, Capacity etc :

Sl. No	Anicuts	Village	Block	Taluk	District	Direct Ayacut Area in Ha
1	Beemarapatty anicut	Beemarapatty	Thandarampattu	Thandarampattu	Tiruvannamalai	20.50.0
2	Mudalaimadai anicut	Malayanur Chekkady	Thandarampattu	Thandarampattu	Tiruvannamalai	0.97.0
3	Malayanur chekkadi anicut	Malayanur Chekkady	Thandarampattu	Thandarampattu	Tiruvannamalai	161.96.0
4	Reddiaypalayam anicut	Malayanur Chekkady	Thandarampattu	Thandarampattu	Tiruvannamalai	49.18.0
5	Chinniyampettai anicut	Chinniyampettai	Thandarampattu	Thandarampattu	Tiruvannamalai	47.38.0
6	Thanipadi anicut	Thanipadi	Thandarampattu	Thandarampattu	Tiruvannamalai	106.04.5
7	T.Vellur anicut	T.Vellur	Thandarampattu	Thandarampattu	Tiruvannamalai	52.68.0
8	Andapattu anicut	Andapattu	Thandarampattu	Thandarampattu	Tiruvannamalai	26.55.0
9	Thandavarayan anicut	Thandavarayan	Thandarampattu	Thandarampattu	Tiruvannamalai	30.23.5

10	Appunaickanpalayam anicut	Narayanakuppam	Thandarampattu	Thandarampattu	Tiruvannamalai	36.22.5
11	Narayanakuppam anicut	Narayanakuppam	Thandarampattu	Thandarampattu	Tiruvannamalai	84.97.5
12	Thiravidathanur anicut	Thiravidathanur	Thandarampattu	Thandarampattu	Tiruvannamalai	67.49.5
13	Puthur Chekkady	Puthur Chekkady	Thandarampattu	Thandarampattu	Tiruvannamalai	22.87.5
14	Athipadi anicut	Puthur Chekkady	Thandarampattu	Thandarampattu	Tiruvannamalai	46.26.0
15	Murugesanur anicut	Puthur Chekkady	Thandarampattu	Thandarampattu	Tiruvannamalai	72.62.5
16	Keeranur anicut	Chinniyampettai	Thandarampattu	Thandarampattu	Tiruvannamalai	2.03.5
17	Varattar anicut	Bondai	Thandarampattu	Thandarampattu	Tiruvannamalai	120.98.0
18	Bondai anicut	Bondai	Thandarampattu	Thandarampattu	Tiruvannamalai	19.75.5
19	Narayanakuppam anicut	Narayanakuppam	Thandarampattu	Thandarampattu	Tiruvannamalai	32.39.0
20	Aruvangadu anicut	Aruvangadu	Thandarampattu	Thandarampattu	Tiruvannamalai	57.88.5

2. List of System tanks with details of Villages, Block, Taluk, District, Direct Ayacut Area, Capacity etc :

Sl. No	Tank	Village	Block	Taluk	District	Direct Ayacut Area in Ha	Capacity
1	Vijayappanur tank	Vijayappanur	Thandaram pattu	Thandaram Pattu	Tiruvanna malai	18.20.0	15.75

3. List of Non System tanks with details of Villages, Block, Taluk, District, Direct Ayacut Area, Capacity etc :

Sl. No	Tank	Village	Block	Taluk	District	Direct Ayacut Area in Ha	Capacity M.cft
1	Putthur chekkadi tank	Putthur chekkadi	Thandaram pattu	Thandaram pattu	Tiruvanna malai	77.28.5	37.56.0
2	Mudalaimadai tank	Mudalaimadai	Thandaram pattu	Thandaram pattu	Tiruvanna malai	59.06.0	34.55.0

5. LIST OF SUPPLY CHANNEL

Sl.No.	Name of Supply Channel	Off take point	Length in km	Village	Block	Taluk	District	Direct Ayacut in ha
1.	<u>PAMBANAR</u> Bheemarapatti	Bheemarapatti	0.457	Bheemarapatti	Thandarampattu	Thandarampattu	Tiruvannamalai	20.05.0
2.	Mudalaimadai	Malayanur Chekkady	1.80	Malayanur Chekkady	Thandarampattu	Thandarampattu	Tiruvannamalai	0.97.0
3.	Malayanur Chekkady	Malayanur Chekkady	5.275	Malayanur Chekkady	Thandarampattu	Thandarampattu	Tiruvannamalai	161.96.0
4.	Reddiyarpalayam	Malayanur Chekkady	3.00	Malayanur Chekkady	Thandarampattu	Thandarampattu	Tiruvannamalai	49.18.0
5.	Chinnaiyanpettai	Chinnaiyanpettai	2.50	Chinnaiyanpettai	Thandarampattu	Thandarampattu	Tiruvannamalai	47.38.0
6.	Tanipadi	Tanipadi	1.20	Tanipadi	Thandarampattu	Thandarampattu	Tiruvannamalai	106.04.5
7.	T.Vellore	T.Vellore	3.66	T.Vellore	Thandarampattu	Thandarampattu	Tiruvannamalai	52.68.0
8.	Anadapattu	Anadapattu	1.20	Anadapattu	Thandarampattu	Thandarampattu	Tiruvannamalai	26.55.0
9.	Thandavarayan	Malamanjanur	2.20	Malamanjanur	Thandarampattu	Thandarampattu	Tiruvannamalai	30.23.5
10.	Appunayakkanpalayam	Narayanakuppam	2.45	Narayanakuppam	Thandarampattu	Thandarampattu	Tiruvannamalai	36.22.5
11.	Narayanakuppam	Narayanakuppam	0.94	Narayanakuppam	Thandarampattu	Thandarampattu	Tiruvannamalai	84.97.5
12.	Thiruvadathanur	Thiruvadathanur	2.05	Thiruvadathanur	Thandarampattu	Thandarampattu	Tiruvannamalai	67.49.5
13.	PutthurChekkady	PutthurChekkady	4.60	PutthurChekkady	Thandarampattu	Thandarampattu	Tiruvannamalai	22.82.5

1.	<u>VARATTAR</u> Athipadi	Athipadi	2.50	Athipadi	Thandarampattu	Thandarampattu	Tiruvannamalai	46.26.0
2.	Murugesanar		1.50		Thandarampattu	Thandarampattu	Tiruvannamalai	72.62.5
3.	Keeranur	Chinnaiyanpettai	0.915	Chinnaiyanpettai	Thandarampattu	Thandarampattu	Tiruvannamalai	2.03.5
4.	Varattar	Bondai	2.10	Bondai	Thandarampattu	Thandarampattu	Tiruvannamalai	120.98.0
5.	Bondai	Bondai	1.70	Bondai	Thandarampattu	Thandarampattu	Tiruvannamalai	19.75.5
6.	Narayanakuppam	Narayanakuppam	1.50	Narayanakuppam	Thandarampattu	Thandarampattu	Tiruvannamalai	32.39.0
7.	Aruvangadu		3.75		Thandarampattu	Thandarampattu	Tiruvannamalai	57.88.5

6. List of Supply channels with feeding tanks:

Sl.No.	Anicuts	Supply Channel		Feeding Tanks
		Left	Right	
1	Beemarpatty anicut	Left	-	-
2	Mudalaimadai anicut	-	Right	Mudalaimadai Tank Sitheri Tank
3	Malayanur chekkadi anicut	-	Right	-
4	Reddiarpalayam anicut	Left	-	Sorakampatty Tank Murkkampatty Tank
5	Chinniyampettai anicut	-	Right	Chinniyampettai Tank
6	Thanipadi anicut	-	Right	-
7	T.Vellur anicut	Left	-	Malamanjanur Pudur Tank
8	Andapattu anicut	-	Right	-
9	Thandavarayan anicut	-	Right	-
10	Appunaickanpalayam anicut	Left	-	Appunaickanpalayam Tank
11	Narayanakuppam anicut	-	Right	-
12	Thiruvidadhanur anicut	Left	-	-
13	Puthur Chekkady	-	Right	Rayandapuram tank
14	Athipadi anicut	Left	-	-
15	Murugesanur anicut	-	Right	-
16	Keeranur anicut	Left	-	Keeranur Tank
17	Varattar anicut	Left	-	-
18	Bondai anicut	-	Right	Bondai Tank
19	Narayanakuppam anicut	-	Right	-
20	Aruvangadu anicut	-	Right	Bondai tank

ABSTRACT ON THE DETAILS OF IRRIGATION INFRASTRUCTURE AVAILABLE AND WORKS TAKENUP UNDER IAMWARM PROJECT**Name of Sub Basin:** Pambanar and Varattar

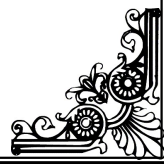
Sl.No.	Details	ANICUT			SYSTEM TANK			NON-SYSTEM TANK			ANY OTHER SUPPLY CHANNEL		REMARKS
		NOS	SUPPLY CHANNEL in KM	DIRECT AYACUT	NOS	SUPPLY CHANNEL in KM	AYACUT	NOS	SUPPLY CHANNEL in KM	AYACUT	LENGTH	DIRECT AYACUT	
1.	Available Infrastructure in sub basin	20	45.31	1059.00.0	1	-	18.20.0	2	0.50	136.34.5	-	-	
2.	Infrastructure excluded in IAMWARM project since works carried out under various schemes from 2000	-	-	-	-	-	-	-	-	-	-	-	
3.	Infrastructure that does not require any rehabilitation works	-	-	-	-	-	-	-	-	-	-	-	-
4.	Works taken up in IAMWARM project	20	45.31	1059.00.0	1	-	18.20.0	2	0.50	136.34.5	-	-	

1. Certified that the Panchayat Union Tanks are not considered in this project

2. Certified that the tanks executed under various schemes (Viz, WRCP I, NABARD, PART II Schemes etc.,) since 2000 were not proposed in this project.



1.6 REHABILITATION OF IRRIGATION INFRASTRUCTURE



1.6 Rehabilitation of Irrigation Infrastructure

1.6 Rehabilitation of Irrigation Infrastructure

1.6.1 Structural Status & Deficiencies in the System

The following are the present structural condition of the Pambanar and Varattar sub-basin system.

1. This system is a old system existing for more than 100 Years as such requires Rehabilitation.
2. Heavy accumulation of silt due to hilly region and contour nature of canal system.
3. Lack of adequate control of regulating structures like Anicuts, Head Sluices, Sand/ scour vents etc.,
4. The damaged (or) dilapidated condition of the existing anicuts, diversion head works etc. and supply channels causes to poor standard of the entire conveyance system.
5. The System and Non system tanks are to be rehabilitated.

Salient Features of Proposals:

In order to improve the conveyance and Operational Efficiency in Irrigation, it is now proposed to improve and modernize the Irrigation Infrastructures in Pambanar and Varattar Sub basin.

1. Repairs and Rehabilitation of 20 nos. of Anicuts.
 - a. Providing Skin wall to leaky body wall of Anicuts.
 - b. Provision for U/S Cut off wall, Apron and D/S Apron.
2. Providing Head sluice for 18 Supply channels except at Reddiyarpalayam and at Puthur chekkadi Anicut supply channels where Head sluice is existed.
3. Desilting and strengthening the bund for 2 Nos. of Non-system tanks and 1 No. of System tank.
4. Desilting the Anicut Supply channels for about 45.81 km.
5. Repairs to 5 Nos. of damaged existing Weir
6. Repairs to 5 Nos. of damaged existing Sluice and Reconstruction of 3 Nos. of sluices
7. Providing Revetment on the sides of Weir and Sluice.
8. Desilting the Supply channels for about 1 km for Pudur chekkadi Eri
9. Providing 23 Nos. S.G. Shutters arrangements to Sluice, Head Sluices and Scour vent.

10. Removing, Repairing and Re-fixing in position of 12 Nos. of existing S.G. Shutters.

1.6.2 Expected Outcome

1. Increase in conveyance efficiency by from 53% to 56 %
2. The present Gap area of 553.87.5 ha. (45.64 %) is to be converted as a fully irrigated area.
3. The following irrigation infrastructure development works are proposed in the sub basin.

Rehabilitation works for 20anicut,

Rehabilitation works for 3 tanks

Rehabilitation of supply channels for 45.81 KM

PAMBANAR AND VARATTAR SUB BASIN

COMPONENTWISE ABSTRACT

SI NO	Name of Tank/Anicut	Standardisation of Bund		Reconstruction of Tank/Anicut Sluice						Repairs to Sluice		Repairs to Anicut/Weir	Supply Channel							Grant Total
		Length in M	Amount	No	Amount	S.G.Shutter			Total Amount	No	Amount		Desilting		Bed bars		Measuring Device		Total Amount	
						No	Size	Amount					Length	Amount	No	Amount	No	Amount		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1	Beemrapaty Anicut			1	0.97	1	0.6x1.0	0.16	1.13			4.02	460	0.31	2	0.04	1	0.14	0.49	5.64
2	Mudalaimadai Anicut			1	0.97	1	0.6x1.0	0.16	1.13			11.71	1800	1.67	8	0.16	1	0.14	1.97	14.81
3	Malayanoorchekkady Anicut			1	0.97	1	0.6x1.0	0.16	1.13			9.83	5280	1.43	27	0.54	1	0.14	2.11	13.07
4	Reddiyarpalayam Anicut											9.24	3000	1.31	16	0.32	1	0.14	1.77	11.01
5	Chinniyampetai Anicut			1	0.97	1	0.6x1.0	0.16	1.13			14.10	2500	2.27	12	0.24	1	0.14	2.65	17.88
6	Thanipadi Anicut			1	0.76	1	0.6x1.0	0.16	0.92			12.64	1200	0.96	6	0.12	1	0.14	1.22	14.78
7	T.Vellur Anicut			1	0.76	1	0.6x1.0	0.16	0.92			12.80	3660	2.79	18	0.36	1	0.14	3.29	17.01
8	Andapatu Anicut			1	0.97	1	0.6x1.0	0.16	1.13			14.90	1200	0.72	7	0.14	1	0.14	1.00	17.03
9	Thandavarayan Anicut			1	0.97	1	0.6x1.0	0.16	1.13			8.42	2200	1.59	8	0.16	1	0.14	1.89	11.44
10	Appunaickanpalayam Anicut			1	0.97	1	0.6x1.0	0.16	1.13			7.52	2450	0.74	11	0.22	1	0.14	1.10	9.75
11	Narayanakuppam Anicut(P)			1	0.97	1	0.6x1.0	0.16	1.13			6.62	940	2.07	4	0.08	1	0.14	2.29	10.04
12	Thiruvidthanur Anicut			1	0.97	1	0.6x1.0	0.16	1.13			14.61	2050	0.57	10	0.20	1	0.14	0.91	16.65
13	Puthurchekkady Anicut											11.68	4600	2.47	23	0.46	1	0.14	3.07	14.75
14	Athipadi Anicut			1	0.97	1	0.6x1.0	0.16	1.13			3.67	2500	1.04	12	0.24	1	0.14	1.42	6.22
15	Murugesanar Anicut			1	0.97	1	0.6x1.0	0.16	1.13			9.08	1500	2.20	19	0.38	1	0.14	2.72	12.93
16	Keeranur Anicut			1	0.97	1	0.6x1.0	0.16	1.13			5.55	920	0.94	4	0.08	1	0.14	1.16	7.84
17	Varatar Anicut			1	0.97	1	0.6x1.0	0.16	1.13			5.65	2100	2.24	13	0.26	1	0.14	2.64	9.42
18	Bondai Anicut			1	0.97	1	0.6x1.0	0.16	1.13			9.10	1700	4.50	8	0.16	1	0.14	4.80	15.03
19	Narayanakuppam Anicut(V)			1	0.97	1	0.6x1.0	0.16	1.13			8.42	1500	0.92	7	0.14	1	0.14	1.20	10.75
20	Aruvanguadu Anicut			1	0.88	1	0.6x1.0	0.16	1.04			8.67	3750	2.54	13	0.36	1	0.14	3.04	12.75
21	Vijappanur Tank	650	3.13	1	2.32	1	0.75x1.0	0.16	2.83			3.65					3	0.36		9.61
22	Mudalaimadai Tank	860	4.48	1	1.99	1	0.75x1.0	0.16	2.36	1	1.13	4.21					2	0.21		12.18

23	Pudurchekkady Eri	1300	5.79	1	3.22	1	0.75x1.0	0.16	3.51			5.20	500	0.51			1	0.13	0.51	15.01
	TOTAL	2810	13.4	21	24.47	21		3.36	28.53	1	1.13	201.29	45810	33.79	233	4.66	26	3.5	41.25	285.6

B. WRO COST TABLE

Sl. No	Description of work	Qty	Amount in Lakhs	Remarks
I. Tank Component				
1	Repairs to Weirs	4Nos	13.06	
2	Improvements to Bund	2.81 km	13.40	
3	Repairs to Sluice	1 Nos	1.13	
4	Reconstruction of Sluice	3 Nos	8.70	
5	Improvements to Supply channel	0.5 km	0.51	
	Sub Total		36.80	
II. Non Tank Component				
1	Improvements to Anicut	20 Nos	188.23	
2	Reconstruction of Sluice	18 Nos	19.83	
3	Improvements to Supply Channel	45.31 km	40.74	
	Sub Total		248.80	
	Sub Total		285.60	285.60
	Environment cell		3.00	3.00
	Ground water		Nil	Nil
	Total			288.60
(Rupees Two Eighty Eight point Six Zero Lakhs only)				

1) Tank component = 36.80 lakhs
 2) Non-Tank component = 248.80 lakhs

Total = 285.60lakhs

C. (PHYSICAL AND FINANCIAL PROGRAM)

Sl. No	Description	I Year		II Year		Total	
		Qty.	Amt. in Lakhs	Qty.	Amt. in Lakhs	Qty.	Amt. in Lakhs
1	Non Tank Component						
a	Improvements to Anicuts	10 Nos	88.23	10 Nos.	100.00	20 Nos	188.23
c	Reconstruction of Sluice	10 Nos	10.88	8 Nos	8.95	18Nos	19.83
f	Improvements to Supply Channels	20.00 Km	21.13	25.31 Km	19.61	45.31Km	40.74
2	Tank Component						
a	Repairs to weir	2 Nos	7.01	2 Nos	6.05	4Nos	13.06
b	Improvements to bund	1400m	6.40	1410 m	7.00	2810 m	13.40
c	Repairs to Sluice	1 Nos	1.13	-	-	1No	1.13
d	Reconstruction of Sluice	2 Nos	5.99	1 Nos	2.71	3 Nos	8.70
d	Improvements to Supply Channel	500 m	0.51	-	-	500 m	0.51
3.	Environment Cell		2.00		1.00		3.00
Total			143.28	Total	145.32		288.60

PACKAGE DETAILS

Sl.No.	Name of Tank / Anicut	Amount in Lac
1.	Beemarpatti Anicut	5.64
2.	Athipadi Anicut	14.81
3.	Murugesanur Anicut	13.07
4.	Aruvangadu Anicut	11.01
5.	Malaiyanur Chekkadi Anicut	17.88
6.	Mudalaimadai Anicut	14.78
7.	Chinnaiyanpettai Anicut	17.01
8.	Keeranur Anicut	17.03
9.	Reddiyarpalayam Anicut	11.44
10.	Tanipadi Anicut	9.75
11.	Varattar Anicut	10.04
12.	Thandavarayan Anicut	16.65
13.	T.Vellore Anicut	14.75
14.	Andapattu Anicut	6.22
15.	Appunayakkanpalayam Anicut	12.93
16.	Narayanakuppam Anicut (Varattar)	7.84
17.	Narayanakuppam Anicut (Pambanar)	9.42
18.	Bondai Anicut	15.03
19.	Thiruvadathanur Anicut	10.75
20.	Putthur Chekkady Anicut	12.75
21.	Mudalaimadi Tank	9.61
22.	Pudhur Chekkady Tank	12.18
23.	Vijayappanur Tank	15.01
	Total	285.60

TANK DETAILS WITH FREE BOARD PROVIDED

NAME OF SUB BASIN: PAMBANAR AND VARATTAR

Sl. No.	Name of the Tank	Maximum Height of Bund (m)	Free Board (m)		Length of Bund (m)
			Provided previously	Provided now	
1.	Mudalaimadai Tank	3.75	0.70	1.50	860
2.	Vijayappanur Tank	2.85	0.60	1.25	650
3.	Puthur Chekkadi Tank	3.20	0.80	1.50	1300

PAMBANAR AND VARATTAR SUB BASIN

Calculation of machineries Requirement

Hydraulic excavator & 10Tippers

6 Hours / Day

672.2 (or) 680
m³ /Day

(10 Nos x 2 loads/ hour x 6 Hr x 5.66 m³/ trip)

For 1 month (20 Working days) 20 x 680 m³ 13600 m³/ month

Total quantity of earth work 13200 m³

Working period for earth work 15 months +3 Months rainy season

Machineries required for earth work:

1. Hydraulic excavator - 6 nos
2. Tippers - (5.66 m³) - 11 nos
3. Power roller (10 T) - 2 nos
4. Vibrated compactor - 2 nos
5. Water lorries - 2 nos

For 8 hours /
day

16 m³ / day

Mixer machine 2 m³ / hour

Total quantity of concrete 7534 m³

Mixer machine required

5Nos for 7 days / month – 15 months

Material conveyance

Tippers

Cement 10 mt / Trip 1 trip / day 10 mt / day

Sand 5.66 m³ / Trip 2 trips / day 11.32m³ /day

Metal / stone 5.60 m³ / Trip 3 trips / day 16.80 m³ /day

Total quantity of cement 2319 mt

Lorry required for conveyance 2319 /10 232 Lorries

Total quantity of steel 375 mt

Lorry required for conveyance 375 /10 38 Lorries

Total quantity of sand 3909 m³

Lorry required for conveyance 3909 /11.20 350 Lorries

Total quantity of metal 6731m³

Lorry required for conveyance 6731 /16.80 401 Lorries

Total quantity of stone 1073 m³

Lorry required for conveyance 1073 /16.80 64 Lorries

Tippers for conveyance of materials

11 Nos for 7 days for 15 months

PAMBANAR AND VARATTAR SUB BASIN - PACKAGE NO 1

FORM II

REQUIREMENT OF EQUIPMENTS AND MATERIALS

PACKAGE NUMBER	EQUIPMENTS REQUIRED IN NUMBERS							MATERIAL REQUIRED						
	HYDRAULIC EXCAVATOR	POWER ROLLER	VIBRATED COMPACTOR	TIPPER / LORRY	WATER LORRY	CONCRETE MIXER MACHINE	CONCRETE VIBRATOR	CEMENT IN M.T.	SAND IN m ³	STEEL IN M.T.	METAL 40MM IN m ³	METAL 20MM IN m ³	Rough Stone IN m ³	FUEL
01/IAMWARM / WRO /PVT /WORKS / I (2008 - 09)	6	2	2	21	2	5	5	2319	3909	375	1018	5713	1073	

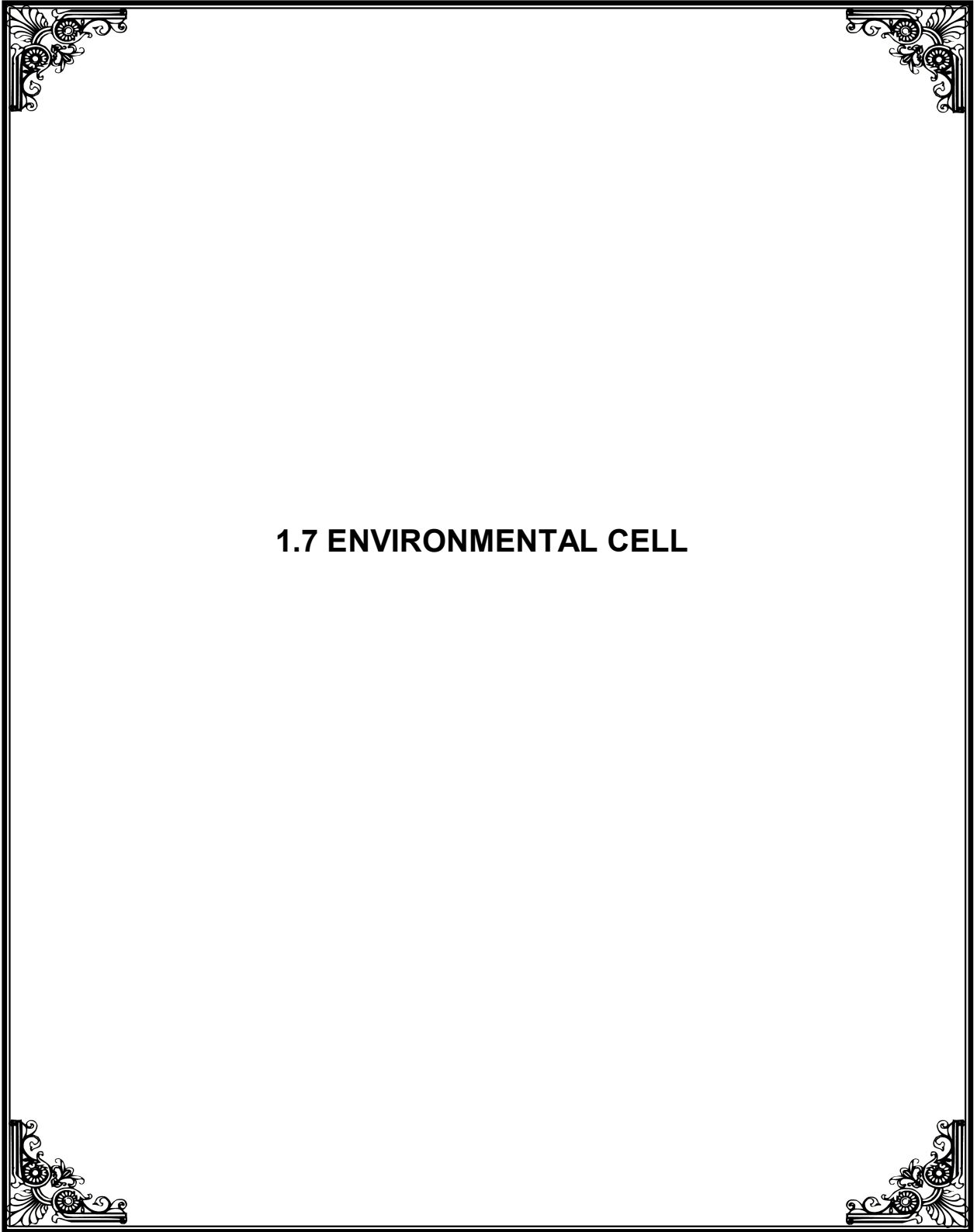
PAMBANAR AND VARATTAR SUB BASIN - PACKAGE I

Construction Methodology

Sl.No.	Description of Item	Working Months									Rainy season			Working Months						Total
		Jan 2010	Feb 2010	Mar 2010	Apr 2010	May 2010	June 2010	July 2010	Aug 2010	Sep 2010	Oct 2010	Nov 2010	Dec 2010	Jan 2011	Feb 2011	Mar 2011	Apr 2011	May 2011	June 2011	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
Earth work excavation																				
1	Channel / River	500	3500	4500	4500	4500	4500	4500	6000	6000				10000	10000	12000	10000	2000	738	83238
2	Foundation	500	500	1000	1000	1500	1500	1500	1000	500				300	200	200	100	47	-	9847
Concrete																				
5	M 7.5 grade	20	60	70	100	100	100	100	120	100				100	75	100	50	50	36	1131
6	M 10 grade	16	16	16	32	30	30	30	50	50				30	50	50	63	53	60	593
7	M 15 grade	-	50	100	120	120	120	120	120	150				130	140	100	100	100	74	1544
8	M 20 grade	130	130	130	260	400	400	400	400	400				320	320	320	320	260	75	4265
9	Rough stone Dry Packing	-	-	-	-	50	70	100	100	100				150	100	100	70	70	65	975

Note:

- 1) The duration of Rainy Season is considered as 3 months only. It generally starts during October and ends during December.
- 2) If the Project commences anywhere between January and May, the Project will have only one Rainy season when the number of working months is considered as 15.
- 3) In the above case, the total Project duration will be 18 months including one Rainy season.



1.7 ENVIRONMENTAL CELL

Report to accompany the estimate for the work of Environmental Component in Detailed Project Report for PAMBANAR-VARATTAR SUB BASIN of Pennaiyar River Basin” under TN – IAMWARM PROJECT

Estimate Amount: Rs 3.00 Lakhs

Under TNWRCP, with World Bank assistance, special emphasis was given for the first time to assess the Environmental Status and degradation caused for all River basins in Tamil Nadu. Soil Assessment study has been conducted by **Environment Protection Training and Research Institute (EPTRI), Hyderabad**. This institute has identified the Environmental issues, mitigatory measures and given their recommendations on the following issues.

- i) Environmental Issues :
 - Soil Erosion, Sand Mining
 - Water Pollution due to Industries
 - Encroachment of river and tank beds
 - Poor solid waste management
- ii) Social Issues:
 - Dry Land Agriculture
 - Reduction in Livestock
 - Women empowerment-SHG's
 - No storing facilities.
 - Health problems due to industrial water pollution
- iii) Mitigatory Measures:
 - Non-judicial and excessive sand mining have to be controlled and regulated.
 - Livestock services delivery and management
 - Common storage facilities may be established
- iv) Agency:
 - The above measures can be improved By the combined working of Environmental Cell wing and Animal Husbandry Department.

The Environmental Cell of WRO assessed the Environmental impact on the quality of Surface and Ground water and Soil by collecting water & soil samples and

testing them, preparation of Micro level Environmental Status Reports for all the River basins with the World Bank assistance for these works up to March 2004.

Also few Awareness programs & workshops were conducted to create Awareness on the Environmental issues & remedies among the public, farmers, Govt. officials and NGOs. Seminars were conducted to find out new techniques and methods developed recently to solve the Environmental problems.

Now under IAMWARM Project, focus is at each Sub Basin level to identify and prioritize the requirements for improvements to storage structures, rehabilitation, new schemes for water harvest, and diversification of crops. Any new schemes or rehabilitation of existing one, consideration of the Environmental issues pertaining to that area and remedial action to overcome the problems is must. Accordingly, Environmental issues prevailing in the Pambanar-Varattar Sub basin is taken up under IAMWARM Project.

PENNAIYAR RIVER

Pennaiyar River originates on the South Eastern slope of Chinnakesava Hills in Karnataka State. The river is called Dakshina Pinakini in Karnataka. The river enters into Tamil Nadu at Sakkarasam palli near Bagalur village of Hosur taluk. The total length of river is 432 Km and out of which 112 Km length of river is in Karnataka State and 320 Km is in Tamil Nadu, it confluences in Bay of Bengal at Cuddalore.

PAMBANAR-VARATTAR SUB-BASIN

This is one of the eighteen sub-basins of the Pennaiyar River Basin, having 3 irrigation tanks, 20 Anicuts under the control of Water Resources Organization (WRO) of Public Works Department (PWD). The Pambanar and Varattar sub basin is located between latitude of 12° 00' 00" to 12° 07' 25" and longitude of 78° 45' 00" E to 78° 55' 20".

Pambanar and Varattar Sub basin has a drainage area of 293.22 Sq.Km. The Taluk covered in the sub basin is Thandarampattu of Tiruvannamalai District. The Pambanar and Varattar Sub Basin has a typical climate, owing to the marginal catchments area in the Western Ghats and extensive major catchments area in plains. It receives an annual average rainfall of 911 mm, with its major share during North-East Monsoon. Pambanar and Varattar Sub Basin enjoys the benefits of mostly North

East monsoon and South West Monsoon. Varattar is the worth mentioning tributary of Pambanar River

ENVIRONMENTAL PROBLEMS:

SOIL EROSION:

Soil erosion causes depletion of fertility through removal of valuable surface soil and lead to reduction in the effective arable soil depth and hence it is one of limiting factors for crop production. As per the Watershed Atlas of Tiruvannamalai District, in some parts of Tiruvannamalai taluk, the soil erosion is reported to be very high.

SAND MINING:

One of the major problem in river basin related to Sand Mining as it poses major threat to River Bed. Sand quarrying for construction and other purposes is growing at an alarming rate which causes failure of Anicuts and Diversion structures, stagnation of water in the deep mined river bed causing consequent health hazards. This needs to be prevented by all means. Now the sand mining has come under the control of WRO. Sand is being collected only at the approved site and the Regular Territorial Division is closely monitoring.

AQUATIC WEEDS :

It is observed that the Aquatic weeds growth Ipomoea locally known as Kadal Palai is found to be in almost 80% of the tanks. The plant growth varies from 40% to 80% in various tanks. In general weeds growth restricts the water storage and loss in capacity of the tanks.

INDUTRIAL POLLUTION:

The effluent from industries located in this sub basin are let into ditches and water drains which ultimately reach the River or supply channels of tanks or lands. Special attention is needed for treating the effluent to avoid water pollution in the sub basin.

CATCHMENT DEGRADATION

The head reaches of the above reservoirs constitute series of hills, valleys and plains. Already heavy silt has been deposited in the reservoir by which capacity has been considerably reduced. In respect of conservation of forest wealth and prevent soil erosion, effective measures were taken up under TamilNadu Aforestation Project

(TAP) by the Forest Department and under the Western gnat development programme by the Agricultural Engineering Department.

SOLID WASTE DISPOSAL:

The problem of Garbage collection and its disposal has assumed importance, in the context of rapid growth of population, urbanization, industrial growth and development. There is no organized scientific method of disposal in all the Municipalities and Panchayats in this sub basin.

At present, in Tiruvannamalai Municipality, solid waste to the tune of 19.20MT per day collected through Lorries and dumped in the compost yard.

SEWAGE DISPOSAL LET INTO WATER BODIES:

Almost all the village no safe disposal of sewage or proper treatment method is adopted. This affect the near by water source directly or affecting the ground water potential indirectly.

So, creating awareness among the Presidents of the local bodies is essential and to motivate them to adapt Solid waste management and Sewage management, wherever required. Workshop including field visits, exclusively for them is to be conducted under the IAMWARM project.

ACTIVITIES PROPOSED:

River Basin Monitoring:-

To monitor the quality of water and soil and create database regarding the environmental status for the sub basin, the following activities are proposed at the sub basin level.

Collection and testing of water and soil samples:

Water samples will be collected and tested in the sub basin at identified sampling points regularly. Continuance of collection and testing of water samples is essential, as good and long range data will enable to understand the problems more precisely.

Hence, it is proposed to collect and test water samples for a period of **Three years** to assess the environmental impact on the quality of surface water of this sub basin more accurately.

In addition to the above identified locations, water samples will also be collected from tanks to estimate the level of pollution in selected locations, where untreated sewage is directly let into tanks and Channels. These samples will be tested, to assess the impact on the quality of surface and ground water.

Soil samples are to be collected from selected locations to assess the impact on the quality of soil due to various Environmental problems like use of chemical fertilizer and using the polluted water. From these locations numbers of samples at regular interval have to be collected and tested to determine precisely the impact on the degradation of the quality of the soil. Therefore testing soil samples are essential. Under this item following provisions have been made.

1 Testing charges for the water & soil samples.

2 Provision of Labour charges, purchase of materials, conveyance, driver salary and computer operator.

Transfer of technical know-how for solid waste management system including source segregation, recycle of dry waste and linkage with user agencies.

Now a new scheme for solid waste management plan is under implementation in all municipalities and Panchayats. Under this scheme, collection tank for disposal and non-disposable garbage have been constructed in most of the local bodies. But recycling the waste and converting the solid waste into manure and production of energy from them are yet to be come up.

Hence demonstration and action programs are planned with user agencies and necessary field visits are programmed to transfer of technical know how for solid waste management system.

Conducting Awareness Programs.

Awareness Programs are necessary to create awareness among the public about environmental aspects and the action to be taken by them to remove or reduce the impacts due to the environmental problems.

Hence, to create and motivate the people, Awareness programmes are to be conducted in the villages where sewage is directly let into water bodies. It is also proposed to conduct awareness meetings in School/ Institutions during the study period of three years covering the following subjects in addition to placing Stickers, tin sheets and Pamphlets containing messages about Environmental Awareness.

- Sanitation. Solid waste treatment.

- Sewage treatment and converting the same into Gas.
- Natural farming.
- Conversion of aquatic weeds into manure etc.

Mode of Execution:

All the works proposed are to be carried out by outsourcing through an Educational Institution.

Total Cost.

The total Proposal cost works out to **Rs.3.00 Lakhs.**
(Rupees Three Lakhs Only).

PWD / WRO
 PLAN FORMULATION WING
 ENVIRONMENTAL CELL DIVISION, CHENNAI
IAMWARM PROJECT
 (ENVIRONMENTAL COMPONENT)

Name of River Basin	Pennaiyar River Basin	
Name of Sub Basin	Pambanar-Varattar Sub-Basin	
Number of WUA	Already fomed:1 No / yet to be formed: 9 Nos.	
Name of Division	Special Project Division, Thiruvannamalai	
Name of Sub-Division	Special Project Sub Division-I, Thiruvannamalai	
	Special Project Sub Division-II,III, Vandavasi	
District	Thiruvanamalai	
Taluk	Thandarampattu	
Block	Thandarampattu	
Name of Tanks & Anicuts under this sub-basin:	List enclosed	
Domestic Sewage (Name of River/ Tank with specific location polluted by Domestic sewage)	Sewage generated are disposed in land & tanks	
Municipal Solid Waste (Name of River/ Tank with specific location where Municipal solid waste is dumped)	Solid waste generated are disposed in land & tanks which may cause ground water pollution.	
Water Quality Status:		
i) Ground Water	Ground water is Moderate to good.	
ii)Surface Water	Water can be utilized for irrugation purpose,however it need treatment before using drinking purpose.	

Assistant Engineer,PWD, WRO,
 Environmental Cell Section-IV(i/c)
 Chepauk, Chennai-5

Asst.Exe. Engineer,PWD, WRO,
 Environmental Cell Sub Division- II
 Chepauk, Chennai-5

Name of Work :

Environmental Activities in Pambanar-Verattar Sub-Basin of Pennaiyar River Basin under
IAMWARM PROJECT

DETAILED ESTIMATE

SI No	Description of work	No	Measurement			Contents
			L	B	D	
I. Environmental Social Monitoring of river basin including peroidal water and soil quality testing and documentation. (By fixing nodel agency any any educational institution)						
1	Collection and testing of water samples and Soil samples					
i)	Water samples collected from river & tanks for a period of Three years					4 Nos
ii)	Soil samples collected from irrigation fields for a period of Three years					3 Nos
iii.)	Hiring jeep driver on service contract basis for the department vehicle	1 No	1 months			1
iv.)	Collection and conveyance charges including all purchases like cans, chemicals, Documentation of test results including labour charges.					LS
II Environmental Social knowledge base analysis and development (By fixing nodel agency any any educational institution)						
a)	Base line Environmental and Social Data Collection including Preparation of Impact Assessment report with expert analysis for 3 yrs @ every 6 months and documentation.					LS
III. Transfer of technical know how for solid waste management system including source segregation, recycle of dry waste and linkage with user agencies. (By fixing nodel agency any any educational institution)						
a)	Motivating the local bodies for Soild waste management project and Sewage treatment plants to prevent pollution of water sources and using for irrigation by transferring technical know how through demonstration Documentary film and Technical visit including herbal garden.	L.S.				L.S.

IV.	Conducting Environmental and social Awareness meeting, programme, demonstration and Exhibitions on various environmental and social related issues including capacity building.(By fixing nodel agency any any educational institution)	
a)	Printing Stickers, Pamphlets, Tin sheets, Providing Banners for Propagating Environmental Awareness among public	LS
b)	Conducting Awareness Programs for Public	LS
c)	Preparing and publishing Environmental Atlas for the Sub Basin for the use of Line departments / Institutions for better Management of Sub basin	LS
d)	Documentation of the entire activities, Videofilms,hire purchase of LCD,Preparation of sub-basin maps of all size & Upgradation of computer and accessories.	LS

Name of Work :							
Environmental Activities in Pambanar-Verattar Sub-Basin of Pennaiyar River Basin under IAMWARM PROJECT							
<u>ABSTRACT ESTIMATE</u>							
S.No	Qty	Description of Work			Rate	Per	Amount
I. Environmental Social Monitoring of river basin including peroidal water and soil quality testing and documentation. (By fixing nodel agency any educational institution)							
a)	4	Nos	Testing charges for Water samples		6000	Each	24000
b)	3	Nos	Testing charges for soil samples from polluted site		6000	Each	18000
c)	1	months	Hiring Jeep driver on service contract basis for the Dept Vehicle@ RS 151.80 /day		4554	month	4554
d)		LS	Collection and conveyance charges including all purchases like cans, bottles,chemicals,Documentation of test results including labour charges.		LS		7500
II	Environmental Social knowledge base analysis and development (By fixing nodel agency any any educational institution)						
a)		LS	Base line Environmental and Social Data Collection including Preparation of Impact Assessment report with expert analysis for 3 yrs @ every 6 months and documentation		LS		130000
III.	Transfer of technical know how for solid waste management system including source segregation, recycle of dry waste and linkage with user agencies. (By fixing nodel agency any educational institution)						

a)	L.S.	Motivating the local bodies for Solid waste management project and Sewage treatment plants to prevent pollution of water sources and using for irrigation by transferring technical know how through demonstration Documentary film and Technical visit including herbal garden.	LS	10000	
IV.	Conducting Environmental and social Awareness meeting, programme, demonstration and Exhibitions on various environmental and social related issues including capacity building. (By fixing nodal agency)				
a)	LS	Printing Stickers, Pamphlets, Tin sheets, Providing Banners for Propagating Environmental Awareness among public	LS	5000	
b)	LS	Conducting Awareness Programs for Public	LS	75000	
c)	LS	Preparing and publishing Environmental Atlas for the Sub Basin for the use of Line departments / Institutions for better Management of Sub basin	LS	18000	
d)	LS	Documentation of the entire activities, Videofilms, hire purchase of LCD, Preparation of sub-basin maps of all size & Upgradation of computer and accessories.	LS	7946	
			Total	300000	
		(Rupees Three Lakhs Only)			

Environmental Activities in Pambanar-varattar Sub-Basin of Pennaiyar River Basin under
IAMWARM PROJECT

Working Sheet

Water Samples

1	Testing Charges rate as per ground water division (Dept) (Partly)	650.00	/Sample
2	Testing Charges rate as per SGS Laboratory (private) (Total Coliform, Faecal Coliform, Pesticides Residual) (Partly)	5250.00	/Sample
3	Service Charges @ 10.30 %	540.75	
	TOTAL	6440.75	(or) 6441

Soil Samples

1	Testing Charges rate as per SM & R Division (Dept) (Partly)	6000	/Sample
2	Testing Charges rate as per SGS Laboratory (private) (Pesticides Residual) (Partly)	4500	/Sample
	Service Charges @ 10.3 %	463.50	
	TOTAL	10963.5	(or) 10964



1.8. GROUNDWATER

In present scenario of water crises, artificial recharge of Ground Water becomes an essential phenomenon to meet out the water scarcity due to ever increasing demand on water.

Artificial recharge is a method to augment the natural infiltration of precipitation or surface water into under ground formation by some method of construction, spreading of water and injecting surface water into ground formation through dug well / bore well.

When the amount of average annual ground water extraction is more than the annual ground water recharges artificial recharge is required to balance the overdraft. Tiruvannamalai district is one of the drought prone districts in Tamil Nadu. In Pambanar and Varattar Sub – basin area of Tiruvannamalai , district average annual rainfall is 911 mm. Due to frequent failure of monsoon or delay in monsoon setting agricultural activity has to depend on ground water to major extent. Hence we have to recharge the replenishable ground water resources whenever and wherever possible.

GEOLOGY:

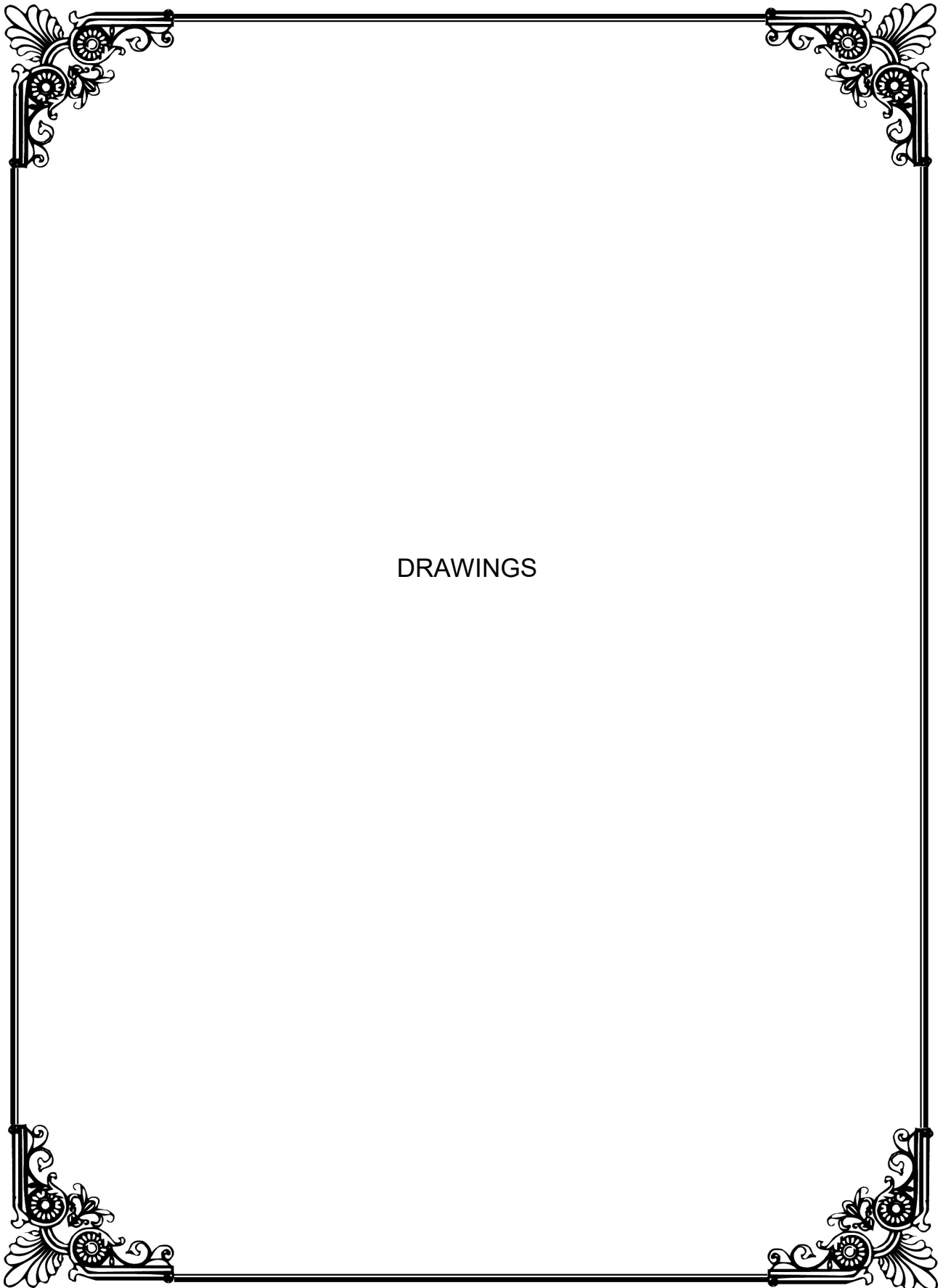
Pambanar originates from Thandarampattu in south-eastern part of Musukundanadhi. The entire sub basin is made up of crystalline rocks of archaean age consisting of charnokites, garnetiferous, Gneiss, Calc Gneiss, Quartzites.

QUALITY:

In Pambanar and Varattar sub basin, the quality of Ground water is good.

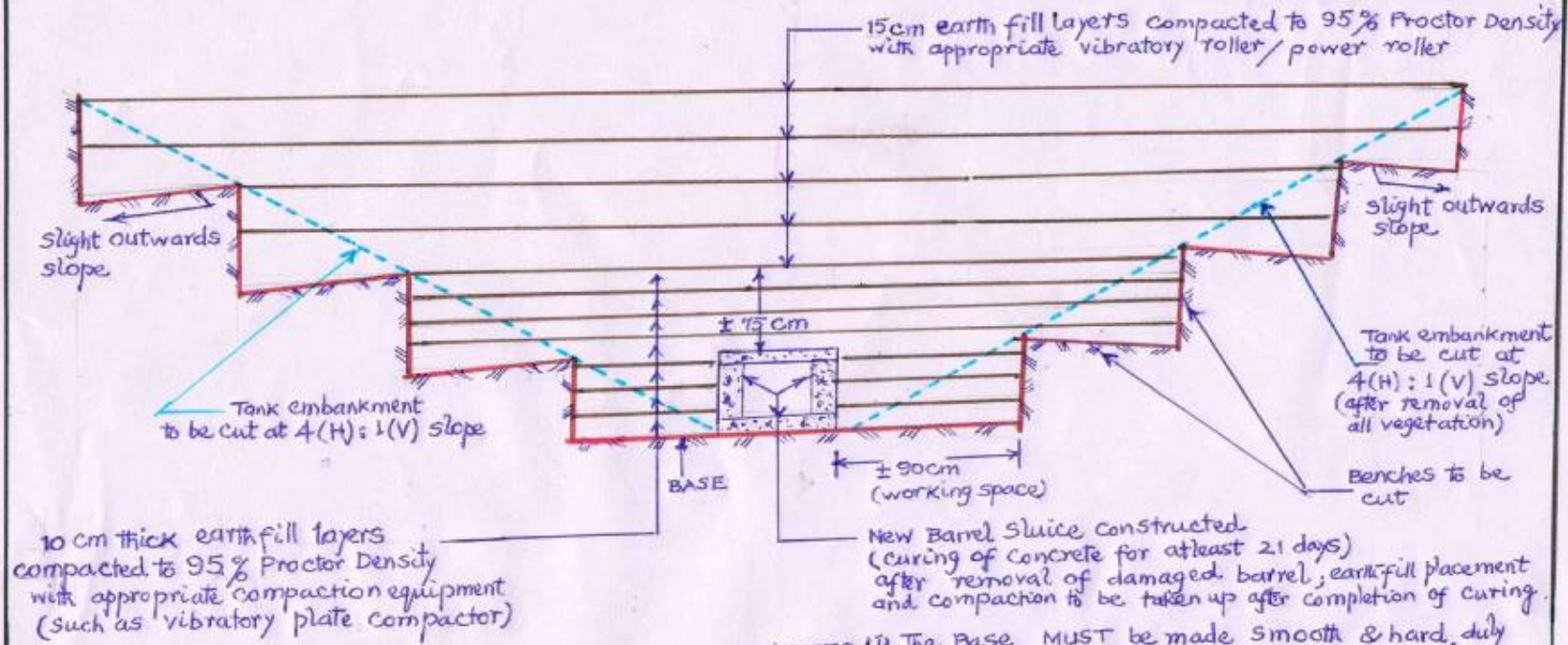
CONCLUSION:

The Pambanar and Varattar Sub basin comes under semi critical region. This sub basin is located in hilly terrain. Hence no proposal is made under “IAMWARM” project.



DRAWINGS

TYPICAL SKETCH

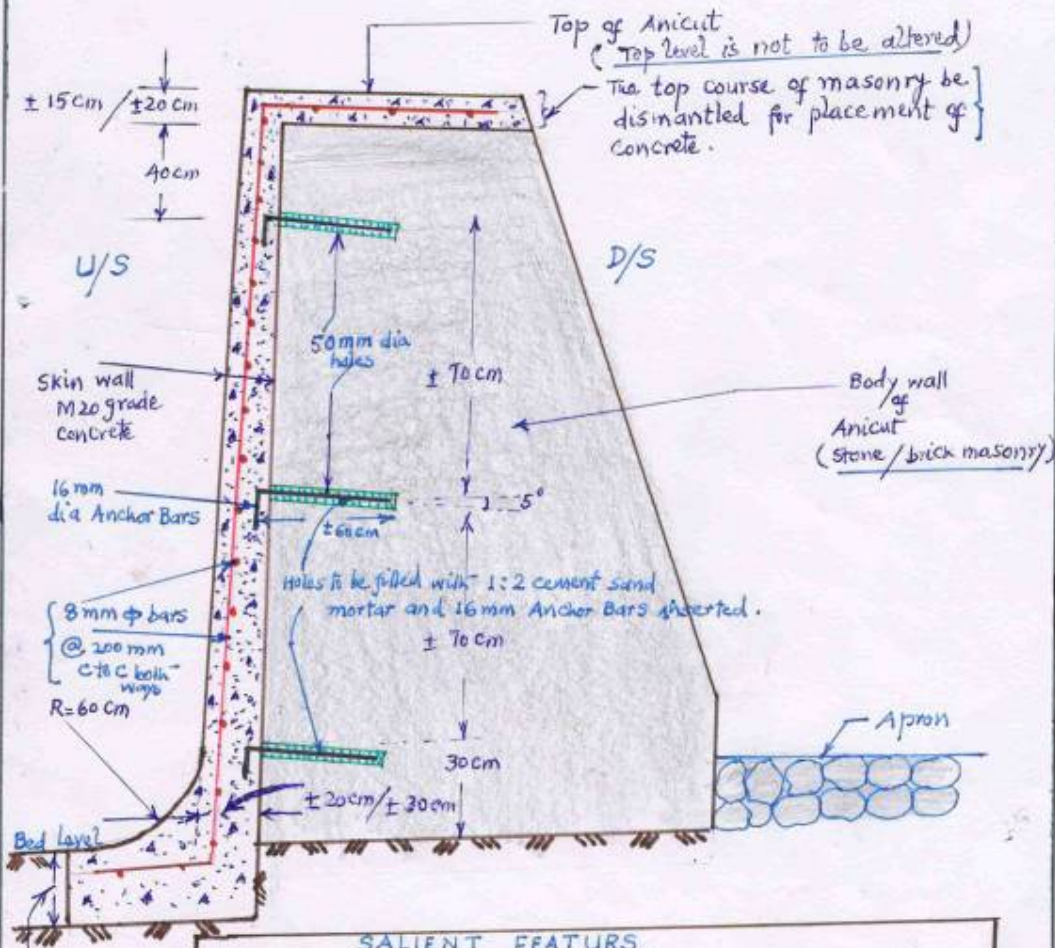


RECONSTRUCTION OF SLUICES

- NOTES**
- (i) The Base MUST be made smooth & hard, duly compacted with compactors/pneumatic tampers.
 - (ii) Earth fill compaction adjoining the Barrel and Benches should be compacted by mechanical/pneumatic tampers to ensure effective compaction.
 - (iii) Earth obtained from "benching" be reused (after removal of clods (bigger than 7.5 cm), vegetation etc) in earth fill layers.

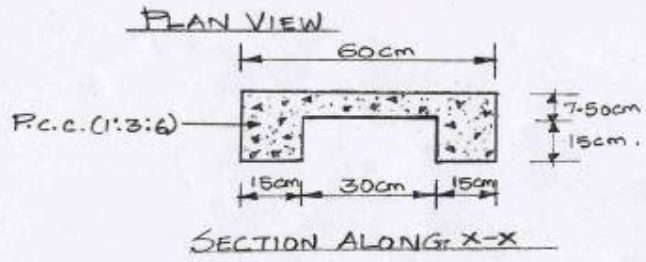
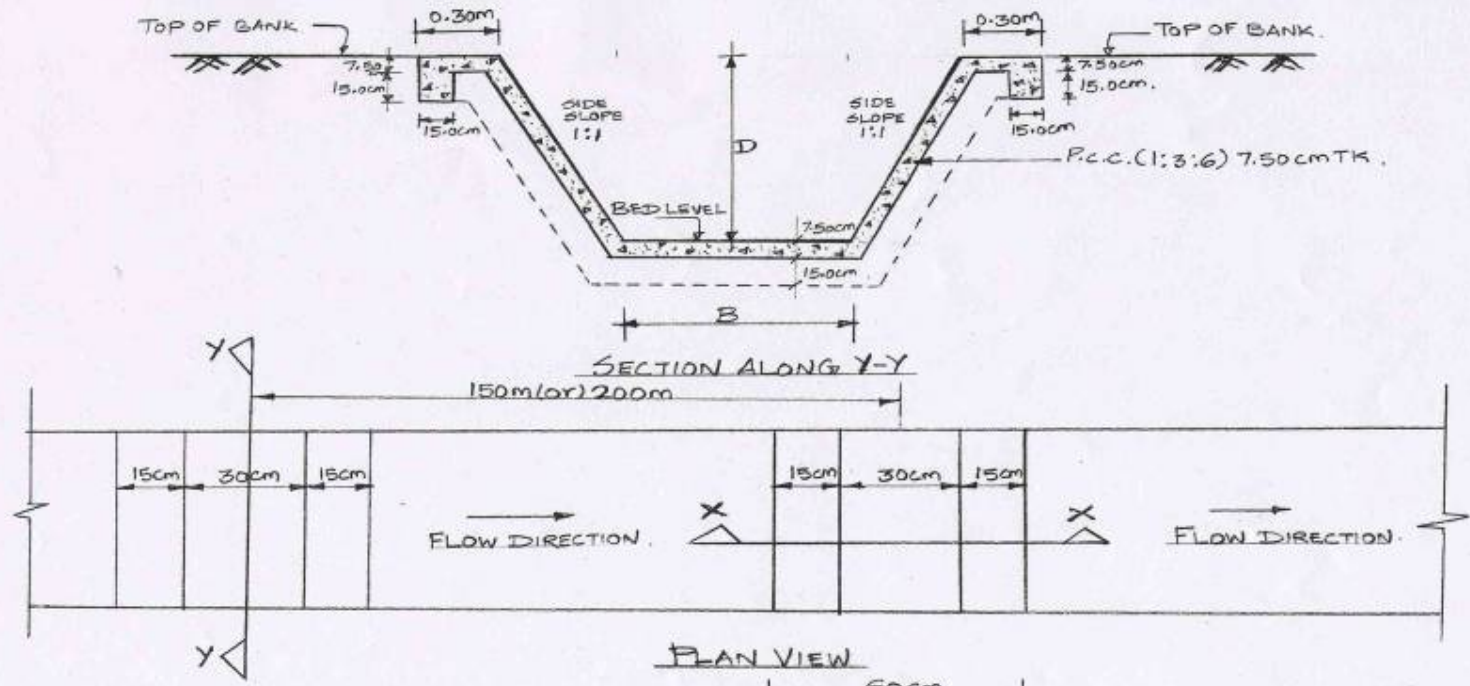
TYPICAL SKETCH

Rehabilitation of Anicut through SKIN WALL Concrete



SALIENT FEATURES

- Joints on U/S surface to be taken to 25 mm depth & surface roughened by chipping.
- Drill holes of 50 mm to be filled with 1:2 mortar and 16 mm Anchor Bars to be pushed in. The roughened surface to be kept wet for 72 hours and cement slurry (1:2:5) of 0.70 water-cement ratio be applied over the surface prior to placement of skin concrete.
- Concrete of M20 grade is to be used with 20 mm maximum aggregate size.
- Curing is to be done for 28 days.
 - Thickness of skin concrete: 15 cm at top & 20 cm at bottom for Anicuts of height upto ± 1.50 m and 20 cm at top & 30 cm at bottom for Anicuts of height more than ± 1.50 m.



TYPICAL SECTION OF BEDBAR/MODEL SECTION FOR SUPPLY CHANNEL.

DRAWING NOT TO SCALE

DIMENSIONS TO SUIT SITE CONDITION.

TYPICAL SKETCH

RAISING & STRENGTHENING OF TANK BUND

