

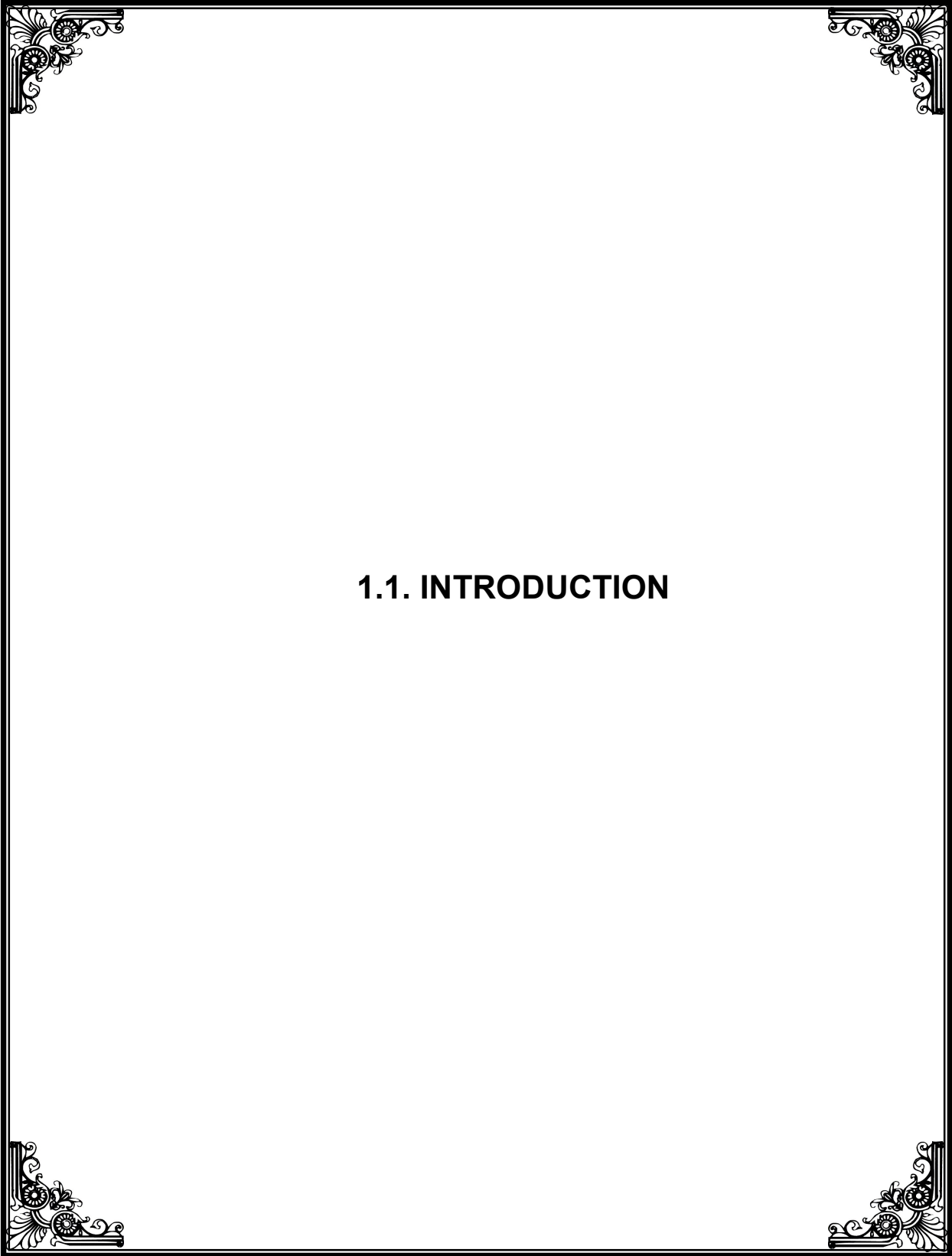


TN IAMWARM Project

NAGARIAR SUB BASIN

**DETAILED PROJECT REPORT
WATER RESOURCES DEPARTMENT**





1.1. INTRODUCTION

INTRODUCTION

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.

1.2 DESCRIPTION OF THE VAIPPAR BASIN

The River Vaippar originates at an altitude of 1644m in Vasudevanallur reserve forest on the eastern slopes of Western Ghats in Tirunelveli District and run eastward for a distance of 112 km and finally empties into Gulf of Mannar near Vembar village, 18 km from Vilathikulam town of Thoothukudi district. The Vaippar river basin is located between latitude 8°59'N to 9°49' N and longitude 77°15'E to 78°23'E, having an area of 5423 Sqkm and is surrounded by Thamirabarani basin on the South, Western ghats and Vaigai basin on the West, Gundar basin on the North and Bay of Bengal on the East. This basin has been divided into 13 sub-basins namely as follows;

1. Nishabanadhi
2. Kalingalar
3. Deviar
4. Nagariyar
5. Sevalperiyar
6. Kayalkudiar
7. Vallampatti Odai/Uppodai
8. Sindapalli Uppodai
9. Arjunanadhi
10. Kousiganadhi
11. Uppathurar
12. Sinkottaiyar
13. Vaippar

1.3 DESCRIPTION OF THE NAGARIYAR SUB-BASIN

Nagariyar is a tributary of Deviyar. Deviyar is the tributary of Nishabanadhi. River Vaippar is called as Nishabanadhi in its head reaches. Nagariyar originates in the western ghats and flows eastwards in Rajapalayam Taluk. The Basin area is 94sqkm. Out of which the hilly area is 28sqkm. Sivagiri is the only influential rainfall station for the basin. The annual average rainfall of the subbasin is 805mm.

Annexure II

CLUSTER WISE / INFRASTRUCTURE WISE / VILLAGE WISE CONVERGENT TABLE

Number & Name of Cluster: CLUSTER - I / NAGARIYAR SUB BASIN

Sl. No.	Infrastructure tank / anicut	Total ayacut (Ha)			Total Area (ha)			WRD						Agriculture		TNAU		Horticulture		Agri marketing		AED		Fisheries		Animal Husbandry	
		FI	PI	Gap	Wop	WP	Gap	Sluice		Weir		Anicut		Act	No./Ha	Act	No./Ha	Act	No./Ha	Act	No./Ha	Act	No./Ha	Act	No./Ha	Act	No./Ha
								R e	R c	R e	R c	R e	R c														
1	Nachadaperi	37.38	9.35	18.30	46.73	65.03	--	--	2	2	--	--	--														
2	Odaikulam	24.91	7.47	12.14	32.38	44.52	--	--	3	1	--	--	--														
3	Nagarikulam	151.97	40.40	19.46	192.37	211.83	--	1	2	1	--	--	--														
4	Devadhana m Big Tank	141.65	72.96	18.70	214.61	233.31	--	--	--	--	--	--	--														
5	Valavanthan Tank	105.96	43.28	17.19	149.24	166.43	--	--	--	1	--	--	--														
6	Naduvakulam Tank	53.96	24.76	24.40	78.72	103.12	--	--	2	--	--	--															
7	Kallanai Anicut (Alagapurikal)	22.22	12.49	10.99	34.71	45.70	--	--	--	--	--	1	--														
8	Kottayadi Anicut	10.99	6.45	8.42	17.44	25.86	--	--	--	--	--	--															
9	Nagarikulam dividing dam	--	--	--	--	--	--	--	--	--	--	1															
10	Nagarikulam Anicut	--	--	--	--	--	--	--	--	--	--	--															
11	Thavarampat ti Anicut	--	--	--	--	--	--	--	--	--	--	--															
12	Mugavoor Anicut	--	--	--	--	--	--	--	--	--	--	1	--														
13	Braminankulam Anicut	--	--	--	--	--	--	--	--	--	--	--															
		549.04	217.16	129.60	766.20	895.80	--	1	9	5	--	2	1														

Total Registered Ayacut = 895.80Ha

Annexure II

CLUSTER WISE / INFRASTRUCTURE WISE / VILLAGE WISE CONVERGENT TABLE

Number & Name of Cluster: CLUSTER - II / NAGARIYAR SUB BASIN

Sl. No.	Infrastructure tank / anicut	Total ayacut (Ha)			Total Area (ha)			WRD						Agriculture		TNAU		Horticulture		Agri marketing		AED		Fisheries		Animal Husbandry		
		FI	PI	Gap	Wop	WP	Gap	Sluice		Weir		Anicut		Act	No./Ha	Act	No./Ha	Act	No./Ha	Act	No./Ha	Act	No./Ha	Act	No./Ha	Act	No./Ha	
								R	R	R	R	R	R															
1	Kadappakudi Tank	41.76	13.92	17.06	55.68	72.74	--	3	--	2	--	--	--															
2	Mugavoor Tank	88.56	19.44	9.42	108	117.42	--	--	2	1	--	--	--															
3	Nallamangalam Tank	20.34	4.77	45.95	25.11	71.07	--	2	2	1	--	--	--															
4	Maruthuvareri Tank	21.81	34.95	22.96	56.76	79.72	--	--	--	--	--	--	--															
5	Elanthiraikondan Tank	78.14	57.11	111.91	135.25	247.16	--	--	--	--	--	--	--															
6	Elizhapatt Anicut	4.97	1.33	2.27	6.3	8.57	--	--	--	--	--	1	--															
7	Nallamangalam anicut						--	--	--	--	--	1	--															
8	Maruthuvareri anicut						--	--	--	--	--	--	--															
9	Elantiraikondan anicut						--	--	--	--	--	--	--															
		255.58	131.52	209.57	387.10	596.68	5	4	4	-	2	-	-															

TOTAL REGISTERED AYACUT = 596.68 Ha

CONVERGENT TABLE - ABSTRACT (FOR EACH CLUSTER)

Sl. No.	Infrastructure tank / anicut	Total ayacut (Ha)			Total Area (ha)			WRD				Agriculture		TNAU		Horticulture		Agri marketing		AED		Fisheries		Animal Husbandry			
		FI	PI	Gap	Wop	WP	Gap	Sluice		Weir		Anicut		Act	No./ Ha	Act	No./ Ha	Act	No./ Ha	Act	No./ Ha	Act	No./ Ha	Act	No./ Ha	Act	No./ Ha
								Re	Rc	Re	Rc	Re	Rc														
1	Cluster - I	549.04	217.76	129.60	766.19	895.80	--	--	2	2	--	--	--														
2	Cluster - II	255.58	131.52	209.58	387.10	596.68	--	--	3	1	--	--	--														
		804.62	349.28	339.18	1153.29	1492.48	--	1	9	5	--	2	1														

Total Registered Ayacut = 1492.48Ha



1.2. HYDROLOGY

2.1 GENERAL

Nagariyar is a major tributary of river Deviyar. Which in turn is a tributary to Nishabanadhi, the main course of Vaippar in head reach.

2.2 LOCATION

The total catchment area of the Nagariyar sub basin is 94 sq km including a hilly catchment of 28sq km. The taluks covered by this sub basin are Rajapalayam taluk in Virudhunagar District

2.3 CATCHMENT AREA OF NAGARIYAR SUB-BASIN

The Nagariyar Sub Basin has a typical climate, owing to the marginal catchments area in the Western Ghats and extensive minor catchments area in plains. Nagariyar enjoys the benefits of mostly North East monsoon and slightly in summer season.

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.

2.5 RAIN FALL

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

Name of Rain gauge Station	North East Monsoon	Summer	South west monsoon	Annual
Sivagiri	555	185	65	805

2.6 CLIMATE

The Vaippar basin lies in a low rainfall belt having an annual average rainfall of 722 mm. Southwest monsoon contribute 148 mm (20%), while NE monsoon contributes 414 mm (53%). This basin receives a major share of its rainfall during NE monsoon. For the measurement of Hydro meteorological parameters in the basin area, there is one weather station at Kavalur near Virudhunagar; its data is taken for the study.

2.7 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

2.8 LAND HOLDINGS

The details of farm holdings and size classes prevalent in Nagariyar Sub basin are given below:

FOR NAGARIYAR SUB BASIN:-

Category	Size of holdings	Numbers	Percentage
Marginal	Below 1.00 Ha	3409	68.20%
Small	1.00 – 2.00 Ha	883	17.70%
Medium	2.00 – 5.00 Ha	583	11.70%
Big	5.0 ha & above	122	2.40%
Total		4997	

Above table revealed that the marginal farmers alone accounted for 68.20 percent in the Nagariyar sub basin followed by small farmers. Developmental initiatives will be

establishment in marginal and small farmers.

2.9 DEMOGRAPHY

Name Of Sub Basin	Total No. Of Blocks	Total No. Of Villages	Population		
			2004	2010	2025
Nagariyar Sub basin	1	9	70000	100000	130000

2.10 LIVE STOCK - POPULATION:-

Name of Sub basin	Cattle	Buffalo	Sheep	Goats	Pigs	Dogs	Others	Poultry
Nagariyar Sub Basin	18740	13450	16067	7047	1548	--	258	--
Monthly requirement	0.034MCUM							

2.11 INDUSTRIES & MONTHLY WATER DEMAND

Name of Sub basin	Medium Industries			Small Industries			Water Requirement		
	2004	2010	2025	2004	2010	2025	2004	2010	2025
Nagariyar Sub Basin	15	20	30	5	20	30	0.04	0.05	0.07

CROPPING PATTERN

Name of the Sub Basin : **Nagariyar**
 District : Virudhunagar
 Registered Ayacut Area : 1492.48Ha

Fully Irrigated : 804.62 Ha
 Partially Irrigated : 348.68 Ha
 Gap ; 339.18Ha
Total Ayacut Area: 1492.48 Ha

S. No.	Crop	Without Project				With Project				Increasing
		FI	PI	RE/G	TOTAL	FI	PI	RE/G	TOTAL	
I	Perennial crop									
1	Coconut	-	88.40	-	88.40	94.59	-	-	94.59	6.19
2	Sapota	-	14.00	-	14.00	14.00	-	-	14.00	0.00
	Total	0.00	102.40	0.00	102.40	108.59	0.00	0.00	108.59	
II	Annual crop									
1	Sugar cane	69.89	-	-	69.89	69.89	-	-	69.89	0.00
2	Banna	-	3.00	-	3.00	9.00	-	-	9.00	6.00
	Total	69.89	3.00	0.00	72.89	78.89	-	-	78.89	
III	1st crop									
1a	Paddy	734.73	236.28	-	971.01	-	-	-	0.00	-971.01
b	Paddy-SRI	-	-	-	0.00	895.00	-	-	895.00	895.00
2	Pulses	-	-	-	0.00	50.00	-	-	50.00	50.00
3	Fodder cholam	-	-	-	0.00	10.00	-	-	10.00	10.00
4	Vegetables									
	Chillies	-	-	-	0.00	100.00	-	-	100.00	100.00
	Brinjal	-	3.00	-	3.00	60.00	-	-	60.00	57.00
	Bhendi	-	-	-	0.00	130.00	-	-	130.00	130.00
	Tomato	-	4.00	-	4.00	60.00	-	-	60.00	56.00
5	Fallow/Gap	-	-	339.18	339.18	-	-	-	0.00	-339.18
	Total	734.73	243.28	339.18	1317.19	1305.00	0.00	0.00	1305.00	-12.19
IV	Grand Total(I+II+III)	804.62	348.68	339.18	1492.48	1492.48	0.00	0.00	1492.48	0.00
	2nd crop									
1a	Paddy	369.74	-	-	369.74	-	-	-	0.00	-369.74
b	Paddy-SRI	-	-	-	0.00	441.00	-	-	441.00	441.00
2	Pulses	-	0.67	-	0.67	109.00	-	-	109.00	108.33
3	Cotton	-	13.94	-	13.94	25.00	-	-	25.00	11.06
4	Vegetables									
	Chillies	-	-	-	0.00	-	-	-	0.00	0.00
	Brinjal	-	-	-	0.00	10.00	-	-	10.00	10.00
	Bhendi	-	-	-	0.00	30.00	-	-	30.00	30.00
	Tomato	-	-	-	0.00	10.00	-	-	10.00	10.00
	Total	369.74	14.61	0.00	384.35	625.00	0.00	0.00	625.00	240.65
	Great Grand Total	1174.36	363.29	339.18	1876.83	2117.48	0.00	0.00	2117.48	240.65
	Cropping Intensity				103.03%				141.88%	

CROP WATER REQUIREMENT (With out Project)

Name of Crop		Area in Ha	NetCrop water requirment in mm	Crop water requirment in Mcum	Irrigation requirment per Ha @ 53% efficiency	Total Irrigation requirment in MCum
Annual	Coconut	88.40	866	0.766	1.445	1.445
	Sapota	14.00	560	0.078	0.147	0.147
	Sugargane	69.89	950	0.664	1.253	1.253
	Banana	3.00	750	0.023	0.043	0.043
I CROP	Paddy	971.01	820	7.962	15.023	15.023
	Vegetables	7.00	350	0.025	0.047	0.047
II CROP	Paddy	369.74	561	2.074	3.913	3.913
	Cotton	13.94	440	0.061	0.115	0.115
	Pulses	0.67	243	0.002	0.004	0.004
III CROP	Pulses	-	-	-	-	-
TOTAL		1537.65				21.99

Nagariyar Sub Basin

CROP WATER REQUIREMENT (WITH PROJECT)

Name of Crop		Area in Ha	Crop water requirement		Irrigation requirement per Ha @			Total Irrigation requirement
			In mm	in Mcum/Ha	Surface Irrigation 60% efficiency	Drip 80% efficiency	Sprinkler 70% efficiency	
Annual	Coconut	41.59	866	0.360	0.600	--	--	0.600
		53.00	866	0.459	--	0.573	--	0.573
	Sugargane	27.89	950	0.265	0.441	--	--	0.441
		42.00	950	0.399	--	0.499	--	0.499
	Banana	3.00	750	0.0225	0.038	--	--	0.038
		6.00	750	0.045	--	0.056	--	0.056
	Sapota	5.00	560	0.028	0.047	--	--	0.047
		9.00	560	0.050	--	0.063	--	0.063
I CROP	Paddy SRI	895	820	7.339	12.232	--	--	12.232
	Pulses	50	243	0.122	0.203	--	--	0.203
	Fodder Choram	10	350	0.035	0.058	--	--	0.058
	Chillies	100	537	0.537	0.895	--	--	0.895
	Vegetables	250	350	0.875	1.458	--	--	1.458
II CROP	Paddy SRI	441	561	2.474	4.120	--	--	4.120
	Cotton	25	440	0.110	0.180	--	--	0.180
	Pulses	109	243	0.265	0.442	--	--	0.442
	Vegetables	50	350	0.175	0.292	--	--	0.292
TOTAL								22.197

(Or) 22.20 Mcum

E) WATER POTENTIAL (WITH PROJECT)

Surface water potential : 8.33 Mcum.

Ground water yield : 21.37 Mcum.

Total : 29.70Mcum

E) WATER DEMAND WITH PROJECT

i) Domestic : 1.11 Mcum

ii) Live Stock : 0.34 Mcum

iii) Industrial : 0.35 Mcum

iv) Irrigation - WRO : 22.20 Mcum

- PU : 3.42 Mcum

Total : 27.42 Mcum

F) WATER BALANCE WITH PROJECT FOR NAGARIYAR

Surplus : 2.28 Mcum

Nagariyar Sub Basin – Vaippar Basin

WITHOUT PROJECT

WATER POTENTIAL

Surface Water potential	:	8.33 Mcum.
Ground Water yield	:	21.37 Mcum
Total	:	<u>29.70 Mcum</u>

WATER DEMAND

i) Domestic		1.11 Mcum
ii) Industries		0.35 Mcum
iii) Live stock		0.34 Mcum
iv) Irrigation	WRO	21.99 Mcum
	PU	3.42 Mcum
Total		27.21 Mcum

WATER BALANCE WITHOUT PROJECT

Surplus – 2.49 Mcum

ANNEXURE – IV

BLOCKWISE AYACUT DETAILS

<i>Sl. No.</i>	<i>Name of Sub basin</i>	<i>Ayacut Details (in Ha)</i>						<i>Total Registered Ayacut (in Ha)</i>
		<i>District</i>	<i>Taluk</i>	<i>Block</i>	<i>Without Project</i>			
					<i>FI</i>	<i>PI</i>	<i>Gap</i>	
1.	Nagariyar Sub basin	Virudhunagar	Rajapalayam	Rajapalayam	804.62	348.68	339.18	1492.48



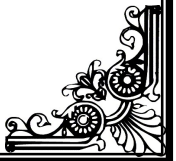
1.3. HYDRAULICS OF THE COMPONENTS

b) TANKS (Non System Tanks)

S. No	District	Taluk	Name of Tanks	Ayacut in Ha	Capacity in Mcft	Number of Fillings	Free catchment in SqKm	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)	Length of Supply Channel (M)	Upper Tank	Lower Tank
													Nos	Length in m					
1	Virudhunagar	Rajapalayam	Nagarikulam Tank	211.825	6.127	1.72	1.0908	1.0908	0.1805	108.780	109.380	3	1	14.95	457.40	2830	1000	Nagariyar River	Koraiyar River
2			Devadhanam Big Tank	233.31	21.06	1.86	3.2400	3.2400	0.5953	175.090	175.690	2	1	19.08	972.50	2625	1200	Nagariyar River	Koraiyar River
3			Elanthirai Kondan Tank	247.160	93.07	0.84	3.2624	15.4725	1.4862	146.125	146.575	5	1	17.93	3183.29	3480	1600	Maruthuvaneri	DeviyarRiver
4			Maruthuvaneri Tank	79.725	44.80	1.10	3.1035	11.3175	0.7779	151.935	152.385	4	1	24.75	2436	2420	600	Kaduppakudi	Ellanthirai Kondan
5			Mugavoor Tank	117.415	15.98	2.44	1.1407	1.1407	0.3649	160.825	161.375	2	1	4.71	431.66	1772	950	Koraiyar River	Pu Tank
6			Natchadaperi Tank	65.030	16.46	1.937	10.3660	10.3660	0.3895	183.230	183.830	2	1	8.1+15.85	2519.86	1636	2000	Jungle Stream	Nagariyar River
7			Naduvakulam Tank	103.125	18.49	0.26	2.3860	2.3860	0.3726	170.620	170.920	2	2	15.50	297.30	2346	-	Vallavanthan	Kaduppakudi
8			Valavandhan Tank	166.430	23.81	2.50	14.8040	14.8040	0.4110	172.845	173.445	2	1	26.10	2951.40	1980	-	odaikulam	Naduvakkulam
9			Nallamangalam Tank	71.070	16.00	1.72	1.1573	1.1573	0.7329	149.995	150.295	4	1	14.75	398.90	1834	1500	Koraiyar River	Koraiyar River
10			Odaikulam Tank	44.515	9.93	2.0	9.1020	9.1020	0.2353	177.210	177.510	3	1	14.40	2309.40	1415	4000	Jungle Stream	Vallavanthan
11			kadapakudi Tank	72.740	13.01	2.5	5.4654	5.4654	0.2536	162.400	163.000	4	1	9.20	646.71	1200	-	Naduvakkulam	Maruthuvaneri



1.4. PARTICIPATION IRRIGATION MANAGEMENT (PIM)



**PARTICIPATORY IRRIGATION MANAGEMENT (PIM
) UNDER IAMWARM PRTOJECT**

SALIENT FEATURES OF IMPLEMENTATION OF PIM IN NAGARIYAR SUB BASIN

1. **The Sub Basin:** This is one of the 13 sub-basins of the Vaippar River Basin. Totally 11 irrigation tanks and 11anicut are under the control of Water Resources Organisation (WRO) of Public Works Department (PWD) in this sub basin. The list of tanks and Anicuts covered with more details are furnished in the Annexure-1. These 11tanks are located within the sub basin's hydraulic spread over 9 villages of Rajapalayam taluk in Virudhunagar District. The total command area under these 11tanks and direct ayacuts of 3Anicuts works out to 1492.48 ha (Annexure 1).

2. Command Area

i.	Under System Tanks	NIL
ii.	Under Non-System Tanks (11 tanks)	1412.35 Ha.
iii.	Under direct Ayacuts of 3Anicuts	80.13Ha

Total **1492.48 Ha**

3. An assessment of number of WUAs

i)	Associations already formed under WRCP	Nil
ii)	Associations proposed to be formed under IAMWARM project covering 11 tanks and 3Anicuts(Direct Ayacut) from 9villages only	9Nos. (1492.48 Ha)
iii)	The total command area covered by the above WUAs works out to	1492.48 Ha.
iv)	More details about formation of WUAs in the sub basin are made available in the Annexure-I	

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

Activities undertaken and “Walkthrough Surveys” carried out:

- i. There are 11 tanks and 11 Anicuts in the sub basin spread over 9 villages, as directed out in Annexure-1. 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 analysed and finalized by WRO officials, are all furnished in the Annexure – 2 and Annexure – 3.

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

- i. Form-I : Details to be notified by District 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 09).

7. Support Organisation (Sos)

- i. Initiating and completing the process of publishing EOI to hire support organisation at sub basin level (End of June 09).
- ii. Short listing and providing request for proposals (RFPs) to all the short listed agencies, and obtaining Technical and Cost proposals (middle of August 09)
- iii. Selection and deployment of support organization to the Sub-basin (End of September 09).

8. Appointment and the role of competent Authorities:

- i. Section 26 of the Tamil Nadu Farmers' Management of Irrigation Systems (TNFMIS) Act provides for the appointment of "Competent Authorities" to assist the respective farmers 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. For the WUAs formed under WRCP, there are four Competent Authorities functioning as listed below:

Sl. No.	Details of WUAs in Code	Details of Competent Authorities
(Virudhunagar District – Special Project Sub Division No - II, Srivilliputhur)		
1.	NGR -VNR-1	Section Officer, WRO, Special Project Section - I, Srivilliputhur
2.	NGR -VNR-2	Section Officer, WRO, Special Project Section - I, Srivilliputhur
3.	NGR -VNR-3	Section Officer, WRO, Special Project Section - I, Srivilliputhur
4.	NGR -VNR-4	Section Officer, WRO, Special Project Section - II, Srivilliputhur
5.	NGR -VNR-5	Section Officer, WRO, Special Project Section - II, Srivilliputhur
6.	NGR -VNR-6	Section Officer, WRO, Special Project Section - III, Srivilliputhur
7.	NGR -VNR-7	Section Officer, WRO, Special Project Section - III, Srivilliputhur
8.	NGR -VNR-8	Section Officer, WRO, Special Project Section - IV, Srivilliputhur
9.	NGR -VNR-9	Section Officer, WRO, Special Project Section - IV, Srivilliputhur

- iii. It is proposed to form 9 WUAs only under IAMWARM project to cover a command area of 1492.48 Ha.
- iv. 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 Nagariyar Sub Basin:

Assistant. Executive Engineer, Special Project Sub Division No-II, Srivilliputhur

WUAs 1 to 9

List of Competent Authorities

a.	Section Officer, WRO, Special Project Section - I, Srivilliputhur	WUAs 1 to 3
b.	Section Officer, WRO, Special Project Section - II, Srivilliputhur	WUAs 4 & 5,
c.	Section Officer, WRO, Special Project Section - III, Srivilliputhur	WUAs 6 & 7
d.	Section Officer, WRO, Special Project Section - IV, Srivilliputhur	WUAs 8 & 9

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

- i. Based on the outcome of the “Awareness Creation Programme” and Walkthrough survey carried out with the involvement of famers, a list of tasks proposed to be takenup for “Modernisation” under IAMWARM project was discussed with No. of farmers from 9 villages. The final list of tasks was also prepared and exhibitedi n the Notice Board of the Village Administrative Officers Office and Panchayat Office. These details were also discussed with farmers and the tasks to be taken up under scheme modernisation finalised.
- 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 also be fixed at the site of the work, as well as in the panchayat office of the villages concerned for information of the farmers. They have also been informed that they are free to supervise the work by the contractor and any lapse in the quality of work may be reported to the field officers of WRO, 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 modernisation 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 after completion the tasks related to modernization of 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 located within the sub basin the normal water charges recovery as informed by the VAO, works out to 50 – 60% only about the expected percentage of 80 - 90%.
- ii. With the proposal to form new WUAs under IAMWARM in “Nagariyar” the Managing Committees will be trained to take up the responsibility of improving the water charges recovery percentage. These will be followed up, after completion the modernisation tasks and handing over of the O & M responsibilities to WUAs.

11. “Capacity Building” of the WUA farmers

- i. The “Support Organisation Group” will prepare “Training Modules” required for building the capacity of the WUA farmers, based on a “Training Needs” Analysis. They will also organise various “Capacity building” programmes at suitable locations within the sub basin command area, to benefit the farmers of the WUAs in the sub – basin.
 - ii. The Support Organisation will also arrange for organising the “Study Tours” both within and outside the state to enhance their knowledge and experiences which will help term to improve the crop productivity and there by the farmer’s income.
 - iii. The support organisation will also conduct necessary “awareness programme” and impart training to educate the farmers of the WUAs in all aspects of the TNFMIS Act, TNFMIS Rules and Election procedures for constituting the “Managing Committee” of the WUAs.
12. The “Competent Authorities” appointed for the sub basin will also be trained to effectively to interact with WUA farmers and maintaining good rapport and relationship with the farming community in the sub basin.

ANNEXURE – I
AN ASSESSMENT OF COMMAND AREA AND WUAs AND WUAs UNDER THE CONTROL WRO OF PWD IN “ NAGARIYAR SUB BASIN”

Sl. No.	Name of Irrigation Systems and Tanks	Comm and 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	
			Village	Taluk	District	WR CP and others	IAMWAR M	Form ed unde r WRC P	To be formed under IAMWAR M
1.	System tanks	--	--	--	--	--	--	--	--
2.	Non System Tanks (Anicut wise)								
3	1.Nagari Dividingdam Devadhanam Big Tank	233.31	South Devadhanam & Koviloor	Rajapalayam	Virudhunagar	Nil	233.31	Nil	IAMWAR M
4	2. Nagarikulam Anicut Nagarikulam Tank	211.83	Muthusampuram & North Devadhanam	Rajapalayam	Virudhunagar	Nil	211.83	Nil	IAMWAR M
5	Nachadaperi Tank	65.03	Muthusampuram & Seithur	Rajapalayam	Virudhunagar	Nil	65.03	Nil	IAMWAR M
6	3.Kallanai Anicut Vallavandhan Tank Naduvakkulam Tank Odalkulam Alagapurikal	166.43	Muthusampuram & Seithur	Rajapalayam	Virudhunagar	Nil	359.78	Nil	IAMWAR M
		103.13							
7	4. KottayadiAnciut	25.86	Koviloor, NorthDevadhanam & Muthusampuram	Rajapalayam	Virudhunagar	Nil	151.84	Nil	IAMWAR M
	5. Ellilapathi Anict	8.57							
	6. Mugavoor Anicut Mugavoor Tank	--							
	7. ThavarampattiAnicut	117.41							
	8. BraminankulamAnicut	--							
		151.84							

8	Kadappakudi Tank	72.74	Mettupatti	Rajapalayam	Virudhunagar	Nil	72.74	Nil	IAMWARM
9	9. Nallamangalam Anicut Nallamangalam Tank	71.07	Nallamangalam	Rajapalayam	Virudhunagar	Nil	71.07	Nil	IAMWARM
10	10. Maruthuvaneri Anicut Maruthuvaneri Tank	79.72	Chettiyarpatti	Rajapalayam	Virudhunagar	Nil	79.72	Nil	IAMWARM
11	11. Ellanthiraikondan Anicut Ellanthiraikondan Tank	247.16	Ellanthiraikondan	Rajapalayam	Virudhunagar	Nil	247.16	Nil	IAMWARM

ABSTRACT

Command area already covered under WRCP and other projects/ schemes - Nil

Command area proposed to be covered under IAMWARM project (grand total of Column 8) 1492.48 ha.

Total command area controlled by WRO of PWD in the sub basin 1492.48ha.

Total No. of WUAs already formed under WRCP -- Nil.

Total No. of WUAs proposed to be formed under IAMWARM - 9Nos.

Total No. of WUAs that will cover the entire sub basin - 9 Nos.

ANNEXURE 2
DETAILS OF “AWARENESS CREATION ACTIVITIES AND WALK THROUGH SURVEYS”

Sl. No.	Date of Visit	Names if the Villages visted	Awareness Programme (No. of farmers attended)	Walk through Survey (No. of farmers participated)	Remarks
1.	26.12.2008	North Devadhanam South Devadhanam	22	65	
		Seithur Muthusampuram	15		
		Koviloor Chettiyarpatti	20		
		Nallamangalam	10		
2.	27.12.2008	Mettupatti	8	35	
		Seithur Muthusampuram	15		
		Elanthiraikondan	10		
3.	11.2.2009	Mettupatti	9	36	
		Chettiyarpatti	10		
		Koviloor	13		

Annexure – 03

**Details of modernisation Works as Suggested by the Farmers and as finalized by the officials of
WRO**

Sl.No	Date of Visit	Name of the Villages Visited	Outcome of walk through Survey and discussions with farmers	
			Works Suggested by Farmers	Works Finalized by WRO Officials
1	26.12.2008 & 11.2.2009	North Devadhanam, Seithur, South Devadhanam, Muthusampuram, Mugavoor, Nallamangalam & Chettiyarpatti	Tank bund Strengthening Leaky Sluices Reconstruction and attending repair works to repaired Sluices and Weir Maruthuvaneri tank supply channel breached. Mugavoor Anicut, Maruthuvaneri Anicut & Nallamangalam Anicut are in damaged condition.	All the Request were fulfilled Devadhanam big tank and Maruthuvaneri tank were taken up in NABARD part – II scheme during the year 2004-2005. so the Tank was deleted. The supply channel Breach work of Maruthuvaneri tank was taken.
2	27.12.2008 & 11.2.2009	Seithur, Muthusampuram, Mettupatti & Elanthiraikondan	Tank bund Strengthening Leaky Sluices Reconstruction and attending repair works to repaired Sluices and Weir. Kallanai anicut, Nagari dividing dam, Kottayadi Anicut, Nagarikulam Anicut, are in damaged condition.	All the Request were fulfilled Elanthiraikondan tank was taken up in NABARD part – II scheme during the year 2004-2005. so the Tank was deleted.

DETAILS OF WUAS PROPOSED

NAGARIYAR SUB BASIN

<i>SI No.</i>	<i>WUA No.</i>	<i>Villages Covered</i>	<i>Name of the WUA</i>	<i>Ayacut Area in Ha</i>
1	NGR 1	South Devadhanam Koviloor	Nagari dividing dam and Devadhanam Big Tank water users Association	233.31
2	NGR 2	North Devadhanam	Nagarikulam Anicut and Nagarikulam Tank water users Association	211.83
3	NGR 3	Seithur	Nachadaperi Tank water users Association	65.03
4	NGR 4	Muthusampuram Seithur	Kallanai Anicut, Alagapuri kal, Vallavanthan Tank, Naduvakulam Tank and Odaikulam Tank water user's Association.	359.78
5	NGR 5	Muthusampuram Koviloor	Kottayadi Anicut, Ellilapathi Anicut, Mugavoor Anicut, Thavampatti Anicut, Braminankuilam Anicut and Mugavoor Tank water user's Association..	151.84
6	NGR 6	Mettupatti	Kadappakudi Tank water user's Association.	72.74
7	NGR 7	Nallamangalam	Nallamangalam Anicut and Nallamangalam Tank water user's Association.	71.07
8	NGR 8	Chettiyarpatti	Maruthuvaneri Anicut and Maruthuvaneri tank water user's Association.	79.72
9	NGR 9	Ellanthiraikondan	Ellanthiraikondan Anicut and Ellanthiraikondan tank water user's Association.	247.16
			<i>TOTAL</i>	<i>1492.48 Ha</i>

NAGARIYAR SUB BASIN
PARTICULARS OF WALK THROUGH SURVEY

WATER RESOURCES DEPARTMENT

Sl.No	Date of Walk through Survey	Location	Farmers request	Technical Solution	Proposal made
1	26.12.2008	Nagarikulam Tank	Bund Strengthening One Sluice Leakey Condition and dilapidated Remaining Sluices and weir are Repaired condition Breach occurred near sluices	Strengthening of Tank Bund Reconstruction of one Sluice and remaining Sluices and weir are to be repaired Construction of Retaining wall near Sluices	Standardisation of Tank Bund Reconstruction of one Sluice and remaining Sluices and weir are to be repaired Construction of Retaining wall near Sluices
2	26.12.2008	Nachadaperi Tank	Bund Strengthening One Sluice Leakey Condition and dilapidated Remaining Sluice and weir are Repaired condition Breaches frequently occurred in Supply Channel	Strengthening of Tank Bund Reconstruction of one Sluice and remaining Sluice and weir are to be repaired Construction of Retaining wall at Breached Portion	Standardisation of Tank Bund Reconstruction of one Sluice and remaining Sluice and weir are to be repaired Construction of Retaining wall at Breached Portion
3	26.12.2008	Devadanam Big Tank	Bund Strengthening One Sluice Leakey Condition and dilapidated Remaining Sluice is repaired condition Weir and Sand Vent are repaired Condition	Work taken up during 2004-05 under Nabard Scheme	Does not arise
4	27.12.2008	Naduvakulam Tank	Bund Strengthening	Tank Bund Strengthening	Standardisation of Tank Bund

			<p>One Sluice is in damaged condition One Sluice is in repaired condition Weir is in repaired condition Breach occurred near sluices</p>	<p>One Sluice is to be reconstructed One Sluice is to be repaired Weir is to be repaired Construction of Retaining wall near Sluices</p>	<p>One Sluice is to be reconstructed One Sluice is to be repaired Weir is to be repaired Construction of Retaining wall near Sluices</p>
5	27.12.2008	Vallavanthan tank Alagapurikal	<p>Bund Strengthening One Sluice is in damaged condition One Sluice is in repaired condition Weir is in repaired condition All Sluices of Alagapurikal are in damaged condition</p>	<p>Tank Bund Strengthening One Sluice is to be reconstructed One Sluice is to be repaired Weir is to be repaired All Sluices of Alagapurikal are to be repaired</p>	<p>Standardisation of Tank Bund One Sluice is to be reconstructed One Sluice is to be repaired Weir is to be repaired All Sluices of Alagapurikal are to be repaired</p>
6	27.12.2008	Umayakulam Tank	<p>Bund Strengthening One Sluice is in damaged condition Two Sluices are in repaired condition Weir and Sand Vent Shutter is in repaired condition The Tank bund near Leftside of Weir frequently breached</p>	<p>Tank Bund Strengthening One Sluice is to be reconstructed Two Sluices are to be repaired Weir is to be repaired and Sand Vent Shutter is to be replaced Construction of retaining wall is to be proposed at breaching portion</p>	<p>Standardisation of Tank Bund One Sluice is to be reconstructed Two Sluices are to be repaired Weir is to be repaired and Sand Vent Shutter is to be replaced Construction of retaining wall is to be proposed at breaching portion</p>
1	<u>CLUSTER - II (NGR- II)</u> 26.12.2008 & 11.2.2009	Mugavoor Tank	<p>Bund Strengthening Desilting the abandoned bypass Supply Channel</p>	<p>Tank Bund Strengthening Desilting bypass Supply Channel to be carried out after getting land clearance from</p>	<p>Standardisation of Tank Bund Desilting bypass Supply Channel to be carried out after getting land clearance from</p>

			One Sluice Leakey Condition and dilapidated One Sluice is repaired condition Weir and Shutter repaired	Revenue Department Reconstruction of one Sluice One Sluice is to be repaired Weir to be repaired and existing Shutter to be replaced	Revenue Department Reconstruction of one Sluice One Sluice is to be repaired Weir to be repaired and existing Shutter to be replaced
2	26.12.2008	Nallamangalam Tank	Bund Strengthening All Sluices are in damaged condition Weir and Sand Vent Shutters are damaged	Tank Bund Strengthening All Sluices are to be reconstructed weir is to be repaired and Sand Vent Shutter is to be replaced	Standardisation of Tank Bund All Sluices are to be reconstructed weir is to be repaired and Sand Vent Shutter is to be replaced
3	26.12.2008 & 11.02.2009	Maruthuvaneri Tank	Bund Strengthening One Sluice is in damaged condition One Sluice is in repaired condition Breaches frequently occurred in Supply Channel	Tank rehabilitation works taken up during 2004-05 under nabard scheme. Construction of retaining wall	Retaining wall proposed at breached portion
4	27.12.2008 & 11.02.2008	Kadappakudi Tank	Bund Strengthening One Sluice is in damaged condition One Sluice is in repaired condition Weir is in repaired condition	Work taken up during 2004-05 under Nabard Scheme	Does not arise
			Footbridge over sand vent to transport fertilizes and agricultural commodities		
5	27.12.2008	Ellanthiraikondan Tank	Bund Strengthening Breach occurred near sluices	Tank Bund Strengthening Construction of Retaining wall near Sluices	Standardisation of Tank Bund Construction of Retaining wall near Sluices



1.5. IRRIGATION INFRASTRUCTURE

HYDRAULIC PARTICULARS OF ANICUTS – NAGARIYAR SUB BASIN.

Sl. No	Name of Anicut	Village	Block	Taluk	District	Length in 'M'	Crest Level	Discharge in Cusecs	No. of Scour vent	No. of Head Sluice	Ayacut in Ha	Remarks
1.	Kallanai Anicut	Muthusamyuram	Rajapalayam	Rajapalayam	Virudhunagar	51.70	178.840	1160.00	1(open Vent)	--	45.705	
2.	Nagari Dividing Dam	NorthDevadham	Rajapalayam	Rajapalayam	Virudhunagar	22.50	171.480	460.90	--	--	--	
3.	Nagarikulam Anicut	NorthDevadham	Rajapalayam	Rajapalayam	Virudhunagar	16.52	176.120	--	2	--	--	
4.	Kottaiyadi Anicut	Muthusamyuram	Rajapalayam	Rajapalayam	Virudhunagar	31.40	163.190	445.50	2	1	25.86	
5.	Thavarampatti Anicut	Muthusamyuram	Rajapalayam	Rajapalayam	Virudhunagar	18.75	--	--	--	-	--	
6.	Mugavoor Anicut	Seithur	Rajapalayam	Rajapalayam	Virudhunagar	64.60	167.780	1799.00	--	--	--	
7.	Biraminankulam Anicut	Seithur	Rajapalayam	Rajapalayam	Virudhunagar	41.20	157.890	1114.00	--	--	--	
8.	Elizlapathi Anicut	Chetiyarpatti	Rajapalayam	Rajapalayam	Virudhunagar	15.85	--	441.50	3	1	8.570	
9.	Nallamangalam Anicut	Nallamangalam	Rajapalayam	Rajapalayam	Virudhunagar	49.70	152.120	2875.00	--	--	--	
10.	Maruthuvaneri Anicut	Chetiyarpatti	Rajapalayam	Rajapalayam	Virudhunagar	43.40	--	1164.00	3	--	--	
11.	Elanthiraikondan Anicut	Chetiyarpatti	Rajapalayam	Rajapalayam	Virudhunagar	36.70	--	1069.00	7	--	--	

HYDRAULIC PARTICULARS OF SUPPLY CHANNELS – NAGARIYAR SUB-BASIN

S.NO.	Name of Supply Channel	Feeding Tank	Length	Bed width	Side Slope	FSD	Bed Fall	Remarks
1.	Elanthiraikondan Tank Supply Channel	Elanthiraikondan Tank	1600	6.00	1 : 1	0.90	1 in 1000	
2.	Natchadaperi Tank Supply Channel	Natchadaperi Tank	2000	4.00	1 : 1	0.90	1 in 300	
3.	Devadhanam Big Tank Supply Channel	Devadhanam Big Tank	1200	4.00	1 : 1	0.60	1 in 600	
4.	Nagarikulam Tank Supply Channel	Nagarikulam Tank	1000	5.00	1 : 1	0.60	1 in 600	
5.	Maruthuvaneri Tank Supply Channel	Maruthuvaneri Tank	600	5.00	1 : 1	0.60	1 in 1000	
6.	Nallamangalam Tank Supply Channel	Nallamangalam Tank	1500	5.00	1 : 1	0.60	1 in 1000	
7.	Mugavoor Tank Supply Channel	Mugavoor Tank	950	5.00	1 : 1	0.60	1 in 1000	
8.	Odaikulam Tank Supply Channel	Odaikulam Tank	4000	4.00	1 : 1	0.60	1 in 300	

LIST OF NON SYSTEM TANKS -NAGARIYAR SUB BASIN.

Sl. No	Name of Tank	Village	Block	Taluk	District	Ayacut in Ha	Capacity	Remarks
1	Nachadaperi	Seithur	Rajapalayam	Rajapalayam	Virudhunagar	65.030	0.4661	
2	Nagarikulam	NorthDevadhanam	Rajapalayam	Rajapalayam	Virudhunagar	211.825	0.1735	
3	Devadhanam Big	NorthDevadhanam	Rajapalayam	Rajapalayam	Virudhunagar	233.31	0.5953	
4	Naduvakkulam	Seithur	Rajapalayam	Rajapalayam	Virudhunagar	103.125	0.5235	
5	Vallavanthan	Muthusampuram	Rajapalayam	Rajapalayam	Virudhunagar	166.430	0.6743	
6	Umay(odai)kulam	Seithur	Rajapalayam	Rajapalayam	Virudhunagar	44.515	0.2812	
7	Mugavoor	Koviloor	Rajapalayam	Rajapalayam	Virudhunagar	117.415	0.4525	
8	Nallamangalam	Nallamangalam	Rajapalayam	Rajapalayam	Virudhunagar	71.070	0.4530	
9	Maruthuvaneri	Chettiyarpatti	Rajapalayam	Rajapalayam	Virudhunagar	79.725	1.2687	
10	Kadapakudi	Mettupatti	Rajapalayam	Rajapalayam	Virudhunagar	72.740	0.3685	
11	Elanthiraikondan	Elanthiraikondan	Rajapalayam	Rajapalayam	Virudhunagar	247.160	2.6355	

ABSTRACT ON THE DETAILS OF IRRIGATION INFRASTRUCTURES AVAILABLE AND WORKS TAKEN UP UNDER IAMWARM PROJECT

Name of Sub Basin : NAGARIYAR

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	11	3.10	80.13	--	--	--	11	12.85	1412.35	--	--	
2	Infrastructures excluded in IAMWARM Project since works carried out under various schemes from 2000	--	--	--	--	--	--	3	4.35	560.195	--	--	
3	Infrastructures that doesnot require any Rehabilitation works	4	--	--	--	--	--	--	--	--	--	--	
4	Works taken up in IAM WARM Project	7	3.10	80.13	--	--	--	8	8.50	852.155	--	--	

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 PARTII Schemes etc.,) since 2000 were not proposed in this project.

**LIST OF WORK DONE UNDER VARIOUS SCHEME SINCE 2000 IN NAGARIYAR
SUB – BASIN**

SI.NO	NAME OF WORK	EST.AMT CR.NO / DR.NO	COMPONENT OF WORK EXECUTED
1	2000 - 2001	-----	-----
2	2001 - 2002	-----	-----
3	2002 - 2003	-----	-----
4	2003 - 2004	-----	-----
5	2004 - 2005		
a)	Modernisation and Particpatry Irrigation Management of Elanthiraikondan Periyakulam Tank in Elanthiraikondan Village Rajapalayam Taluk of Virudhunagar Dicstrict.	CR No.13SE / VBC / 2004-05	<p>Tank Bund Improvements</p> <p>1) From Ls. 0 to 3365m 2) Model Section - 4Nos 3) Ramp - 7Nos 4) Retaining wall - 60m</p> <p>Sluice Repair works to sluice 2,3,4 & 5 including leading channel S.G.Shutter for Plug - 4Nos S.G.Shutter for Vent for Plug - 4Nos</p> <p>Supply channel Desilting of Supply channel to a length of 1100m</p> <p>Weir Repair works to weir apron repairs</p> <p>Field Channel Improvements to field channel at sluice No.3,4&5 Total length - 1990m Formers Assocation Building Constructed - 1no</p>
b)	Modernisation and Particpatry Irrigation Management of Devathanan Big Tank in south Devathanan Village Rajapalayam Taluk of Virudhunagar Dicstrict.	CR No.11SE / VBC / 2004-05 Est.Amount 44.31lakhs	<p>Tank Bund Improvements</p> <p>1) From Ls. 0 to 2625m 2) Model Section - 2Nos</p> <p>Sluice Improments works to sluice 1&2 including Side Retaining wall - 36m S.G.Shutter for Plug - 2Nos S.G.Shutter for Vent - 2Nos</p> <p>Supply channel Retaining wall - 80m Sand vent shutter - 2Nos</p> <p>Weir Repair works to shutter -2Nos</p> <p>Field Channel Improvements to field channel at sluice No.1&2 Total length - 2330m Construction of Community Hall - 1no</p>

c)	<p>Modernisation and Participatory Irrigation Management of Maruthuvaneri Tank in Chittiyarpatti Village Rajapalayam Taluk of Virudhunagar District.</p>	<p>DR No.88/RPDN / 2004-05 Est.Amount 24.02 lakhs</p>	<p>Tank Bund Improvements 1) From Ls. 0 to 2560m 2) Retaining wall - 50m and gravel spreading</p> <p>Sluice Improvements works to sluice 1&2 including Side Retaining wall - 40m S.G.Shutter for Plug - 2Nos S.G.Shutter for Vent - 2Nos</p> <p>Supply Channel Desilting channel - 600m</p> <p>Weir Repair works to weir & Shutter -2Nos</p> <p>Field Channel Improvements to field channel at sluice No.2 Total length - 1350m</p>
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1.6. REHABILITATION OF IRRIGATION INFRASTRUCTURES

STRUCTURAL STATUS & DEFICIENCIES IN THE SYSTEM

The following are the present structural condition of the Nagariyar Sub basin

1. This systems are old systems existing for more than 100 Years as such requires Rehabilitation.
2. Heavy accumulation of silt due to hilly region and contour nature of Channel 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 conveyer system.
5. The Non system tanks are to be rehabilitated.

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

1. Training the River by removing the Shoals accumulated in the U/s and D/s of the anicuts & evicting the encroachments by earthwork excavation using machineries
2. Repairs to the damaged Anicuts
 - a. Repairs to the existing leaky body wall portion of weir by providing skin wall.
 - b. Repairs to the existing damaged apron portion by providing new apron and wearing coat.
 - c. strengthening the weaker portion of banks of upstream and downstream of Anicut by providing retaining walls.
 - d. The regulating arrangements need replacements.
3. Construction of Retaining wall is to be proposed in the breached portion of Maruthuvanery tank supply channel .
4. Providing bed bars to maintain the bed level and inner slopes of the supply channels
5. Providing steps in the supply channels for easy approach to the fields by the farmers wherever necessary
6. Repairing, Restoring the traditional water bodies (i.e. tanks)
 - a. Restoring the capacity of the tanks, supply channels by desilting
 - b. Strengthening the bunds of the tanks and channels wherever necessary for effectively storing the water and conveying it to the entire command area and also for conveying agriculture inputs to the field.

- c. Repairs to the damaged weirs
- d. Reconstruction of Collapsed Sluices
- e. Repairs to the damaged Sluices
- f. Providing Retaining walls in selective area of the tanks
- g. Providing S.G. Shutter / Plug arrangements to Sluices, Head sluices, Scour vents etc.,
- h. Removing, Repairing and refixing in position of the existing S.G. shuttering arrangements and providing locking arrangements etc.,

Outcome of the Project

1. Increase in conveyance efficiency by 53% to 60%
2. The present Gap area of 339.18 Ha in Nagariyar is to be converted as a fully irrigated area
3. The following irrigation infrastructure development works are proposed in the sub basins
 - i) Rehabilitation of 11 Anicuts and 11 tanks and its Supply Channel in Nagariyar Sub basin

SALIENT FEATURES OF PROPOSED WORKS

Standardisation of Tank bund :-

In Nagariyar Sub basin there are 11 nos. of tanks having an Anicut of 1492.48Ha. In most of the Tanks the tank bunds are below standards. The tank bund for a length of 14578 m has to be standardized. This will also increase the capacity of tank.

In the tank bund retaining walls for a length of 220 m has to be proposed in weaker and breached portions for strengthening the tank bund limited to damaged portion only.

In this sub basin the most of the tank sluices and are in damaged conditions and also without shutter arrangements. Hence reconstruction of sluices, and repairs to the sluices and weirs and shutter arrangements wherever necessary to be proposed. Due to this repair to the sluices and weirs and reconstruction of Sluices the wastage of water is sustainably reduced and proper water regulation for irrigation has to be maintained.

Desilting the Supply Channel:-

The earthen supply channel feeding to 11 tanks having an Ayacut of 1492.48 ha. and length of 9700 m is at present reduced from the original section, which results in an adequate quantum of water is not carried out through this channel to the tanks and finds its way to adjacent fields and lesser quantum of water flows to the tanks and balance water overflank and flows in to agriculture land.

By restoring the supply channel to the original section to carry adequate discharge to the tanks without flanking. Hence the desilting of supply channel proposed in this project. This ensures adequate storage in the tanks during normal rainfall seasons.

Anicut Improvement :-

In the Sub Basin out of 11 Anicuts 8 No's of anicuts has been proposed to be repaired. Out of 11 anicuts, one anicut namely nagari dividing dam is proposed to be reconstructed. Another one new construction of a dividing dam across Nagariyar to feed Alagapurikal is also proposed in this project.

Some of the anicuts Apron and wingwall are also in damaged condition which require repairs. Most of the Bank connection are frequently breached on U/S side of anicuts for which retaining wall is proposed. Regulating arrangements in anicuts also require replacement.

Shoal removal is essential at anicut site in order to have free flow through anicut without any wastages.

PWD COMPONENTWISE DETAILS OF INFRASTRUCTURES OF NAGARIYAR SUB BASIN

S I n o	Name of Tanks & Anicuts	TankBund				Sluice				Weir				Supply Channel				Shutter for Sluice		Shutter for Weir		Messering Device		Total
		Earth work		Retain ing wall		Repair		Reconstruc tion		Repair		Reco nstru ction		Earthwork		Retainin g wall		Nos	Amt	Nos	Amt	Nos	Amt	
		Length	Amt	Length	Amt	Nos	Amt	Nos	Amt	Nos	Amt	Nos	Amt	Length	Amt	Length	Amt							
	<u>I.TANKS</u>																							
1	Nachadaperi	1636	13.61	-	-	--	--	2	15.33	2	3.50	--	--	2000	3.77	--	--	2	0.62	-	-	2	0.30	37.13
2	Nagarikulam	2565	16.73	-	-	1	1.81	2	20.29	1	3.61	--	--	1000	1.93	--	--	2	0.62	3	3.30	3	0.45	48.74
3	Naduvakulam	2346	19.41	-	-	--	--	2	7.36	--	--	--	--	--	-	--	--	2	0.62	-	-	2	0.30	27.69
4	Valavanthan	1980	-	-	-	--	--	--	-	--	--	--	--	--	-	--	--	--	-	-	-	2	0.30	0.30
5	Odaikulam	1415	12.19	-	-	--	--	3	18.03	-	-	--	--	4000	6.71	--	--	3	0.93	-	-	3	0.45	38.31
6	Devadanam Big Tank	2730	-	-	-	--	--	--	-	--	--	--	--	--	-	--	--	--	-	-	2	0.30	0.30	
	Total	9942	61.94	-	-	1	1.81	9	61.01	3	7.11	--	--	7000	12.41	--	--	9	2.79	3	3.30	14	2.10	152.47
	<u>II.Tanks</u>																							
1	Mugavoor	1772	15.33	-	-	--	--	1	2.80	--	--	--	--	--	-	--	--	1	0.31	-	-	2	0.30	18.74
2	Nallamagalam	1834	17.74	-	-	-	-	2	14.15	1	0.56	--	--	1500	2.80	--	--	2	0.62	1	0.40	4	0.60	36.87
3	Maruthuvaneri	2420	-	-	-	--	--	--	-	--	--	--	--	--	-	30	5.81	--	--	-	-	2	0.30	6.11
4	Kadapakudi	1030	8.66	-	-	-	-	--	-	2	1.30	--	--	--	-	--	--	-	-	-	-	3	0.45	10.41
5	Elanthiraikondan	3480	-	-	-	--	--	--	-	--	--	--	--	--	-	--	--	--	--	-	-	5	0.75	0.75
	Total	4636	41.73	-	-	-	-	3	16.95	3	1.86	--	--	1500	2.80	30	5.81	3	0.93	1	0.40	16	2.40	72.88

PWD COMPONENTWISE DETAILS OF INFRASTRUCTURES OF NAGARIYAR SUB BASIN

Sl. no	Name of Tanks & Anicuts	Anicut Head & Sluices				River Training				S.G.Shutter		Total
		Repair		Reconstruction		Earthwork		Retaining Wall		Nos	Amt	
		Nos	Amt	Nos	Amt	Length	Amt	Length	Amt			
<u>I ANICUTS</u>												
1	Nagaridividingdam	--	--	1	41.76	800	3.02	--	--	--	--	44.78
2	Nagarikulam	--	--	--	--	--	--	--	--	--	--	--
3	Kallanai & Alagapuri Kal	1	28.2	--	--	3900	11.72	--	--	--	--	39.92
4	Kottayadi	1	0.91	--	--	600	1.42	--	--	2	1.34	3.67
5	Thavarampatti	--	--	--	--	1500	1.19	--	--	--	--	1.19
6	Mugavoor	1	7.19	--	--	400	0.97	--	--	2	0.4	8.56
7	Braminankulam	--	--	--	--	--	--	--	--	--	--	--
	Total	3	36.30	1	41.76	6200	18.32	--	--	4	1.74	98.12
<u>II ANICUTS</u>												
1	Ezhillapathi	1	8.65	--	--	700	2.04	--	--	3	2.26	12.95
2	Nallamangalam	1	13.54	--	--	600	1.61	--	--	--	--	15.15
3	Maruthuvaneri	--	--	--	--	--	--	--	--	--	--	--
4	Elanthiraikondan	--	--	--	--	--	--	--	--	--	--	--
	Total	2	22.19	--	--	1300	3.65	--	--	--	2.26	28.10

1. Certified that the Panchayat union Tanks are not Considered in this Project.
2. Certified that the components of works in the tanks which were executed under various schemes (Namely WRCP 1,NABARD PART-II etc.,) since 2003. were not proposed in this project

Total Amount for Tanks	= 225.34
Total Amount for Anicuts	= 126.22
Total	= 351.56 Lakhs

Package Details

Package – I

<i>Sl.No.</i>	<i>Name of Tank / Anicut</i>	<i>Amount in Lakhs</i>
1.	Rehabilitation of Kallanai anicut, Nagariyar dividing dam, Kottaiyadi Anicut, Thavarampatti anicut, Mugavoor anicut, and its tank and supply channel in Nagariyar sub basin in Rajapalayam Taluk of Virudhunagar District.	250.59
	Total	250.59

Package Details

Package – II

<i>Sl.No.</i>	<i>Name of Tank / Anicut</i>	<i>Amount in Lakhs</i>
1.	Rehabilitation of Elizhapatt anicut, Nallamangalam anicut, and its tank and supply channel in Nagariyar sub basin in Rajapalayam Taluk of Virudhunagar District.	100.98
	Total	100.98

ABSTRACT

PACKAGE – I

Sl.No.	Name of Tanks & Anicuts	Amount Rs in Lakhs
	<u>Tanks</u>	
1	Nachadaperi tank	37.13
2	Nagarikulam Tank	48.74
3	Naduvakulam Tank	27.69
4	Vallavanthankulam Tank	0.30
5	Odaikulam Tank	38.31
6	Devathanam Big Tank	0.30
	<u>Anicuts</u>	
1	Kallanai & Alagapuri kal	39.92
2	Nagari Dividing Dam	44.78
3	Kottayadi Anicut	3.67
4	Thavarampatti Anicut	1.19
5	Mugavoor Anicut	8.56
	<i>Total</i>	<i>250.59</i>

ABSTRACT

PACKAGE – II

Sl.No.	Name of Tanks & Anicuts	Amount Rs in Lakhs
	<u>Tanks</u>	
1	Mugavoor Tank	18.73
2	Nallamangalam Tank	36.87
3	Maruthuvaneri Tank	6.11
4	Kadapakudi Tank	10.41
5	Elanthiraikondan Tank	0.75
	<u>Anicuts</u>	
1	Ellilapathi Anicut	12.95
2	Nallamangalam Anicut	15.15
	<i>Total</i>	<i>100.98</i>

B.WRO COST TABLE

SI.No	Description of work	Quantity	Amount in Lakhs	Remarks
<u>A.Tank component</u>				
I	Tank Bund Improvements			
a)	Earth work for Bund	12598m	103.67	
b)	Retaining wall	--	--	
II	Improvement of Sluice			
1)	Reconstruction			
a)	Tower head	10Nos	70.95	
b)	Wing wall	2 Nos	7.00	
2)	Repair			
a)	Tower head	1 Nos	1.81	
b)	Wing wall	--	--	
III	Improvement of Weir			
a)	Repair	6 Nos	8.97	
IV)	<u>Shutter arrangement</u>			
a)	Sluice	12 Nos	3.72	
b)	Weir	4 Nos	3.7	
V)	Supply Channel Improvment			
a)	Earthwork	8500m	15.21	
b)	Retaining wall	30m	5.81	
VI)	Measuring Device	30 Nos	4.5	
	<i>Sub Total - A</i>		225.35	
<u>II. Non tank Component</u>				
a)	Repair	5 Nos	58.49	
b)	Reconstruction	1 No	41.76	
c)	Earthwork	7500m	21.97	

d)	Retaining wall	--	--	
e)	Anicut shutter	7 Nos	4.00	
	Sub Total - B		126.22	
	Total (A+B)		351.57	
	Environment cell		3.50	
	Groundwater		0.00	
	Total		355.07	

1)	Tank component	:	225.35 Lakhs
2)	Non-Tank component	:	126.22 Lakhs
3)	Environment cell	:	3.50
	Total	:	355.07 Lakhs

- 1) Certified that the Panchayat union Tanks are not considered in this Project.
- 2) Certified that the components of works in the tanks which were executed under various schemes (Namely WRCP 1,NABARD PART-II etc.,) since 2003. were not proposed in this project

1. WRO COST TABLE (PHYSICAL AND FINANCIAL PROGRAM)

Sl. No.	Component	I Year		II Year		Qty	Amount in Lakhs	Qty	Amount in Lakhs
		Qty	Amount in Lakhs	Qty	Amount in Lakhs				
A. Tank Bund Component									
Tank Bund Improvements									
I									
	a	Earthwork for Bund	8000	65.67	4598	38.00	12598	M	103.67
	b	Retaining wall	--	--	--	--	--	--	--
Improvement of sluices									
II									
1		Reconstruction							
	a	Tower Head	6.00	42.57	4.00	28.38	10.00	Nos.	70.95
	b	Wing Wall	2.00	7.00	--	--	2	Nos.	7.00
2		Repair							
	a	Tower Head	--	--	1.00	0.81	1	No	1.81
	b	Wing Wall	--	--	--	--	--	--	--
Improvement of Weir									
III									
1		Reconstruction	--	---	--	---	---	---	---
2		Repair	4	6.00	2	2.97	6	Nos.	8.97
Shutter Arrangement									
IV									
1		S.G.Shutter							
	a	Sluice	--	--	--	--	--	--	--
	b	Weir	3	3.30	1	0.40	4	Nos.	3.70
	c	Anicut	--	--	--	--	--	--	--
2		S.G.Plug for Sluice	8	2.48	4	1.24	12	Nos	3.72
Supply Channel Improvement									
V									
1		Earthwork	5100	9.21	3400	6.00	8500	M	15.21
2		Retaining Wall	--	--	30	5.81	30.00	M	5.81
3		Drop/Dividing Dam	--	--	--	--	--	--	--
4		Measuring Device	16	2.40	14	2.10	30	Nos	4.5

VI		River Training							
1		Anicut							
	a	Repair	3	40.00	2	18.49	8	Nos.	58.49
	b	Reconstruction	1.00	20.00	--	21.76	1	No.	41.76
2	a	Earthwork	5000	14.60	2500	7.37	7500	M	21.97
	b	Retainingwall	--	--	--	--	--	--	--
		S.G Shutter	5	3.00	2	1.00	7	Nos	4.00
		TOTAL		217.23		134.34			351.57

NAGARIYAR SUB BASIN

TANK DETAILS WITH FREE BOARD

<i>Sl. No.</i>	<i>Name of Tank</i>	<i>Maximum depth of Storage in M</i>	<i>Length of Bund in M</i>	<i>Existing Free Board in M</i>	<i>Provided Free Board in M</i>	<i>Maximum Height of Bund in M</i>
1	Nachadaperi	4.70	1636	1.25	1.50	5.850
2	Nagarikulam	4.685	2565	1.50	1.50	6.485
3	Devathanam Big Tank	5.475	2730	1.50	1.50	7.575
4	Mugavoor	3.720	1733	1.25	1.50	5.420
5	Naduvakkulam	4.215	2346	1.25	1.50	5.765
6	Vallavanthan	4.895	1980	1.50	1.50	6.995
7	Umay(odai)kulam	3.585	1415	1.25	1.50	5.135
8	Nallamangalam	4.160	1834	1.25	1.50	5.710
9	Maruthuvaneri	2.885	2420	1.50	1.50	4.835
10	Kadapakudi	3.255	1030	1.25	1.50	4.800
11	Elanthiraikondan	5.320	3480	1.50	1.50	7.270

PACKAGE I

Calculation of machineries Requirement

Hydraulic excavator &

4 Tippers / Lorries

6 Hours / Day

(4 No x 2 loads/ hour x 6 Hr x 4 m³/ trip)

192 m³ /Day

For 1 month (20 Working days)

20 x 192 m³

3840 m³/ month

Total quantity of earth work

144900 m³

Working period for earth work

6 months + 4 Months rainy season

Machineries required for earth work:

1. Hydraulic excavator - 3 nos
2. Tippers / Lorries - 12 nos
3. Power roller - 3 nos
4. Vibrated compactor - 2 nos
5. Water lorries - 3 nos

Mixer machine

2 m³ / hour

For 6 hours / day

12 m³ / day

Total quantity of concrete

6106 m³

Mixer machine required

6 Nos for 10 days / month -- 9 months

Material conveyence

Tippers / Lorries

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

1421 mt

Lorry required for conveyence

1421/10

142 Lorries

Total quantity of sand

2823 m³

Lorry required for conveyence

2823/11.20

250 Lorries

Total quantity of metal

5495 m³

Lorry required for conveyence

5495 /16.80

327 Lorries

Total quantity of stone

85 m³

Lorry required for conveyence

85 /16.80

5 Lorries

Tipper / Lorries for conveyance of materials

3 Nos for 20 days for 14 months

PACKAGE II
Calculation of machineries Requirement

Hydraulic excavator & 4 Tippers / Lorries	6 Hours / Day	
(4 No x 2 loads/ hour x 6 Hr x 4 m ³ / trip)		192 m ³ /Day
For 1 month (20 Working days)	20 x 192 m ³	3840 m ³ / month
Total quantity of earth work	59500 m ³	
Working period for earth work	6 months + 4 Months rainy season	

Machineries required for earth work:

1. Hydraulic excavator - 2 nos
2. Tippers / Lorries - 8 nos
3. Power roller - 2 nos
4. Vibrated compactor - 1 nos
5. Water lorries - 2 nos

Mixer machine	2 m ³ / hour	For 6 hours / day	12 m ³ / day
Total quantity of concrete		2052 m ³	
Mixer machine required		2 Nos for 10 days / month -- 9 months	
Material conveyence		Tippers / Lorries	
Cement	10 mt / Trip	1 trip / day	10 mt / day
Sand	5.66 m ³ / Trip	2 trips / day	11.32m ³ /day
Metal / stone	5.60 m ³ / Trip	3 trips / day	16.80 m ³ /day
Total quantity of cement		552 mt	
Lorry required for conveyence		552/10	55 Lorries
Total quantity of sand		956 m ³	
Lorry required for conveyence		956/11.20	84 Lorries
Total quantity of metal		1847 m ³	
Lorry required for conveyence		1847 /16.80	110 Lorries
Total quantity of stone		25 m ³	
Lorry required for conveyence		25 /16.80	2 Lorries
Tipper / Lorries for conveyence of materials		1 No for 20 days for 14 months	

PACKAGE NO I

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 m³	STEEL IN M.T.	METAL 40MM IN m³	METAL 20MM IN m³	RR IN m³	FUEL IN LITRE
PACKAGE NO - I	3	3	2	15	3	6	6	1421	2823	71	509	4986	77	170000

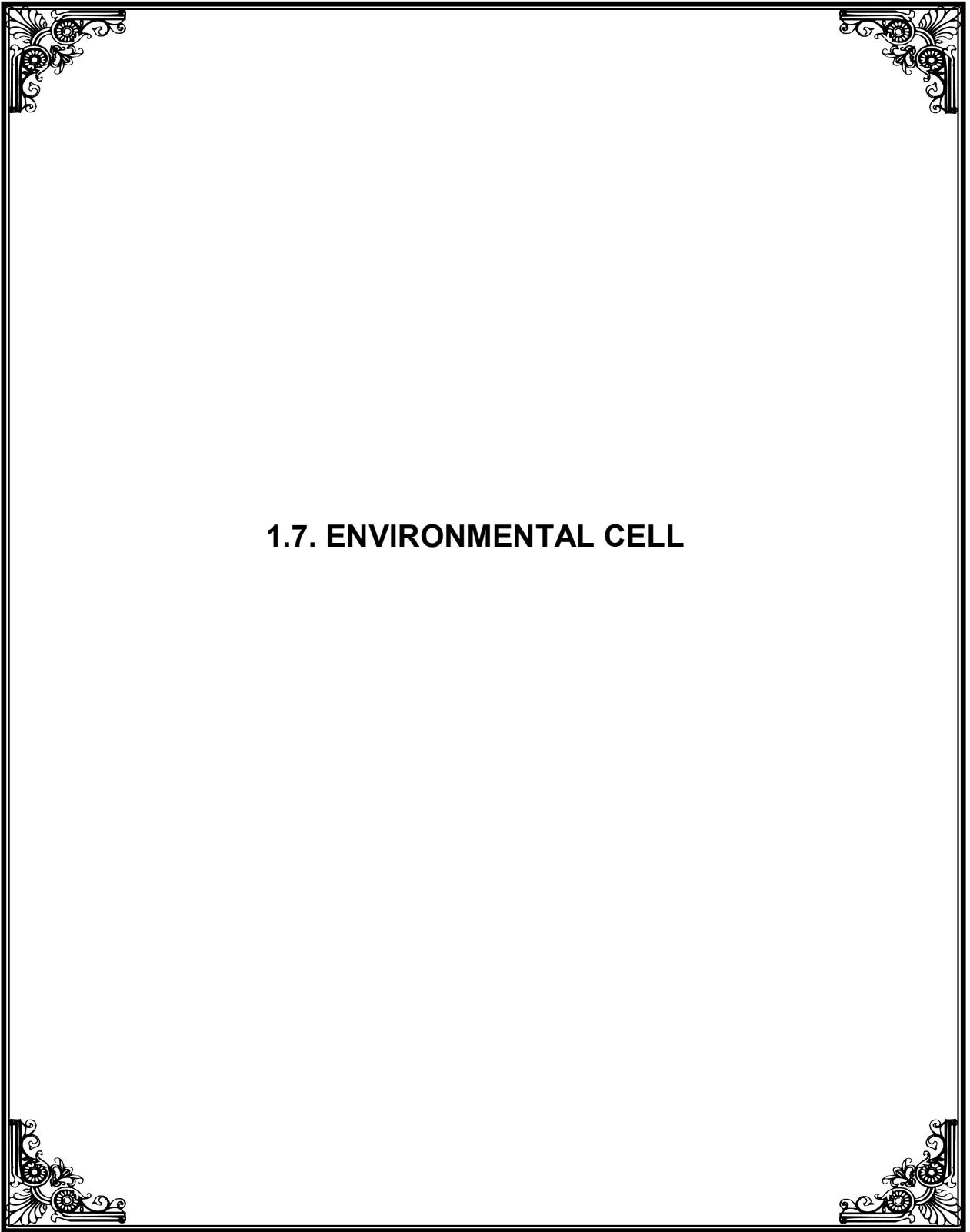
PACKAGE NO II

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 m³	STEEL IN M.T.	METAL 40MM IN m³	METAL 20MM IN m³	RR IN m³	FUEL IN LITRE
PACKAGE NO – II	2	2	1	9	2	2	2	552	956	9	234	1613	23	77000

PACKAGE I
Construction Methodology

SI N O	Description of Item	Working Months															Rainy season			Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
	Earth work excavation																			
1	TankBund	10000	4000	11000	5000	3500	6500	4500	9000	8500	9000	7500	9000	8500	9500	9000	-	--	-	114500
2	Channel	--	--	--	--	--	--	2300	2200	2100	1900	--	--	--	--	--	-	--	-	8500
3	Foundation	3500	3000	4650	2850	3900	4000	--	--	--	--	--	--	--	--	--	-	--	-	21900
	Concrete																			
4	M 7.5 grade	100	166	150	150	--	--	--	--	--	--	--	--	--	--	--	-	--	-	566
5	M 10 grade	--	200	250	200	150	300	350	300	250	300	500	500	500	500	250	-	--	-	4550
6	M 15 grade	--	--	--	110	90	125	100	--	50	55	--	--	--	--	--	-	--	-	530
7	M 20 grade	--	--	--	--	50	50	50	--	75	40	50	50	50	25	20	-	--	-	460
8	Random rubble masonry	--	10	--	20	20	15	20	--	--	--	--	--	--	--	--	-	--	-	85
9	Plastering	--	--	--	--	50	--	50	--	75	--	25	10	--	--	--	-	--	-	210



1.7. ENVIRONMENTAL CELL

INDEX

Environmental Monitoring on water and soil quality and creating awareness & updating of “Environmental and Social Assessment report” for NAGARIAR SUB BASIN.

SI No	DETAILS	SHEET NO
1	Environmental Details Proforma	
2	List Of Water User Association	
3	Tanks Severely Affected by Weeds	(Annexure-I)
4	Sewage discharged into water bodies(Domestic sewage)	(Annexure-II)
5	Solid Waste into Water bodies	(Annexure- III)
6	List of Industries in the Sub basin	(Annexure –IV)
7	List of Ground water sampling point	(Annexure –V)
8	Result of Ground water quality	(Annexure - VI)
9	Estimate Report	
10	Detailed Estimate	
11	Abstract Estimate	
12	Baseline Data collection proforma	
13	Sub Basin Map	

IAMWARM PROJECT
(ENVIRONMENT COMPONENT IN SUB BASINS)

Name of River Basin: **VAIPPAR BASIN**

Name of Sub Basin: **NAGARIAR**

Name of WUA: To be form

Name of Division: **1.Executivr Engineer, PWD/WRO
Special Project Division,
virudhunagar**

Name of Sub Division: **1.Assi.Exe. Engineer, PWD/WRO
Special Project Sub Division,
virudhunagar**

District: **Virudhunagar,**

Taluk: **Rajapalayam**

Block: **Rajapalayam**

I. Name of the Tank Severly affected by Aquatic weeds: **Annexure- I**

II. Domestic Sewage: **Annexure -II**

III.Municipal Solid Waste: **Annexure -III**

III. Industreies: **Annexure -IV**

IV. Water Quality Status:

i. Surface water: **So for No water sampling points**

II. Ground water: **Annexure -V**

**Assistant Engineer PWD WRD,
Env.Cell Section III,
Madurai-2.**

**Assistant Executive Engineer ,
PWD WRD,
Env.cell Sub Division, Madurai-2**

**Executive Engineer PWD WRD,
Environmental cell Division,
Madurai-2**

ANNEXURE-I

NAGARIAR SUB-BASIN --WEED DETAILS

Sl.No	District	Taluk	Block	Name of Village	Name of Tank	Ayacut(ha)	Type of Water Weeds
1	Viruthunagar	Rajapalayam	Rajapalayam	Nachadaperi Tank	Muthusampuram	65.03.0	ProsopisJuliflora/Ipomea
2				Nagarikulam Tank	Vadakkudevadhanam	211.82.5	ProsopisJuliflora/Ipomea
3				Devadanam Big Tank	Devadanam	233.31.0	ProsopisJuliflora/Ipomea
4				Mugavoor Tank	Mugavoor	117.41.5	ProsopisJuliflora/Ipomea
5				Naduvakulam Tank	Seithur	103.12.5	ProsopisJuliflora/Ipomea
6				Valavanthan Tank	Muthusampuram	166.43.0	ProsopisJuliflora/Ipomea
7				Umay(odai)kulamTank	Seithur	44.51.5	ProsopisJuliflora/Ipomea
8				Nallamangalam Tank	Nallamangalam Tank	71.07.0	ProsopisJuliflora/Ipomea
9				Maruthuvaneri Tank	Settiyarpatty	79.72.5	ProsopisJuliflora/Ipomea
10				Kadapakudi Tank	Mettupatty	72.74.0	ProsopisJuliflora/Ipomea
11				Elanthirai Kondan Tank	Elanthirai Kondan Tank	247.16.0	ProsopisJuliflora/Ipomea

ANNEXURE - II

NAGARIAR SUB BASIN

DOMESTIC SEWAGE

Sl. No.	Name of Town	Water body into which Sewage is discharged
1	Rajapalayam	Sanjeevinathapuram Tank
2	Punalveli	Nallamangalam Tank
3	Seithur	Ganapathykulam Tank
4	Nallamanagalam	Nallamangalam Tank
5	Mugavoor	Panchayat Oorani
6	Dhalavaipuram	Marudhuvaneri Tank
7	Chettiyarpatti	Marudhuvaneri Tank

ANNEXURE- III

NAGARIAR SUB BASIN

MUNICIPAL SOLID WASTE

Sl No.	Location of Solid waste disposal	Disposal of solid waste in Land	Qty.in M.T.	Disposal of solid waste into water body		
				River	Tank	Oorani
1	Seithur	Compost yard	5.5	—	—	—
2	Rajapalayam	Compost yard	45.75	—	—	Oorani
3	Devadhanam	Compost yard		—	—	—
4	Punalveli			River	—	—
5	Nallamangalam			River	—	—
6	Mugavoor			—	Tank	—
7	Chettiyarpatti	Road Side		—	—	—
8	Puttur	Road Side	2.20	—	—	—
9	Muthusampuram	Road Side		—	—	—

|
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|

ANNEXURE - I V

LIST OF INDUSTRIES IN NAGARIAR SUB BASIN

Sl.no	Name of Industry & Address	Taluk	Category	Type
INDUSTRIES IN VIRUDHUNAGAR DISTRICT				
RAJAPALAYAM TALUK				
1	Palanivel Textiles Unit-1, 10/51.Sethur Road, Dhalaivaipuram, Rajapalayam.	Rajapalayam	Textile	R/S
2	Palanivel Textiles Unit-II, 5/21.Sethur Road, Dhalaivaipuram, Rajapalayam.	Rajapalayam	Textile	R/S
3	M.Rajendran Dyeing Factory, Dhalaivaipuram, Rajapalayam	Rajapalayam	Deying	R/S
4	Sriram Ganesh Rice flour Mill, Chettiyarpatti, Dhalaivaipuram, Rajapalayam	Rajapalayam	Ricemill	O/S
5	S.Ammaiyappanadar Brothers unit-I,61/H,Dhalaivaipuram, Rajapalayam	Rajapalayam	Sizing	O/S
6	S.Ammaiyappanadar Brothers unit-II,61/H,Dhalaivaipuram, Rajapalayam	Rajapalayam	Sizing	O/S
7	Guru Meenakshi BlueMetals, 126 Teachers colony, Dhalaivaipuram, Rajapalayam	Rajapalayam	Stone Crusher	O/S

ANNEXURE- VI
GROUND WATER TEST RESULTS IN NAGARIAR SUB BASIN

Station code	General			Nutrients No3+No2 as N,mg/L	Alkalinity		Hardness		Major Ions								Other In-Organics			Biol SAR
	PH	EC, Umho/cm	TDS ,MG/L		Phen, mg CaCo3	Total mg CaCo3	Total,mg CaCo3 mg/L	Ca++mg CaCo3	Ca++mg/L	Mg++ mg/L	Na++mg/L	K++ mg/L	HCO3mg/L	CO3 MG/l	SO4 mg/L	Cl mg/L	Sl.mg/L	F.mg/L	B.mg/L	
3492	8.2	1330	726	4	0	285	605	240	96	89	39	3	348	0	432	624		0.87		9.3
3486	8.2	1020	556	4	0	160	350	150	60	49	81	3	195	0	29	220		0.46		2.6
3525	8.2	1350	807	4	0	345	30	15	6	4	276	31	421	0	134	128		1.2		3.1
3529	8.0	2080	1134	4	0	250	730	250	100	116.0	145	2	503	0	96	503		0.44		3.3

ANNEXURE- V
NAGARIAR SUB BASIN

Sl.No	Station code No.	Location
1	3492	Seithur
2	3486	Srivilliputtur
3	3525	Devathanam
4	3529	Rajapalayam

Environmental Monitoring on water and soil quality and creating awareness & updating of “Environmental and Social Assessment report” for NAGARIAR sub basin.

Estimate: Rs 3.50 Lakhs

INTRODUCTION

Under TNWRCP, with World Bank assistance, special emphasis was given to WRO, to assess the environmental status and degradation caused for all River basins in Tamilnadu.

The Environmental cell of WRO assessed Soil and Water samples in this River basin. The assessment includes environmental impact on the quality of surface water, ground water and soil by collecting water & soil samples and testing them. Moreover, “preparation of Micro Level Environmental Status Reports” all the River Basins has also prepared. These works have been carried out with the World Bank Assistance upto March 2012.

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 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 environment issues pertaining to that area and remedial action to overcome the problems is must.

DESCRIPTION OF SUB BASIN

Nagariar, a tributary of Deviar, is in turn a tributary of Nichabanathi. This sub basin lies in between the main sub basin of Deviar. It originates in the eastern slope of Western ghates at an altitude of about 1400m above MSL. Apart from Pacheiar, a tributary to Nagariar, a number of small streams join in the reserve forest area. After passing through number of tanks, the surplus water empties into Deviar.

The total catchment area of this sub basin is 94 sq.km. Out of which the hilly area is 28 sq.km. Sivagiri rainfall station is the influential station.

Formation of a new reservoir namely “Sasthakoil reservoir” with a storage capacity of 1.03mcm across Nagariar at latitude 9 24’ 30” N and longitude 77 24’30” E near Sasthakoil in Rajapalayam taluk in Virudhunagar district.

ENVIRONMENTAL PROBLEMS IN THIS SUB BASIN

SAND MINING

In this sub basin sand has been removed to a depth of about 1.80-m in the Nagariar River near Kallanai anicut in seithur village, Rajapalayam taluk. As a result, there is no flow of water on the left side of the river through Kallanai anicut to the lower down tanks Further the anicut structure is facing threat.

At various places wherever sand is available mining is being carried out in small quantities for local use.

INDUSTRIAL POLLUTION

There are no major industries situated in this sub basin. Only small-scale industries are there in this sub Basin. The Dying, bleaching and Textile processing industries located with in Rajapalayam taluk. The effluent discharge is minimum and meager. They are discharging the wastes into the nearby tanks, channels without treatment.

However, the effluents discharged from the industries are closely monitored by TNPCB. Any further activity to minimize the effect of pollution on water bodies will be dealt by the TNPCB.

CATCHMENT DEGRADATION

In this sub basin there is one sasthakoil reservoir 11 Anicuts and 11 Tanks. Soil erosion is there in the riverbeds of this sub basin. In respect of prevention of soil erosion, the Agricultural Engineering Department took up effective measures. However Agricultural Engineering Department will give proposals to prevent further soil erosion.

Other major environmental issues polluting Water resources pertaining this sub basin are listed below

SOLID WASTE DISPOSAL

Dumping of solid wastes by the villagers is very limited. Usually they are being dumped near the toe of the tank bunds. Only in urban areas solid wastes are dumped near the roadside drains, nearby irrigation channels and low – lying areas. Even the civic bodies are recklessly dumping the solid waste into water bodies.

There is no organised scientific method of disposal in all the Municipalities, town and Village Panchayats. The garbage is dumped in the basin area and hence the harmful chemical substances of the landfill seep through and reach the ground water reservoirs and contaminate these sources

Scheme for Solid waste Management plans is under implementation by Rural Development Department. Under this scheme, collection tank for disposable and undisputable garbage have been constructed. In most of the panchayats, recycling the waste and converting the solid waste into manure and production of energy is yet to come up. Hence motivating the local bodies for proper implementation of solid waste management project is must.

Sold waste if allowed to accumulate is health hazard and there is a correlation between improper disposal of solid waste and incidence of vector-borne diseases. Hence motivating the local bodies for proper implementation of solid waste management in IAMWARM project is must, to protect the water bodies from the accumulation of wastes.

SEWAGE DISPOSAL LET INTO WATER BODIES

Treatment of sewage and arrangements for safe disposal, has not been provided in most of the Villages. Underground drainage arrangements have not been provided even in municipalities and town panchayats. This sewage is washed away and got pounded in the backwaters and unhealthy conditions exit.

Industrial effluent from Textile mills in Rajapalayam is directly mixed with Thondamankulam tank and Maruthuvaneri tank near Dhalavaipuram village. Due to this effluent the quality of tank water goes on decreasing. The locations of disposal of sewage directly let into water bodies in this sub basin are furnished in Annexure II.

So, creating awareness among the presidents of the local bodies is must 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.

WATER WEEDS

In the recent decades, on account of the rapid industrial development, numerous obnoxious and deleterious chemical compounds are released into the water bodies. Agricultural drainage, discharge of domestic sewage and industrial effluents trigger the growth of water weeds. Indiscriminate uses of fertilizers have led to the increase in nutrients into natural water system causing nitrification and

eutrophication. Aquatic weeds may be emergent, submerged or free floating. Submerged weeds can survive only if there is optimum sunlight. Floating debris favours the development of aquatic weeds.

“Prosopis Juliflora” plants are multi-stemmed shrubby bushes growing from 3m to 15m tall. Juliflora has been known to send its roots 10, 20 or even 30m to catch water. The roots lift water much higher than it can be lifted by capillary action of the soil. The draft on water supply is greatest during a long, hot growing season, with scanty precipitation and low humidity.

Prosopis Juliflora and Ipomea have invaded the cultivable lands in lower reaches and water bodies' ie.tanks, channels and rivers. In most of the Nagariar sub basin tanks are severely affected by Prosopis Juliflora and Ipomea, in some places water Hyacinth, Eichornia.

Hence these plants need to be eliminated totally for the conserving precious water resources. But on the contrary, in some villages local people desire to grow this plant in the water spread area of the tanks. Once in 4 or 5 years they get cutting order from the revenue authorities, sale the Prosopis Juliflora or coal produced from it and keep the money for the common expenses like court case for the litigation with the nearby villages, temple repair and Local festivals etc. This is on account of lack of guidance and ignorance of its ill effects. Hence, this problem has to be addressed in all forms, wherever possible Bio gas plant has to be promoted.

GROUND WATER QUALITY

From the chemical composition data for the observation wells, the ground water in the lower reaches of sedimentary formation is of moderate quality.

ACTIVITIES PROPOSED

To monitor the quality of water and soil and create database regarding the Environmental Status for each sub basin, this proposal has now been included with the following activities at sub basin level. The provisions and necessity are explained below.

I. WATER QUALITY AND PROJECT WORKS MONITORING

Water samples were collected and testing of water samples is essential, as good and long - range data will enable to understand the problems more precisely. This has now proposed to continue for a period of three years at the following places in the Nagariar sub basin to Assess the Environmental impact on the quality of surface water in the above sub-basin.

1. NG-1 – At Sasthakoil Reservoir.
2. NG-2 – Seithur—Devathanam Road Bridge near Devathanam.
3. NG-3 – Road Bridge at Nallamangalam.

I. ENVIRONMENTAL AND SOCIAL KNOWLEDGE BASE:

Micro Level Environmental Status Report has been prepared for the entire Vaippar River Basin. To prepare an Environmental Action Plan of a River basin data regarding environmental issues in sub basin wise is necessary. Hence, provision for collecting the environmental and social issues in village wise and analysing them and preparing development report has also made in this proposal.

III. TRANSFER OF TECHNICAL KNOWS HOW FOR SOLID WASTE MANAGEMENT SYSTEM (INCLUDING SOURCE)

SEGREGATION, RECYCLES OF DRY WASTE AND LINKAGE WITH USER AGENCIES:

Now, a new scheme for Solid Waste Management plan is under implementation in all Municipalities and major panchayats. Under this scheme, collection tank for disposable and non-disposable garbage have been constructed in most of the Panchayats. But, recycling the waste and converting the solid waste into manure and production of energy from them are yet to come up.

Hence Demonstration and action programs are planned with user agencies and necessary field visits exclusively for officials of local body and Panchayat presidents & members are programmed to transfer of Technical Know How for Solid Waste Management.

III. 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 programs are to be conducted in the villages where sewage is directly let into water bodies. It is proposed to conduct Awareness Meeting in School/ Institutions and awareness programs, during the study period of three years covering the following subjects in

addition to Placing Stickers, Tin sheets, Pham lets and Placing banner containing messages about, the following Environmental problems.

- Sanitation.
- Solid waste treatment.
- Sewage treatment and converting the same into gas
- Organic farming.
- Conversion of aquatic weeds into manure etc

As per the instructions of the environmental specialist Mr. Anupham Joshi, the following alterations are made in the proposal,

In addition to the above, pesticides test for water quality is added and test will be carried out for three locations for once in a year.

Moreover, it is proposed to conduct field visits for environmental monitoring of project activities with respect to environmental safe guards.

It is proposed to study the impact due to project investments and hence, provisions for data collection and development reports have now been added.

Provision for preparing environmental atlas is now inserted in the context of marking all environmental and social issues with consultations of stake holders, line departments and NGOS.

MODE OF EXECUTION:

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

TOTAL COST.

The total cost works out to Rs: 3.50 Lakhs (Rupees THREE Lakhs and fifty thousands only)

Environmental Monitoring on water and soil quality and creating awareness , updating of " Environmental & Social assessment report" for NAGARIYAR SUB BASIN in VAIPPAR BASIN.

DETAILED ESTIMATE

Sl no	Description of work	No	Measurement		Contents
			L	B	
I. Water & Soil Quality Monitoring, Project Works Monitoring					
a)	Water Samples from rivers in 3 locations collected once in four months for a period of three years. 3x3x3 = 27 Nos		27 Nos		27 Nos
b)	Water Samples from rivers in 3 locations collected once in a year for a period of three years. 3x1x3 = 9 Nos (pesticides)		9 Nos		9 Nos
c)	Conveyance, Purchases like Cans, Bottles, Chemicals, engaging labour for collecting water and soil samples etc and Documentation of Water and Soil quality data and engaging labour etc.,		3 years		3 Years
d)	Provisions for field visits for environmental monitoring for project activities with respect to environmental safe guards.		3 Years		3 Years
II. ENVIRONMENTAL, SOCIAL KNOWLEDGE BASE, ANALYSIS AND DEVELOPMENT BASE					
a)	Village Level Data Collection on Environmental and Social State regarding other impacts		14 Manmonths		14 Man months
b)	Expert Analysis and Development Reporting on other impacts		LS		LS
c)	Impact studies due to project investments		6 man months		6 Man months
d)	Expert Analysis and Development Reporting due to project investments		LS		L.S
II. Environmental Social Awareness Creation					
a)	Awareness Programs for Public		1 No		1 No

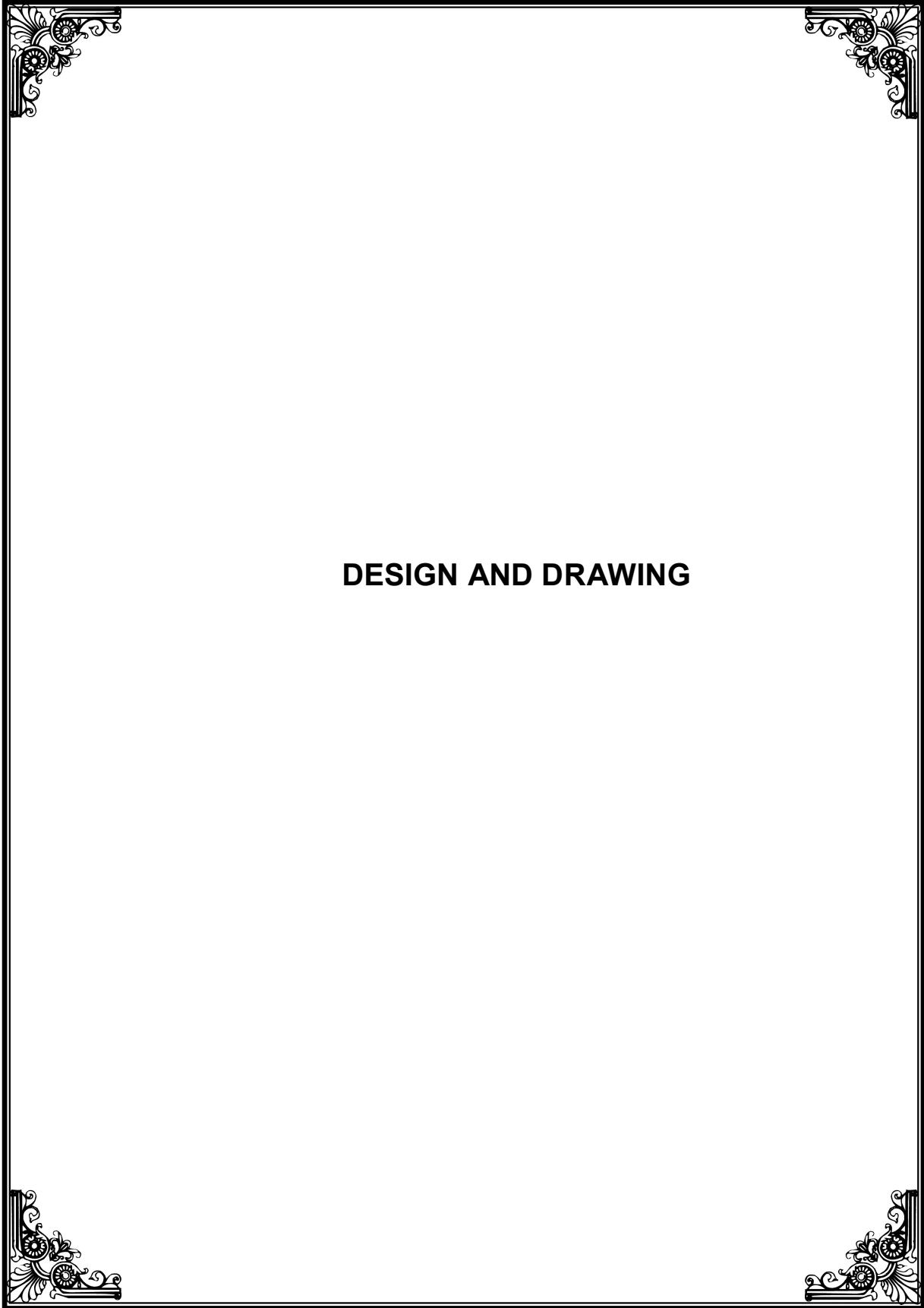
b)	Preparing and publishing environmental Atlas for the sub basin for the use of line departments /Institutions for better management of sub basin.			LS
c)	Documentation of the entire activities, hire purchase of LCD and Up gradation of Computer and Accessories, Video films and Web site development and engaging computer operator etc.,		LS	LS
III.	Variation in Rates and unforeseen items		LS	LS

Environmental Monitoring on water and soil quality and Creating awareness, updating of " Environmental and Social Assessment report" for NAGARIYAR SUB-BASIN in VAIPPAR BASIN.

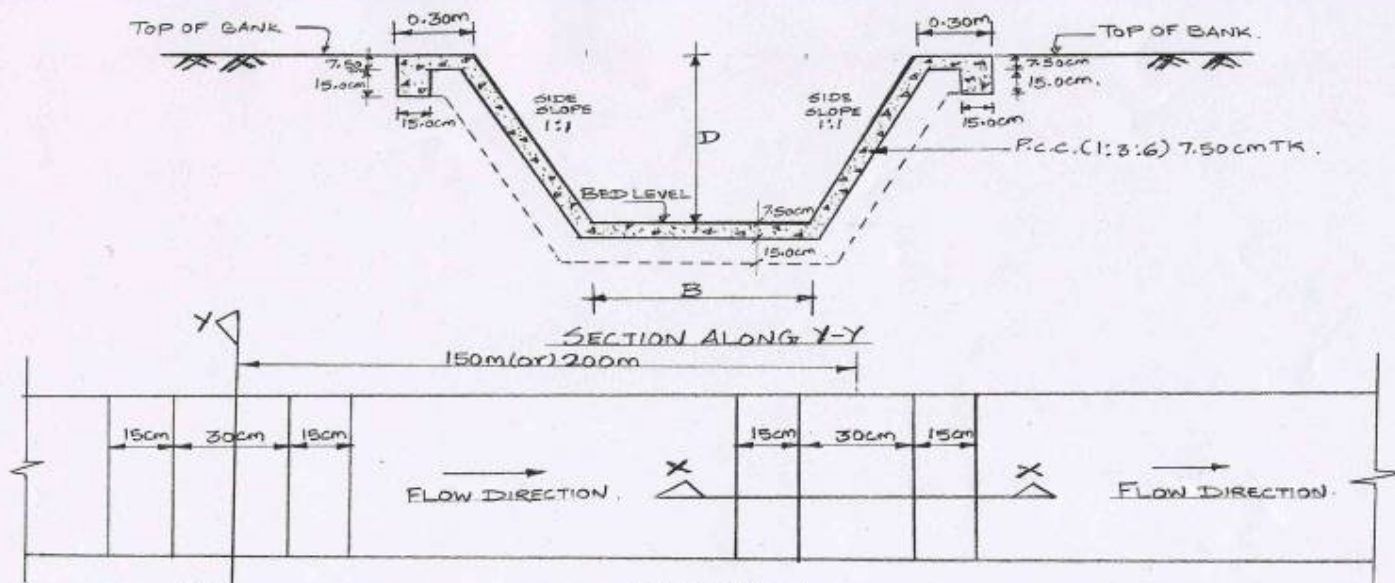
ABSTRACT ESTIMATE

Sl.No.	Qty.	Description of Work	Rate	Per	Amount
I.Water & Soil Quality Monitoring, Project Works Monitoring					
a)	27 Nos	Water Sample Testing	1400	each	37,800
b)	9 Nos	Water Sample Testing (pesticides)	12000	each	108,000
c)	3 Years	Conveyance, Purchases like Cans,Bottles,Chemicals, engaging labour for collecting water and soil samples etc and Documentation of Water and Soil quality data, engaging labour etc.,	2200	per year	6,600
d)	3 Years	Provisions for field visits for environmental monitoring for project activities with respect to environmental safe guards.	2000	1 year	6,000
II.Environmental, Social Knowledge Base, Analysis and Development base					

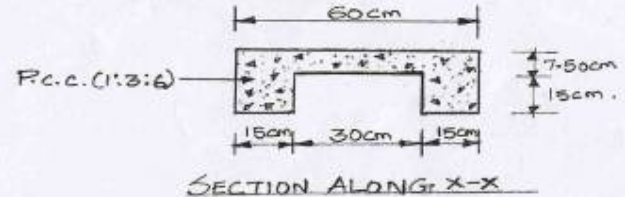
a)	14 Man months	Village Level Data Collection on Environmental and Social State regarding other impacts	5000	month	70,000
b)	L.S	Expert Analysis and Development Reporting on other impacts	L.S	L.S	10,000
c)	6 Man months	Impact studies due to project investments	5000	month	30,000
d)	L.S	Expert Analysis and Development Reporting due to project investments	L.S		10,000
III. Environmental Social Awareness Creation					
a)	1 Nos	Awareness Program for Public	15000	each	15000
b)	L.S	Preparing and publishing environmental Atlas for the sub basin for the use of line departments /Institutions for better management of sub basin.	L.S		50000
e)	LS	Documentation of the entire activities, hire purchase of LCD and Up gradation of Computer and Accessories, Video films and Web site development and engaging computer operator etc.,	L.S		6,000
III.Variation in rates and unforeseen items.					600
				Total	350,000
Rupees Three Lakhs and fifty thousand only					



DESIGN AND DRAWING



PLAN VIEW



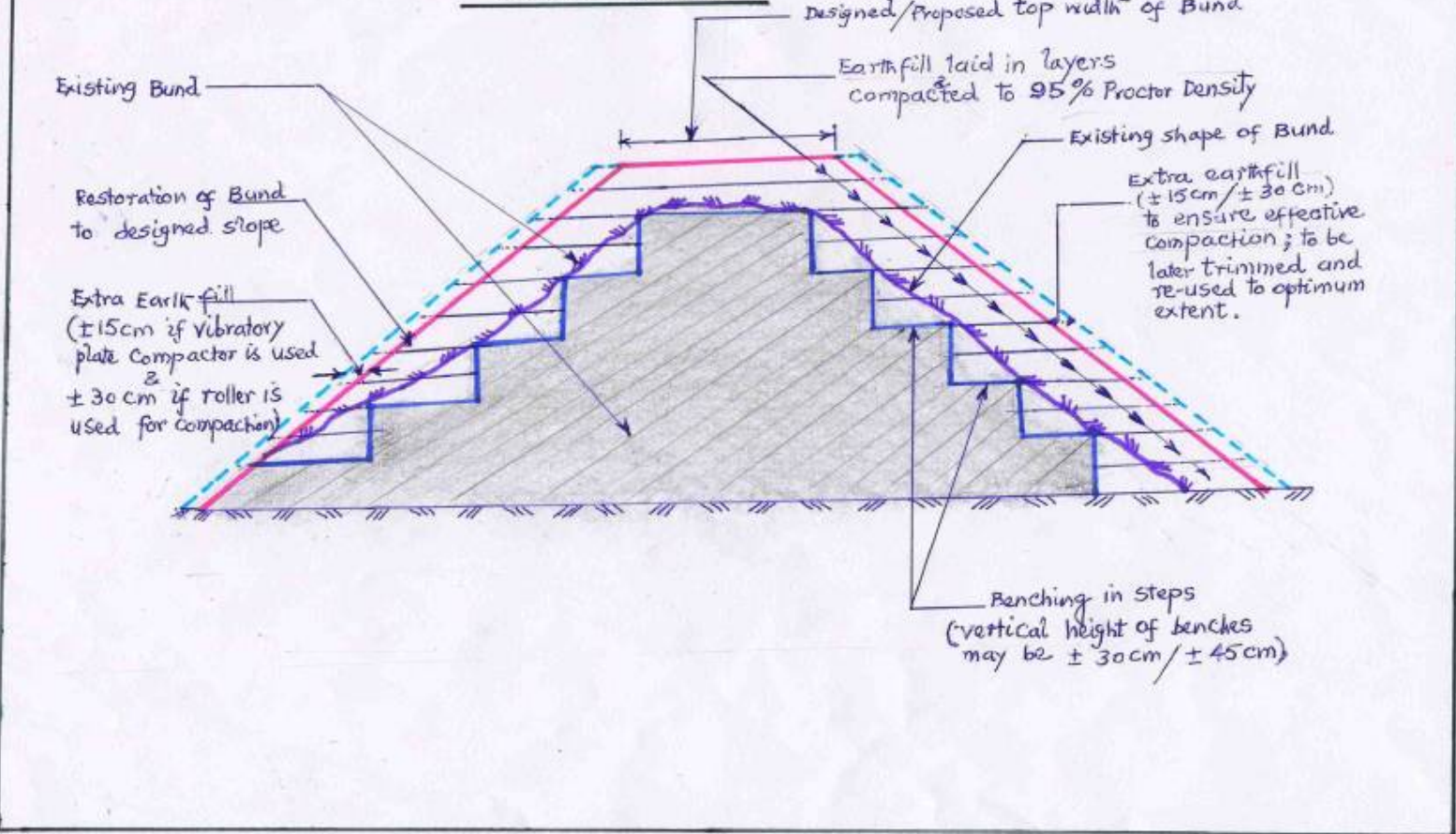
TYPICAL SECTION OF BEDBAR/MODEL SECTION FOR SUPPLY CHANNEL.

DIMENSIONS TO SUIT SITE CONDITION.

DRAWING NOT TO SCALE

TYPICAL SKETCH

RAISING & STRENGTHENING OF TANK BUND



Designed/Proposed top width of Bund

Earthfill laid in layers compacted to 95% Proctor Density

Existing shape of Bund

Extra earthfill (±15cm/±30cm) to ensure effective compaction; to be later trimmed and re-used to optimum extent.

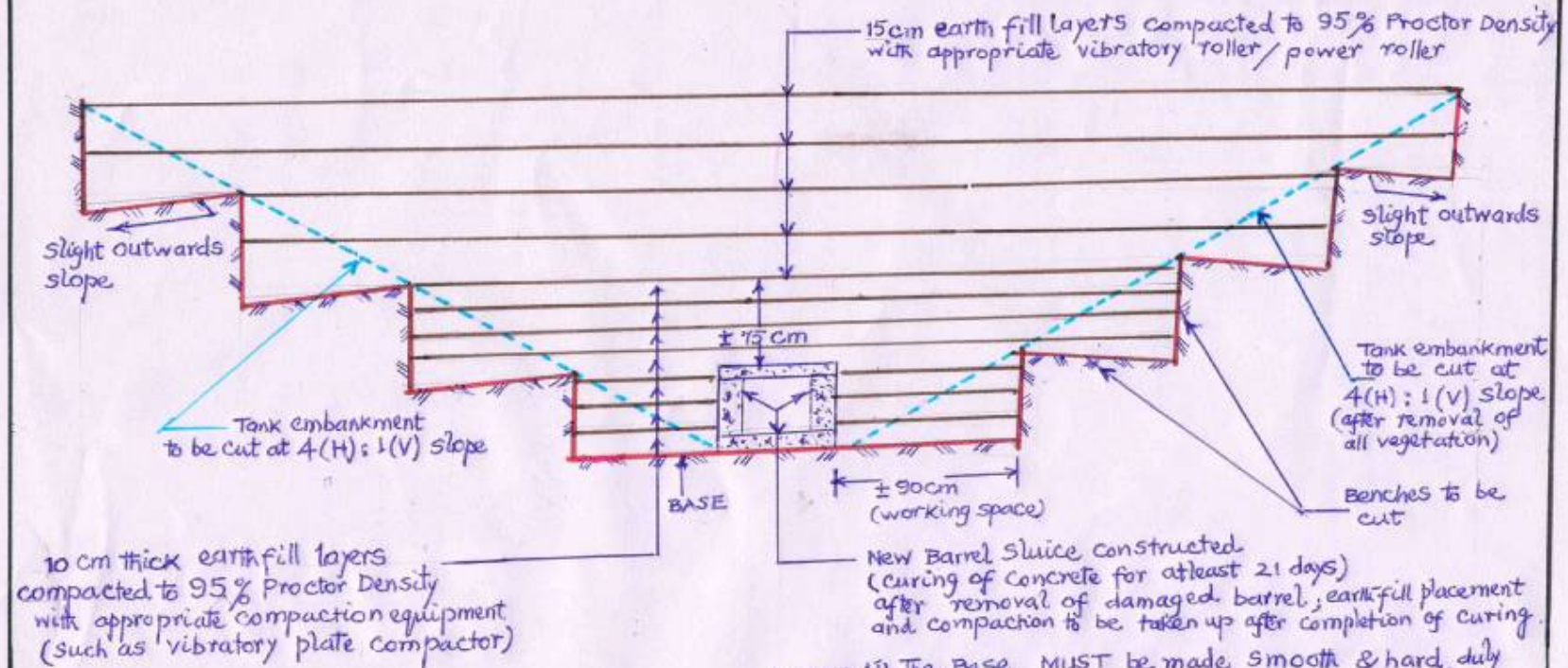
Existing Bund

Restoration of Bund to designed slope

Extra Earth fill (±15cm if Vibratory plate Compactor is used & ±30cm if roller is used for compaction)

Benching in steps (vertical height of benches may be ±30cm/±45cm)

TYPICAL SKETCH

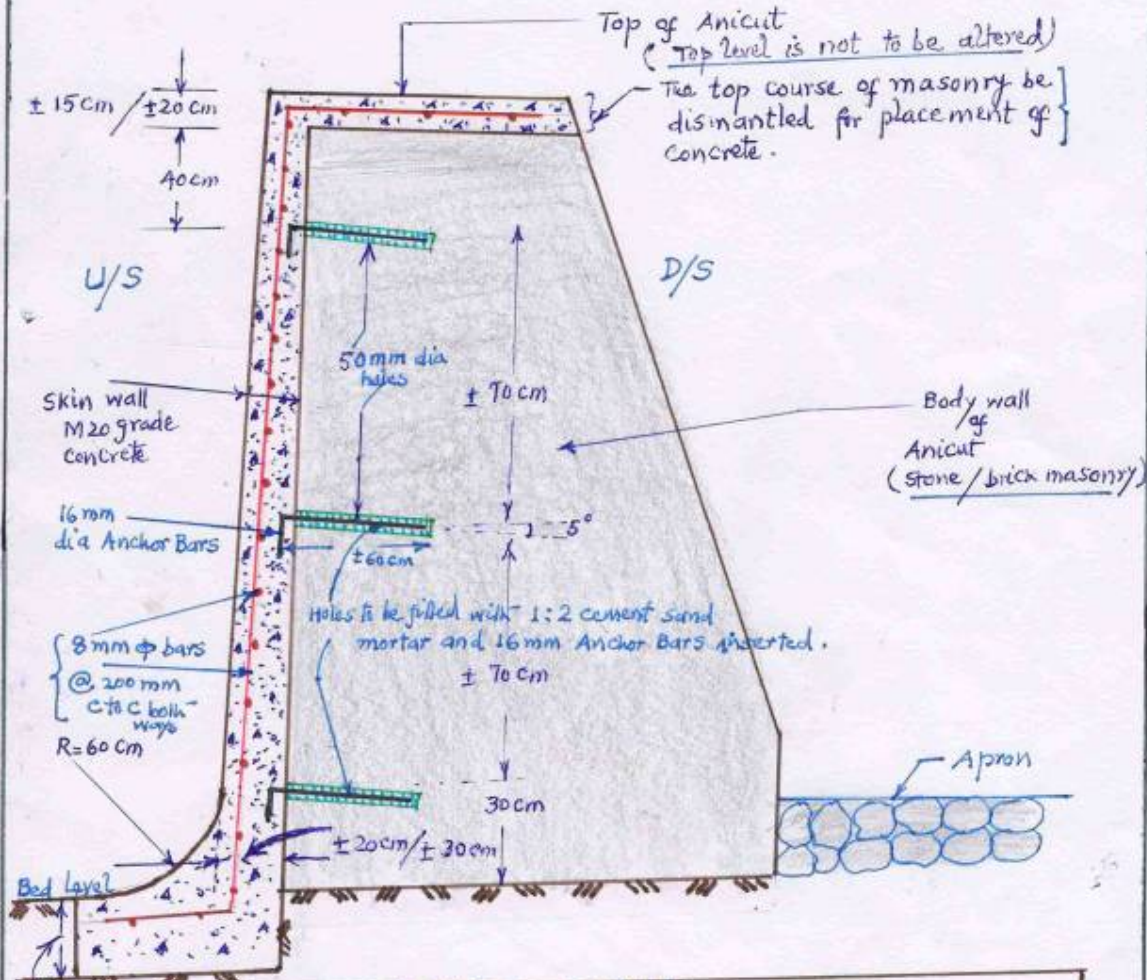


RECONSTRUCTION OF SLUICES

- 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 raked 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.