TN – IAMWARM PROJECT

UPPATHURAR SUB BASIN

DETAILED PROJECT REPORT

WATER RESOURCE DEPARTMENT

1.1 INTRODUCTION

INTRODUCTION

GENERAL:

Agriculture is the dominant sector in the Indian economy. Tamilnadu, which is supposed to be the next state to Rajasthan in average annual rain fall 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 available.

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

With the above objectives a comprehensive programme has been proposed with Multi disciplinary approach.

DESCRIPTION OF THE VAIPPAR BASIN:

The Vaippar river Basin is one of the Major river basins in TamilNadu having a drainage area of 5423 Sqkm. It is bounded by Vaigai basin and Western Ghats on the western side. Tamarabarani and Kallar river basin on southern side and Gundar river basin on northern side. The basin area is covered in 4 districts namely Virudhunagar 68%, Thoothukudi 20%, Madurai 7%, and Thirunelveli 5%. The length of the Vaippar river is 112 kms finally it debouches in to Gulf of manner.

This basin has been divided into 13 Sub-basins namely as follows:

1. Nichabhanadhi
2. Kalinkalar
3. Deviar
4. Nagariyar
5. Sevalperiyar
7. Vallampatti odai.
8. Sindapalli Uppodai
9. Arjunanadhi
10. Gowshiganadhi
11. Uppathurar
12. Senkottaiyar
13. Vaippar Main

DESCRIPTION OF THE UPPATHURAR SUB BASIN:

Uppathurar Sub Basin lies in the South of Vaippar. Valampatti Odai sub basin lies in the west and the tail end of Vaippar sub basin lies in the east of Uppathurar sub basin. Uppathurar originates at an altitude of about 100 m above M.S.L near Ilaiyarasanendal area of Sankarankoil taluk of Tirunelveli District. Another small stream which originates at an altitude of about 120 m above M.S.L near Devarkulam area of Sankarankovil taluk also joins Uppathurar near Sundaralingapuram village in Kovilpatti taluk of Thoothukudi District. After the confluence of the river is also called as Uppathurar. The river crosses the National High Ways NH-7 near Nalli Chattiram in between Kovilpatti and Sattur. In this portion the river passes through Sattur taluk of Virudhunagar District up to Uppathurar. Then it enters into Vilathikulam taluk of Thoothukudi District and joins with Vaippar near Kilnattukurichi village of Vilathikulam taluk. The total distance of this river is about 17 Km. Kovilpatti is the major town lying in this basin.

As the stream starts only from plain catchment, there is no hilly catchment area. The total drainage area is 407 Sq.Km. Kovilpatti, Sattur and Vilathikulam are the three rainfall stations which have got influential effect to this basin. Out of the three, the influential effect of Kovilpatti is greater than the other two. There is only two anicut one is called Nalli anicut across the Odai. and the other one is called ayyaneri anicut. The system anycut of nalli anicut is 85.05.00 ha and the ayyaneri anicut is 84.21.00 ha. The non-system ayacut under this basin is 644 ha. Thus the total irrigable area is 468.60 ha.

The Uppathurar sub basin is located between the latitude 9^{o}-10’ .00” N and 9^{o}-15’ .00” N and longitude 77^{o}-45’ .00” E and 78^{o}-00’ .00” E. The command area of this sub basin comes under the Sattur taluk of Virudhunagar District and Ettayapuram taluk and Kovilpatti taluk of Thoothukudi District.

AYACUT DETAILS:-

Virudhunagar District:

Sattur Taluk	:	85.05.00 Ha
Sub Total	**:**	**85.05.00 Ha**

Thoothukudi District:

Ettayapuram Taluk	:	180.31.00 Ha
Kovilpatti Taluk	:	203.24.00 Ha
Sub Total	:	383.55.00 Ha
Total	**:**	**468.60.00 Ha**

SCOPE OF THE PROJECT:-

The water Resources Organisation in coordination with the following line departments have proposed to improve the irrigation service delivery and productivity of irrigated agriculture with effective integrated water resources management in these sub basins. The line departments are

1. Agriculture Department
2. Department of Horticulture and Plantation Crops.
3. Agriculture Engineering Department
4. Tamil Nadu Agricultural University
5. Department of Agricultural Marketing and Agribusiness services
6. Animal Husbandry and Veterinary services.
7. Fisheries Department
8. Environmental cell of Water Resources Organisation.

WATER RESOURCES ORGANISATION:-

In order to improve the conveyance and operational efficiency, it is now proposed to improve and modernize the structural components in Uppathurar Sub basin.

- Training the River by removing the Shoals accumulated in the U/S and D/S of the Anicuts & evicting the encroachments by earth work excavation using Machineries.
- Repairs to the damaged anicuts.

- Desilting the supply channels & Surplus courses by earth work excavation using machineries.
- Providing revetments and retaining walls in selective area of the supply channels.
- Strengthening the tank bund by desilting the tank using machineries.
- Repairs to the damaged weirs
- Reconstruction of Collapsed sluices
- Repairs to the damaged sluices
- Providing revetments and retaining walls in selective area of the tanks scour vents etc.,
- Removing, Repairing and refixing in position of the existing S.G. shuttering arrangements and providing locking arrangements etc.,

UPPATHURAR SUB BASIN:-

It has following anicuts

Sl.No.	Name of Anicut	Tanks benefited
1.	Ayyaneri anicut	Puduappaneri
2.	Nalli anicut	Nalli Big tank

The Uppathurar sub basin has the following P.W.D. tanks.

Sl.No.	Name of tank	Ayacut in Hec.
1.	Puduappaneri tank	84.21.00
2.	Chitrampatti tank	119.03.00
3.	Nalli Big tank	85.05.00
4.	Meenakshipuram	53.64.00
5.	Karupur	126.67.00

CLUSTER WISE / CONVERGENT TABLE

Name of Sub Basin: Uppathurar District: Viruthunagar and Thoothukudi

Sl No.	Name of the cluster/ Infrastructure/ Village	Total Ayacut (Ha)			Total Area (Ha)			WRO		Agriculture		TNAU		Horticulture		Agri marketing		AHD		Fisheries		Animal Husbandry	
		FI	PI	Gap	Wop	WP	Focus crop			Act	No./ Ha	Act	No./ Ha	Act	No./ Ha	Act	No./ Ha	Act	No./ Ha	Act	No./ Ha	Act	No./ Ha
1	2	3	4	5	6	7	8	9		10	11	12	13	14	15	16	17	18	19	20	21	22	23
	Cluster I																						
1	Nalli Big Tank	30.00	5.00	50.05	35.00	58.29	Paddy Maize Block Gram Bhendi	Bund st, Slu, Re WRC SCI WRE	3000 2 1 2000 1	Sri Demo Maize Pulses	3 9 10 10	AEP BHENDI TOMATO	1 5 1	Bhendi Tomato Chillis	5 1 15	IEC	1	IHC DMM TF IEC	1 5 1 1	-	-	-	-
	Cluster II																						
2	Chitampatty tank	-	2.50	115.30	2.50	57.38	Paddy Maize Pulses Bhendi	Bund st, Slu, Re WRE Corewall	2950 3 1 1	Maize	3	PULSES	3	BringalC hillis	8 13	IEC	1	IHC DMM TF IEC	1 5 1 1	-	-	DRIP FP FCL	2.0 1 750m
3	Puthuappaneri tank	-	2.53	81.70	2.53	40.53	Paddy Maize Pulses	Bund st, Slu, Re SCI WRE	2050 3 500 1	Maize Pulses	3 6			-	-	IEC	1	IHC DMM TF IEC	1 5 1 1	-	-	DRIP FP FCL	1.0 1 550m
	Total		**5.03**	**197.00**	**5.03**	**97.91**																	
	Cluster - III																						
4	Karuppur Tank	60.02	6.6	61.30	66.62	93.90	Paddy Maize Pulses	Bund st, Slu, Re WRE	1900 2 1	Sri Maize	6 2	Pulses Sun flower	1 1	Bringal Chillies	2 10	IEC	1	IHC DMM TF IEC	1 5 1 1	ACQA DOC IEC	1 1 1	Spring FP FCL FM	2.0 2 800m 2
5	Meenakshipuram Tank	-	2.5	51.10	2.5	26.32	Paddy Maize Pulses	Bund st, Slu, Re SCI WRE	2010 2 3000 1	Maize Pulses	2 3	Sri	6	-	-	IEC	1	IHC DMM TF IEC	1 5 1 1	-	-	Spring FCL FM	2.0 350m 2
	Total	**60.02**	**9.10**	**112.40**	**69.12**	**120.22**																	
	Grant Total	**90.02**	**19.13**	**359.45**	**109.15**	**276.42**																	

NOTE :

B.S- Bund Standard

S. Re - Sluice repair

W.R. - Weir repair

W.R.C - Weir Re - Construction

S.C.I - Supply Channel Improveme

Cluster Convergence Table-IIIrd Phase Sub-basins (Abstract For Each Cluster)

Name of the Sub-Basin: **UPPATHURAR** **District:** Virudhunagar and Thoothukudi

Cluster with the name of the tank	Name of the cluster Blocks	Name of the cluster Revenue Villages	Total Ayacut area in Ha.			Total area in ha			WRD		Agriculture		Horticulture		AED		TNAU		Agri. Mark.		AHD		Fisheries	
			F1	P1	Gap area	WOP	WP	(Focus crop)	Activities	Nos. & length	Activities	Nos./Ha	Activities	Nos./Ha	Activities	Nos./Ha	Activities	Nos./ Ha	Activities	Nos./Ha	Activities	Nos./Ha	Activities	Nos./Ha
Cluster I																								
Nalli Big Tank	Sattur	Nalli	30.00.00	5.00.00	50.05.00	35.00.00	58.29	Paddy Maize Blackgram Bhendi	B.S, S.Re, W.R.C, S.C.I, W.Re	3000, 2, 1, 2000, 3	SRI HYBRID, DEMO	3, 2 1	AEP BHENDI TOMATO	1 5 1							IHC, DMM, TF, IEC	1, 5, 1, 1		
Cluster II																								
Chitrampatty	Kovilpatty	Chitrampatty	-	5.00.00	197.00.00	5.00.00	97.91	Paddy Maize Pulses Bhendi	B.S, S.Re, Corewall W.Re	5000, 6, 3, 1 ,	SRI Hybrid Demo Vermi	4 6	AEP BHENDI TOMATO	2 10 2							IHC, DMM, TF, IEC	1, 5, 1, 1		
Cluster III																								
Karuppur	Pudur	Karuppur	58.00.00	7.50.00	61.17.00	65.50.00	120.22	Paddy Maize Pulses	B.S, S.Re, W.Re, S.C.I	3910 4, 2, 1	SRI HYBRID, DEMO	3, 4 4	AEP BHENDI TOMATO	2 10 2							IHC, DMM, TF, IEC	1, 5, 1, 1		

Note:

B.S - Bund Standard

S.Re - Sluice Repair

W.R - Weir Repair

W.R.C - Weir Re-Construction

S.C.I - Supply Channel Improvements

1.2 HYDROLOGY

UPPATHURAR SUB BASIN

1.2.HYDROLOGY

1.2.1 CATCHMENT AREA :

The catchments area of this Sub Basin is 487 SqKm. This Sub Basin receives rain fall from North – East monsoon . During summer, the rain fall received is more or less equal to that of South – West monsoon. There are 24 non – system tanks under the control of WRO, PWD with a total registered ayacut of 498.60.00 Ha. But at present only 109.15.00 Ha is being cultivated during the Ist Crop.

1.2.2 HYDROMETROLOGY:

The weather data observed at Kavalur water shed , maintained by the Chief Engineer, PWD, WRO, State Ground Water and Surface Water Resources Data Centre ,Chennai is used for analysis , since long term data is available.

1.2.3 RAIN FALL:

There are three influencing rain fall station in this Sub Basin namely Aruppukottai, Sattur and Vilathikulam. The mean arial annual rainfall of this sub basin is 719 mm. The South -West monsoon rainfall is 145 mm and that of North- East monsoon rainfall is 380 mm. Remaining 194 mm of rainfall is in winter and summer seasons.

1.2.4 CLIMATE :

The annual temperature varies from 23.94^{0}C to 34.89^{0}C . The average mean temperature is 29.33^{0}C.

RELATIVE HUMIDITY:

The average relative humidity is 62.47 %.

WIND SPEED:

The average wind speed is 62.47 Km / hour. Increase in wind speed occurs during the cyclone which occurs mostly in November.

SUN SHINE:

The average sun shine hours is 7.29 hours per day.

1.2.5: SOIL CLASSIFICATION;

Soils classification maps have been prepared in 1996 by the National Bureau of Soil Survey and Land Use Planning, Bangalore(NBSS) in co operation with the Department of Agriculture of Tamilnadu . Based on this, the predominant soil order found in this Sub Basin, are Inceptisol , Alfisol , and vetisols.

1.2.6 LAND HOLDINGS:

More than 57.66 % of the land holdings are below 1 Ha followed by 26.49 % of land holding with 1 to 2 Ha size medium farmers having 2 to 5 ha are 12.70% and big farmers contributes to 0.53% only. The total Nos of land holdings is ..... .

Category	Size of Holdings	Numbers	% to total
Marginal	Below 1.00 ha	320	57.66
Small	1.00 – 2.00 ha	147	26.49
Medium	2.00 – 5.00 ha	85	15.32
Big	5.00 ha & above	3	0.53
	TOTAL	555	100.00

1.2.7.DEMOGRAPHY:

There are five blocks lying partially in this Sub Basin. They are Aruppukottai, Sattur and Virudhunagar Blocks of Virudhunagar District and Pudur and Vilathikulam Blocks of Thoothukudi District. The population details were obtained from the Director of Statistics , Chennai are used for calculation of domestic water requirement.

Name of sub basin	Total number of blocks	Total number of villages	Population		
			2004	2010	2025
Senkottaiyar Sub Basin	3	9	207835	231943	305494

1.2.8 WATER POTENTIAL:

Surface Water Potential : 18.00 M Cum
Ground Water Potential : 60.34 M Cum
Total : 78.34 M Cum

1.2.9 LIVE STOCK POPULATION:

Name of Sub basin	**Cattle**	**Buffalo**	**Sheep**	**Goats**	**Pigs**	**Dogs**	**Others**	**Poultry**
Uppathurar	**91.19**	**7754**	**35293**	**22334**	**1759**	**1550**	**315**	**50097**

Baisn								
Water Requirement	2004 0.14	2010 0.10	2025 0.15					

1.2.13 INDUSTRIES & MONTHLY WATER DEMAND in M cum :

Name of sub basin	Medium Industries			Small Industries			Water Requirement		
	2004	2010	2025	2004	2010	2025	2004	2010	2025
Uppathurar Sub basin	9	13	21	1853	2527	4212	0.28	0.38	0.64

TANKS MAINTAINED BY PANCHAYAT UNION IN UPPATHURAR SUB BASIN

Sl No	Name of village	Name of tank	Ayacut in Ha	
	Sattur Union, Virudhunagar Dt.			
1.	Karisalpatty	Karisalpatty	4.94	
2.	Sindhuvampatty	Kosavankulam	6.09	
3.	Sindhuvampatty	Periyakulam	16.19	
4.	Kanchampatty	Periyakulam	10.53	
5.	Kanchampatty	Keelakulam	4.13	
		SUB TOTAL	41.88	

Tuticorin District, Pudur Union

6.	Karuppur	Karuppurkulam	26.45

Kovilpatti Union

7.	Karisalkulam	Avalnatham	31.26
8.	Meenakshipuram	Meenakshipuram Kulam	4.52
9.	Kadalaiyur	Varathampatti Kulam	3.51
10.	Chettikulam	Chettikulam	9.02

Kuruvikulam Union

11.	Elayarasanendal	Poovankavalankulam	18.10
12.	Elayarasanendal	Sirukulam	13.24
13.	Elayarasanendal	Periyakulam	24.37
14.	Elayarasanendal	Mythinikulam	7.00
15.	Ayyaneri	Kombankulam	5.50
16.	Puliyankulam	Periyakulam	9.23

TOTAL -- 194.08 Ha

CROPPING PATTERN

Name of the sub Basin	**: Uppathur**	Fully Irrigated	:	90.02	Ha
Nodal District	: Tuticorin & Virudhunagar	Partially Irrigated	:	19.13	Ha
Registered Ayacut Area	468.60 Ha.	Gap	:	359.45	Ha
		Total Ayacut Area	:	**468.60**	Ha

S.No.	Crop	Without Project				With Project				Increas-ing
		FI	PI	RF/G	TOTAL	FI	PI	RF/G	TOTAL	
I	**Perennial crop**									
		0	0	0	0	0	0	0	0	0
	Sub Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
II	**Annual crop**									
		0	0	0	**0**	0	0	0	**0**	0
	Sub Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	0
III	**1st crop**									
1. a	Paddy	90.02	0	0	**90.02**	0.00	0	0	**0.00**	-90.02
b	Paddy - SRI	0	0	0	**0.00**	90.00	0	0	**90.00**	90.00
2	Cumbu	0	9.62	0	**9.62**	0.00	0	0	**0.00**	-9.62
3	Maize	0	0	0	**0.00**	60.00	0	0	**60.00**	60.00
4	Pulses	0	0	0	**0.00**	52.78	0	0	**52.78**	52.78
5	Cholam	0	3.64	0	**3.64**	3.64	0	0	**3.64**	0.00
6	Brinjal	0	2.05	0	**2.05**	15.00	0	0	**15.00**	12.95
7	Chillie	0	3.82	0	**3.82**	50.00	0	0	**50.00**	46.18
8	Bhendi	0	0	0	**0.00**	4.00	0	0	**4.00**	4.00
9	Tomato	0	0	0	**0.00**	1.00	0	0	**1.00**	1.00
10	Prosophis	0	0	192.18	**192.18**	0.00	0	192.18	**192.18**	0.00
11	Fallows / Gap	0	0	167.27	**167.27**	0	0	0	**0.00**	-167.27
	Sub Total	**90.02**	**19.13**	**359.45**	**468.60**	**276.42**	**0.00**	**192.18**	**468.60**	**0.00**
	Grand Total (I+II+III)	**90.02**	**19.13**	**359.45**	**468.60**	**276.42**	**0.00**	**192.18**	**468.60**	**0.00**
IV	**2 nd Crop**									
2	Maize	0	0	0	**0.00**	50.00	0	0	**50.00**	50.00
3	Pulses	0	0	0	**0.00**	30.00	0	0	**30.00**	30.00
4	Sunflower	0	0	0	**0.00**	10.00	0	0	**10.00**	10.00
	Sub Total	**0.00**	**0.00**	**0.00**	**0.00**	**90.00**	**0.00**	**0.00**	**90.00**	**90.00**
V	**3 rd Crop**									
	Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0**
	Great Grand Total	**90.02**	**19.13**	**359.45**	**468.60**	**366.42**	**0.00**	**192.18**	**558.60**	**90.00**
	Cropping Intensity				**23.29%**				**78.19%**	

UPPATHURAR SUB BASIN - VAIPPAR BASIN

Water Potential without Project

Surface Water Potential		=	71.00	Mcm
Ground Water Potential		=	60.34	Mcm
Total Potential		=	**131.34**	Mcm

Water Demand without Project

Domestic		=	5.29	Mcm
Livestock		=	1.25	Mcm
Industrial		=	9.04	Mcm
Irrigation	WRO	=	2.15	Mcm
	PU & GW	=	4.61	Mcm
Total Water Demand		=	22.34	Mcm
Water Balance		=	**109.00**	Mcm

UPPATHURAR SUB BASIN - VAIPPAR BASIN

Crop water requirement without Project

I.No.	Name of Crop	Area in Ha	Crop water requirement in mm	Total Crop water requirement in Mcm	Irrigation water requirement at source Eff=43%	Total Irrigation requirement in Mcm
I	1st crop (Sep- Jan)					
1. a	Paddy	90.02	950	0.855	1.99	1.99
b	Paddy - SRI	0.00	665	0.000	0.00	0.00
2	Cumbu	9.62	300	0.029	0.07	0.07
3	Maize	0.00	550	0.000	0.00	0.00
4	Pulses	0.00	300	0.000	0.00	0.00
5	Cholam	3.64	300	0.011	0.03	0.03
6	Brinjal	2.05	500	0.010	0.02	0.02
7	Chillie	3.82	500	0.019	0.04	0.04
8	Bhendi	0.00	500	0.000	0.00	0.00
9	Tomato	0.00	462	0.000	0.00	0.00
10	Prosophis	0.00	0	0.000	0.00	0.00
11	Fallows	0.00	0	0.000	0.00	0.00
	Sub Total	109.15		0.92	2.15	2.15
II	2nd Crop					
1	Maize	0.00	550	0.000	0.00	0.00
2	Pulses	0.00	300	0.000	0.00	0.00
3	Sunflower	0.00	595	0.000	0.00	0.00
	Total	0.00		0.00	0.00	0.00
	Great Grand Total	109.15		0.92	2.15	2.15

UPPATHURAR SUB BASIN - VAIPPAR BASIN

Crop water requirement with Project

Sl.No.	Name of Crop	Area in Ha	Crop water requirement in mm	Total Crop water requirement in Mcm	Irrigation water requirement at source Eff=53%	Total Irrigation requirement in Mcm
I	**1st crop (Sep- Jan)**					
1. a	Paddy	0.00	950	0.000	0.00	0.00
b	Paddy - SRI	90.00	665	0.599	1.13	1.13
2	Cumbu	0.00	300	0.000	0.00	0.00
3	Maize	60.00	550	0.330	0.62	0.62
4	Pulses	52.78	300	0.158	0.30	0.30
5	Cholam	3.64	300	0.011	0.02	0.02
6	Brinjal	15.00	500	0.075	0.14	0.14
7	Chillie	50.00	500	0.250	0.47	0.47
8	Bhendi	4.00	500	0.020	0.04	0.04
9	Tomato	1.00	462	0.005	0.01	0.01
10	Prosophis	0.00	0	0.000	0.00	0.00
11	Fallows	0.00	0	0.000	0.00	0.00
	Sub Total	**276.42**		**1.45**	**2.73**	**2.73**
II	**2nd Crop**					
1	Maize	50.00	550	0.275	0.52	0.52
2	Pulses	30.00	300	0.090	0.17	0.17
3	Sunflower	10.00	595	0.060	0.11	0.11
	Total	**90.00**		**0.42**	**0.80**	**0.80**
	Great Grand Total	**366.42**		**1.87**	**3.53**	**3.53**

UPPATHURAR SUB BASIN - VAIPPAR BASIN

Water Potential with Project

Surface Water Potential		=	71.00	Mcm
Ground Water Potential		=	60.34	Mcm
Total Potential		=	**131.34**	Mcm

Water Demand with Project

Domestic		=	5.29	Mcm
Livestock		=	1.25	Mcm
Industrial		=	9.04	Mcm
Irrigation	WRO	=	3.53	Mcm
	PU & GW	=	4.61	Mcm
Total Water Demand		=	**23.72**	Mcm
Water Balance		=	**107.62**	Mcm

1.3 HYDRAULICS OF THE COMPONENTS

HYDRAULIC PARTICULARS

a) ANICUT

Sl.No	Name of Anicut	Village	Ayacut	Length of Anicut(M)	Crest level of Anicut (M)	Front (M)	Free Sq.km	Combined Sq.km	Maximum flood discharge Cumecs/ Cusecs	Head sluice Location	Vent(M)	Sill Level sluice (M)	Discharge cumecs	Supply Channel					Remarks
														Length (m)	Bed width (M)	FSD (M)	Bed slope	Sluice	
1.	Nalli	Sivananai nthapuram	NIL	42.65 m	31.09 m	-	-	-	840984 c/s	Right Side	1.05 x 0.45	100.00	20.92 c/s	200 0 m	2.10 m	0.45 m	1 in 3300	-	Tank Anycut only
2.	Ayyaneri	Ayyaneri	NIL	-	-	-	-	-	984 c/s	Left Side	-	-	22 c/s	500 m	5.00 m	-	1 in 3300	-	

b) TANKS (Separate statement for & Non System Tanks)

Sl. No	District	Taluk	Name of Work	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	, Thoothukudi . Virudhunagar	Ettayapuram, Kovilpatti, Sattur	Nalli	85.05.0	17.50	2	3.71 Sq.km	16.59	53.63	30.58	31.180	2	1 2 3 4	17.00 25.00 17.00 10.00	2702 C/S	30000 m	2000m	-	-
2			Chitrampatti	119.03.00	18.4.0	2	13.19	18.18	-	33.70	34.30	3	1 2	58.00 8.40		2950	-	-	-
3			Appaneri	84.21.0	13.00	2	-	2.56	0.76	27.80	28.40	3	1	8.8		2050	500	-	-
4			Karuppur	126.67.0	22.33	2	-	27.22	0.76	30.25	30.85	2	1	119.60		1900	-	-	-
5.			Meenkshipuram	53.64.0	16.90	2	-		1.60	29.00	30.60	2	1	26.00		2010	3000	-	-

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.	**Nalli Big Tank**	**Nalli Anaicut**	**2.000**	**Sivanaintha puram**	**Sattur**	**Sattur**	**Virudhunagar**	**NIL**
2.	**Puthu Appaneri Tank**	**Ayyaneri Anaicut**	**0.500**	**Appaneri**	**Kovilpatti**	**Kovilpatti**	**Thoothukudi**	**NIL**
3.	**Meenakshi puram Tank**	**Kottar Anaicut**	**3.000**	**Meenakshi puram**	**Kovilpatti**	**Ettayapuram**	**Thoothukudi**	**NIL**

1.4 PARTICIPATORY IRRIGATION MANAGEMENT (PIM)

1.4 Participatory Irrigation Management (PIM) Under IAM WARM Project in UPPATHURAR Sub basin

The Sub-Basin : This is one of the Thirteen sub-basins of the Vaippar River Basin. Totally 5 irrigation tanks are under the control of Water Resources Organisation (WRO) of Public Works Department (PWD) in this sub-basin. The list of Tanks covered with more details are furnished in the Annexure-1. These 5 tanks are located within the sub-basin's hydraulic boundary spread over 9 villages of Sattur Taluks in Virudhunagar District and Ettayapuram and Kovilpatty Taluks of Thoothukudi District. The total Command area under these 5 tanks works out to 468.60 Ha. (Annexure 1)

Command Area :

i) Under system tanks	:	Nil
ii) Under Non-system tanks (5 tanks)	:	468.60 Ha
Total (5 Tanks)		**468.60 Ha**

An assessment of number of WUAs

i)	Associations already formed under WRCP	Nil
ii)	Associations proposed to be formed under IAMWARM Project covering 24 tanks	5 Nos.
iii)	The total command area covered	468.60 Ha

4. An account of "Awareness Creation" among the farming community :

Activities undertaken and "Walkthrough Surveys" carried out. :

i) There are 5 tanks in the sub - basin spread over 9 village, 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, and 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 District Collectors (End of July 09)

ii) Form - II : WUA documents to be notified by District Collectors (End of Dec 09)

iii) Completion of preparatory works for the conduct of Elections for WUAs (End of Feb 2010)

6. Schedule for conduct of Elections in the sub basin for forming Management Committees (End of April 2010)

7. Support Organizations (SOs) :

i) initiating and completing the process of publishing EOI to hire Support Organization at Sub-basin level (End of June 2009)

ii) Short listing and providing Request for proposals (RFPs) to all the short listed agencies and obtaining Technical and Cost Proposals (Middle of Aug 2009)

iii) Selection and deployment of support organization to the sub - basin (End of October 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 farmers organizations (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 WUA's 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 UPPATHURAR Sub Basin.

Virudhunagar District.

Assistant Executive Engineer, WRO., PWD.,

Vaippar Basin Sub Division, Virudhunagar.

Thoothukudi District.
Assistant Executive Engineer, WRO., PWD.,
Upper Vaippar Basin Sub Division, Sankarankoil.
and
Asst. Executive Engineer. WRO., PWD.,
Vaippar Basin Sub Division, Vilathikulam.

List of Competent Authorities :

a.	Section Officer, WRO Vaippar Basin Section, Sattur.	WUAs 1,
b.	Section Officer, WRO Vaippar Basin Section Sankarankoil.	WUAs 2,3
c.	Section Officer, WRO Vaippar Basin Section Vilathikulam.	WUA 4,5

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 farmers, a list of tasks proposed to be taken up for "Modernisation" under IAMWARM project was discussed with 50 Nos of farmers from 9 villages. The final list of tasks will be prepared and exhibited in the Notice Board of the village Administrative office and Panchayat Office. These details were also discussed with the farmers and the tasks to be taken up under scheme modernisation finalized.

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 the works, 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 designed as the Nodal Officer of the sub-basin concerned.

iii) The field officers of WRO are all aware of the problems in handling 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 handling over the irrigation systems after completing the tasks related to modernization of Irrigation systems, under IAM WARM Project.

10. Current Status of Recovery of water charges :

i) An enquiry conducted with the "village Administrative Officers" (VAOs) of randomly selected villages located with in the sub basin the normal water charges recovery as informed by the VAO, works out to 40-50% about the expected percentage of 80-90%.

ii) With the proposal to form new WUAs under IAMWARM in "UPPATHURAR" 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 handling 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" 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 organize 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 three by the farmer's income.

iii) The support organisation will also conduct necessary "awareness programme" and impact training to educate the farmers of the WUAs in all aspects of the TNFMIS Act, TNFMS Rules and Election procedures for consituting the "Managing Committiees" of the WUAs.

12. The "Competent 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.

DETAILS OF WUAS PROPOSED IN UPPATHURAR SUB BASIN.

Sl.No	WUA No.	Name of Tank	Name of Villages	Name of WUA	Ayacut in Ha
1	I	Nalli Tank	Nalli & Kalingapatti	Nalli Big Tank water user Association.	85.05.00
2	II	Chitrampatti Tank	Chitrampatti & Puliyankulam	Chitrampatti Tank water user Association	119.03.00
3	III	Pudhu Appaneri Tank	Pudhu appaneri & Appaneri	Pudhuappaneri Tank water User Association	84.21.00
4	IV	Karuppur Tank	Karuppur	Karuppur Tank Water User Association	126.67.00
5.	V	Meenakshipuram	Meenakshipuram & Venkatachalapuram	Meenakshipuram Tank Water User Association	53.64.00

GOVERNMENT ORDER :

The Water Resources Consolidation Project was implemented in Tamilnadu with World Bank assistance during the period from 1994 to 2004. In the light of the experience gained under the above project, it is proposed to take up a new project on titled as Tamilnadu Irrigated Agriculture and Water Bodies Restoration and Management **(IN Tamil NEERVALA NILAVALA THITTAM)** with objectives to improve irrigation service delivery and productivity of Irrigated Agriculture with effective Water Resources Management in a river basin / sub basin frame work in Tamil Nadu with World Bank assistance for a period of six years

from 2007 to 2013, vide G.O.Ms No.43 PWD. This project will be implemented in an integrated manner with the participation of line departments and other institutions. The World Bank has approved the Project cost of Rs.2547 crores.

The Project is proposed to be implemented in 63 basins during the over all Project period of 6 years from 2007 – 08 excluding the areas already covered under Water Resources Consolidation Project and the Cauvery Basin. Now it this proposed to take up the IIIrd Phase in the Vaippar Basin. The project is to be started in 13 Sub basins.

The Uppathurar Sub Basin is one among the 13 sub basins, in to Single package for a total sum of Rs.183 lakhs and this estimate has been titeled as '' **Rehabilitation and Modernisation of Non System tanks in Uppathurar Sub Basin in Sattur, Taluks of Virudhunagar District and Kovilpatti, Ettayapuram and Tuticorin District.''**

DEFICIENCIES FOUND IN THIS PROPOSAL IN GENERAL :

In most of the command areas of the channels, tanks, Irrigation channels etc., distribution are taken up to a certain limit beyond which the water is left to be conveyed by the farmers themselves to the fields for irrigation. No technical attention is paid on the application of water to the fields. Since maintained by the farmers with out the proper awareness of irrigation. Most of the fields are having zigzag Boundaries and the field bunds are in abnormal size which reduces the cultivable area considerably.

In this Sub Basin their are some uncontrolled structures in the non-system area. Tanks are all to be desilted. Since for a long period these tanks have not been desilted due to the shortage of maintenance fund.

The other major problems being experienced in this proposal are as follows.

(i) This system is a very old system existing for more than 100 Years; it therefore requires wide spread rehabilitation.
(ii) Lack of adequate control of regulating structures like Anicuts, Head Sluices, Sand vents etc.,
(iii) Heavy Accumulation of silt .
(iv) Thick vegetation growth in the supply channels obstructing free flow of water.
(v) The cross masonry works need repairs.
(vi) Micro irrigation needs to be propagated in the application of water to the fields.
(vii) Most of the lands are in fragmented condition, consequently there is a lot of water loss in field to field irrigation.
(viii) Farmers are not aware of modern techniques of irrigation and hybrid varieties of crops.
(ix) Lack of efficient farm management.

Water Resources Department (WRD)

Approach: To rehabilitate the irrigation system and service delivery:

a. Thematic Maps on land use, soils, crops, water bodies, and other agricultural and demographic attributes are prepared by IWS.
b. The crop water requirements for the crops during without and with Project situation are prepared by IWS. The crops proposed by Agriculture and Horticulture Departments will be tailored in consultation with Agricultural Marketing Department and the Water Users Association.
c. The adequacy & status of the feeder channels to tanks, distribution system etc, have been assessed by the WRO (both regional and Plan Formulation wing) as follows:
    - Repairs to the damaged Anicuts
    - Providing Head Sluice to some of the supply channels to avoid breaches during Floods and for better water management.
    - Providing Scour vent in the tank weirs.
    - Desilting the supply channels by earthwork excavation using machineries.

- Providing revetments and retaining walls in selective locations of tanks and supply channels .
- Providing Model sections to maintain the top of the bund, front and rear slope of the tank bund.
- Providing steps in the tank bund for easy approach to the fields by the farmers wherever necessary
- Strengthening the tank bund by desilting the tank using machineries
- Reconstruction of Collapsed weirs
- Repairs to the damaged weirs
- Repairs to the damaged Sluices
- Providing revetments and Retaining walls in selective areas of the tanks
- Providing S.G. Shutter / Plug arrangements to Sluices, Head sluices, Scour vents etc.,
- Removing, Repairing and refixing in position of the existing S.G. shuttering arrangements and providing locking arrangements etc.,

Sl.No.	Walk Through Survey		Farmers request	Technical Solution								Proposals in plan								Remarks
	Date	Location		WRO	Agri	Horti	AED	TNAU	AGMT	AHD	Fisheries	WRO	Agri	Horti	AED	TNAU	AGMT	AHD	Fisheries	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1	10.12.2008	Nalli BigTank, Sattur Taljuk	Supply channel to be improved. Tank to be desilted and bund will be strengthened. Reconstruction of damaged sluice and weir. Seed and fertilizers required for cotton and trip irrigation. Thurshing floor formation and construction of godown.	Supply channel will be desilted and tank will be desilted and strengthened sluice reconstructed weir reconstructed proposed.								Supply channel and tank will be desilted by earth machinaries reconstruction of sluice and weir of damaged.								

2	11.12.2008	Chittrampatti Tank, Kovilpatti Taluk.	Tank to be desilted and bund tol be strengthened from borrowpet area. Reconstructing damaged sluices. New construction of weir proposed with scour vent. Downstream side and upstream side apron are requiered for weir. Causeway required across Odai. SRI and Model farm. Driff Irrigation system requested II crop sunflower seeds with details requested.	Tank to be desilted with Eearth Moving machinearies and bund will be strengthened with suitable earth. Reconstruction of damaged sluice and weir. Core wall construction for the breached portion.								Tank to be desilted with earth machinery. Bund strengthened with suitable earth. Reconstruction of sluice, weir required sand vent.								

3	11.12.2008	Pudhu Appaneri Tank, Kovilpatty Taluk.	Tank to be desilted and bund to be improved. Sluice damaged to be reparied and shutter to be formed. Downstream apron for weir requested. Appaneri anicut and supply channel to be improved to feed tank. Moola Odail to be improved. Driff Irrigation system dn change over of old pumpset to be done. Constructin of godown.	Tank to be desilted with earth machinery. Bund to be strengthened with suitable earth. New shutter fixed for slucie. Supply channel tobe improved.								Tank to be desilted with earth machinery. Bund to be strengthened with suitable earth. New shutter fixed for slucie. Supply channel tobe improved.									

4	23.12.2008	Karuppur Tank, Ettayapuram Taluk	Tank to be desilted and budn to be strengthened. Existingsuice to be removed and reconstructed with concrete. Weir to be improved with sand vent. Left side bund will be raised. A/C godown constructed for store agri products. F.B to be constructed below sluice. Seed and fertilizers to be supplied. Agri items to be given to farmers. Retaining wall to be constructed in both sides of weir.	Tank to be desilted with earth machinery. Slucie to be repaired. Sand vent porposed in weir. Retaining wall reconstructed in concrete.								Tank to be desilted and bunds strengthened. Sluice to be repaired. Sand vent proposed to Weir									

5	23.12.2008	Meenchipuram, Ettayapuram Taluk	Tank to be desilted and bund to be strengthened. Existing sluice to be removed and reconstructed. Weir to be improved and reconstructed. Juliflora jungle in the ayacut to be removed by Agriculture Engineering Department. Thrushing floor and godown will be constructed.	Tank to be desilted with earth machinery and bund to be strengthened. Sluice will be repaired to flow water. Jungle will be removed while desilting.								Tank will be desilted and bund strengthened with earth machinery. Sluice to be repaired. Weir to be repaired.								

1.5. IRRIGATION INFRASTRUCTURE

LIST OF ANICUTS

Sl. No	Anicuts	Village	Block	Taluk	District	Tank Ayacut Area in Ha	Capacity
1.	Nalli Anicut	Sivanainanthapuram	Sattur	Sattur	Virudhunagar	85.05.0	-
2.	Ayyaneri Anicut	Appaneri	Kovilpatti	Kovilpatti	Thoothukudi	84.21.0	-

LIST OF TANKS (Separate statement for Non System tanks)

Sl. No	Tank	Village	Block	Taluk	District	Direct Ayacut Area in Ha	Capacity
1.	**Nalli Big Tank**	Nalli	Virudhunagar	Sattur	Virudhunagar	85.05.00	17.50 mft
2.	**Chittrampatti**	Chittrampatti	Kuruvikulam	Kovilpatti	Thoothukudi	119.03.00	18.40 mft
3.	**Puthu Appaneri Tank**	Appaneri	Kuruvikulam	Kovilpatti	Thoothukudi	84.21.00	13.00 mft
4.	**Karuppur**	Karuppur	Puthur	Ettayapuram	Thoothukudi	126.67.00	22.33 mft
5.	**Meenakshi puram Tank**	Meenakshipuram	Kovilpatti	Ettayapuram	Thoothukudi	53.64.00	16.90 mft

List of tanks/Anicuts executed under various schemes (Viz, Part II Scheme, NABARD, WRCP I etc.,) since 2000.

Sl.No.	Name of Anicut / Tank	Ayacut	Scheme in which executed	Amount	Details of components executed	Remarks
			------ NIL -----			

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.	**Nalli Big Tank**	**Nalli Agri**	**2.000**	**Sivanaintha puram**	**Sattur**	**Sattur**	**Virudhunagar**	**85.05.00**
2.	**Puthu Appaneri Tank**	**Ayyaneri Agriculture**	**0.500**	**Appaneri**	**Kovilpatti**	**Kovilpatti**	**Thoothukudi**	**84.21.00**
3.	**Meenakshi puram Tank**	**Kottar odai**	**3.000**	**Meenakshi puram**	**Kovilpatti**	**Ettayapuram**	**Thoothukudi**	**53.64.00**

List of tanks/Anicuts executed under various schemes (Viz, Part II Scheme, NABARD, WRCP I etc.,) since 2000.

Sl.No.	Name of Anicut / Tank	Ayacut	Scheme in which executed	Amount	Details of components executed	Remarks
			------ NIL -----			

ABSTRACT ON THE DETAILS OF IRRIGATION INFRASTRUCTURE AVAILABLE AND WORKS TAKEUP UNDER IAMWARM PROJECT

NAME OF SUB BASIN: UPPATHURAR

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	2	5.50 KM	-	-	-	-	5	-	468.60.00	-	-	-
2	Infrastructure excluded in iam warm project since works carried out under various schemes from 2000	-	-	-	-	-	-	-	-	-	-	-	-
3	Infrastructures that does not require any rehabilitation works	-	-	-	-	-	-	-	-	-	-	-	-
4	Works taken up in iamwarm project	2	5.50	-	-	-	-	5	-	468.60.00	-	-	-

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

A. REHABILATION OF IRRIGATION INFRA STRUCTURE OF THE SUB BASIN STRUCTURAL STATUS & DEFICIENCES IN THE SYSTEM :

Necessary walk through surveys in these tanks and its anicut were performed with line departments on 10.12.2008, 11.12.2008 and 23.12.2008 Based on the observations made, the following are the present structural condition of the Uppathurar Sub Basin System.

- ❖ This system is a good old system existing for more that 100 years as such requires Rehabilitation.
- ❖ No scheme works were done during the past 10 years result non effective Irrigation systems.
- ❖ The damaged or dilapidated condition of the existing anicuts, diversion head works etc., and supply channels causes to poor standard of the entire conveyor system.
- ❖ This Uppathurar sub basin totally consists of Non system tanks and no reservoir in the sub basin area. Hence the sub basin requires restoration.

In order to improve the conveyance and Operational Efficiency proposed to improve and modernise the Irrigation Infrastructure in Uppathurar Sub Basin.

** Repairs to the damaged anicuts. In the ayaneri Anicut, the flood bank on either side was completely washed away. Hence it is proposed to provide a corewall to a length 50 m on either side and the flood bank is proposed to a length of 400m on either side and pointing is proposed on the weir portion

In the Nalli Anicut pointing and R.R.Masonry wall repairing and replacing of shutter arrangements to head sluice and anicut is proposed

** Providing revetments and Retaining walls in selective locations of tanks and supply channels.

** Providing model sections to maintain the top of the bund, front and rear slopes of the tank bund.

** Providing steps in the tank bund for easy approach to the fields by the farmers wherever necessary.

** Improving the capacity of the tanks, supply channels by desalting and bed bar.

** Strengthening the bunds of the tanks and channels wherever necessary for effective storing of water and conveying it to the entire command area and also for conveying agricultural inputs to the field. Power roller has been proposed. Vibrator compactor has been proposed to smaller width area,

** Repairs to the damaged weirs.

** Repairs to the damaged sluices.

** Reconstruction of Weir @ Nalli Tank.

** Providing S.G. Shutter / Plug arrangements to Sluices, Head Sluices.

** Providing Scour Vents of weir@ Chittrampatty and Karuppur Tanks.

** 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 from 53% to 60%.

2. The present Gap area of 359.45 Ha is to be converted as a fully irrigated area to a extent of 182.32 Ha (359.45Ha – 177.13 Ha). The rest of 177.13 Ha is prosophis area and no provision has been made to remove the prosophis in this project.

Rehabilitation works for 2 anicuts.

Rehabilitation works for 5 tanks.

Rehabilitation of supply channels 5.50 km.

DETAILS OF WORKS PROPOSED

Sl No	Name of tank	Ayacut in Ha	Bund					Sluices					well syphon	Nos weir (m)			Scour vent		Recharger	Supply channel		Anicut		
			Length	to be Standardisation	rw	ms	Steps	No of sluices	Reconstruction	Repairs	SG Plug	SG Shutter		Nos	Reconstruction	Repairs	Nos	Repairs		Rw	earth work	Nos	Repair	Shutter
1	Nalli big tank	85.05	3000	3000	-	6	4	2	0	2	2			4	1	1	0	0	0		2000	1	1	1
2	Chitrampatti tank	119.03	2950	2950	1	6	4	3	0	3	3			2	0	1	1	1	0	0	0	0	0	0
3	Pudu Appaneri Tank	84.21	2050	2050	-	6	4	3	-	3	3			1	0	1	-	-	-	-	500	1	1	1
4	Karuppur Tank	126.67	1900	1900	1	6	4	2	0	2	2			1	0	1	2	2	0	0	0	0	0	0
5	Meenakshipuram tank	53.64	2010	2010	-	6	4	2	0	2	2			1	0	1	-	-	0	0	3000	0	0	0
	Total	468.60	11910	11910	2	30	20	12	0	12	12			9	1	5	3	3	0	0	5500	2	2	2

Details of proposals in each Infrastructure of the sub basin

Sl. No	Name of tank/ Anicut/ Reservoir	Bund		Sluice		Weir		Anicut		Supply Channel		Amount in Lakhs
		Length	Amt	No	Amt	No	Amt	No	Amt	Length	Amt	
1	2	3	4	5	6	7	8	9	10	11	12	13
1.	Nalli Big Tank	3000	13.00	2	2.40	1	3.80	1	2.25	2000	3.70	25.15
2.	Chitrampatti	2950	12.80	3	2.76	2	3.05	-	-	-	-	18.61
3.	Pudu Appaneri	2050	9.80	3	2.76	1	0.30	1	18.75	500	0.95	32.56
4.	Karuppur	1900	9.90	2	1.84	1	5.60	-	-	-	-	17.34
5.	Meenakshipuram	2010	9.10	2	1.84	1	0.50	-	-	3000	5.59	17.03

Details of supply channel

S.No	Name of Tanks	Anicut		Open offtake	
		Length	Amt	Length	Amt
1.	Nalli Big Tank	2000	3.70	-	-
2.	Pudu Appaneri Tank	500	0.95	-	-
3.	Meenakshipuram Tank	-	-	3000	5.59
		2500	4.65	3000	5.59

TANK DETAILS WITH FREE BOARD PROVIDED

SL. NO	NAME OF THE TANK	MAXIMUM HIGHET OF BUND	FREE BOARD		LENGTH OF BUND
			PROVIDED PREVIOUSLY	PROVIDED NOW	
1.	Nalli Big Tank	4.65m	0.90m	1.50	3000m
2.	Chitrampatti	3.70	1.00	1.50	2950 m
3.	Pudu Appaneri	4.20	1.00	1.50	2050m
4.	Karuppur	3.25	1.00	1.50	1900m
5.	Meenakshipuram	4.08	1.00	1.50	2010m

Note :-

1) For Height of bund un to 3.0m - Free board is 1.25m

2) For Height of more than 3.0m - Free board is 1.50m

DETAILS OF COST TABLE ANALYSIS TO BE CARRIED OUT IN PWD TANKS IN UPPATHURAR SUB BASIN – PACKAGE NO.1

Sl.No	TANK BUND									SLUICE									Weir		Weir		Scour vent		Scourvent proposed		Supply Channel					Anicut				Total Amount	Over all total amount
	Bund		Improvements to Breached and weaker portion		Model Section		Steps			Recon struction		Repairs		SG Plug		SG Shutter			Re construction		Repairs		Shutter				Retaining Wall		Earth Work			Repair		Shutter			
	Len	Amo	Len	Amount	Nos	Amount	Nos	Amount	Total Amnt	nos	Amount	nos	Amount	nos	Amount	nos	Amount	Total	nos	Amount	nos	Amount	nos	Amount	nos	Amount	Length	Amount	Length	Amount	Total Amnt	nos	Amount	nos	Amount		
1	3000	9.24	-	-	6	1.07	2	0.17	10.48	-	-	2	2.62	2	0.60	-	-	3.22	1	16.75	-	-	-	-	-	-	-	-	2000	2.37	19.12	1	0.51	1	0.75	1.26	34.08
2	2950	11.10	1	1.08	6	1.00	3	0.25	13.43	-	-	3	0.77	3	0.90	-	-	1.67	-	-	1	0.90	1	1.50	1	2.13	-	-	-	-	4.53	-	-	-	-	-	19.63
3	2050	6.62	-	-	4	0.68	3	0.25	7.55	-	-	3	0.78	3	0.90	-	-	1.68	-	-	-	-	-	-	1	-	-	-	500	0.59	0.59	1	17.75	2	1.75	19.50	29.32
4	1900	6.23	1	0.92	4	0.66	2	0.16	7.97	-	-	2	0.53	2	0.60	-	-	1.13	-	-	-	-	2	3.00	2	2.37	-	-	-	-	5.37	-	-	-	-	-	14.47
5	2010	6.60	-	-	4	0.65	2	0.16	7.41	-	-	2	0.54	2	0.60			1.14	-	-	1	0.88	-	-	3	-	-	-	3000	3.42	4.30	-	-	-	-	-	12.85
Total	11910	39.79	2	2.00	24	4.06	12	0.99	46.84	-	-	12	5.24	12	3.6			8.84	1	16.75	2	1.78	3	4.50	3	4.50			5500	6.38	33.91	2	18.26	3	2.50	20.76	110.35

COST TABLE (GENERAL)

Sl No		Component	Qty		Amount in Lakhs
I		**Tank Bund Improvement**			
	a	Earthwork for bund	11,910	M	39.79
	b	Improvements to Breached and Weaker Portion (10+50)	60	RM	2.00
	c	Model Section	24	NO	4.06
	d	Steps	12	NO	0.99
II		**Improvement to Sluices**			
1		**Reconstruction**			
	a	Tower Head	-	-	-
	b	Wing Wall	-	-	-
2		**Repair**			
	a	Tower Head	2	NO	2.62
	b	Wing Wall	10	NO	2.62
III		**Improvements to Weir**			
1		Reconstruction	1	NO	16.75
2		Repair	2	NO	1.78
3		Scour Vent	3	NO	4.50
IV		**Shutter Arrangement**			
1		**Sluice**			
	a	SG Plug and Gage Plate	12	NO	3.60
	b	SG Shutter			
2		**Weir**			
	a	SG Shutter in scour vents	3	NO	4.50
3		**Anicut**			
		Anicut shutter	1	NO	1.00
		Head sluice shutter	2	NO	1.50
V		**Supply Channel Improvement**			
1	a	Earthwork for bund	5500	M	6.38
2	b	Retaining Wall			
VI		**River Training**			
1		**Anicut**			
	a	Repair	2	NO	18.26
VII		Measuring devices in channel offtaking from sluices	12	NOS	2.03
		Total cost of Civil Works			**112.38**
VIII		**Environmental Cell Activities**			2.50
IX		**Ground Water**			NIL
		Total Amount			**114.58**

PACKAGE DETAILS

PACKAGE – 1

SL. NO	NAME OF TANK / ANICUT	AMOUNT IN LAKHS
1.	Rehabilitation and mutualisation of Non-system tanks and Anicuts of Uppathurar Sub Basin in Sattur Taluk of Virudhunagar District any Ettayapuram and Kovilpatti Taluk of Tuticorin District.	
	Total	112.38

C. (PHYSICAL AND FINANCIAL PROGRAM)

Sl. No	Description	I Year		II Year		Total		
		Quantity	Amount in Lakhs	Quantity	Amount in Lakhs	Quantity		Amount in Lakhs
1.	Tank Component	-	112.38	-	-	-		112.38
	Total		112.38					**112.38**

PACKAGE I
Construction Methodology

Sl No	Description of Item	Working Months						Rainy season						Total
		1	2	3	4	5	6	7	8	9	10	11	12	
	Earth work excavation													
1	Channel & river training	4500	4500`	4500	4500	4500	4500	-	-	-	1553	-	-	28553 m3
2	Foundation	800	800	800	614									3014 m3
3	Bund	15000	15000	15000	15000	15000	15000	-	-	-	9000	9000	6011	114011 m3
	Concrete													
5	M 7.5 grade	40	40	40	33									153 m3
6	M 10 grade	-	300	300	300	168								1368 m3
7	M 15 grade	-	-	-	-	30	10							40 m3
8	M 20 grade	-	-	-	-	10	6							16 m3
9	Random rubble masonry	-	-	50	50	50	40							190 m3
10	Plastering	-	-	-	-	20	19							39 m2
11	Pointing	-	-	-	150	150	133							433 m2

Required Materials

SL. No	Description	Qty.	Unit	Cement in M.T	Sand in M3	40mm Metal in M3	20mm Metal in M3	Rubble stone in M3	Gravel in M3	Steel in Qtl.
1.	Random Rubble Masonry MCM 1:4	190	m3	23.25	64.60	-	-	209	-	-
2.	Sand for filling	96	m3	-	96	-	-	-	-	-
3.	CC 1 : 4 : 8 using 40mm metal (M7.5)	153	m3	24.78	68.85	137.70	-	-	-	-
4.	CC 1 : 3 : 6 using Graded Metal of 40mm and 20mm size (M10)	1368	m3	295.48	615.60	738.72	492.48	-	-	-
5.	Cement concrete 1: 2 : 4 using 20mm jelly (M15)	40	m3	12.96	18.00	-	36.00	-	-	-
6.	RCC 1 : 1½ : 3 using 20mm metal (M20)	16	m3	6.91	7.20	-	14.40	-	-	-
7.	Steel fabrication	29	Qtl	-	-	-	-	-	-	29
8.	Plastering in cm 1 : 3 , 20 mm thick	39	m2	0.41	0.38	-	-	-	-	-
9.	Pointing in cm 1 : 3 for masonry	433	m2	0.56	1.16	-	-	-	-	-
10.	Gravel	362	m3	-	-	-	-	-	362.00	-
11.	Rough stone dry packing	791	m3	-	-	-	-	870.10	-	-
	Total			**364.35 (or) 395 M.T**	**871.79 (or) 872 m3**	**876.42 (or) 877 m3**	**542.86 (or) 543 m3**	**1079.1 (or) 1080 m3**	**362 m3**	**29 Qtl**

PACKAGE 1
Calculation of Machineries Requirement

12 Tippers / Lorries	6 Hours / Day	
(12 No x 2 loads/Hour x 6Hr x 5 m3 / trip)		720 m^3/ Day
For 1 month (22 Working days)	22 x 720 m3	15840 m^3/ Month
Total quality of earth work	1,45,578 m^3	
Working period for earth work	9 months + 3 months rainy season	

Machineries required for earth work :

1.	Hydraulic excavator	-	3 Nos
2.	Tippers / Lorries	-	15 Nos
3.	Power roller	-	3 Nos
4.	Vibrated compactor	-	3 Nos
5.	Water Lorries	-	3 Nos

Mixed machine	2 m^3 / hour	For 6 hours / day	12 m^3 / day
Total quality of concrete		1577 m^3	
Mixed machine required		**3 Nos** day 10 Days / Month – 5 Months	

	Material conveyance	**Tippers / Lorries**	
Cement	10 mt / Trip	1 trip / day	10mt / day
sand	5.66 m^3 / Trip	2 trips / day	11.32 m^3 / day
Metal / Stone	5.60 m^3 / Trip	3 Trips / day	16.80 m^3 / day
Total Quality of cement		365 mt	
Lorry required for conveyance		365 / 10 mt	37 Lorries
Total quality of sand		872 m^3	
Lorry required for conveyance		872 / 11.32 m^3	77 Lorries
Total quality of metal		1420 m^3	
Lorry required for conveyance		1420 / 16.80 m^3	85 Lorries
Total quality of stone		1080 m^3	
Lorry required for conveyance		1080 / 16.80 m^3	64 Lorries

Total Lorries - 263 Lorries

Tipper / Lorries for conveyance of materials **3 Nos for 23 days for 4 months**

PACKAGE NO 1

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 Qtl.	METAL 40MM IN m^3	METAL 20MM IN m^3	RR IN m^3	FUEL
	3	3	3	15	3	3	3	365	872	29	138	1282	1080	-

1.7. ENVIRONMENTAL COMPONENT

INDEX

IAMWARM Project

(Environmental Component in Uppathurar Sub basin)

Name of the River Basin	Vaippar River Basin
Name of Sub basin	Uppathurar Sub basin
Name of WUA	**To be formed**
Name of Division	**1. The Executive Engineer, PWD-WRO., Vaippar Basin division, Rajapalayam.** **2. The Executive Engineer, PWD-WRO., Vaippar Basin division, Virudhunagar.**
Name of Sub division	**1.The Assistant Executive Engineer, PWD-WRO, Vaippar Basin Sub division, Sankarankovil.** **2. The Assistant Executive Engineer, PWD-WRO., Vaippar Basin Sub division, Virudhunagar.** **3. The Assistant Executive Engineer, PWD-WRO., Vaippar Basin Sub division, Vilathikulam.**
District	**1.Virudhunagar District** **2.Thoothukudi District**
Taluk	Virudhunagar District **1. Sattur Taluk** Thoothukudi District **2. Kovilpatti Taluk** **3. Ettayapuram Taluk**
Block	Virudhunagar District **1. Sattur Block** Thoothukudi District **2. Kovilpatti Block** **3. Pudur Block**
I) Name of tank severely affected by Aquatic weeds	Enclosed Annexure - I
II) Domestic Sewage	**Part of Kovilpatti municipality sewage is let in to the Moopanpatti tank (near Railway station)**
III) Municipal solid Waste	**Kovilpatti municipality -The daily collection of is 26 MT of solid waste is dumped in the open yard.**
IV) Industries	Enclosed Annexure - II

V) Water quality status	i)Surface water **The surface water samples were collected and tested periodically by the Environmental Cell Division, Madurai. The surface water quality is generally good in this sub basin, low in TDS (< 0.5gms/cm), chloride is medium to hard (temporary) and alkaline in nature. All the steams and tanks are complied with drinking and irrigation quality standards.**
	ii) Ground water **The ground water samples were collected at Ilayarasanenthal, Uppathur, Pulvoipatti, Kovilpatti, Therkumuthulapurm, and tested periodically by the Geo chemical laboratory, Madurai. The water analysis data indicate that the shallow ground water quality in the Uppathurar sub basin is moderate and generally suitable and safe for drinking and irrigation purposes as the parameters like electrical conductivity, chloride, sulphate, hardness and fluorides values are all found to be with in the permissible limits. The excess nitrate content is present in 1 or 2 places. As excessive nitrate values are not persistently present in the ground water, the nitrate pollution has not taken place in this sub basin.**

ANNEXURE – I

Tanks affected by Aquatic weeds

Sl. No	Name of tank	Name of village	Ayacut in Ha	Type of weed
1	**Pudu Appaneri tank**	**Pudu Appaneri**	**84.21**	**Prosopis Julie flora**
2	**Chithirampatti tank**	**Chithirampatti**	**119.03**	**Prosopis Julie flora**
3	**Nalli big tank**	**Nalli**	**85.05**	**Prosopis Julie flora**
4	**Meenakshipuram tank**	**Meenakshipuram**	**53.64**	**Ipomoea cornea**
5	**Karuppur tank**	**Karuppur**	**126.67**	**Ipomoea cornea**
		Total	468.60	

ANNEXURE – II

List of Industries

Sl. No	Name and Address of the industries	Type	Category
	Sattur Taluk		
1	**Valli Textile Mills (Power Plant), N. Venkateshwarapuram, Sattur**	**Power Plant**	**Red/ Medium**
2	**S.R. Glue & Geltine, 84-B, Pulvaipatti, Sattur.**	**Glue Factory**	**Red/ Small**
3	**Jai Narayana Fire Works, Kanajampatti, Sattur.**	**Fire Works.**	**Red/ Small**
4	**Kailash Sparkers, Kanjampatti, Sattur.**	**Fire Works.**	**Red/ Small**
5	**V.K. Spinning Mills Pvt. Ltd., Ovanaickenpatti, Sattur.**	**Spinning**	**Red/ Small**
6	**Loyal Textiles Mills Ltd., Garment Division, Nalli Village, Sattur.**	**Dry Garments**	**Green/ Medium**
7	**Sri Vijayalakshmi Spinners, 3/12, Nalli Village, Sattur.**	**Spinning**	**Orange/ Small**
	Kovilpatti taluk	**Spinning**	**Red / Large**
8	**Loyal textile mills ltd(CPP),Kovilpatti.**		
9	**Krishna Calcium Industries, Ayyaneri Village, Kovilpatti.**	**Chemical**	**Red/ Medium**
10	**IVCRL infra structures and projects ltd(HTMIX), Inammaniyaachi**	**HT mix**	**Red/ Small**
11	**Dwaraka Match Industries, R.S.No. 147/1, Kovilpatti.**	**Matches.**	**Red/ Small**
12	**Parakavi Kal Quarry, Nakkalamuthanpatti, Kovilpatti.**	**Quarry.**	**Red/ Small**
13	**Ramiah Spinners, New Appaneri, Kovilpatti.**	**Stone quarry**	**Red/ Small**
14	**Jothio Industry, 240/1, Old Appaneri Village,Kovilpatti.**	**Quarry.**	**Red/ Small**
15	**Baskaran match works, Inammaniyaachi.**	**Matches**	**Red/ Small**
16	**Anna rathna match industries, Kovilpatti.**	**Matches**	**Red/ Small**
17	**Antony match industries, Kovilpatti.**	**Matches**	**Red/ Small**
18	**Aruna match works, Kovilpatti.**	**Matches**	**Red/ Small**
19	**East india match industries, Kovilpatti.**	**Matches**	**Red/ Small**
20	**Easwari match works, Kovilpatti.**	**Matches**	**Red/ Small**
21	**Indra match works, Kovilpatti.**	**Matches**	**Red/ Small**

22	Jai kissan fire works industries, Kovilpatti.	Fire works	Red/ Small
23	Jeyam match works, Kovilpatti.	Matches	Red/ Small
24	Jeyaprakash match works, Kovilpatti.	Matches	Red/ Small
25	Jegath match industries, Kovilpatti.	Matches	Red/ Small
26	Kamatchi match works, Kovilpatti.	Matches	Red/ Small
27	Mahalakshmi match factory, Kovilpatti.	Matches	Red/ Small
28	Mahesh match industries, Kovilpatti.	Matches	Red/ Small
29	Maheswari match factory, Kovilpatti.	Matches	Red/ Small
30	Original fire works industries, Kovilpatti.	Fire works	Red/ Small
31	Original wax matches industries, Kovilpatti.	Matches	Red/ Small
32	Prabhat match factory, Kovilpatti.	Matches	Red/ Small
33	Rajan match works, Kovilpatti.	Matches	Red/ Small
34	Sri Renganatha match (unit-I)industries, Kovilpatti.	Matches	Red/ Small
35	The Kailash matches industries, Kovilpatti.	Matches	Red/ Small
36	The Kissan matches industries, Kovilpatti.	Matches	Red/ Small
37	The viswanath matches industries, Kovilpatti.	Matches	Red/ Small
38	Venus match factory, Kovilpatti.	Matches	Red/ Small
39	Bhuvaneswari industries, Meenakshipuram.	Chemical	Red/ Small
40	Golden chemicals, Tittankulam.	Chemical	Red/ Small
41	Lakshmi lubricants(Used oil division), Tittankulam.	Lubricants	Red/ Small
42	Lakshmi lubricants(Waste oil division), Tittankulam.	Lubricants	Red/ Small
43	Padma clinic, Inammaniyaachi.	Hospital	Red/ Small
44	Aarthi hospital, Kovilpatti.	Hospital	Red/ Small

45	K.G clinic, Kovilpatti.	Hospital	Red/ Small
46	Kamala hospital, Inammaniyaachi.	Hospital	Red/ Small
47	Aarthi hospital, Kovilpatti.	Hospital	Red/ Small
48	Padma prabha hospital, Kovilpatti.	Hospital	Red/ Small
49	Sivasakthi clinic, Kovilpatti.	Hospital	Red/ Small
50	Sri Murali hospital, Kovilpatti.	Hospital	Red/ Small
51	Srinivasa clinic, Kovilpatti.	Hospital	Red/ Small
52	Gowry clinic, Kovilpatti.	Hospital	Red/ Small
53	Loyal textile mills ltd, Kovilpatti.	Textile Spinning mill	Orange/ Large
54	The Lakshmi mills company ltd, Kovilpatti.	Textile Spinning mill	Orange/ Large
55	Ramiah Spinners, New Appaneri, Kovilpatti.	Spinning	Orange/ Large
56	Kasthuri Rengaramanujam Cotton Mills (P) Ltd, Chitrampatti, Kovilpatti.	Spinning	Orange/ Medium
57	Mahavishnu Spinning Mill, Ayyaneri Village, Kovilpatti.	Spinning	Orange/ Medium
58	Revathi Spinning Mill, Chitrampatti, Kovilpatti.	Spinning	Orange/ Medium
59	Sri Vannivinayaka Textiles, R.S.No. 21, 14, Ayyaneri Village, Kovilpatti	Spinning	Orange/ Medium
60	Lakshmi Thiruvengadam Textiles, Puliyangulam Road, Ayyaneri Post, Kovilpatti.	Spinning	Orange/ Small
61	N.A.Rahmathulla automobile works, Illupaiyurani.	Engineering	Orange/ Small
62	Sri srinivasa auto service station, Alampatti.	Engineering	Orange/ Small
63	Allied motor vehicle maintenance and service, kovilpatti.	Engineering	Orange/ Small
64	Ponnar cotton mill industries, Illupaiyurani.	Ginning	Orange/ Small
65	Thamrai kalyana mahal, Inammaniachi.	Marriage hall	Orange/ Small
66	Aarthi mahal, Kovilpatti.	Marriage hall	Orange/ Small

67	Angalaparameswari kalyana mandapam, Kovilpatti.	Marriage hall	Orange/ Small
68	Chithambaranadar Kamatchiammal kalyana mandapam, Kovilpatti.	Marriage hall	Orange/ Small
69	ESSV Mariappan achari Mariammal kalyana mandapam, Kovilpatti.	Marriage hall	Orange/ Small
70	Jeyakrishna kalyana mandapam, Kovilpatti.	Marriage hall	Orange/ Small
71	Jeyashri mahal, Kovilpatti.	Marriage hall	Orange/ Small
72	Kammavar trust marriage hall, Kovilpatti.	Marriage hall	Orange/ Small
73	Nandini mahal, Kovilpatti.	Marriage hall	Orange/ Small
74	Rajarathinam meerammal thirumana mandapam,Kovilpatti.	Marriage hall	Orange/ Small
75	Saratha thirumana mandapam, Kovilpatti.	Marriage hall	Orange/ Small
76	Sarswathii mahal, Kovilpatti.	Marriage hall	Orange/ Small
77	Sri Kalyaniammal thirumana mandapam, Kovilpatti.	Marriage hall	Orange/ Small
78	Sri Kamarajar marriage hall, Kovilpatti.	Marriage hall	Orange/ Small
79	Sri Lakshmi mahal kalyana mandapam, Kovilpatti.	Marriage hall	Orange/ Small
80	Vaira mahal kalyana mandapam, Kovilpatti.	Marriage hall	Orange/ Small
81	Saratha thirumana mandapam, Kovilpatti.	Marriage hall	Orange/ Small
82	Saratha thirumana mandapam, Kovilpatti.	Marriage hall	Orange/ Small
83	Alkenes kraft, Kovilpatti.	Kraft	Orange/ Small
84	Kovilpatti co-op marketing society ltd, Kovilpatti.	Ginning	Orange/ Small
85	Lotus poly packs, Kovilpatti.	Plastic	Orange/ Small
86	Lotus RP industies, Kovilpatti.	Plastic	Orange/ Small
87	MSPR plastics, Kovilpatti.	Plastic	Orange/ Small
88	Prasad plastics, Kovilpatti.	Plastic	Orange/ Small

89	**Rathna polymer industries, Kovilpatti**	**Plastic**	**Orange/ Small**
90	**Sri Easwari polymers, Kovilpatti.**	**Plastic**	**Orange/ Small**
91	**Sri Murugan plastic works, Kovilpatti.**	**Plastic**	**Orange/ Small**
92	**Vimal plastic industries, Kovilpatti.**	**Plastic**	**Orange/ Small**
93	**S.Muthukumaran plastics, Kovilpatti.**	**Plastic**	**Orange/ Small**
94	**Sri Murugan plastic industries, Kovilpatti.**	**Plastic**	**Orange/ Small**
95	**Sri Rajeswari weaves, Kovilpatti.**	**Weaving**	**Orange/ Small**
96	**The original printing press, Kovilpatti.**	**Printing**	**Orange/ Small**
97	**The original printing press, Kovilpatti.**	**Printing**	**Orange/ Small**
98	**The State transport corporation ltd(Mdu div-II), Kovilpatti.**	**Engineering**	**Orange/ Small**
99	**Velayutham chettiyar firm, Kovilpatti.**	**Paper**	**Orange/ Small**
100	**Matha paper boards, Kovilpatti.**	**Paper**	**Orange/ Small**
101	**Thamarai chemical company, Kovilpatti.**	**Chemical**	**Orange/ Small**
102	**Cherman crusher, Kovilpatti.**	**Stone crusher**	**Orange/ Small**
103	**S.Essakkimani @Prema plastics, Tittankulam.**	**Plastic**	**Orange/ Small**
104	**Srikrishna polymers, Tittankulam.**	**Plastic**	**Orange/ Small**
105	**Tirunelveli district co-op milk producers union ltd,Tittankulam.**	**Milk**	**Orange/ Small**
106	Ettaiyapuram taluk **Thamarai chemical,Karuppur**	**Lime kiln**	**Orange/ Small**

Name of work :- Environmental Monitoring on Water and Soil Quality and Creating Awareness & Updating of “Environmental and Social Assessment Report” for Uppathurar Sub -Basin

Estimate Rs 2.50 Lakhs

ENVIRONMANTAL MANAGEMENT FRAME WORK

INRODUCTION

Under TNWRCP, with World Bank assistance, special emphasis was given for the first time in WRO, to assess the Environmental status and degradation caused for all River basins in Tamilnadu. An Environmental assessment study has been conducted by Environment Protection Training and Research Institute, Hyderabad and identifies the Environmental issues, social issues and remedial measures for Vaippar river basin as follows.

Environmental issues	-Poor solid waste management
	-Dye industry effluent
Social issues	-Dry land agriculture
	-Reduction in livestock
	-Women empowerment-SHGs
	-Prevalence of child labour
Remedial measures	-Livestock services delivered and managed.
	-Solid Waste management

The Environmental Cell of WRO assessed Environmental impact on the quality of Surface water, Ground water and Soil by collecting water & soil samples and testing them. Micro level Environmental Status Report for Vaippar River basin was prepared with the assistance of World Bank.

Also awareness programs and Workshops were conducted to create awareness on the Environmental issues and remedies among the Public, Farmers, Government Officials and NGO’s. 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 Environmental issues pertaining to that area and remedial action to overcome the problems is must.

DESCRIPTION OF SUB BASIN

Uppathurar sub basin lies on the south of Vaippar sub basin and east of Vallampatti Odai sub basin. Uppathurar originates at about 100 m above MSL near Ilaiyarasanendal area of Kovilpatti taluk of Thoothukudi district. Another small stream which originates at about 120 m above MSL near Devarkulam village area also joins Uppathurar near Sundaralingapuram village in Kovilpatti taluk of Thoothukudi District. The river crosses the National Highway NH – 7 near Nallichatram village in between Kovilpatti and Sattur and joins with Vaippar river near Kilnattukurichi village of Ettayapuram taluk. The total length of this tributary is about 17 km.

The total drainage area of this sub basin is 407 sq.km and there is no hilly catchment. Kovilpatti town lies in this sub basin. Kovilpatti is the rainfall stationthat has got influential effect to this sub basin than Sattur and Vilathikulam.

There are two anucuts across uppathurar river viz,Puthu appaneri anicut and Nalli anicut. There are five PWD tanks having a total ayacut of 468.60 ha.

ENVIRONMENTAL PROBLEMS:

The following environmental issues were identified in the Uppathurar sub basin.

WATER WEEDS

Ipomoea cornea and **Prosopis Julie flora** has invaded the water bodies ie.tanks, channels and rivers. These plants need to be eliminated totally for conserving precious water resources. The details of tanks affected by water weeds are given in the annexure-I. The aquatic weed growth affect the carrying capacity of channel and storage capacity of tanks, damage the lining of the channel, decrease the water quality and increases the evapo transpiration.

INDUSTRIAL POLLUTION

The total number of industries located in the Uppathurar sub basin is more than 110,which includes the industries like Matches, Fireworks, Spinning, Chemical, Paper, Hospital, Stone mining, Quarry, Engineering, Lime kiln, Stone crusher, etc,. There is no highly polluting Red category Industries. The details of industries in the uppathurar sub basin are listed out in the annexure – II

All the industries have their own treatment plant and the treated effluent is used to irrigate their own farm land. Trade Effluent from these industries is being monitored periodically by TNPCB. Any improvement to minimize the effect of pollution will be dealt by the TNPCB.

SOLID WASTE DIPOSAL

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 Panchayats of this sub basin.

In Kovilpatti municipality, about 26 MT of solid waste is collected and dumped in the nearby compost yard for treatment.

Under the Rural welfare funds a new scheme for Solid waster Management plan is under implementation. Under that scheme, collection tank for disposable and un-disposable garbage have been constructed. But in most of the Panchayats, recycling the waste and converting the solid waste into manure and production of energy is yet to come up.

SEWAGE DISPOSAL LET INTO WATER BODIES

During the field survey, it is found that in many locations, public sanitary complex have been constructed near streams. This leads to every possibility to contaminate the water sources. It is observed that the sewage from Kovilpatti municipality is directly let into the Moopanpatti tank located near railway station.

So creating awareness among the Presidents of the local bodies is must and to motivate them to adopt solid waste management and sewage management. Wherever required. Workshop including filed visits, exclusively for them is to be conducted under the IAM WARM project.

ACTIVITIES PROPOSED

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

I. MONITORING WATER AND SOIL QUALITY, PROJECT WORKS MONITORING

It is proposed to collect and test the water sample at 3 new locations as detailed below, for a period of three years so as to ascertain the Environmental impact on the quality of surface water of this sub basin. Water samples at the following locations will be collected and tested once in 4 months.

1. Chithirampatti - D/S of Kovilpatti-Vembakottai road.
2. Nalli chatram - D/S of bridge in Kovilpatti – Sattur road.
3. Uppathur - D/S of Uppathur vilage.

In addition to the above identified locations, water samples will also be collected once in a year from tanks and nearby wells in two selected locations, where sewage is directly let into water bodies. These samples will be tested to asses the impact on the quality of surface and ground water.

Soil samples are also to be collected from one selected location to asses the impact on the quality of soil due various Environmental problems like use of chemical fertilizer and using the polluted water. Even from the same locations more number of samples at regular one-year interval has been collected and tested to determine precisely the impact on the degradation of the quality of the soil. Therefore testing of soil samples is essential.

Under this item following provisions have been made.

1. Testing charges for the water and soil samples.
2. Provision for Conveyance, Purchase of Cans, bottles, chemicals, Documentation of water quality data, Driver salary and Computer operator

II.ENVIRONMENTAL AND SOCIAL KNOWLEDGE

Micro level Environmental Status Reports for Vaippar river basin have been prepared. In these reports Environmental problems and remedial measures have been documented at the basin level. Moreover Environmental and social assessment on river basins of Tamilnadu have been done by Environmental protection Training & Research Institute, Hydrabad. Based on these report and the data now proposed to be collected, Environmental and social

assessment for each sub basins are to be updated and documented in order to program further activities.

Under this item following provisions have been made.

1. Salary for supporting staff i.e.Technical assistant, Mazdoors,
2. Expert analysis and development reporting.

III.ENVIRONMENTAL AND SOCIAL AWARENESS CREATION

Awareness programs are necessary to create awareness among the public about environmental problems 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 conducted in the villages where sewage is directly let in to the water bodies. It is also proposed to conduct awareness meeting in schools /institutions to cover the following subjects in addition to placing stickers, tin sheets, and pamphlets containing message related to the following.

- **Sanitation.**
- **Solid waste treatment.**
- **Sewage treatment and converting the same in to gas.**
- **Natural farming.**
- **Conversion of aquatic weeds in to 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 one location 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 institution / NGO's.

TOTAL COST

The total proposal cost works out to Rs. **2.50 Lakhs (Rupees Two Lakhs and Fifty thousand only)**

Name of Work : - Environmental Monitoring on Water and Soil Quality and Creating Awareness & Updating of "Environmental and Social Assessment Report" for UPPATHURAR SUBBASIN

Detailed Estimate

Sl no	Description of work	No	Measurements			Contents
			L	B	D	
I	Monitoring Water and Soil Quality, Project Works Monitoring					
1	**Water samples from rivers in three locations once in four months for a period of three years. 3x3x3 = 27 Nos.**	**27 Nos**				**27 Nos**
2	**Water samples from rivers in three locations once in four months for a period of three years. 3x1x3 =3 Nos**	**3 N0s**				**3 Nos**
3	**Hiring Jeep driver on service contract basis for the Department vehicle =1Manmonths/yearx3years=3 Nos**	**3 Man months**				**3 Man months**
4	**Conveyance, Purchase of Cans, bottles, chemicals and Documentation of water quality data engaging labour**	**LS**				**LS**
5	**Provisions for field visits for environmental monitoring for project activities with respect to environmental safe guards**	**3 years**				**3years**
II	Environmental and Social knowledge base					
1	**Village level data collection on Environmental and Social state regarding other impacts**	**6 Man months**				**6 Man months**
2	**Expert analysis and Development reporting on other impacts**	**LS**				**LS**
3	**Impact studies due to project investments**	**4 man months**				**4 man months**
4	**Expert analysis and Development reporting due to project investments**	**L.S**				**L.S**
III	Environmental and Social Awareness creation					
1	**Awareness propagation through Stickers, Tin sheets, Phamlets and Banners**	**3 years**				**3 years**
2	**Perparing and publishing Environmental atlas for the sub basin for the use of line departments\institutions for better management of sub basin.**	**L.S**				**L/S**
3	**Documentation of the entire activities, Up gradation of computer and accessories and purchase of Video films and stationeries and engaging computer operator**	**LS**				**LS**
IV	Variation in Rates and unforeseen items					**LS**

Name of Work : - Environmental Monitoring on Water and Soil Quality and Creating Awareness & Updating of "Environmental and Social Assessment Report" for UPPATHURAR SUBBASIN

Abstract Estimate

Sl no	Qty.	Description of work	Rate (Rs)	Per	Amount
I	Monitoring Water and Soil Quality, Project Works Monitoring				
1	**27 Nos**	**Testing charges for Water samples**	**1400**	**Each**	**37800**
2	**3 Nos**	**Testing charges for Waterl sample (pesticides)**	**12000**	**LS**	**36000**
3	**3 Man months**	**Hiring Jeep driver on service contract basis**	**3500**	**1Man month**	**10,500**
4	**LS**	**Conveyance, Purchase of Cans, bottles, chemicals and Documentation of water quality data Engaging labour**	**LS**	**LS**	**13800**
5	**3 years**	**Provisions for field visits for environmental monitoring for project activities with respect to environmental safe guards**	**2000**	**year**	**6000**
II	Environmental and Social knowledge base				
1	**6 Man months**	**Village level data collection on Environmental and Social state regarding other impacts**	**5000**	**1Man months**	**35,000**
2	**LS**	**Expert analysis and Development reporting on other impacts**	**LS**	**LS**	**15,000**
3	**4 man months**	**Impact studies due to project investments**	**5000**	**1Man months**	**20000**
4	**L.S**	**Expert analysis and Development reporting due to project investments**	**L.S**	**L.S**	**10000**
III	Environmental and Social Awareness creation				
1	**3 years**	**Awareness propagation through Stickers, Tin sheets, Phamlets and Banners**	**1000**	**Per year**	**3,000**
2	**L.S**	**Perparing and publishing Environmental atlas for the sub basin for the use of line departments\institutions for better management of sub basin.**	**L.S**	**L.S**	**50000**
3	**LS**	**Documentation of the entire activities, Up gradation of computer and accessories and purchase of Video films and stationeries and engaging computer operator**	**LS**		**12,000**
IV	**LS**	Variation in Rates and unforeseen items			**900**
				Total	2,50,000

(Rupees Two Lakhs and fifty thousand only)

1.8. GROUND WATER

GROUNDWATER DIVISION, TIRUNELVELI.

1. GROUNDWATER STATUS

The uppathurar sub-basin falls in Kovilpatti and Pudur Blocks of thothukudi District and sattur block of virudhunagar district. As per the latest groundwater potential assessment in thoothukudi District these two blocks have been categorized as “Over-Exploited”, which means that the annual groundwater extraction for all purposes is more than 100% of the annual groundwater recharge.

2. WATER LEVEL CONDITIONS

The average pre-monsoon water level for the last 35 year in this sub basin area is 7.75 m below ground level and the average post-monsoon water level is at 4.14 m below ground level. (Observed from the nearest control well No.93114 Located at Therkku Muthalapuram village.)

3. ARTIFICIAL RECHARGE TO GROUNDWATER

The artificial recharge to ground water aims at augmentation of ground water reservoir by modifying the natural movement of surface water utilizing suitable civil construction techniques. Artificial recharge techniques normally address to following issues :-

(i) To enhance the sustainable yield in areas where over-development has depleted the aquifer.
(ii) Conservation and storage of excess surface water for future requirements, since these requirements often changes within a season or a period.
(iii) To improve the quality of existing ground water through dilution.
(iv) To remove bacteriological and other impurities from sewage and waste water so that water is suitable for re-use.

The basic purpose of artificial recharge of ground water is to restore supplies from aquifers depleted sue to excessive ground water development.

4. RECOMMENDED ARTIFICIAL RECHARGE STRUCTURES.

1. Construction of series of check across the Uppathurar is suitable in this area.

2. Old un-used irrigation wells may be converted in to artificial recharge structures after constructing suitable filter beds for rain water.

1.9 DESIGNS AND DRAWINGS

REHABILITION OF MEENAKSHIPURAM TANK SUPPLY CHANNEL TOFEED MEENAKSHIPURAM TANK IN ETTAYAPURAM TALUK OF TOOTHUKUDI DISTRICT

DESIGN CALCULATION OF SUPPLY CHANNEL

Total ayacut of Meenakshipuram tank is 53.64Ha. or 132.50Ac

Assuming a duty of 6 acres per mcft of water.

The required volume of supply = Ayacut/duty
= 132.50/6 = 22.08 mcft

The quantity to be supplemented = 1/3 of the total requirement
= 1/3 x 22.08
= 7.36 M.cft
Add 20% for losses = 1.47 M.cft

= 8.83 M.cft

Number of days of supply = 4 days

Therefore discharge in the channel = 8.83 x 10^6cft / 4 x 24 x 60 x 60 sec
= 25.55 cusecs (or) 26.00 cusecs
Required discharge = 26 cusecs
Bed level open off take @ 0m = 30.600 m
Bed level @ tank = 27.600 m
Difference = 3.000 m
Therefore bed tall = 3.000/3000
= 1 in 1000
Assume a Section = 5 m x 0.75
Side Slope = 1 : 1
A = 0.75/2(5+6.50) = 4.31 m^2
P = 5 + 2 $(0.75^2 + 0.75^2)$ = 7.12m^2
R = A/P = 4.31/7.12 = 0.61m
V = $1/0.025 \times (0.58)^{2/3} \times (1/1000)^{1/2}$
= 40 x 0.72 x 0.03
= 0.864 cusecs (or) 0.864 / 0.0283
= 30.53 cusecs (or) 31 cusecs

Hence Safe
Adopt Section = 5m x 0.75m

RECONSTRUCTION OF SURPLUS @ LS 1850m – 1860m OF NALLI BIG TANK IN SATTUR TALUK OF VIRUDHU NAGAR DISTRICT

Design Calculation of Weir

Combined Catchment = 16.59 sq.km
Intercepted Catchment = 12.88 sq.km
Maximum water level M.W.L = 31.180 m
Full tank Level F.T.L = 30.580 m
Ground Level G.L = 27.400 m
Tank Bund Level T.B.L = 32.080 m
Slope on either side of bund = 2 : 1
Ryve's coefficient for combined Catchment = 9.00
Ryve's coefficient for intercepted Catchment = 1.80

Using equation we have
Q_p = Peak flood discharge = $C\ {}_1A^{2/3} – c_1\ a^{2/3}$

Where C = 9.0 A = 16.59 Sq.km
c_1 = 1.8 a = 12.88 Sq.km

$Q_p = 9.0(16.59)^{2/3} – 1.80(12.88)^{2/3}$
$= 9 \times 6.56 – 1.80 \times 5.54$
= 49.07 cumecs say 50 cumecs
Ie., Max. head of water over surplusweir = H = 31.180 – 30.580
= 0.60 m
Therefore crest of weir is kept @ F.T.L
∴ Depth of drop ie height weir crest = D = 30.580 – 27.400
= 3.18m (or) 3.20m

The width of horizontal masonry floor = 2 (D+H)
= 2 (3.20 + 0.60) = 7.60m

The length of the weir can be find out using the equation
$Q_p = C.LH^{3/2}$
Where Q_p = 49.07 cumecs say 50 cumecs
C = 1.84
The Discharge through the existing three weir of the tank
$Q_p = 1.84 \times (17+17+25) \times (0.60)^{3/2}$ = 50.45 cumecs

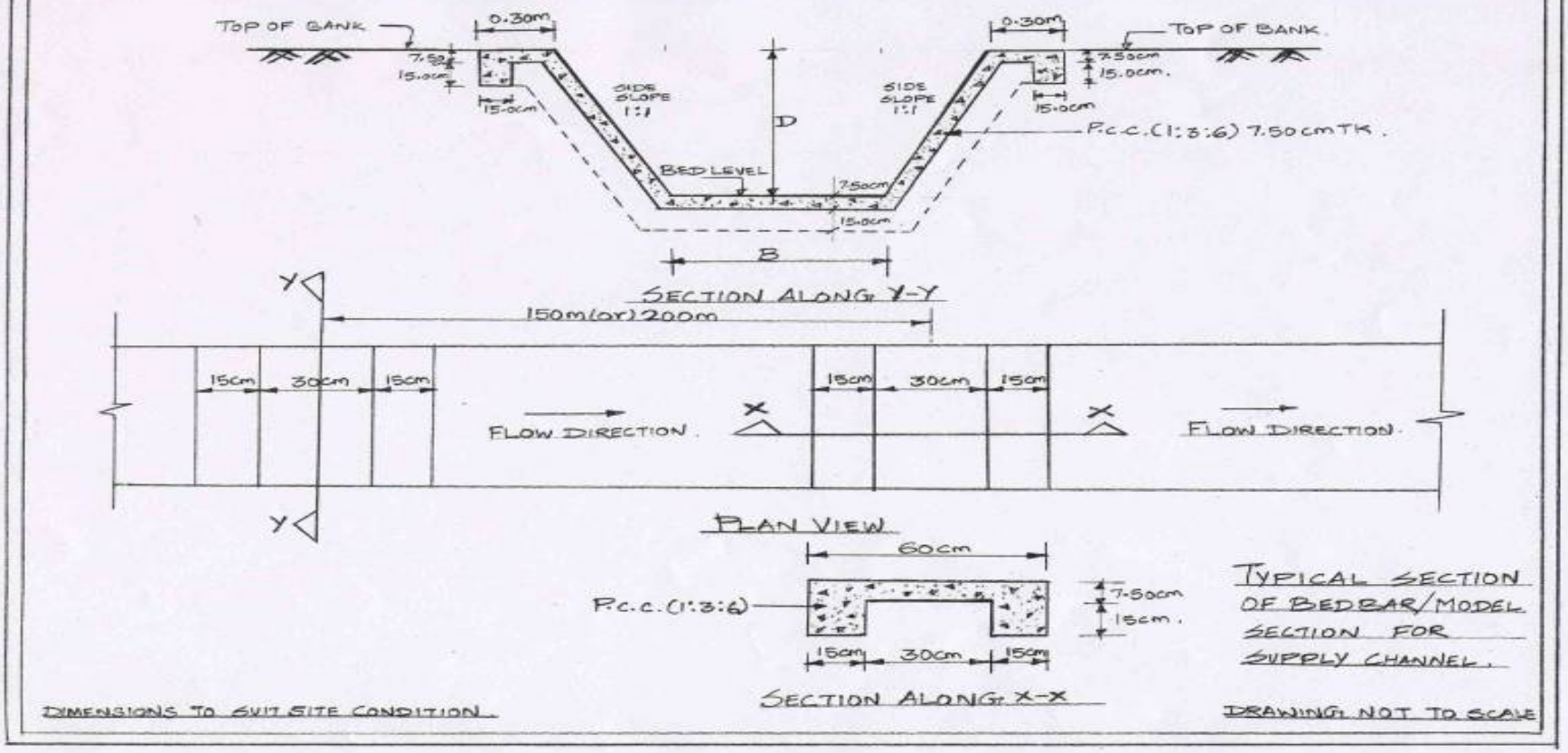
Where as the total calculated discharge is 50 cumecs. Hence, the existing Three weir is also sufficient to discharge. But the existing one more dilapilated weir is to be reconstructed with existing length of weir to be maintained as 10m

$Q_p = 1.84 \times 10 \times (0.60)^{3/2}$ = 8.55 cumecs
The existing three weir discharge = 50.45 cumecs
The forth reconstruction weir discharge = 8.55 cumecs

Total discharge of the tank = 59.00 cumecs

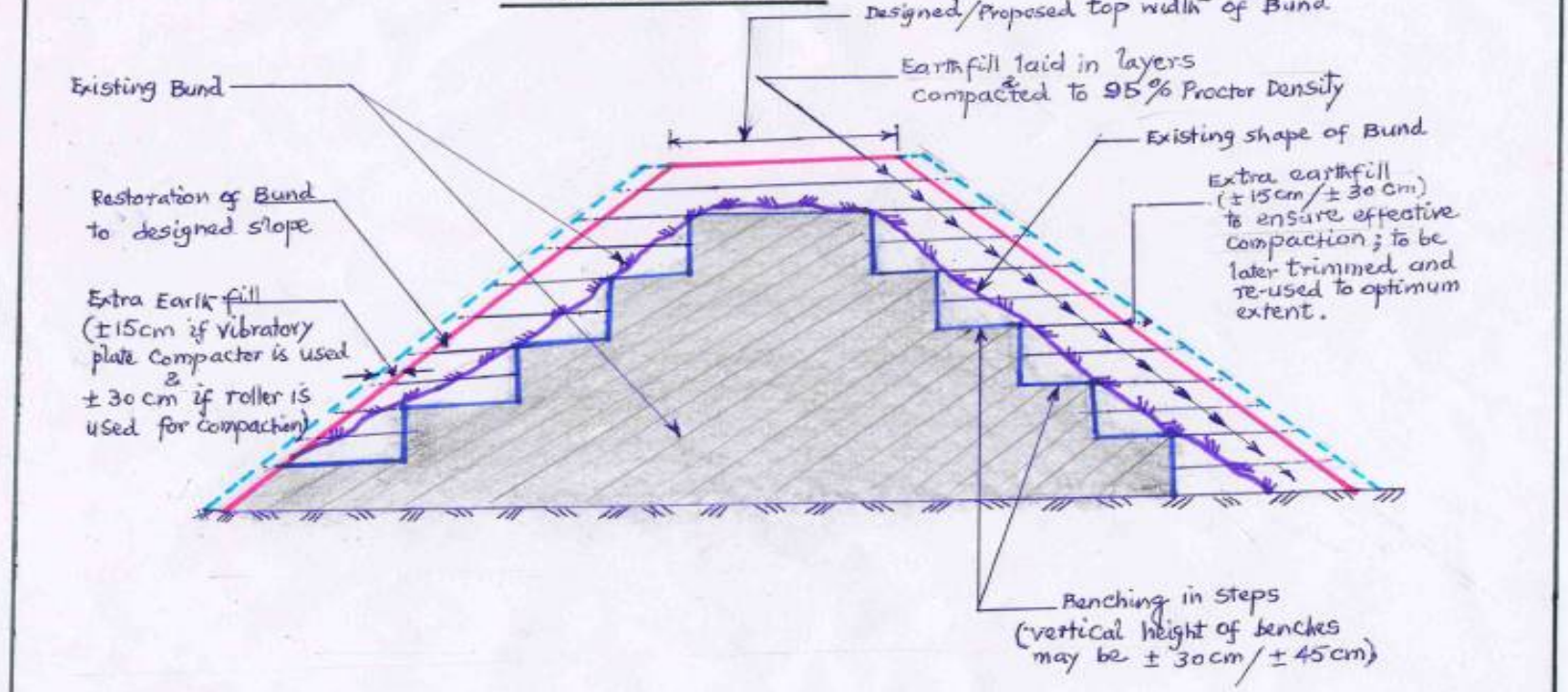
But the available max. flood discharge = 50 cumecs

Hence safe

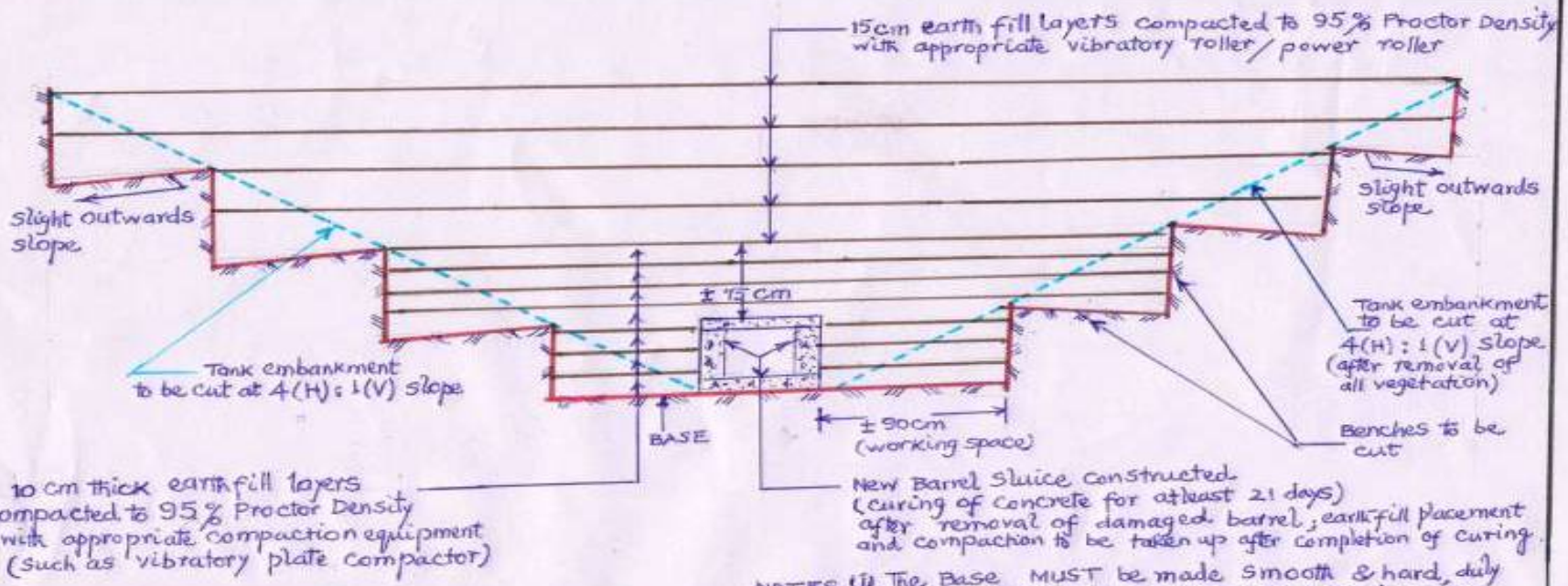

TOP OF BANK
0.30m
7.50cm
15.0cm
15.0cm
SIDE SLOPE 1:1
D
BED LEVEL
7.50cm
15.0cm
B
SIDE SLOPE 1:1
0.30m
TOP OF BANK
7.50cm
15.0cm.
15.0cm
P.c.c.(1:3:6) 7.50cm TK.
SECTION ALONG Y-Y
150m(or)200m
Y
Y
15cm
30cm
15cm
FLOW DIRECTION.
X
X
15cm
30cm
15cm
FLOW DIRECTION.
PLAN VIEW
60cm
P.c.c.(1:3:6)
7.50cm
15cm.
15cm
30cm
15cm
SECTION ALONG X-X
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



TYPICAL SKETCH



RECONSTRUCTION OF SLUICES

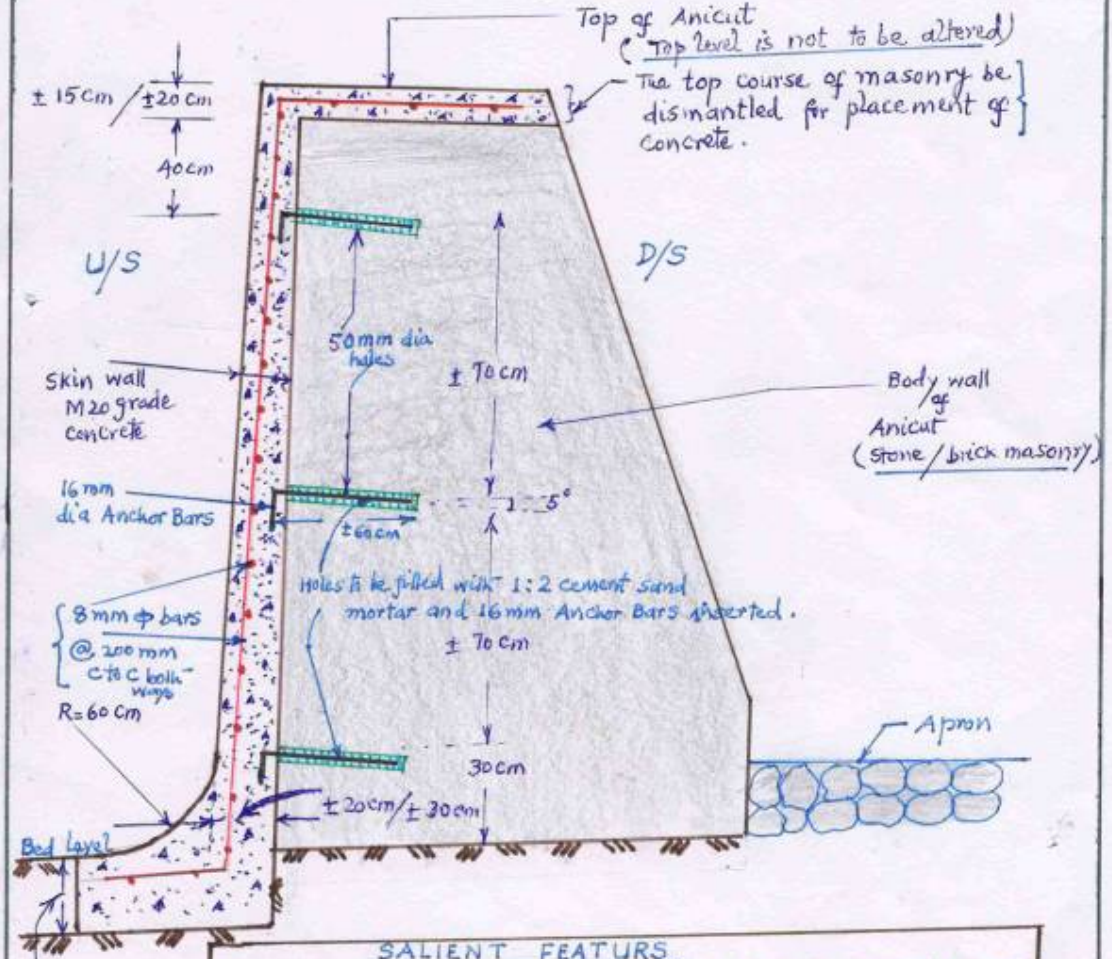
NOTES (i) The Base MUST be made smooth & hard, duly compacted with compactors / pneumatic tampers.

(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 7.5cm), vegetation etc) in earth fill layers.

TYPICAL SKETCH

Rehabilitation of Anicut through SKIN WALL Concrete



SALIENT FEATURS

- 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 21 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