

# DETAILED PROJECT REPORT OF THE PROJECT

**REPORT TO ACCOMPANY THE ESTIMATE FOR DIVERSION OF SURPLUS WATER FROM RAMANADHI RESERVOIR TO JAMBUNADHI SYSTEM OF TANKS AND EXCAVATION OF NEW CANAL FROM PADMANABAPERI TANK TO PUNGANKULAM AND LOWERDOWN TANKS IN TENKASI AND ALANGULAM TALUKS OF TENKASI DISTRICT.**

**Estimate Amount Rs: 4108.50 Lakhs**

## **RIVER BASIN:**

**Basin: Thamirabarani**

**Sub Basin: Gadana**

**Ramanadhi river:** Thamirabarani is the major river basin in Tirunelveli district of Tamilnadu. Ramanadhi river is a tributary of Thamirabarani. Ramanadhi joins with Gadana river which is one of the major tributaries of Thamirabarani. Ramanadhi reservoir was constructed across Ramanadhi to hold a capacity of 152 Mcft. The catchment of this reservoir is 6.40 sq.mile and maximum flood discharge is 10450 cusecs.

**Jambunadhi river :** Jambunadhi river is a minor tributary of Thamirabarani river originating at an altitude of about 1360 metres above MSL in Papanasam hills in extension forest area of Kadayam region in Ambasamudram taluk. Jambunadhi river joins with Ramanadhi river after traversing a distance of 10.40km in plains.

There are four anicuts situated across Jambunadhi and the tanks included in this system are being fed by the channels taking off from these anicuts. The first anicut of Jambunadhi river is Kuthalaperi anicut. Kuthalaperi channel offtakes from this anicut runs for a length of 4820m and feeds six tanks namely Idayankulam, Sambankulam, Kollankulam, Kuthalaperikulam, Pudhukulam and Sennalthakulam. The second anicut of Jambunadhi river is Narayanaperi anicut. Narayanaperi channel offtakes from this anicut and runs for length of 5600m and feeds four tanks namely Narayanaperikulam, Kaikondarkulam, Vellalanpudhukulam and Padmanabaperikulam. The third anicut of Jambunadhi river is Erappanodai anicut and it feeds Vadapathukulam tank. The fourth anicut of Jambunadhi river is Ayyampillai anicut. The Ayyampillai channel offtakes from this anicut and feed three tanks namely Ayyampillaikulam, Paramananthakulam and Nainarkulam.

## **NECESSACITY OF THE SCHEME:**

The tanks under Jambunadhi system are not getting adequate water from Jambunadhi due to lack of adequate rain in catchment areas of Jambunadhi river.

Also, Seven rain fed tanks in Kadayam panchayat union namely Aladikulam, Elavanthakulam, Pungankulam, Chennathakulam, Madathur South tank and Madathur North tank and another system connected tank namely Pandarakulam are in want of water, as this tanks are situated in rain shadow region.

On the other hand, in Ramanadhi river after meeting the irrigation demand of Ramanadhi system, huge quantity of water is found surplus at Ramanadhi reservoir which is wasted into sea through Thamirabarani river during floods.

Hence, the ayacutdhars under Kuthalaperi and Narayanaperi anicut represented to divert the surplus flood water of Ramanadhi Reservoir to Jambunadhi system ayacuts. Farmers from Pungankulam, Aladikulam, Elavanthakulam, Chennathakulam, North Madathur tank and South Madathur tank areas were also requested to link their tanks with Jambunadhi system so that they can get flood water for their tanks.

Based on the cry of farmers, Member of Legislative Assembly of Tenkasi constituency had also represented to divert surplus water of Ramanadhi Reservoir to Jambunadhi system of tanks. Considering the above facts and the genuine demand of farmers, this scheme is formulated.

### **History of the scheme:**

The alignment of the canal was inspected by the Chief Engineer (Plan Formulation), Chennai and Superintending Engineer, Plan Formulation, Trichy on 06.03.2015 and instructions were given to prepare the estimate vide CE's inspection notes no. 17/F2/AEE4/2014/Dated.10.04.2015. Based on the above instructions, preliminary estimate for this scheme was prepared for an estimate value of Rs.4200 lakhs and the same was announced on the floor of assembly during the budget session on 25.09.2015. Initially, an amount of Rs.500 lakhs was allotted towards land acquisition cost and Rs.40 lakhs was allotted towards surveying & levelling operation for this scheme under state fund vide G.O,M.S.no 292 Public Works (I.Spl.2 ) Department, dated: 22.12.2015. Based on that, this detailed project report has been prepared.

### **SCOPE OF THE SCHEME:**

This scheme involves diversion of flood water from Ramanadhi reservoir foreshore portion by constructing an offtake head sluice with discharging capacity 200 cusecs at 750m from left flank end of the reservoir. The link canal offtaking from Ramanadhi reservoir will infall into Jambunadhi river at U/S side of the Janbunadhi river's second anicut namely Narayanaperi anicut (Reach 1A). In between this, a supply channel will be excavated from this link canal to feed the first and upper anicut of Jambunadhi namely Kuthalaperi anicut (Reach 1B). The water sharing between Kuthalaperi anicut and Narayanaperi anicut will be controlled by regulators that are proposed. The water diverted through the link canal will be carried through existing Narayanaperi channel offtaking from Narayanaperi anicut to Narayanaperikulam. At inlet point of Narayanaperi tank, water will be shared to

Kaikondarkulam located adjacent to Narayanaperi tank by introducing a regulator cum sluice. The carrying capacity of Narayanaperi channel has to be increased by widening and raising the channel where ever necessary.

The diverted water after filling Narayanaperi tank will be passed to two lower down chain of tanks viz. Vellalanpudhukulam and Padmanabaperikulam. The surplus of Padmanabaperi tank will then diverted from it's surplus course to Pungankulam by excavating a new link canal (Reach 2A - Pungankulam supply channel). A regulator cum sluice is proposed at LS150 m of this surplus course to facilitate this. (At present Padamanabaperi tank's surplus course flows to Nagalkulam which is a system tank under Chittar system). Another two separate supply channels to feed Aladikulam (Reach 2B) and Chennathakulam (Reach 2C) will be excavated by introducing regulators at their respective offtake points from Pungankulam supply channel.

### **HYDROLOGY:**

Ramanadhi Reservoir is located in the Eastern slopes of Western ghats near Kadayam village of Ambasamudram taluk. The catchment area is influenced by both North east and South west monsoons.

Surplus details of Ramanadhi Reservoir was analysed from 1978 to 2014. (ie. 37 years). It was found that an annual average surplus of 190.52 Mcft of was realized from Ramanadhi reservoir. The surplus available at 75% dependability is 24.09 Mcft. Similarly the surplus available at 50% dependability is 116.35 Mcft. A surplus of 172.80 Mcft is available at 43% dependability.

Based on this, this scheme is formulated divert 172.80 Mcft surplus water @ 200 cusecs for 10 days which is lesser than the available annual average of 190.52 Mcft.

### **WATER BUDGET:**

#### **WATER POTENTIAL AVAILABLE:**

Total water proposed to be diverted from Ramanadhi reservoir	
with discharge of 200 cusecs for 10 days	= 172.80 Mcft.
Deduct for losses 10%	= 17.28 Mcft
Net water available	= 155.52 Mcft

#### **i) WATER REQUIREMENT CALCULATION BASED ON CROP REQUIRMENT:**

Bridging the gap of paddy of 388.48 ac @ 6 ac / Mcft.	= 64.75 Mcft.
Stabilisation of paddy of 1553.90 ac @ 25 ac / Mcft.	= 62.16Mcft.
Well recharged ayacut of 2107.80 ac at 100 ac / Mcft	= 21.08Mcft.

Total Requirement

= 147.99 Mcft

The water potential available is 155.52Mcft which is more than the crop water requirement of 147.99Mcft.

## ii) WATER REQUIREMENT CALCULATION BASED ON TANK CAPACITY

Sl. No	Name of Anicut	Name of Benefitted Tank	Name of Village	Registered Ayacut in Ha.	Capacity of Tank in Mcft
<b>A. Kuthalaperi Anicut</b>					
1.		Idayankulam	Tippanampatti	12.50.0	0.78
2.		Sambankulam	Tippanampatti	30.85.0	4.52
3.		Kollankulam	Tippanampatti	7.50.0	2.61
4.		Kuthalaperikulam	Tippanampatti	81.03.0	11.69
5.		Pudhukulam	Tippanampatti	44.11.5	7.26
6.		Sennalthakulam	Tippanampatti	81.22.0	11.72
<b>B. Narayanaperi Anicut</b>					
7.		Narayanaperikulam	Tippanampatti	81.14.5	13.10
8.		Kaikondarkulam	Avudaiyanoor	38.12.5	6.59
9.		Vellalanpudhukulam	Avudaiyanoor	26.47.0	4.94
10.		Padmanabaperikulam	Avudaiyanoor	21.95.5	4.73
<b>Rainfed Tanks</b>					
11.		Pungankulam	Vengadampatti	9.68.0	4.78
12.		Aladikulam	Vengadampatti	1.59.0	0.37
13.		Elavanthakulam	Vengadampatti	8.21.0	1.51
14.		Chennathakulam	Vengadampatti	6.49.0	2.27
15.		Madathur North tank	Madathur	36.44.5	6.25
16.		Madathur South tank	Madathur	28.77.0	6.07
17.		Pandarakulam	Madathur	46.59.0	9.40
<b>C. Erappanodai Anicut</b>					
18.		Vadapathukulam	Melakadayam	89.81.5	10.49
<b>D. Ayyampillai Anicut</b>					
19.		Ayyampillaikulam	Therku Kadayam	107.77.5	12.50
20.		Paramananthakulam	Pottalpurur	11.59.5	2.90
21.		Nainarkulam	Pottalpurur	14.20.0	3.92
		<b>Total</b>		<b>786.07.0Ha</b>	<b>128.40 Mcft.</b>

Net water potential available is 155.52Mcft which is more than the tank capacity of 128.40  
The balance water will be used for recharging the wells.

### SCHEME PROPOSALS:

The scheme contemplates the following reaches

#### (1) Reach 1A & 1B :

**Reach 1A** : Link canal from Ramanadhi reservoir to Jambunadhi river (ie upto u/s side of Kuthalaperi anicut) for length 3215 m

**Reach 1B** : Supply channel off taking from LS. 2800 m of Reach 1A to Kuthalaperi anicut for a length of 125 m.

**(2) Improvement to Kuthalaperi anicut, Narayanaperi anicut and Narayanaperi channel.**

**(3) Reach 2A** : Pungankulam supply channel for a length of 2800 m off taking from LS 150 m of existing Padmanabaperikulam surplus course.

**(4) Reach 2B** : Aladikulam supply channel for a length of 1180 m off taking @ LS 1545 m of the proposed Pungankulam supply channel.

**(5) Reach 2C** : Chennathakulam supply channel for a length of 880m offtaking @ LS 2715 m of the proposed Pungankulam supply channel.

Hydraulic particulars of the proposed new channel are as follows;

**HYDRAULIC PARTICULARS:**

Hydraulic Particulars	Ramanadhi-Jambhunadhi link Canal				Supply Channels		
	Reach-IA			Reach-IB Kuthalaperi supply channel	Reach-2A Pungankulam Supply channel	Reach-2B Aladikulam Supply channel	Reach-2C Sennatha- kulam supply channel
Chainage	LS 0m - 2700m	LS2700 m - 2800m	LS 2800m - 3215M	LS 0m - 125M	LS 0m - 2800M	LS 0m - 1180M	LS 0m - 880M
Bed Width	2.30m	3.70m	4.00m	4.00m	3.00m	2.00m	2.00m
FSD	1.20m	1.20m	1.20m	1.20m	0.90m	0.60m	0.60m
Free Board	0.60m	0.60m	0.60m	0.60m	0.50m	0.50m	0.50m
TBL	FSD+ Free Board	FSD + Free Board	FSD + Free Board	FSD + Free Board	FSD + Free Board	FSD + Free Board	FSD + Free Board
Side Slope	0.25:1	0.25:1	1:1	1:1	1:1	1:1	1:1
Bed Fall	1 in 500	1 in 1500	1 in 1500	1 in 1500	1 in 1500	1 in 2000	1 in 2000
Discharge	200 cusecs	200 cusecs	200 cusecs	200 cusecs	90 cusecs	20 cusecs	20 cusecs

### **(1) Reach-1A & 1B :**

This reach constitutes a link canal that to be excavated for a length of 3215m from the foreshore of Ramanadhi reservoir to Jambunadhi river (Reach1A). The FRL /MWL of Ramanadhi reservoir is +193.240m above MSL. The sill level of proposed offtake head sluice at Ramanadhi reservoir will be at +192.020 m, which is 1.22m lower than the FRL/MWL of Ramanadhi reservoir.

A supply channel is proposed to take off from LS 2800m of Reach 1A to feed Kuthalaperi anicut for a length of 125 m (Reach 1B).

The following provisions are made in this Reach 1A & 1B:

1. Construction of new head sluice at LS 0m (ie. At offtake point) of proposed link canal at foreshore of Ramanadhi Reservoir.
2. Construction of closed canal with concrete facing from LS 23m to 420m and 1353.50 m to 2700 m.
3. Construction of direct sluice at LS 565 m and 1350 m to feed the ponds and wells in Keelakadayam village through existing odai.
4. Construction of trough aqueduct from LS 600 m to 1300 m
5. Construction of regulator cum sluice at LS 2800 m to feed Kuthalaperi anicut.
6. Construction of inlets at LS 460 m and 3115 m.
7. Construction of road culverts at LS 2900 m and 3135 m.
8. Construction of cascades from LS 440 m to 450 m and from LS 470 m to 550 m and drops at LS 3000 m, 3150 m and 3200 m to negotiate the steep fall.
9. Formation of ramp on the left side of the surplus course for a length of 510 m to reach the left flank end of Ramanadhi reservoir
10. Formation of approach road for a length of 750 m from Left flank end to the proposed head sluice at the foreshore of Ramanadhi reservoir .

### **(2) Improvements to Kuthalaperi anicut, Narayanaperi anicut and Narayanaperi Channel**

#### **A) Kuthalaperi Anicut**

The first anicut of Jambunadhi is Kuttalaperi anicut. Improvements such as construction of skin wall, protection wall and apron at the downstream side of anicut and head sluice are proposed.

#### **B) Narayanaperi Anicut**

The Second anicut of Jambunadhi is Narayanaperi anicut. Improvements such as replacing the existing shutter of the sluice portion in order to increase the discharging capacity

of existing head sluice into the Narayanaperi channel. It is also proposed to form flood banks at Jambunadhi river from upstream side of Narayanaperi anicut to downstream side of Kuttalaperi anicut including regarding river bed to increase the storage capacity at U/S side of Narayanaperi anicut.

### **C) Narayanaperi Channel**

A Supply Channel takes off from Narayanaperi anicut to feed Narayanaperikulam and Kaikondarkulam. The length of the channel is 5600m. It is proposed to carry out improvement works in this channel in order to increase the carrying capacity to 200 cusecs. The following cross masonry structures are proposed in this channel.

1. Construction of Inlet at LS 5158m to accommodate the drain water from adjacent fields through railway culvert
2. Construction of regulator cum sluice at LS 5600m to feed Narayanaperikulam and Kaikondarkulam.

### **Reach-2A:**

A new supply channel is proposed to be excavated for a length of 2800m taking off at LS 150m of Padmanabaperikulam surplus course and infall into Pungankulam with a carrying capacity of 90 cusecs.

The following provisions are made in this Reach:

1. Construction of new head regulator cum sluice at LS 0m and road bridge at LS 5m of proposed Pungankulam supply channel.
2. Construction of canal syphon at LS 465 m.
3. Construction of box culverts at LS 650 m, 1500 m and 1865 m at road crossings.
4. Construction of road culvert at LS 835 m.
5. Construction of drops at LS 1650 m, 1800 m, 2000 m and 2400 m to negotiate the steep fall.
6. Construction of regulator cum sluice at LS1545 m of Pungankulam supply channel to feed Aladikulam.
7. Construction of inlets at LS 1900 m and 2450 m.
8. Construction of regulator cum sluice at LS 2715 m of Pungankulam supply channel to feed Chennathakulam.
9. Construction of well water crossings at LS 1100 m and 1300 m.

### **Reach-2B:**

The proposed Aladikulam supply channel is to be excavated for a length of 1180m taking off at LS1545 m of Pungankulam supply channel with a carrying capacity of 20 cusecs.

The following provisions are made in Reach 2 B:

1. Construction of inlets at LS 910 m and 950 m.
2. Construction of box culverts at LS 390 m and 960 m at road crossings.
3. Construction of road culverts at LS 710 m and 915 m at the road crossings.
4. Construction of drops at LS 650 m, 810 m and 890 m
5. Construction of well water crossing at LS 205 m, 325 m, 445 m, 545 m and 660 m.

### **Reach-2C:**

The proposed Chennathakulam supply channel is to be excavated for a length of 880m taking off at LS 2715 m of Pungankulam supply channel with a carrying capacity of 20 cusecs.

The following provisions are made in this Reach:

1. Construction of well syphon at LS 240m.
2. Construction of road culverts at LS 375 m and 820 m.
3. Construction of drop at LS 700 m to negotiate the steep fall.

### **Environment and Ecology**

The Executive Engineer PWD/WRD, Environment Cell Division, Madurai has prepared an estimate for incorporating Environmental activities and Mitigation works including preparation of EIA Report for the above scheme for Rs.20.00 Lakhs. The above provision has also included in this estimate.

### **Other Provisions:**

1. Construction of operator room for operating the head sluice at the foreshore of Ramanadhi Reservoir.
2. Provision for Electrification, water supply, inaugural ceremony, visit of dignitaries, documentation charges, centage charges to bridges, shifting of telephone and electric city lines, etc
3. Provision for price adjustment
4. Provision for Escalation charges
5. Provision for PS charges and contingencies
6. Provision for Advertisement charges
7. Provision for Labour welfare fund
8. Provision for Photographic charges
9. provision for purchase of Office Equipments
10. Provision for Installation of flood gauge measurements
11. Provision for Training to officer and Engineers
12. Provision for Quality maintenance & Monitoring of ground water (ie., Provision for monthly/Annual Assessment of quality of water.)
13. Provision for project management like Chief Engineers review meetings, conducting policy planning meetings etc.

14. Provision for Operation and Maintenance cost for shutter.

15. Provision for providing fencing arrangements to protect falling of animals and human beings in deep cut portion.

Based on the above announcement detailed project report for the scheme has been prepared. The hydraulic particulars of the scheme are as follows.

#### **LOWER DOWN RIPARIAN RIGHTS:**

The proposed new canal will be operated only when the tanks under last anicut of Ramanadhi system (i.e. Adaichani anicut) surpluses into Gadana river and also when there is a surplus in Ramanadhi reservoir. Hence the lower down irrigation of Ramanadhi river will not be affected under any circumstances.

The proposed regulator cum sluice at LS 5600 m of Narayanaperi channel and 150 m of Padmanabaperi surplus course will be operated only when the water from Ramanadhi reservoir enters into Jambunadhi river. Hence the lower down riparian rights will not get affected.

#### **WELLS BENEFITTED:**

In the zone of influence along the alignment of proposed canal 729 Nos. of wells will get benefitted through ground water recharge. The following table shows the village wise wells located in the zone of influence.

<b>SI.No</b>	<b>Village</b>	<b>No of wells</b>	<b>Ayacut in Ac.</b>	<b>Ayacut in Ha.</b>
1.	Mathalamparai	11	42.00	17.00.0
2.	Kadayamperumpathu	12	59.30	24.10.0
3.	Tippanampatti	424	1285.10	520.03.0
4.	Avudaiyanoor	125	272.00	110.08.0
5.	Vengadampatti	95	254.00	102.79.0
6.	Madathur	24	72.00	29.14.0
7.	Keelakadayam	15	45.00	18.21.0
8.	Therku Kadayam	16	58.00	23.47.0
9.	Pottalpur	7	20.5	8.30.0
	<b>TOTAL</b>	<b>729</b>	<b>2107.80 Ac.</b>	<b>853.01 Ha.</b>

#### **AYACUT BENEFITTED:**

By implementation of this scheme, the total ayacut proposed to be benefitted by this scheme is 4050.18 ac or 1639.08 ha.

Ayacut benefitted through 21 tanks = 1942.38 ac. or 786.07 ha.

Ayacut benefitted through well recharge (729 wells) =2107.80 ac or 853.01ha.

### **LAND ACQUISITION:**

In G.O,M.S. no 292 Public Works (I.Spl.2 ) Department, dated: 22.12.2015, government have accorded administrative sanction for Rs.500 lakhs for acquiring an extent of 1.02Acres of Wet Lands and 44.26 Acres of dry lands and transferring 9.14 acres of poramboke lands for the scheme of Ramanadhi -Jambunadhi link canal, Kuthalaperi supply channel, Pungankulam supply channel, Aladikulam supply channel and Chennathakulam supply channel in Tenkasi and Alangulam taluks.

The Land acquisition process is taken up by the Project circle, Tirunelveli and is in progress.

### **APPROVED DESIGN AND DRAWINGS:**

In G.O, M.S.no 292 Public Works (I.Spl.2 ) Department, dated: 22.12.2015, Government have accorded administrative sanction for 40.00 lakhs towards surveying & levelling and subsoil investigation for preparing DPR for the scheme of Diversion of surplus water from Ramanadhi reservoir to Jambunadhi system of tanks and excavation of new canal from Padmanabaperi tank to Pungankulam and lowerdown tanks in Tenkasi and Alangulam taluks of Tirunelveli district. The above subsoil investigation work has been executed and field particulars submitted to the Designs circle, Chennai for obtaining design and drawings for the components of the scheme.

The approved drawing for link canal, supply channels and cross drainage works were obtained from the Superintending Engineer, Designs circle Chennai, and detailed project report is prepared accordingly.

The Detailed Project Report for the scheme is prepared by dividing the entire scheme into two slices as follows.

Slice-1: Excavation of Ramanadhi to Jambunadhi link canal from Ls 0m to 3215m, Excavation of Kuthalaperi supply channel from LS 0m to 125m including cross drainage works.

Slice-2: Excavation of Pungankulam supply channel, Aladikulam supply channel, Chennathakulam channel and improvements to Kuthalaperi anicut, Narayanaperi anicut and Narayanaperi channel.

### **COST OF SCHEME:**

The estimate has been priced to schedule of rate for the year 2018-2019 of Tirunelveli District and the total cost works out to Rs.4108.50 lakhs .

### **BC RATIO**

The BC ratio of the scheme works out to 2.13:1 without Land acquisition and Preliminaries and 2.04:1 with Land acquisition and Preliminaries.

### **ADDITIONAL FOOD PRODUCTION:**

The net additional food production anticipated by implementation of the scheme works out to 14065 tonnes. The rate per tonne works out to Rs.0.30 lakhs. The rate per hectare and rate per acre works out to 2.53 lakhs and 1.02 lakhs respectively.

### **PROGRAMME OF CONSTRUCTION:**

The scheme is proposed to be completed in a span of three years. In First year all preliminary works, land acquisition and initial 20% of work has to be completed, In Second year 60% of work will be completed. Balance 20% of work has to be completed in the Third year. Provision has been made in the estimate for escalation with 5% for each year.

### **CONCLUSION:**

On implementation of this scheme, decades long irrigation need of the people of Mathalamparai, Thippanampatti, Avudaiyanoor, Therkkukadayam, Keelakadayam and Pottalputhur areas will be meet out. Also the living status of the people of the area will get improved due to stablized irrigation facilities to their crops. With the rejuvenation of ground water, it will enhance the drinking water facilities to the people, cattle and other livelihoods throughout the year. The farmers can use the canal road for the transportation of agricultural products, men and materials. The electric power consumption may also come down with the rise in ground water level, utilizing the minimum power for pumping. Migration of agricultural workers due to crop failures will get minimized.

*dyk*  
27/10/23

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