GOVERNMENT OF TAMIL NADU

PUBLIC WORKS DEPARTMENT

WATER RESOURCES ORGANISATION

REIA & SIA STUDY FOR FORMATION OF FLOOD CARRIER CANAL FROM CAUVERY (KATTALAI) TO SOUTH VELLAR RIVER TO DIVERT THE FLOOD WATER FOR SUSTAINING DRINKING WATER NEEDS AND RECHARGING GROUND WATER IN THE DROUGHT PRONE AREAS OF KARUR, TRICHY AND PUDHUKOTTAI DISTRICTS

EXECUTIVE SUMMARY

WAPCOS LIMITED

(A GOVERNMENT OF INDIA UNDERTAKING)

MINISTRY OF JAL SHAKTI,

DEPARTMENT OF WATER RESOURCES,

RIVER DEVELOPMENT AND GANGA REJUVENATION

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EXECUTIVE SUMMARY

1. INTRODUCTION

The Cauvery –South Vellar flood carrier canal project intends to inter- connect River Cauvery from the Mayanur barrage with South Vellar through the en-route main rivers Pungar, Koraiyar, Agniyar and South Vellar.

It is proposed to divert the flood flow from river Cauvery released from Mettur, Bhavani and Amaravathi reservoirs, received at the Mayanur barrage through this Flood Carrier Canal. At important river crossings between Cauvery and South Vellar, outlets in the shape of escape in the Flood Carrier Canal shall be provided to meet the demands of downstream areas could be met as and when required.

The needs of the domestic water supply schemes on en-route of the canal could be taken care by means of artificial recharge of ground water. The domestic need could be supplemented to great extent by direct or indirect means.

Besides, domestic demand agricultural demand will also be fulfilled. Further, by diverting 6000 cusec (169.9 cumec) of flood water from Koraiyar after utilization in that basin, through this flood canal, flooding of habitations of Trichy and Srirangam towns, will be avoided. On other hand, Flood Carrier Canal will convey surplus water to the water deficit Anicut and tanks at the downstream side of the proposed Flood Carrier Canal to the extent of about 19500 ha, for stabilization and bridging the gap in head reaches up to South Vellar basins.

2. POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

As per EIA Notification issued by MoEF&CC on 14thSeptember 2006, application for prior Environmental Clearance was submitted to SEIAA vide letter dated 10.07.2020. The Draft Terms of Reference was discussed in the SEAC meeting held on 10.10.2020 and approval of Terms Reference (TOR) for the EIA study was issued by SEIAA vide letter No.SEIAA-TN/F.No.7719/SEAC/ToR-799/2020 dated 10.11.2020.

3. PROJECT DESCRIPTION

The precipitation is the only source for all water. Most of the districts in Tamil Nadu recorded deficit rainfall ranging from 19% to 59%. Most parts of Trichy, Karur, Pudukottai and Ramanathapuram districts receive very less rainfall. The rainfall received during South

West and North East monsoons, ensures recharging groundwater and replenishing of all water resources. This ensures sufficient supply until next monsoon season. At the same time, river Cauvery, which is in adjacent basin, receives heavy flood one in 4 years occasionally due to the huge rains in the Western Ghats and thus the water level in the Mettur dam rises to its full capacity and excess water is released through spills. A portion of surplus water is being stored in tanks wherever possible. The balance, surplus outfalls into sea.

It is proposed to divert the above referred occasional flood waters from Cauvery basin to deficit basins, upto Gundar river for the benefit of people in Karur, Trichy, Pudukottai, Sivagangai and Ramanathapuram districts. The diverted water will sustain drinking needs and if surplus occurs it will cater to the irrigation needs as an inter basin transfer of intra state rivers. This flood water will be taken through a canal which is aligned in the proposed alignment of NWDA's Mahanadhi-Godavari-Cauvery-Gundar link canal under NPP.

In the 1st phase, it is proposed to form the Flood Carrier Canal up to South Vellar River for meeting drinking water requirement. Besides envisaging the benefits to the CCA in Kulathur, Pudukkottai and Thirumayam Taluks of Pudukottai District, the en-route command area of about 1000 ha, which lies in Krishnarayapuram and Kulithalai Taluks of Karur District, Trichy and Srirangam Taluks of Trichy District, will also be covered under this Flood Carrier Canal Project. This will be achieved by meeting the irrigation demand to some extent either by supplying water to the existing tank system in the vicinity on Eastern side area or by lifting water to the Western side area of the proposed canal. The groundwater will also be recharged by irrigation water on the field.

The proposed Flood Carrier Canal project will meet the drinking water requirements and bring economic prosperity to the acute water short, drought-prone command area lying in the vicinity of the link canal project through stabilization of the existing command area.

The length of canal is divided into **8** slices in Phase I, **7** slices in Phase-II and **2** slices in Phase-III. Further each slice in phase I may be split into various reaches for facilitating easy implementation of the scheme.

Details of Slices in Phase-I

S. No.	Slice with RD in Km	Canal Length (km)
1.	Slice I (0 – 17.880)	17.880
2.	Slice II (17.880 – 35.215)	17.335

S. No.	Slice with RD in Km	Canal Length (km)
3.	Slice III (35.215 – 47.330)	12.115
4.	Slice IV (47.330 – 59.930)	12.600
5.	Slice V (59.930 – 77.745)	17.815
6.	Slice VI (77.745 – 93.845)	16.100
7.	Slice VII (93.845 – 111.795)	17.950
8.	Slice VIII (111.795 – 118.450)	6.350
	Total	**118.450**

The ayacut proposed to be brought under irrigation for getting the benefit of proposed flood carrier canal in Karur and Trichy districts by gravity or lift has to be identified in consultation with territorial divisions concerned. However, an extent of 750 ha. ayacut in each Karur and Trichy districts which is deemed to irrigable, have been taken for calculating water requirement.. The total command area to be benefitted is18566 ha in The details are given in Table below

Benefitted Command Area

S. No.	River	Ayacut Benefitted		
		Stabilization (ha)	Gap (ha)	Total (ha)
1.	En-route irrigation in Karur District	550.00	200.00	750.00
2.	En-route Irrigation in Trichy District	550.00	200.00	750.00
3.	Agniyar	2997.00	543.00	3540.00
4.	South Vellar	12821.10	705.28	13526.38
	Total	**16918.10**	**1648.28**	**18566.38**

In phase-I, a total extent of 1320.332 ha of land are to be acquired for the Flood Carrier Canal project. Out of the total land to be acquired, the extent of 1141.954 ha is patta land and the remaining is Poromboke land.

An extent of 1141.954 ha of Patta land, and 178.378 ha of Poromboke land is to be acquired for Flood Carrier Canal. The total land to acquired for the project is 1320.332 ha. The district wise land acquisition details are given in Table below.

Details of District Wise Land Acquisition

S. No	Name of the District	Length (km)	No. of Villages	Poramboke Land Area (ha)	Patta Land area (ha)	Total Area (ha)
1.	Karur	47.235	17	42.208	458.404	500.612
2.	Trichy	18.801	10	24.28	155.48	179.76

3.	Pudukkottai	52.414	25	111.89	528.07	639.96
	Total	118.45	52	178.378	1141.954	1320.332

This estimate is priced to the schedule of rates for the year 2019 – 20 and the project cost has been estimated as Rs. 694100 lakh (Rs. 6941 crore).

4. ENVIRONMENTAL BASELINE STATUS

The Study Area for the EIA Report encompasses the entire area within a radius of 10 km of the project area. The Baseline Status of various environmental parameters in the Study Area is described in the following paragraphs.

4.1 Meteorology

Meteorological data with respect to wind, temperature, rainfall, relative humidity, etc., was collected to represent the project area from the secondary sources. The average annual rainfall is reported as 844.20 mm, and most of which is received in the period from September to November under the influence of North-East monsoons. The mean monthly temperature ranges from 20.6°C to 38.2°C.

4.2 Land-use Pattern

The land use pattern of the Study Area has been studied using satellite data. The major landuse category in the study area is barren land, as it accounts for about 58% of the study area followed by Built up area (27.70%) and Waterbody (27.42%). The area under Settlement/built up area and Water body accounts for about is 0.37% and 0.94% of the study area respectively.

4.3 Ambient Air Quality

The average concentration of PM_{10} at various stations monitored ranged from 35.66 to 69.54 $\mu g/m^3$. The average $PM_{2.5}$ concentration at various stations ranged between 15.80 to 32.11$\mu g/m^3$.

4.4 Ambient Noise Levels

Ambient Noise Levels were monitored at various locations in the Study Area. The day time equivalent noise level ranged from 38.25 to 72.45dB(A).

4.5 Aquatic Ecology

Biodiversity Assessment was conducted by Department of Department of Environmental sciences, Bishop Herber College, Tiruchirappalli during December 2020. Findings of the study are summarised as below:

- The primary productivity value was recorded (4.36gC/m3/hr) in Thirukampuliyur and (3.39gC/m3/hr) in Amma park
- Based on the study carried out in core and buffer zones 141 plant species were recorded in the study area. No endangered and endemic plants are recorded.

- Totally 10 species of fishes, 19 species of reptiles, 59 species of birds, 13 species of mammals, 32 species of butterflies etc were recorded in the study area
- No Rare, Endangered and Threatened (RET) species were recorded in the study area
- No forest is present along the proposed alignment of the CSV River
- No Rare, Endangered, Threatened, or endemic species of plants recorded in the study area.
- No ecologically sensitive area such as Sanctuary, National parks, Biosphere reserves fall in the proposed alignment

5. ASSESSMENT OF IMPACTS& MITIGATION MEASURES

Based on the project details and the baseline environmental status, potential impacts that are expected to occur as a result of the execution and operation of the proposed project have been identified.

5.1 Impact on Land Environment

Construction phase

- Environmental degradation due to immigration of labour population.
- Operation of construction equipment.
- Soil Erosion.
- Impacts due to construction of roads.

Mitigation measures:

- It is proposed to treat the effluent from construction sites having high suspended solids in settling tanks prior to disposal.
- Solid waste management at labour camps shall be based on the principle of reduce, reuse and recycle and adequate facilities for collection and conveyance of the solid waste.

5.2 Impact on Water Environment

Construction phase

- About 1550 persons would be staying in labour camps. The sewage generated would be of the order of 0.21 MLD from the labour camp. The disposal of sewage without treatment could lead to significant problems related to water pollution and public health. The disposal of sewage without treatment can cause problems of odour and water pollution.
- During construction phase, the domestic wastes generated will contain mainly vegetable matter followed by paper, cardboard, packaging materials, wood boards, polythene, sewage and other liquid wastes etc. may find their way into water bodies.

Mitigation measures:

- The labour population is proposed to be situated in existing colonies. One community toilet needs to be provided for 20 persons. The sewage from the community toilets can be treated in a Packaged Sewage Treatment Plant (STP). The treated effluent can be used for meeting irrigation requirements of areas being afforested under greenbelt development

Operation phase

- Impacts on downstream water users
- Impacts on waterlogging and soil salinity
- Changes in water quality due to increased use of fertilizers
- Impacts due to effluents from project colony
- Impacts on downstream water quality

Mitigation measures

- Integrated Plant and Nutrient Management
- Use of Agro-Chemicals
- Integrated Pest Management.

5.3 Impacts on Ambient Air Quality

Construction phase

- The potential source of air quality impact arising from the establishment/ construction of the proposed project is fugitive dust generation.
- The combustion of diesel various construction equipment could be one of the possible sources of incremental air pollution during the construction phase.

Mitigation measures:

- All the vehicles must have valid PUC certificates at all the time during construction phase of the project, Water sprinkling shall be done to suppress the dust emissions from the site.
- All the DG sets used for construction shall have valid consents from Tamil Nadu Pollution Control Board and shall have built-in stacks to reduce the air emission impacts.

5.4 Impacts on Noise Environment

Construction phase

- Noise during construction phase are due to operation of various construction equipment.
- There will be significant increase in vehicular movement for transportation of construction material.

Mitigation measures:

- Vehicles to be equipped with mufflers recommended by the vehicle manufacturer.
- Staging of construction equipment and unnecessary idling of equipment within noise sensitive areas to be avoided whenever possible.
- Monitoring of noise levels will be conducted during construction phase of the project. In case of exceeding of pre-determined acceptable noise levels by the machinery will require the contractor(s) to stop work and remedy the situation prior to continuing construction.
- The construction activities shall be limited to day time. Suitable barriers shall be provided around construction sites.

5.5 Impacts on Terrestrial Ecology

Construction phase

- Labour population is likely to congregate near various construction sites. It can be assumed that the technical staff likely to congregate will be of higher economic status and will live in a more urbanized habitat, and will not use wood as fuel. However, workers and other population groups residing in the local area may use fuel wood.
- During construction phase, a large number of machinery and construction labour will have to be mobilized. This activity may create some disturbance to the wildlife population. The operation of various construction equipment is likely to generate significant noise. The noise may scare the fauna in the region and force them to migrate to other areas

Mitigation measures:

- Afforestation
- Soil stabilization measures & improving water regime,
- Sustenance of Livelihoods
- Establishment of botanical gardens for conservation and propagation of RET species.
- Anti-poaching measures

Operation phase:

- The increased level of fodder availability and forestry products would reduce the presence on existing pasture and vegetal cover, which is a significant positive impact.
- The project will create immersed area quiescent/tranquil conditions, which can lead to proliferation of vegetation e.g. grass, etc. along the reservoir banks. Such conditions are generally ideal for various kinds of birds, especially, water birds. This is expected to increase the avi-faunal population of the area.

Mitigation measures:

- For the improvement of vigilance and measures to check poaching, number of measures described below would be undertaken.
- Installation of artificial nest boxes in the influence zone and catchment area of the project after consultation with the forest department as well as local NGOs

6. ENVIRONMENTAL MANAGEMENT PLAN

The Environmental Management Plan (EMP) was delineated to ensure that the adverse impacts likely to accrue are altogether removed or minimized to the extent possible. The key measures suggested as a part of the Environmental Management Plan are area listed as below:

- ✓ Provision for drinking water
- ✓ Provision of community toilets, STP
- ✓ Temporary colonies of the construction workers with adequate sanitation facilities to prevent degrading the environmental quality of the area.
- ✓ Provision of Free Fuel

- ✓ Habitat improvement for avi-fauna
- ✓ Fire protection in labour camp and staff colonies
- ✓ Construction waste including debris shall be disposed safely in the designated areas.
- ✓ Energy conservation

After selection of suitable and feasible environmental mitigation measures, the cost required for implementation of various environmental management measures has been estimated to have an idea of their cost-effectiveness.

7. RESETTLEMENT AND REHABILITATION (R&R)

The R&R shall be given by Right to Fair Compensation & Transparency in Land Acquisition, Rehabilitation & Resettlement Act, 2013 (RTFCTLARRA, 2013). The total budget for implementation of the Rehabilitation and Resettlement Plan is Rs.45188.61 lakhs.

8. ENVIRONMENTAL MONITORING PROGRAMME

An Environmental Monitoring Programme for implementation during project construction and operation phases has been suggested to oversee the environmental safeguards, to ascertain the agreement between prediction and reality and to suggest the remedial measures not foreseen during the planning stage but during the operation phase and to generate data for further use. The cost required for implementation of the Environmental Monitoring Programme is of the order of Rs.54.26 lakh @ Rs.19.40 lakh/year with 10% annual price increase.

9. PROJECT BENEFITS

Proposed project the following are the immediate benefits:

- Requirements of the domestic water supply schemes en-route of the canal shall be taken care by means of artificial recharge of ground water.
- Flood Carrier Canal will convey surplus water to the water deficit Anicut and tanks at the downstream side of the proposed Flood Carrier Canal to the extent of about 18500 ha, for stabilization and bridging the gap in head reaches up to South Vellar basins.
- Diversion of 6000 cusec (169.9 cumec) of flood water from Koraiyar after, through the flood canal, will reduce adverse impacts due to flooding of habitations of Trichy and Srirangam towns.
- Increased crop production
- Increased income levels
- Impetus to urbanization
- Improvement in public health due to increased water availability for meeting domestic requirements resulting in reduction in incidence of water-borne diseases.

10. EMP IMPLEMNTATION COST

The total amount to be spent for implementation of Environmental Management Plan (EMP) would be Rs.496.10 crore. The details are given in Table below.

Summary of cost estimate for implementing Environmental Management Plan

S. No.	Item	Cost (Rs. lakh)
A. Mitigation Measures		
1.	Solid Waste Management for labour camp	10
2.	Water Pollution Control Measures	218.0
3.	Provision of Free Fuel	149.2
4.	Biodiversity Conservation Plan	45.0
5.	Wildlife Protection Plan	148.83
6.	Habitat improvement for avi-fauna	11.46
7.	Air pollution control measures	95.68
8.	Implementation of various noise control measures	27.0
	Sub-Total (A)	**795.22**
B. Measures as per Additional Studies		
9.	Rehabilitation and Resettlement	45188.61
10.	Corporate Environmental Responsibility	3470.50
11.	Monitoring and Implementation of R& R plan.	50.0
	Sub-Total (B)	**48709.11**
C. Environmental Management Plan		
12.	Energy Conservation Measures	25.0
13.	Public Awareness Programme	25.0
	Sub-Total (C)	**50.0**
D. Environmental Monitoring Programme		
14.	Implementation of Environmental Monitoring Programme during construction stage	54.26
	Sub-Total (D)	**54.26**
	Grand Total (A+B+C+D)	**49608.59 lakh Say 496.10 Crore**

WAPCOS LIMITED

(A Government of India Undertaking)

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