Final Comprehensive Report filed by the Additional Chief Secretary/Commissioner of Revenue Administration (13th Respondent) before the Honourable National Green Tribunal in Original Application No.264 of 2020 (SZ) on the action taken by the Government for the temporary and permanent measures to prevent recurrence of flooding and sewage over flows in the areas highlighted in the newspapers.

IN THE MATTER OF

Tribunal on its own motion- SUO MOTU based on The New Item in The Hindu E-paper Chennai Edition Dated:30.11.2020, "Days after rain, water stagnation continues to plague many areas of Chennai"

...Applicant(s)

Versus

1) The Principal Secretary to Govt. of Tamil Nadu,
   Health and Family Welfare Department,
   Govt. Secretariat, Fort St. George,
   Chennai, Tamil Nadu 600 009.

2) The Secretary to Govt. of Tamil Nadu,
   Department of Environment & Forests,
   Govt. Secretariat, Fort St. George,
   Chennai, Tamil Nadu 600 009.

3) The Additional Chief Secretary to Govt. of Tamil Nadu,
   Revenue and Disaster Management Department,
   Govt. Secretariat, Fort St. George,
   Chennai, Tamil Nadu 600 009.

4) The Additional Chief Secretary to Govt. of Tamil Nadu,
   Municipal Administration and Water Supply Department, Govt. Secretariat, Fort St. George,
   Chennai, Tamil Nadu 600 009.

5) The Chairman,
   Tamil Nadu Pollution Control Board,
   No.76, Anna Salai, Guindy,
   Chennai, Tamil Nadu 600 032.

6) Tamil Nadu Water Supply and Drainage Board,
Represented by its Managing Director,
31, Kamarajar Salai, Chepauk,
Chennai, Tamil Nadu 600 005.

7) The District Collector,
Chennai District,
District Collectorate Office,
No.62, Rajaji Salai, 4th Floor,
Chennai, Tamil Nadu 600 001.

8) The District Collector,
Chengalpet District,
Collector Office, GST Road,
Chengalpattu 603001.

9) The District Collector,
Tiruvallur District,
First Floor, Collectorate,
Chengalpattu 602001.

10) The District Collector,
Kancheepuram District,
First Floor, Collectorate,
Kancheepuram 631501.

11) Greater Chennai Corporation,
Rep., by its Commissioner,
Ripon Building,
Chennai- 600003.

12) Chennai Metropolitan Water Supply & Sewerage Board,
Rep., by its Managing Director,
No.1, Pumping Station Road,
Chintadripet, Chennai- 600031.

...Respondent(s)

The above case has been Suo Motu registered by the Hon'ble National Green Tribunal on the basis of newspaper reports published in 'The Hindu' E-paper Chennai Edition, dated 30.11.2020 under the caption, **"Days after rain, water stagnation continues to plague many areas of Chennai"**, Dinamalar Chennai edition dated 30.11.2020 under the caption " **கழிவு நீர் பிரச்சனைக்கு விமோசனம் கிடைக்குமா?**" (Will there be a solution of sewage water problem?), the Times of India newspaper dated 08.12.2020 under the captions **"Sewage overflows from manhole in Kallikuppam"** and **"Residents protest as many areas along OMR remain under water"** and the Dinamalar newspaper dated 10.12.2020 under the captions **"சென்னை வெள்ளம்: மத்திய குழு ஆலோசனை என்ன?"** (What the Central team suggested?), **"ஒரு மாதமாக தேங்கி நிற்கும் கழிவு நீர்"** (Sewage water stagnant for one month), **"கழிவு நீர் கால்வாயாக மாறி தெருக்கள்"** (Streets become a Sewage Water canal), **"அடுக்குமாடி குடியிருப்பில் சுகாதார சீர்கேடு"** (Sanitary problem in residential multi-storey apartment) and other similar news paper reports projecting the sufferings of residents of Chennai Corporation and its suburban districts on account of rain water inundating their residential area and also mixing of rain water with sewage causing health hazards to the people and delay in taking steps to drain these stagnated water .

2) In this connection, it is informed that, in the first order issued by the Tribunal on 22nd December 2020, a Joint Committee comprising the following officials, was formulated to prepare an action plan with short- and long-term measures as to how such issues can be avoided in future, to enlist the steps taken by them and to submit the report before the next hearing scheduled on 22.02.2021.

i. District Collectors of Chennai, Chengalpet, Tiruvallur and Kancheepuram Districts,

ii. The Additional Secretary, Revenue and Disaster Management Department,

iii. The Additional Secretary of Municipal Administration and Water Supply Departments,

iv. The Commissioner, Greater Chennai Corporation,

v. A Senior Officer from the level of Superintending Engineer of Public Works Department (PWD)/ Water Resources Organisation (WRO),

vi. A Senior Officer from Tamil Nadu Water Supply and Drainage Board,

vii. A Senior Officer from Tamil Nadu Pollution Control Board as designated by its chairman and

viii. A Senior Officer from Chennai Metro Water Supply and Sewerage Board to be nominated by its Managing Director.

3) In the second order issued by hon'ble Tribunal on 22.02.2021, the Chief Secretary, State of Tamil Nadu was directed to monitor the meetings of the Committee and provide all necessary assistance and guidance for the Committee to evolve a future action plan for preventing such things being recurring in future, for permanently resolving the issues and providing necessary financial as well as technical support for the Departments who are expected to execute the same, so as to enable them to work out the action plan in an effective manner which should not be stopped for want of funds or logistic support to be obtained from other Departments which are also likely to be coordinated for implementing the action plan. The Public Works Department (PWD) Resources Organisation (WRO) was designated as the nodal agency for coordination and also for providing necessary logistics for this purpose.

4) In the same order of the Hon'ble Tribunal, it has been mentioned about another news report dt. 06.02.2021 published in Times of India with caption **"six weeks after rains, roads in Chennai, Mangadu still under water"**.

5) Further, in the third order, issued by the Hon'ble Tribunal on 15th March 2021, based on the request of the Committee for completion of pleading and filing the report, the case was postponed to 31.03.2021. Subsequently, based on the request by authorities and by notifications, the case was adjourned to 07.05.2021.

6) Further, in the fourth order issued by the Hon'ble Tribunal on 18th June 2021, it has been stated that the report in the form of an affidavit, filed by the Superintending Engineer, Palar Basin Circle, WRD, PWD Chennai is not helpful to resolve the issue and that no proper future action plan has been envisaged by any of the local bodies/regulators and therefore the Tribunal deems it fit that the Additional Chief Secretary/Commissioner of Revenue Administration who is the State Relief Commissioner, be impleaded and hence impleaded the ACS/CRA as the additional 13th respondent.

7) Further in the same order of the hon'ble Tribunal, the ACS/CRA (13th respondent) has been directed to file a comprehensive report to the Tribunal on or before 16.08.2021, highlighting the action taken by the Government to prevent recurrence of flooding in that area and also to convene a meeting of Commissioner, Greater Chennai Corporation/Municipalities and other stakeholders who are expected to deal with these issues within the areas covered by the case and resolve them in a permanent manner by preparing the action plan and executing the same in an effective manner.

8) As per the orders of the Hon'ble Tribunal, meetings were convened by the Additional Chief Secretary / Commissioner of Revenue Administration on 22.07.2021 and 29.07.2021 with the stakeholders i.e., Greater Chennai Corporation, Directorate of Municipal Administration, Commissionerate of Town Panchayat, Water Resources Department, Chennai Metro Water Supply and Sewerage Board, Tamil Nadu Slum Clearance Board, Highways Department and the District Collectors of Chennai, Tiruvallur, Kancheepuram and Chengalpattu to discuss about the causes of flooding in the areas of subject matter and to evolve a time bound action plan for temporary as well as permanent measures to prevent recurrence of flooding in those areas.

9) Further, a co-ordination meeting was convened by the ACS/CRA 02.08.2021 with the officials of (1) Department of Forest (2) Conservation Authority of Pallikaranai Marsh Land (CAPAL) (3) Department of Environment (DOE) (4) Water Resources Department and (5) Greater Chennai Corporation to discuss and arrive at a permanent solution for improving the hydraulic function of Pallikkaranai Marsh Land.

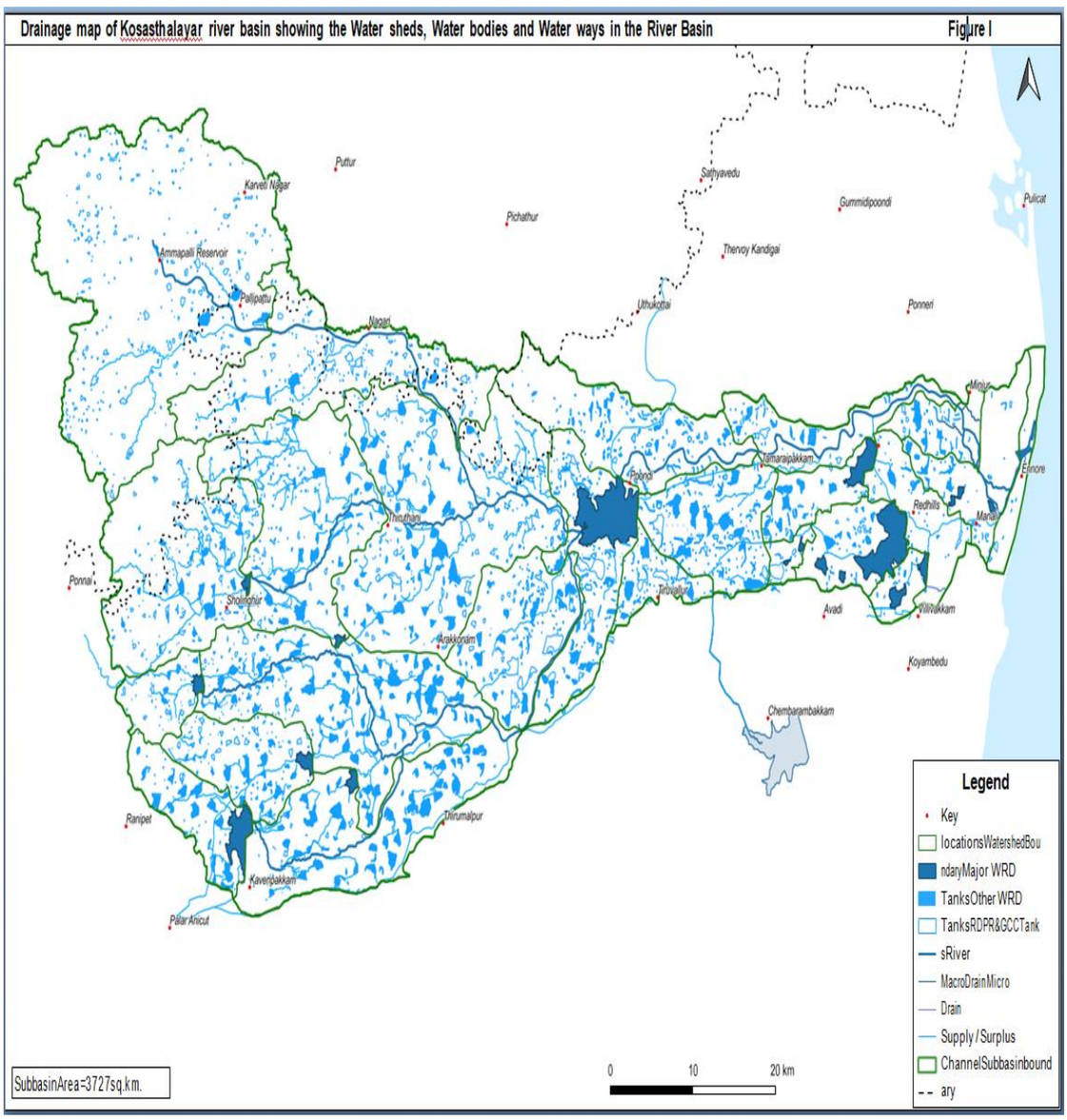
All the areas highlighted in the Newspaper reports are located in Chennai and its peri urban areas of Tiruvallur, Kancheepuram and Chengalpattu districts. In order to understand the drainage pattern of the whole area to solve the problem of inundation in a comprehensive manner, a brief repot on the drainage system of Chennai and its sub urban areas is furnished below.

Drainage System of Chennai and its sub urban areas

The main rivers passing through Chennai city and its sub-urban area are Kosasthalaiyar river in the North, Cooum river in the middle and Adayar river in the South. These rivers are having flows only during Northeast monsoon periods mostly influenced by cyclones / low pressures / depressions developments in Bay of Bengal.

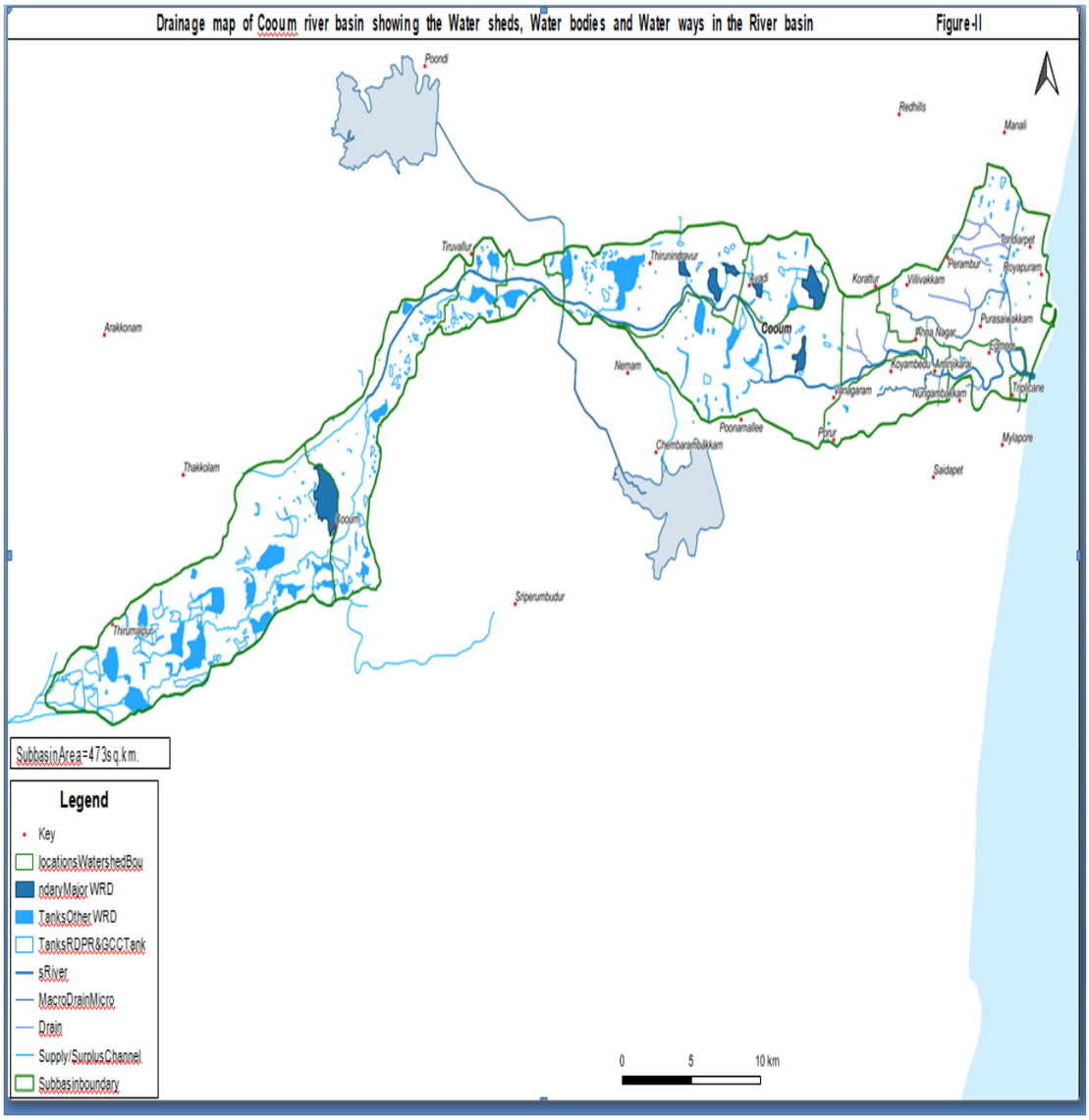
Kosasthalaiyar River

Kosasthalaiyar River receives water from Nandhi River, Lava and Kusa Rivers of Nagari River and Kosasthalaiyar (Kaveripakkam tank surplus course) which discharge their flows into Poondi Reservoir, after which it is called Kosasthalaiyar River. It also receives water flows from downstream water sheds through Allikuzhi odai, Rajanodai, Poochikal, Kattankal and Red Hills surplus course and confluences with sea through Ennore creek. The Drainage map of **Kosasthalaiyar river basin** showing the Watersheds, Water bodies and Water ways in this river basin is furnished in **Figure I.**



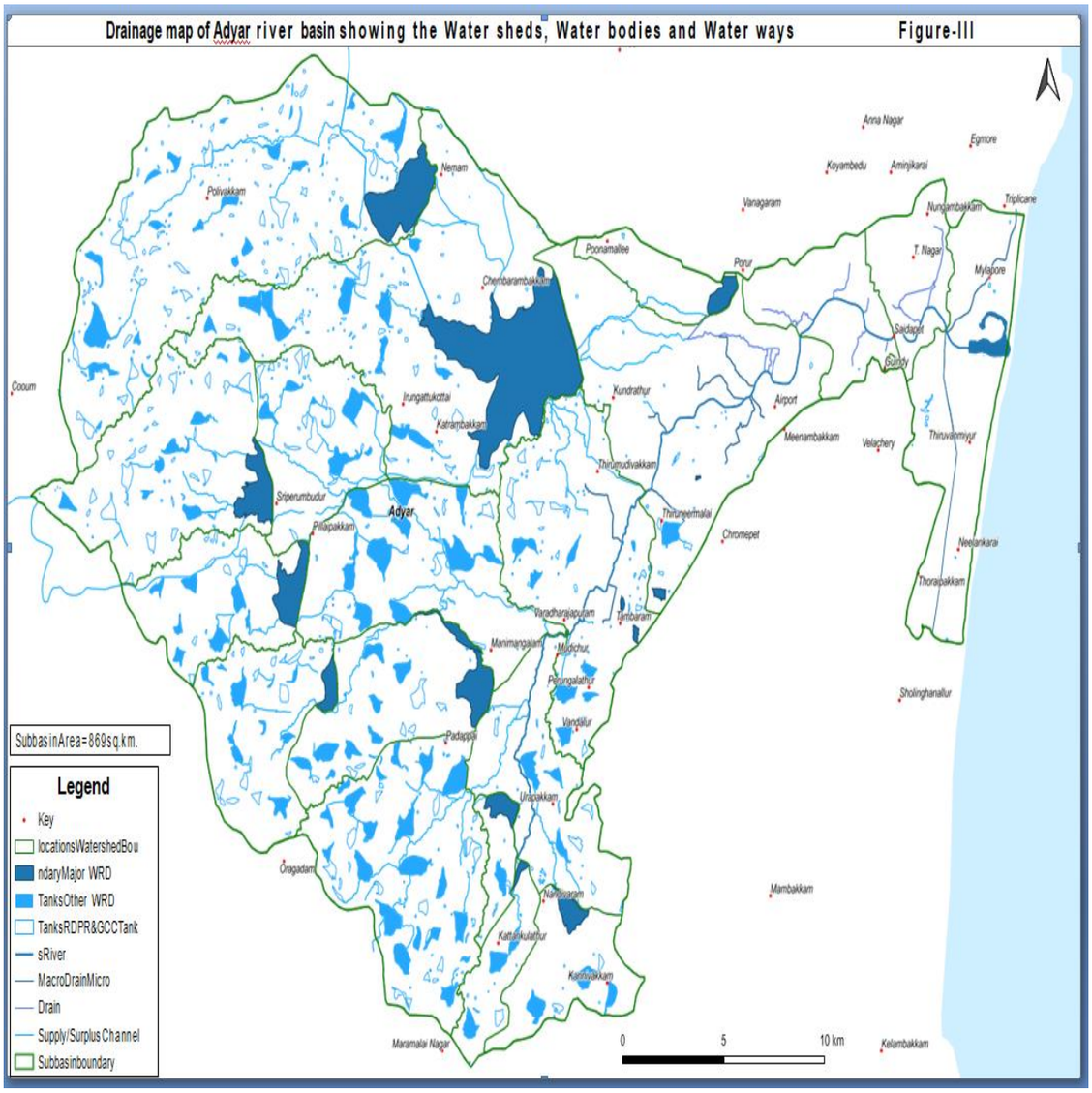
Cooum River

Cooum River originates from the surplus of Cooum tank and receives water through the tributaries of Virugambakkam – Arumbakkam canal, Nungambakkam canal and Otteri Nullah which are having their entire drainage area within Chennai city limits and confluence with sea through the river mouth in between Marina Beach and Chennai Port. The Drainage map of **Cooum river basin** showing the Watersheds, Water bodies and Water ways in this basin is furnished in **Figure II.**



Adayar River

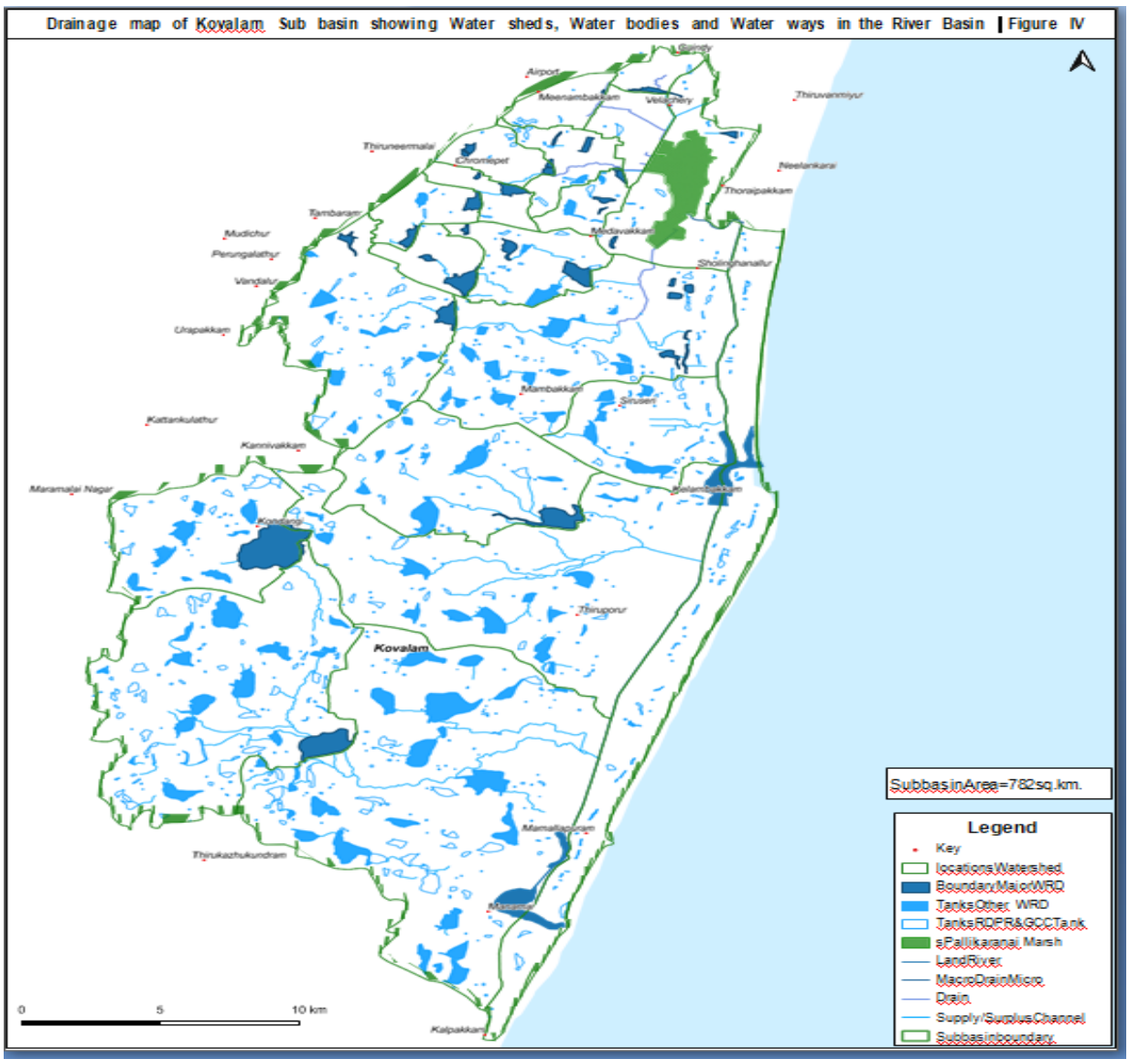
Adayar River originates from the surplus of Adanur tank and further receives its water through the main tributaries viz., Orathur tank surplus, Mannivakkam tank surplus, Manimangalam tank surplus, Somangalam tank surplus, Chembarambakkam tank surplus, Porur tank surplus (Kolapakkam canal and Manapakkam canal), Ramapuram canal and Mambalam – Nandanam channel which has entire drainage area within Chennai city limits and finally confluence with sea in between M.G.R. Janaki College and Theosophical Society in Adayar. The Drainage map of **Adayar river basin** showing the Watersheds, Water bodies and Water ways is furnished in **Figure III.**



Kovalam Subbasin

All the isolated water sheds including Pallikaranai water shed located along the coast in between the rivers Adayar and Palar connected through South Buckingham Canal and confluence with the sea through Muttukkadu back waters and Kovalm creek which is

delineated as Kovalam sub basin. The Drainage map of **Kovalam sub basin** showing the Watersheds, Water bodies and Water ways is furnished in **Figure IV.**



Source: Hydrology Report of Chennai Real Time Flood Forecasting Project - 2021

Buckingham canal

Buckingham canal was formed parallel to the coast, to facilitate inland navigation when there was no vehicular and road facilities, by connecting all the naturally formed flood absorbing bowls / estuaries / backwaters) along the east coast and the river mouths of Araniar river (Pulicat estuaries), Kosasthalaiyar river (Ennore back waters), Cooum river, Adayar river, Kovalam creek (Muttukkadu back waters), Palar river, Ongur river (Cheyyur back waters), Varahanadhi river (Marakkanam back waters), Pennaiyar river, Gadilam river, and Vellar & Coleroon rivers (Killai & Pitchavaram backwaters), leaving the naturally

formed high level strip of land situated on the eastern side along the coast.

Buckingham Canal also serves as a

1) Drainage out lets for the isolated water sheds located along the coast.
2) As a flood absorbing water body for a shorter duration and also
3) As a barrier against sea water intrusion.

Causes for urban flooding and proposed Mitigation Measures

The Chennai drainage basin spreads over the districts of Ranipet, Tiruvallur, Kancheepuram, Chengalpattu and Chennai.

The above four river basins are having their ultimate drainage outlet into the sea through 1) Ennore creek, 2) Cooum River mouth, 3) Adayar River mouth and 4) Kovalam creek respectively.

Since Chennai basin area spreads over flat terrain covering the cyclone prone coastal regions of Chennai, Tiruvallur, Kancheepuram and Chengalpattu districts, the above outlets of the sub basins are connected to the rivers through the naturally formed flood absorbing bowls located along the coast namely,

1) Ennore back waters
2) Cooum estuary surrounding the island grounds
3) Adayar estuary and
4) Pallikaranai swamp and Muttukadu backwaters respectively.

The drainage watersheds behind the above rivers or estuaries spread over farm lands and urbanised area consist of numerous Water bodies, their inflow and outflow channels both in the catchment areas and downstream areas (Ayacut lands) channels in the catchment of water bodies and their surplus channels.

As per the revenue land records, the inflow and outflow channels both in the catchment areas and downstream command areas were classified as patta dry / patta wet lands owned by private persons. Due to rapid urbanisation and socio-economic needs the above patta wet / dry lands owned by private persons were developed into residential / commercial / institutional layouts without planning for proper drainage system for the flow of excess surplus waters of the tanks and flood waters from the catchment areas.

The rapid urbanization of Greater Chennai and Peri-Urban areas falling in the neighbouring Districts of Kancheepuram and Tiruvallur has created huge stress on the existing urban infrastructure and also necessitated the creation of infrastructure anew in the pockets of urbanization. One of the adverse consequences of the rapid urbanization is the change in land use pattern resulting in a situation where new colonies have sprung up on a massive scale in the erstwhile farmlands in Chennai, Tiruvallur, Kancheepuram and Chengalpattu Districts. Most of the areas highlighted in the newspapers are the developed areas where the change in land use pattern was planed without planning for proper drainage system for the flow of excess surplus waters of the upper tanks and flood waters from the catchment areas.

In order to have a comprehensive and integrated flood management system of Greater Chennai City, its Peri-Urban areas and surrounding rural areas, the following permanent mitigation measures have to be undertaken through the departments / organization responsible for the same:

i. Construction of integrated road / street side storm water drainage network in the extended area of GCC

ii. Formation of surplus channels for missing links in the river basin

iii. Formation of straight cut diversion canals

iv. Strengthening of embankments of the rivers and Water bodies with both masonry and earthen structures

v. Formation of macro storm water drains, adopting cut & cover macro drain systems for the missing links for the surplus canals of tanks

vi. Construction of river training works and groynes, reconstruction of anicuts

vii. Construction of check dams, barrages, anicuts and reservoirs across rivers and their tributaries and distributaries

viii. Improvement to surplus courses through the respective stake holder departments / organization.

Comprehensive report on the Short-term and Long-term action plans to prevent flooding issues and sewage over flow issues highlighted in the newspapers' reports.

Based on the decisions taken during the coordination meetings held on 22.07.2021, 29.07.2021 and 02.08.2021, time bound action plans furnished by the respective stake holder departments / organizations, for the temporary and permanent measures to be taken up to prevent recurrence of flooding and sewage over flows in the areas highlighted in the newspapers are summarized in the comprehensive report submitted below:

Area I: Baba Nagar, Villivakkam

The residential area namely Baba Nagar, Villivakkam is a residential layout developed in part of downstream command areas of Kolathur Tank. The storm water of this area has to be drained to

Kodungayur Tank through the Madhavaram tank right flank surplus channel which was newly constructed under Chennai City Rivers Conservated Project during the years 2001 to 2005. The main cause of inundation at present is the dilapidated condition of the storm water drain network connecting this area with Madhavaram tank right flank surplus channel passing through Thanigachalam Nagar for which action is being taken by Greater Chennai Corporation as follows:

Areas highlighted in press reports	Drainage water shed	Final Disposal to the Macro Drain	River Basin
Baba Nagar, Villivakkam	Kodungaiyur tank water shed	North Buckingham canal through Thanigachalam Nagar drain and Kodungaiyur drain	Kosasthalaiyar

Stakeholder Department / Organization responsible for the preventive measures: GCC, WRD

Short term Measures for temporary Mitigation:

As temporary measure adequate number of High-power motors will be engaged for bailing out of rain water to the arterial drain at IRR.

Time Bound Action Plan for Long term Measures for permanent Mitigation

Estimate has been prepared by GCC for construction of Storm Water Drain at Baba Nagar 3rd main road, R K Link road, Baba Nagar 8th, 10,11th streets , Srinivasa Nagar main road , Makkaram thottam, Poompuhar Nagar 1 st , 2nd main road , Poompuhar Nagar 7th cross, 17th, 21,28 street Anjugam Nagar 4th cross street, Sri Ganapathy Rao colony, Netaji Nagar main road, Annai indira Nagar, Gokul street, Bharathiyar street, Rajiv Gandhi Nagar main road for a length of 5.25 Km at a cost of Rs.22.94 crore for disposal into Thanikachalam Canal.

GCC has addressed the Additional Chief Secretary to Government/MA&WS Department on 29.07.2021 for providing funds under CMCDM/TURIF/CGF.

The tender conditions have been revised in the interest of GCC so that there will be more contractors participating in the bidding and hence retender will be called for the above works.

The works are proposed to be completed by June 2022.

Instructions have been given to commence the work within 2 months and adhere to time limits to complete work.

The encroachments in the Baba Nagar streets will be removed by 31.10.2021 so that the proposed storm water drainage works could be taken up.

The proposal has been discussed with WRO/PWD in this meeting and their concurrence was obtained to proceed with the work.

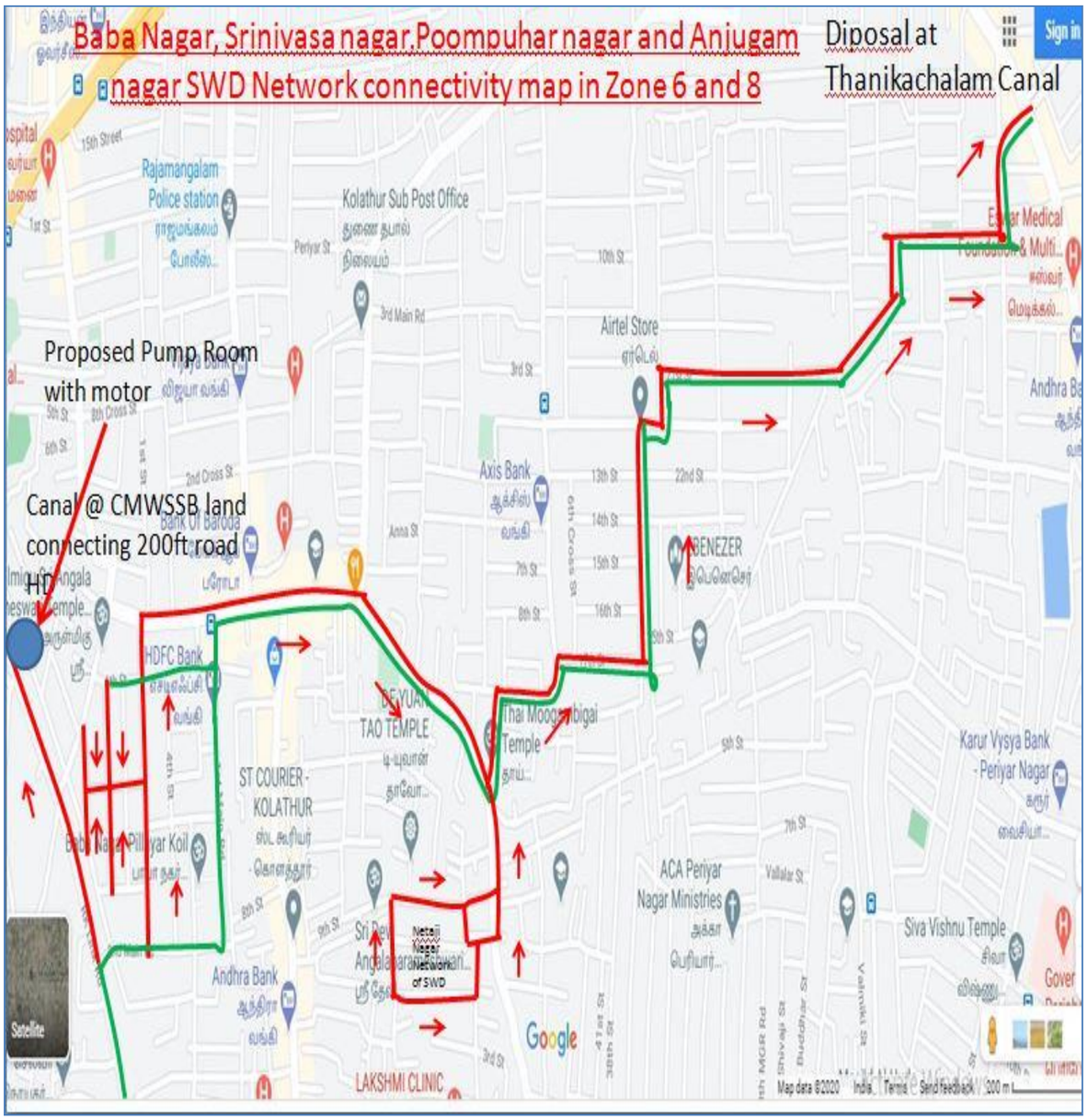
WRD officials also informed that since the Thanikachalam Nagar drain is not adequate to carry the surplus waters of Madhavaram tank right flank weir as well as the local drains in and around Kolathur, for the permanent solution to this area, WRD will initiate the land acquisition process as per the latest Land Acquisition Act in co-ordination of Revenue Department of Chennai District for diverting the surplus waters of the Madhavaram Retteri tank into Redhills Surplus Course through the weir at its left flank.

Further, WRD officials informed that an estimate for the reconstruction of the dilapidated retaining wall for 3.05 km of Thanikachalam Nagar canal has been prepared for Rs.38.50 crores and the fund sanction is awaited. WRD officials were requested to expedite the work through necessary follow up action with the Government.

The map showing the existing and proposed storm water network of this area is furnished in Figure-**V**.

Figure- V

Baba Nagar, Srinivasa nagar,Poompuhar nagar and Anjugam nagar SWD Network connectivity map in Zone 6 and 8



Area II: Ambatur and Korattur Areas

The areas in Ambatur & Korattur highlighted in the newspaper reports are the industrial and residential areas through which the surplus water of Ambatur & Korattur tank were flowing over the farm lands under agricultural use owned by private land owners which were later developed into residential and industrial layouts. The surplus canal for Ambatur & Korattur tanks were created under Chennai City River Conservation Project during the year 2001 to 2015. The cause of flooding in this area at present is due to inadequacy of the surplus

channels to handle the peak flows. Necessary actions are being taken by GCC and WRD to increase the discharging capacity of the surplus channels as detailed below:

Areas highlighted in press reports	Drainage water shed	Final Disposal to the Macro Drain	River Basin
Ambattur and Korattur Areas	Ambattur tank -> Korattur tank-> Madhavaram tank water shed	North Buckingam Canal through Madhavaram tank left flank surplus canal and Red Hills tank surplus canal	Kosasthalaiyar

Stakeholder Department / Organization responsible for the preventive measures: GCC, WRD

Time Bound Action Plan for Long term Measures for permanent Mitigation

The improvement works to the Ambattur Surplus Canal and Korattur Surplus Canal for a length of 7.22 km at an estimate cost of Rs.150.80 crore including construction of flood protection wall wherever not available, canal bed lining is taken up under the ISWD project of Kosasthalaiyar Basin under ADB fund. Letter of Authorisation was issued on 05.02.2021.

The tender period for completion of the works is 36 Months ending by 04.02.2024.

It is informed by GCC officials that WRD had given Stop Notice to stop the work citing the reason that bed lining is not required. Hence GCC and WRD officials were instructed to resolve the issue through discussions so that the work can commence without delay.

It was informed by the WRD officials on 10.08.2021 that a meeting was convened with GCC Engineers and the suggestion of incorporating the recharge wells to improve the ground water is

accepted by GCC and the concurrence for proceeding with the ongoing work is given to GCC.

It was also informed by WRD officials that the entire flow from Ambattur and Korattur tank surplus course has to reach Red Hills surplus course through Madhavaram tank and Madhavaram left flank surplus canal. For the permanent solution to the upstream areas of Madhavaram tank, WRD will initiate the land acquisition process as per the latest Land Acquisition Act in co-ordination of Revenue Department of Chennai District for forming an earthen canal to divert the Madhavaram Retteri surplus water from left weir to Redhills Surplus Course.

The proposal for forming the left flank surplus canal to discharge 5000 cusecs of water has been prepared for Rs.162.10 crores for LA and Rs. 100.50 crores for canal construction as per the orders of Hon'ble Supreme Court of India and awaiting fund sanction from the Government. WRD has been requested to expedite the work by necessary follow up with the Government.

The map showing the existing and proposed storm water network of this area is enclosed in **Figures VI, VII and VIII.**

Figure-VI

Package 44 – Improvements to Ambattur Surplus Canal

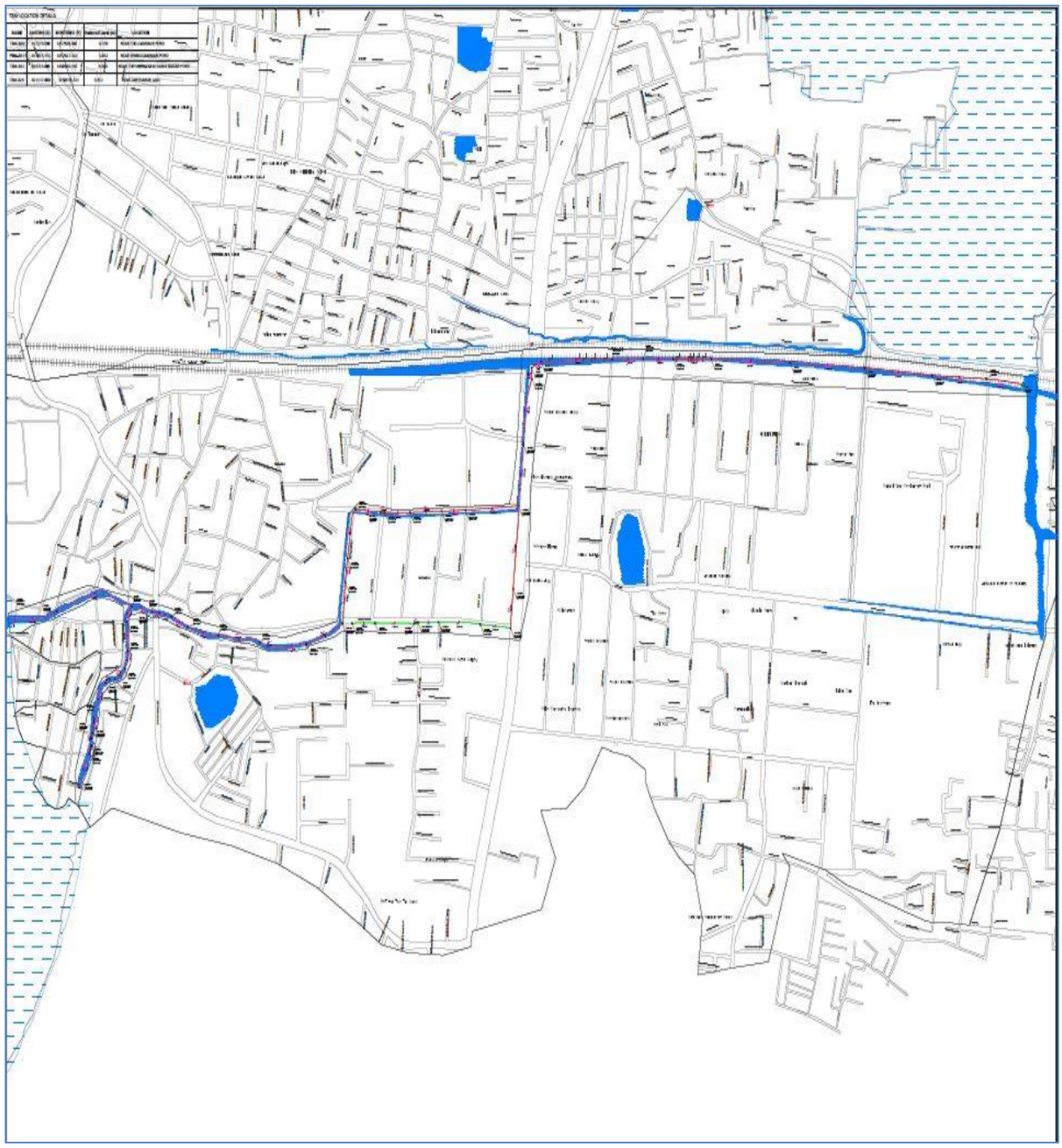


Figure-VII

Package 44 – Improvements to Korattur Surplus Canal

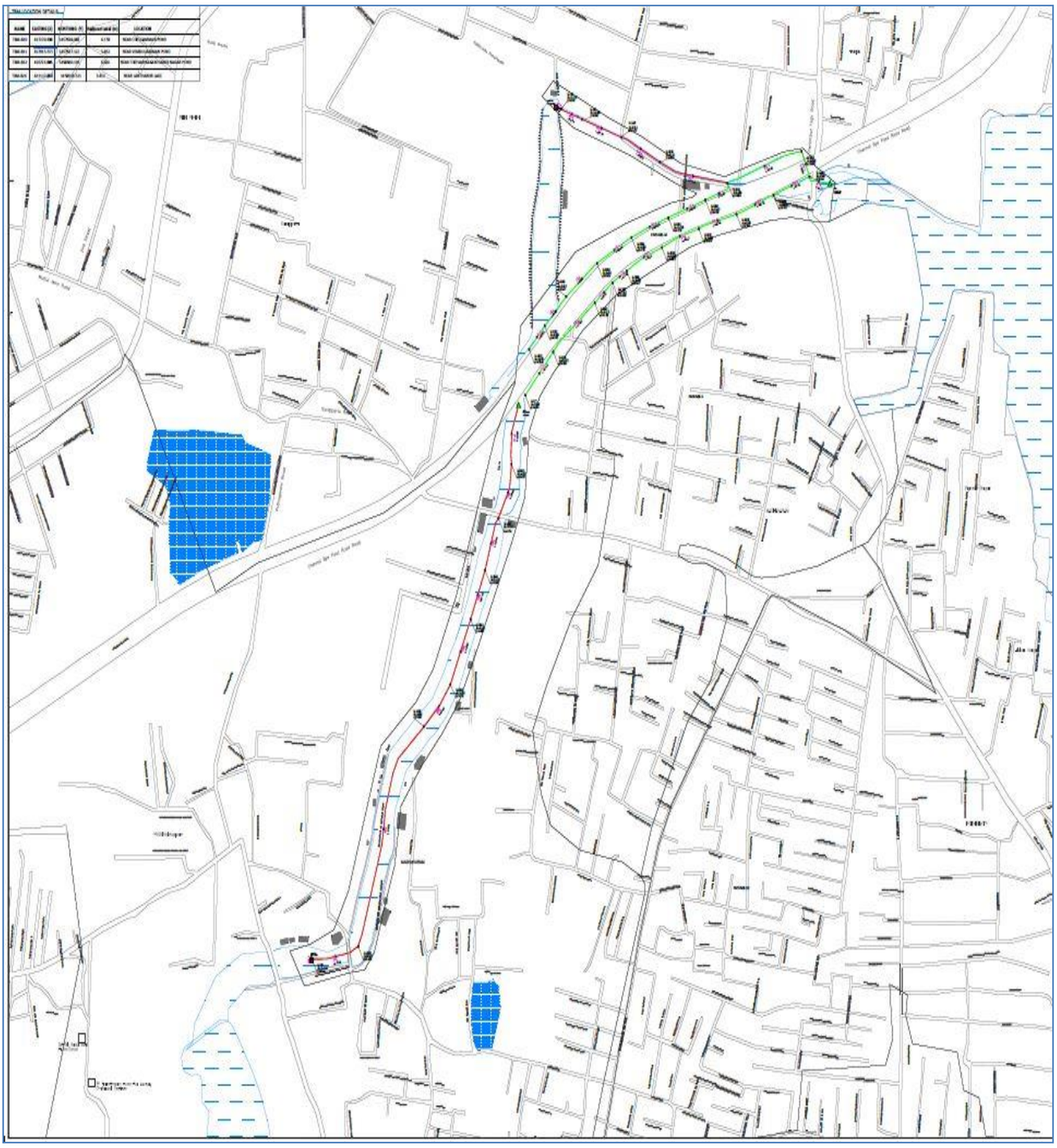
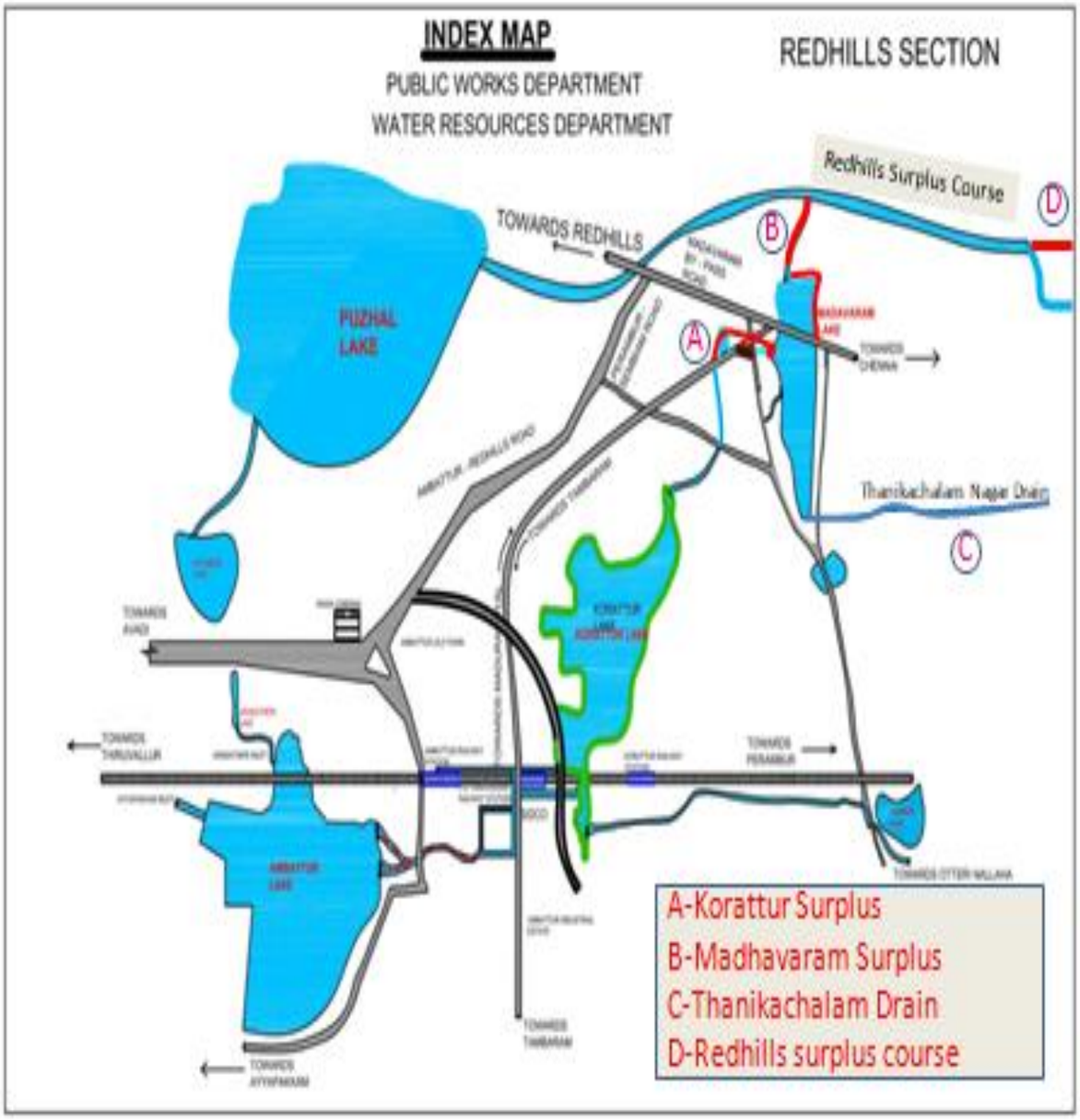


Figure-VIII

PWD-WRD - RED HILLS SECTION



Area III: P.V. Rajammannar Salai, K.K. Nagar and M.G.R. canal, M.G.R. Nagar

1. P.V. Rajammannar Salai, K.K. Nagar: The area highlighted in the newspaper reports are the residential areas in M.G.R. Nagar & K.K. Nagar which are situated along the left bank of Adayar river. The main cause of inundation in this area is lack of proper storm water drain network to drain the run of into Adayar for which actions are being taken Greater Chennai Corporation as follows:

Areas highlighted in press reports	Drainage water shed	Final Disposal to the Macro Drain	River Basin
P.V.Rajammannar Salai, K.K.Nagar	MGR Canal water shed on the east Nesapakkam canal water shed on the west	Adayar river through MGR canal on the east and Nesapakkam canal on the west	Adayar

Stakeholder Department / Organization responsible for the preventive measures: GCC

Short term Measures for temporary Mitigation:

As temporary measure adequate number of High-power motors will be engaged for bailing out of rain water to MGR canal

Time Bound Action Plan for Long term Measures for permanent Mitigation

Construction of Missing link storm water drain on the northern side of the PV Rajamannar salai has been completed for a length of 937 m at a cost of Rs.2.70 crore under CMCDM fund.

It is proposed to take up demolition of the old dilapidated brick drain and Reconstruction of storm water drain at RK Shanmugam Salai from PV Rajamannar Salai to Anna main road for a length of 860m and at Lakmanaswamy Salai for a length of 300m, Ramasamy Salai for a length of 300m with disposal of rain water to MGR Canal at a cost of Rs.5.20 Crore.

Further, in order to reduce the load from various streets of the upper catchment area, it is proposed to take up (another diversion disposal route) construction of storm water drain along Munusamy Street, Link Road, Kanu Nagar main road with disposal to Adyar River, for a length of 1300m at an estimate cost of Rs.6.44 crore.

GCC has addressed the Additional Chief Secretary to Government / MA&WS Department on 29.07.2021 for providing funds under CMCDM/TURIF/CGF.

The works will be completed by June 2022.

2. M.G.R. Canal, M.G.R. Nagar

Areas highlighted in press reports	Drainage water shed	Final Disposal to the Macro Drain	River Basin
MGR Canal, MGR Nagar (due to encroachments in the canal)	MGR Canal water shed	Adayar river through MGR canal	Adayar

Stakeholder Department / Organization responsible for the preventive measures: GCC

Time Bound Action Plan for Long term Measures for permanent Mitigation

MGR Canal starts from Lakshmanasamy salai to Adyar River. The length of the canal is 1.80 km.

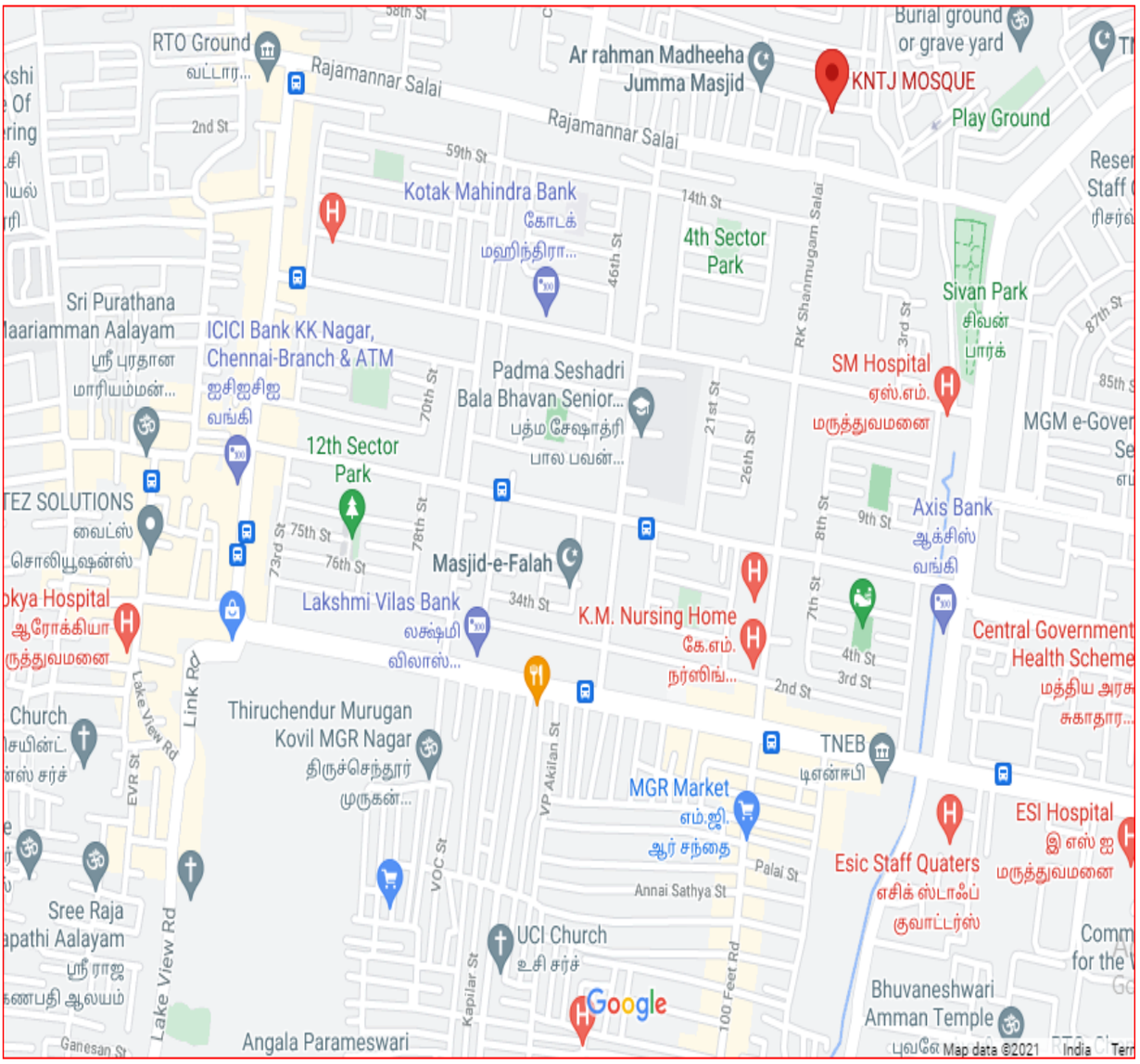
The encroachments at the start of the canal have been removed on 21.02.2021 near Lakshmanasamy salai for free flow of rain water.

The desilting of the MGR canal is being carried out routinely using the Robotic Excavator before monsoon every year and free flow of rain water is ensured.

The map showing the existing and proposed storm water network of this area is furnished in **Figure – IX**.

Figure-IX

Proposed SWD at R.K.Shanmugam Salai , Lakhmanasamy Salai, Ramasamy Salai, Munusamy Salai, Link Road , Kanu Nagar Main Road in Dn.131, Zone-10



Area IV: Bharathidasan Colony near Kasi Theater

This area is the residential and commercial area on the left side bank of Adayar river is Jafferkhan Pettai abutting Inner Ring Road. The main cause of inundation in this area due to lack of proper storm water drain connectivity to Adayar River.

Areas highlighted in press reports	Drainage water shed	Final Disposal to the Macro Drain	River Basin
Bharathidasan Colony near Kasi Theatre	Isolated water shed along Inner Ring Road	Adayar River through the drain along Inner Ring Road	Adayar

Stakeholder Department / Organization responsible for the preventive measures: Highways Department

Time Bound Action Plan for short term Measures for temporary Mitigation

Highways Department has carried out Reconstruction of dilapidated Storm Water Drain of size 1.50 m x 1.50 m for a length 10m at IRR road near Kasi Theatre for free flow of rain water to Adyar river.

Due to this rectification work, rain water stagnation is prevented in Bharathidasan colony main road.

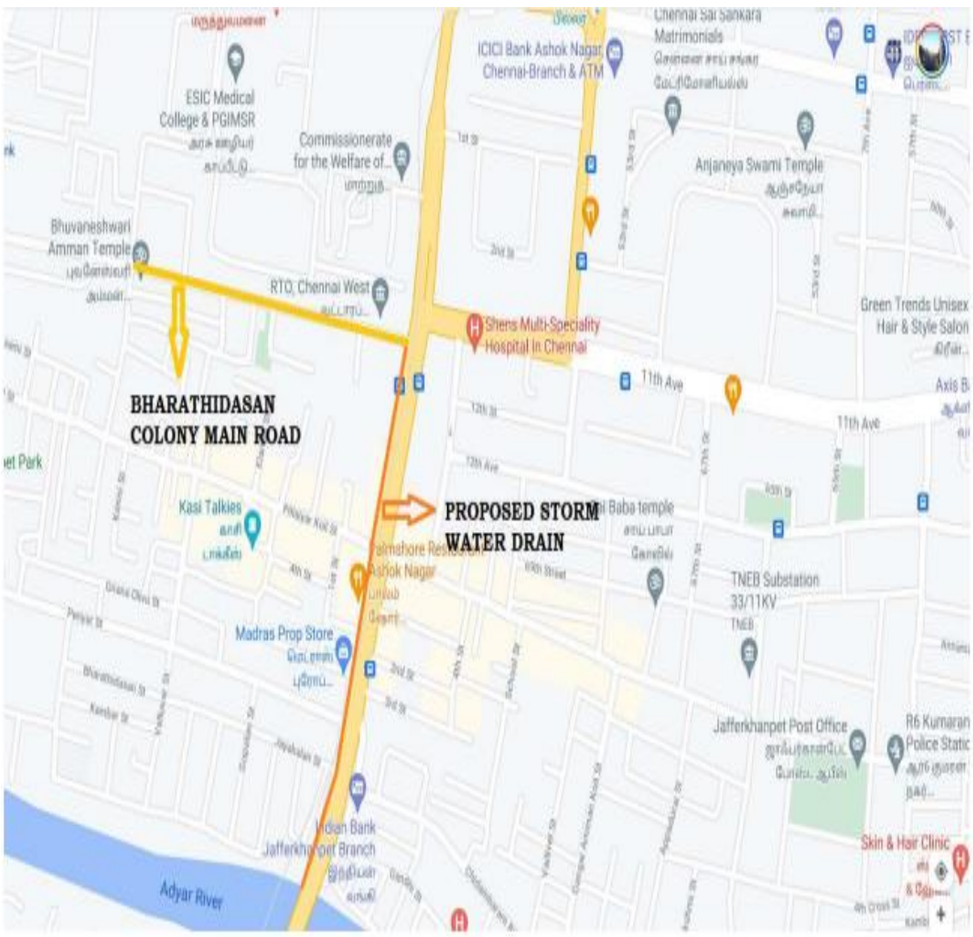
Time Bound Action Plan for long term Measures for permanent Mitigation

As the size of the drain for 600m length is inadequate, the proposal for reconstruction of 600m length of drain of adequate size at an estimated cost of Rs.6.00 Crores, will be taken up in CRIDP during 2021-22.

The map showing the existing and proposed storm water network of this area is furnished in **Figure – X**.

Figure-X

BHARATHIDASAN COLONY



Area V: Alagappa Road, Ritherdon Road, Tana Street, EVK Sampath Salai, and Poonamalee high road from Chetpet to Ripon Building

The above areas are the residential and commercial area situated on the northern side of Cooum river abutting Poonemalee high road. The main cause of inundation in the areas is due to lack of proper storm water drain network and connectivity to the macro drain namely Cooum River in the south. The following actions are being taken by Greater Chennai Corporation and Highways Department to prevent inundation in these areas.

1. Alagappa Road:

Areas highlighted in press reports	Drainage water shed	Final Disposal to the Macro Drain	River Basin
Alagappa Road	Chetpet-Poonamallee High Road water shed	Cooum river through two nos. of drains on the east of Egmore Railway station	Cooum river

Stakeholder Department / Organization responsible for the preventive measures: GCC, Highways Department

Time Bound Action Plan for Long term Measures for permanent Mitigation

Construction of missing link storm water drain has been completed at Alagappa road for a length of 320 m at an Estimated cost of Rs. 74.45 lakhs under CMCDM fund.

Further, Highways Department has carried out the Demolition and Reconstruction of storm water drain at Poonamalle High Road in this junction.

Hence water stagnation is prevented in Poonamallee High Road.

2. Ritherdon Road

Areas highlighted in press reports	Drainage water shed	Final Disposal to the Macro Drain	River Basin
Ritherdon Road	Otteri Nullah water shed on the North Poonamallee High Road water shed on the south	North Buckingham canal through Otteri Nullah on the North To Cooum river on the South	Cooum

Stakeholder Department / Organization responsible for the preventive measures: GCC

Time Bound Action Plan for Long term Measures for permanent Mitigation

Construction of Missing link storm water drain has been completed at Ritherdon road under CMCDM fund for a length of 864 m at a cost of Rs.2.80 crore. There will not be inundation problem in future.

3. Tana Street

Areas highlighted in press reports	Drainage water shed	Final Disposal to the Macro Drain	River Basin
Tana Street	Otteri Nullah Water shed	To North B'Canal through Otteri Nullah	Cooum

Stakeholder Department / Organization responsible for the preventive measures: GCC, Highways Department

Time Bound Action Plan for Long term Measures for permanent Mitigation

Demolition of old drains and reconstruction of storm water drain has been completed at Tana Street for a length of 650m at a cost of Rs.1.50 crore with disposal to Otteri Nullah, under Capital Fund. There will not be inundation problem in future.

4. E.V.K.Sampath Salai

Areas highlighted in press reports	Drainage water shed	Final Disposal to the Macro Drain	River Basin
E.V.K.Sampath Salai	Otteri Nullah water shed on the North and Poonamallee High Road water shed on the south	North Buckingham canal through Otteri Nullah on the North To Cooum river on the South	Cooum

Stakeholder Department / Organization responsible for the preventive measures: GCC, Highways Department

Short term Measures for temporary Mitigation:

As temporary measure adequate number of High-power pumps will be engaged for bailing out of rain water to the arterial drain in Anderson Church campus.

Time Bound Action Plan for Long term Measures for permanent Mitigation

Construction of missing link storm water drain at EVK Sampath road for a length of 1200 m at a cost of Rs. 2.62 Crore has been completed under CMCDM fund.

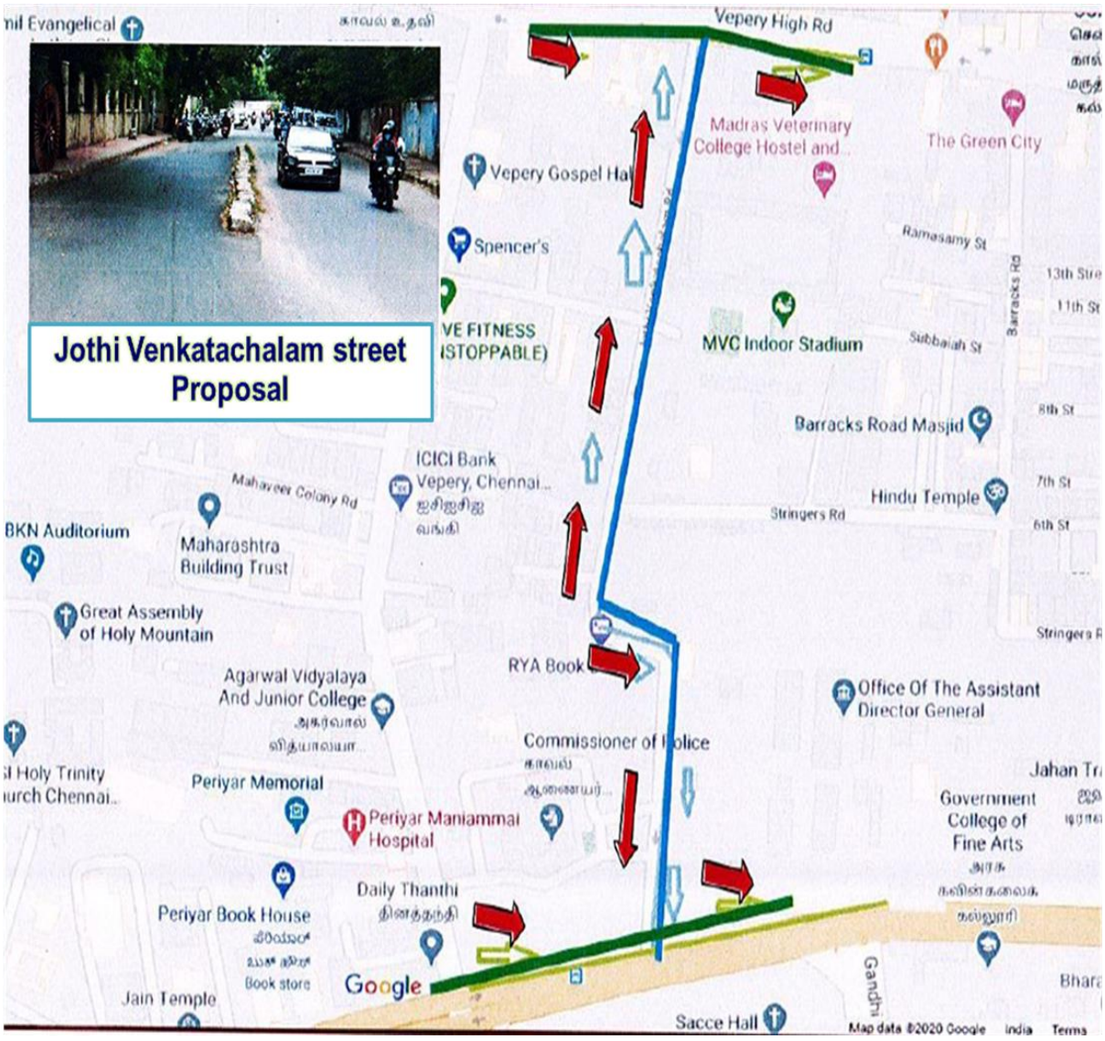
It is proposed to take up the construction of storm water drain at Jothi Venkatachalam Street with disposal to Poonamalle High Road and finally to Cooum River. The Estimated cost for the construction of storm water drain is Rs. 1.50 crore for a length of 600 m. The work is to be taken up under World Bank fund. Tender to be called after getting NOC from World Bank.

The works will be completed before March’2022.

The map showing the existing and proposed storm water network of this area is furnished in **Figure XI**.

Figure-XI

JOTHI VENKATACHALAM STREET PROPOSAL



5. Poonamallee High Road from Chetpet to Ripon Building

Areas highlighted in press reports	Drainage water shed	Final Disposal to the Macro Drain	River Basin
Poonamallee High Road from Chetpet to Ripon Building	Chetpet-Poonamallee High Road water shed	Cooum river through Highways drains on the east and west	Cooum river

Stakeholder Department / Organization responsible for the preventive measures: GCC, Highways Department

Short term Measures for temporary Mitigation:

As a temporary measure, two 250 mm dia pipes have been placed at km 2/2 of Grand Western Trunk Road which drains water from north side of road to south side. Storm water on the left side gets drained quickly compared to the water on the right side, as there is a disposal near the Gandhi Irwin bridge. In addition to this, a pair of 1000mm

diameter pipe has been placed through HDD technology without interrupting the traffic at four locations Km 1/6, Km 1/7, Km 1/8, Km 2/2. But these including the culvert at Km 1/7 and 2/1 caters to approximately 459 cusecs of water, whereas the runoff comes from the catchment area of 2.5 Sq.km is around 1130 cusees. The existing culvert and temporary measures provide only 40% of the required flood prevention.

Time Bound Action Plan for Long term Measures for permanent Mitigation

Grand Western Trunk Road (NH4) is one of the important arterial roads in Chennai city connecting the state with the Western part of the country. In this road, from Km 0/0 - 9/2 is being maintained by the Chennai City Roads (C & M) Division of the Highways Department.

This road is an abandoned NH which is an important road to connect the Sub urban Areas with Chennai Corporation limit. Many of main localities such as Rajiv Gandhi Government Hospital, Kilpauk Hospital, Commissioner of Police office, MGR Central Railway station, Egmore Railway station, Pachaiyappa college and many other important offices and multi-specialty hospitals are located in this road.

From Km 1/7 - 2/3 of GWT road, there exists storm water drain of size 1.5 m x 1.2 m on either side of the road and culvert of size 1.8m x 0.9 m at Km 1/7. The entire storm water disposes at two locations. One at km 1/7 and another one at km 2/1 crossing narrow railway culvert and disposing to Cooum river.

On 29.10.2020, heavy precipitation was recorded near Purasaiwalkam which lead to inundation of Vepery and Periamedu stretch leading to traffic congestion for more than 2 hours from Police Commissioners office to Chennai Central. This kind of inundation happened for more than 4 times. In order to restore the traffic, tractor

pump of capacity 50 Hp and two pumps of 15 hp capacity have been placed at various locations as an immediate remedy.

During Joint inspection with the Chief Engineer, Greater Chennai Corporation and Chief Project Manager, Southern Railways, it was decided to construct additional culvert near Egmore Railway station and lead drain to Cooum river.

In this regard, letter to provide additional vents for culverts had been addressed to the Chief Project Manager Chennai Division Southern Railways vide Letter No. 1299/2019/JDO-2, Dated: 08.12.2020. Also, funds have been requested from Government in flood Permanent Restoration 2020 proposal as permanent measure to dispose the storm water. The following are the sizes and cost required for construction of culverts across Great Western Trunk Road and Railway track.

PROPOSED CULVERTS WITH LEAD DRAIN

GRAND WESTERN TRUNK ROAD BETWEEN km 1/7 – 2/6

S. No	**Location**	**Culvert size proposed**	**Lead drain**	**Proposed railway culvert**	**Cost in lakhs**
1	Km 1/7	2x(2.00x1.50) m	50 m	2x(2.00x1.50) m	290.00
2	Km 2/1	1x(2.00x2.00) m			35.00
3	Km 2/3	2x(2.00x1.50) m	200 m	3x(2.50x1.50) m	500.00
Total					**825.00**

Based on the above request, the railways have requested to deposit an amount of Rs. 4,00,00,000/- (Four Crores only) for construction of culvert in the following locations.

Km 1/7 (EVR Periyar Salai - Egmore MLA Office)
Km 2/3 (EVR Periyar Salai - EVK Sampath road junction)

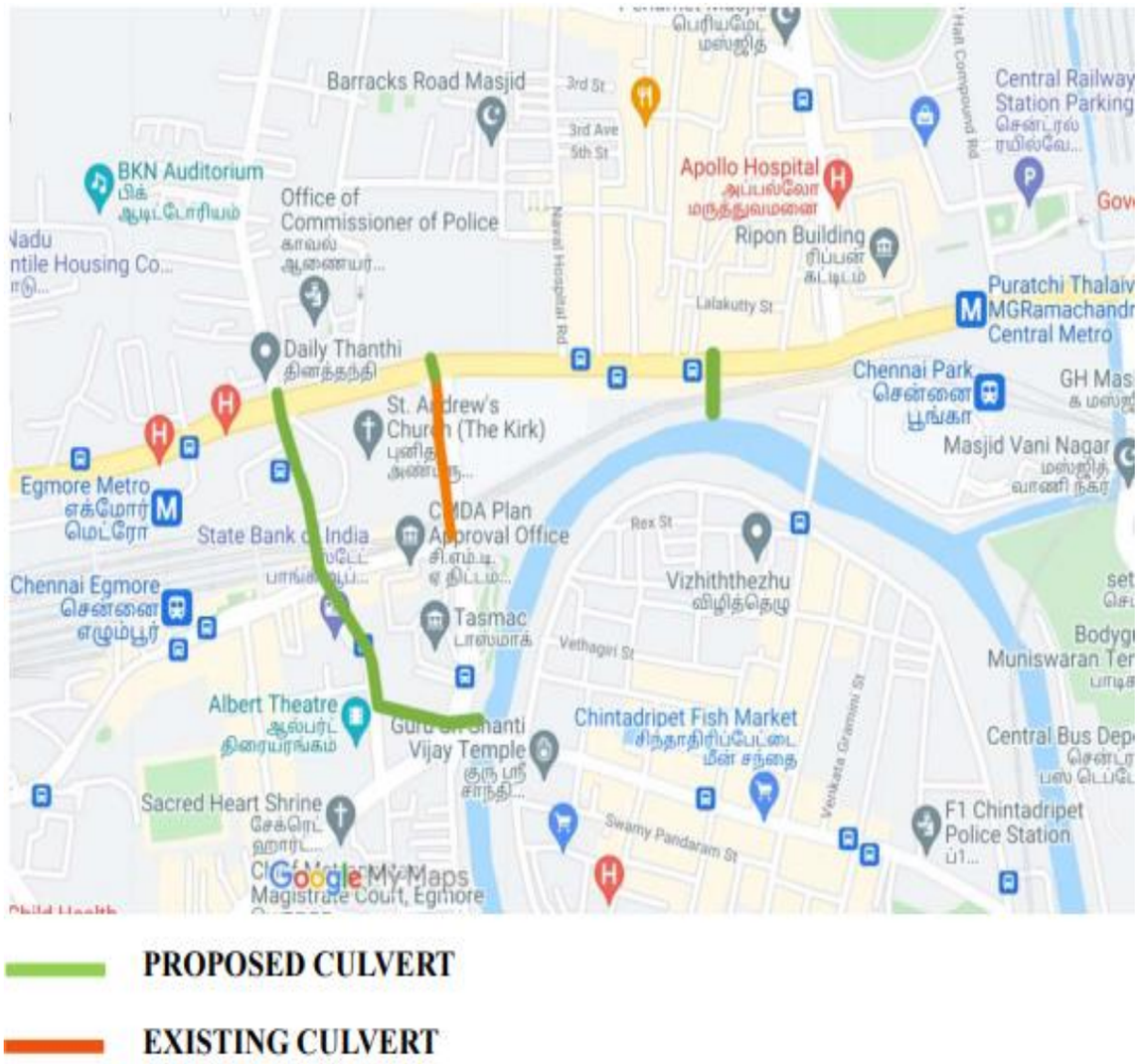
Also, Highways Department has addressed to the Chief Engineer, General, Greater Chennai Corporation to construct lead drain in Whannels road leading to Cooum river connecting the Railway culvert at

km 2/3. GCC has been requested to take necessary action to construct the drain along Whannels road before the completion of the proposed culverts across Railway Track by Railways Department.

The map showing the existing and proposed storm water network of this area is furnished in **Figure – XII**.

Figure-XII

PROPOSED CULVERTS WITH LEAD DRAIN - GRAND WESTERN TRUNK ROAD



Area VI: K.P. Park – Pulianthoppu High Road

This area is situated in between Cooum river in the South, Otteri Nullah in the North and North B canal on the East. The main cause of inundation in this area is due to lack of storm water drain network and connectivity to the macro drains namely Otteri Nullah on the North B canal on the East. The following actions are being taken by Greater Chennai Corporation to prevent flooding in this area.

Areas highlighted in press reports	Drainage water shed	Final Disposal to the Macro Drain	River Basin
K.P. Park - Pulianthoppu High Road	Otteri Nullah Water shed	To North Buckingham Canal through Otteri Nullah	Cooum

Stakeholder Department / Organization responsible for the preventive measures: GCC, Highways Department

Short term Measures for temporary Mitigation:

As temporary measure adequate number of High-power pumps will be engaged for bailing out of rain water to Otteri Nullah.

Time Bound Action Plan for Long term Measures for permanent Mitigation

It is proposed to take up construction of storm water drain at Pulianthope High Road and other surrounding roads for a length of 2.05 Km at a cost of Rs 7.41 Crore

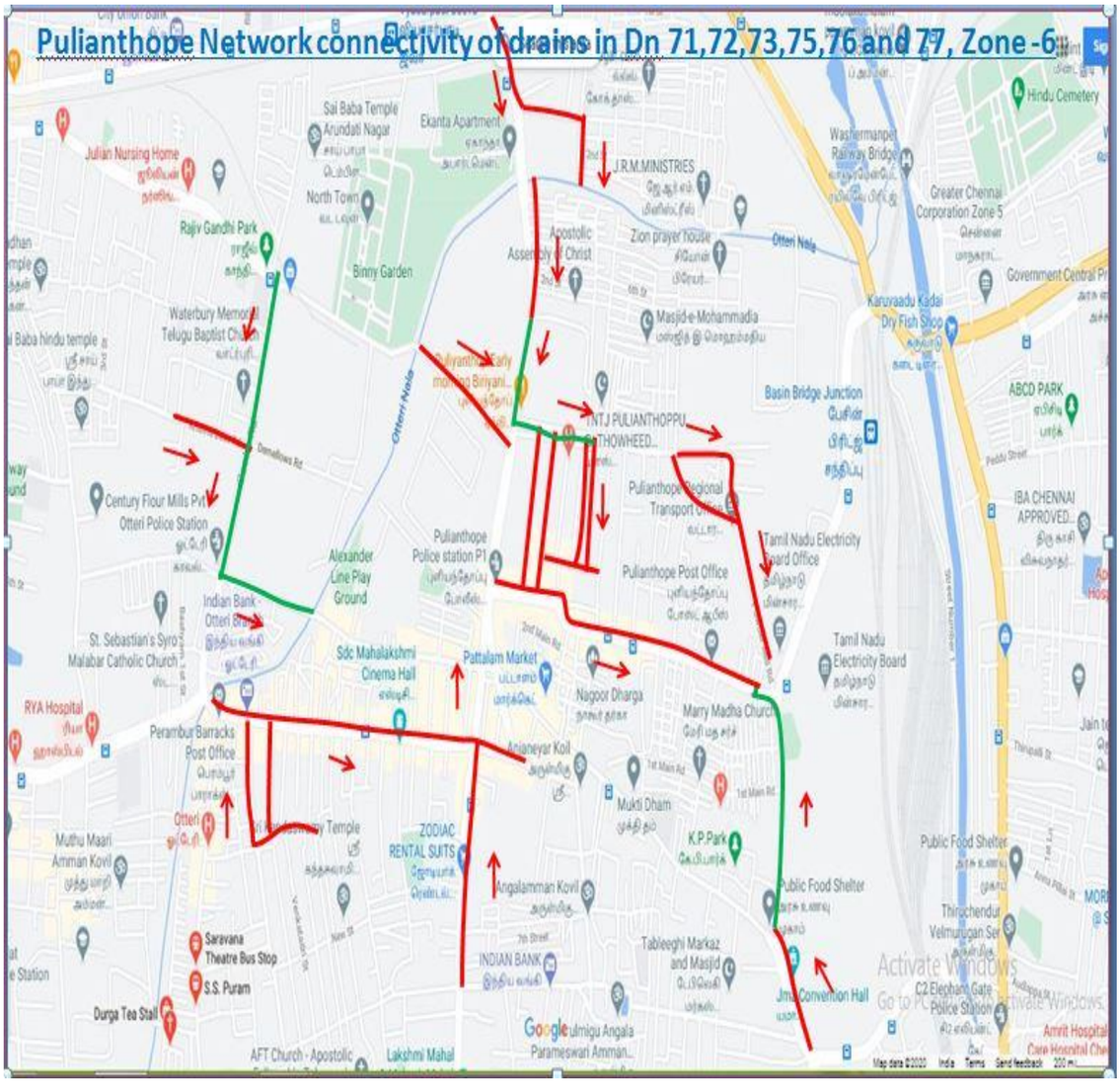
It was decided that the Additional Chief Secretary to Government, MA&WS Department may be addressed for providing funds under CMCDM/TURIF/CGF.

The works will be completed by June ’2022.

The map showing the existing and proposed storm water network of this area is furnished in **Figure – XIII**.

Figure-XIII

PULIANTHOPE HIGH ROAD, DN.77,ZONE 6



Area VII: Waltax Road

This area is the residential and commercial area situated on the Eastern side of Central Railway Station and North Buckingham canal. The main cause of inundation is lack of proper storm water drain network and its link to the North Buckingham canal. Grater Chennai Corporation and Highways Department are taking the following actions to prevent flooding in this area.

Areas highlighted in press reports	Drainage water shed	Final Disposal to the Macro Drain	River Basin
Waltax Road	Isolated water shed on the east North Buckingham Canal	To North Buckingham Canal	Cooum

Stakeholder Department / Organization responsible for the preventive measures: GCC, Highways Department

Time Bound Action Plan for Long term Measures for permanent Mitigation

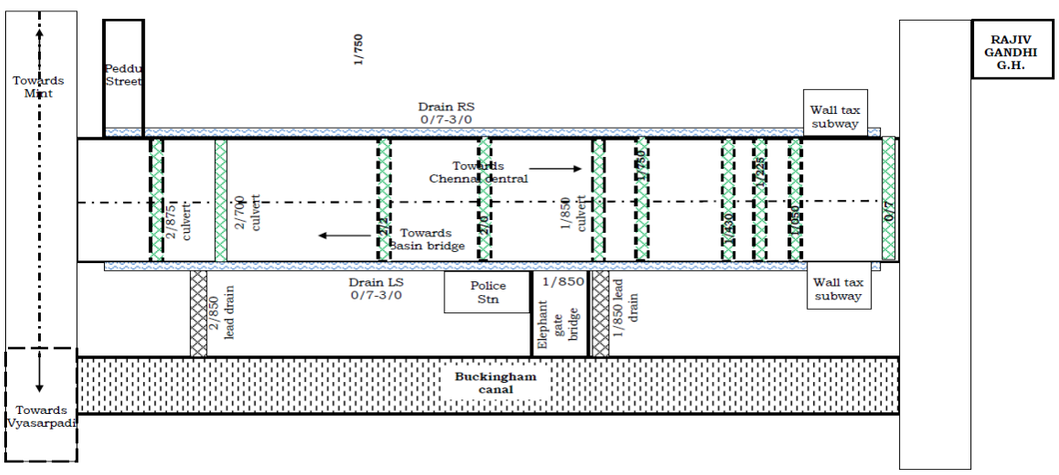
This road starts from Km 0/8 of GWT road near central railway station and ends at Madhavaram Roundtana for a length of 11.20 km. The stretch km 0/7 – 3/0 is locally called as Waltax road. There has been heavy stagnation of storm water on the road for a length of 2.3 kms. Due to the stagnation, there has been traffic interruption for more than 4 hours. During the monsoon season, as a temporary measure, pumps have been placed at various locations to pump out the water. Now, as a permanent measure to dispose the water into North Buckingham canal, construction of storm water drains from Km 0/7 – 3/0 on the Left Side & Right Side of Grand Northern Trunk Road has been taken up for a value of Rs. 33.00 crores. The work is physically completed for 10%. The Works will be completed by June 2022.

The map showing the existing and proposed storm water network of this area is furnished in **Figure – XIV**.

Figure-XIV

WALTAX ROAD

CONSTRUCTION OF STORM WATER DRAIN BY HIGHWAYS DEPARTMENT ALONG WALTAX ROAD



Area VIII: Velachery, Pallikkaranai, Madippakkam, Medavakkam and Semmanchery

These areas are situated around Pallikkaranai which is a naturally formed marshy wetland below sea level between OMR and Velacheri – Tambaram road in South Chennai. Pallikaranai marsh land falls with in Perungudi, Thoraipakkam and Sholinganallur villages of Chennai District and Perumbakkam and Semmanchery villages of Chengalpattu District. Since there are no defined courses for the inflow channels falling into Pallikkaranai marsh land, the developed areas in the above villages are facing inundation during rainy seasons whenever the water level in Pallikaranai marsh land rises above normal level. Hence the stakeholders departments namely WRD, GCC, Highways Department and Forest Department have prepared estimates for various structural interventions to reduce flooding in this areas as detailed below:

Areas highlighted in press reports	Drainage water shed	Final Disposal to the Macro Drains	River Basin
Flood mitigation measures for prevention of rain water stagnation in Velachery, Pallikkaranai, Madippakkam, Medavakkam and Semmanchery	Isolated water shed draining into Pallikaranai	To South Buckingham canal through Pallikaranai and Okkiam Maduvu	Kovalam

Stakeholder Department / Organization responsible for the preventive measures: Conservation Authority of Pallikaranai Marsh Land (Forest Department), WRD, GCC, Highways

Time Bound Action Plan for Long term Measures for permanent Mitigation

Greater Chennai Corporation

Greater Chennai Corporation has proposed for Construction of three Underground double vent / single vent storm water macro drains

from Pallikkaranai swamp to South Buckingham canal along Pallavaram - Thuraipakkam Radial Road, Medavakkam – Sholingalallur Main Road and Nookampalayam Main Road over a length of 9600 m for a sum of Rs.268.50 Crore.

Out of the above three works proposed by GCC, further to avoid rain water stagnation in Semmenchery and to avoid water entering the Pallikaranai Marsh Land from upper catchment area, it is proposed to take up the construction of Underground double vent storm water macro drain of size 3.50x3.50m at a cost of Rs.120 crore for a length of 4.30km from Pallikaranai marsh land to South Buckingham canal for which funding has been sought under SDRF. As per the instructions of Additional Chief Secretary / CRA, the DPR has been sent to TNUIFSL for proof checking.

Rain water stagnation was observed in OMR and other areas in this Zone. Hence, it is proposed to take up construction of Integrated storm water drain in Kovalam basin in M1&M2 component under KfW fund for which KfW has appointed Design and Supervision Consultant. The consultants will be submitting the DPR and the ISWD network by August. Accordingly, the ISWD work will be carried out.

Forest Department

1. Forming Channel to drain excess rain water and also desilting the inlet channels to enable free flow of rain water:

South Chennai Wetland complex comprises of 32 irrigation tanks around Pallikaranai Marsh. The storm water from these 32 tanks drain in to marsh through 8 inlets.

The storm water from these 32 tanks will drain through channels into Pallikaranai and these channels are choked with waste and get clogged frequently. The slush and debris obstruct flow of flood water and reduces the water holding capacity and recharging of ground water

in Marsh Land. If removal of debris is carried out, it will increase the water flow, increase the water holding capacity, storage, improve the ground water recharge and enhance the flow of rain water, mitigating flooding.

Accordingly, it is proposed to enable the Marsh to effectively discharge its important eco-system function of flood mitigation by removal of debris to facilitate free and fast flow of rain water. Storm water from Alandur, Adambakkam, Velachery, Madipakkam area draining into the Veerangal Odai near MRTS, Velachery and enters into Pallikaranai Marsh near Viragu Thotti of Kaiveli Signal. This storm water will spread in to Marsh and will drain via., Radial Road, Okkiyam maduvu, Buckingham canal, Muttukadu Creek. To facilitate free flow of storm water it is proposed to have a channel to carry the excess rainwater faster to the radial road. This work is very essential as residents in Velachery, Madipakkam, Adampakkam, Alandur, etc., around the Marsh Land are very severely affected during monsoon period and this work will facilitate free flow of rain water from Veerangal Odai to Radial Road during rainy season and will avoid unnecessary stagnation of water in the residential areas around the Marsh Land thereby mitigating inundation.

2. Removing Invasive Alien Species: -

Invasive plants establish where disturbances create bare soil, all of which are associated with Wetlands. In the case of wetland, the seed is often dispersed via water or whole plants and plant fragments can be dispersed via floatation. *Eichhornia crassipes*, commonly known as common water hyacinth, is an aquatic plant and is often a highly problematic invasive species outside its native range. If this water hyacinth is not controlled, it will cover entire water spread area and affects water flow and blocks sunlight from reaching native aquatic

plants which often die. Hence it is important to remove this water hyacinth to conserve water in the Wetland and also to enable free and fast flow of rainwater. Small culvert channels on the either side of radial road are severely affected by this water hyacinth and this has to be removed periodically.

The dynamics of sedimentation will also affect water-land ratio leading to shifts in the vegetation mosaics and also create newer habitat niches for invasive terrestrial plants like *prosopis juliflora*. In Pallikaranai Marsh Land, the invasion of *Prosopis juliflora* has been rather rapid along the northeast boundary and this may be attributed to the substrate created by the solid waste disposal from the Perungudi side. Other species of plants that have the potential of interfering with the hydrology and the land-water ratio of the marshland are the cattail, water lettuce, duckweed and water hyacinth. Managing these plants therefore need appropriate strategies and are completely eliminated. Considering the dynamic nature of the surrounding landscape, it is important to monitor not just the diversity and abundance of birds, but also the dynamics of micro-habitats within the protected area and the shifting mosaics of major habitats in the entire watershed landscape that sustains the marshland.

The works proposed like formation of Channel Decluttering of existing inlets and removal of invasive species will be done by Forest department at an estimate cost of Rs.10.7 crores for which proposal is with a Government for funding.

Meanwhile**,** as a short term measures, Forest Department has given proposal for Rs.66 lakhs for the temporary measures to give relief during the ensuing Northeast Monsoon and requested for funding under State Disaster Mitigation.

Water Resources Department

Madurapakkam odai, Ottiyambakkam Odai and Arasankazhani Odai confluence at DLF / Semmenchery and drains into Pallikaranai Swamp over Patta Land. But due to urbanization, these patta lands are developed as residential layout. The Natural flow of the above drains were affected due to this conversion of lands. The Missing links between Ottiyambakkam Arasankalani and Madurapakkam Odai at DLF, Nookampalayam Slum Clearance Board Apartment have spread flood and causing flooding in Semmenchery, Ottiyambakkam and Perumbakkam areas. Hence, WRD has proposed following list of permanent flood mitigation works to interlink all these Odai in the form of Cut & Cover Drains.

Linking of Ottiyambakkam and Madurapakkam Odai with Arasankazhani Odai through three reaches of Cut & Cover drains at a total civil cost of Rs. 96.50 Cr, out of which two reaches (I & II) does not involve any land acquisition and Reach III requiring Land Acquisition (LPS sent to District Collector, Chengalpattu for approval). This project has been sent to Government for sanction of funds.

- Reach – I Double vent cut & Cover for a length of 960m at a cost of Rs.43.00 Crore without any Land acquisition.
- Reach – II Single vent Cut & Cover for a length of 720m at a cost of Rs.19.30 Crore without any Land acquisition.
- Reach – III Double vent Cut & Cover for a length of 800m at a cost of Rs.34.20 Crore with Land acquisition involved.

In above proposals were cleared by the State Executive Committee of TNSDMA for funding under State Disaster Mitigation Funding for which action is being taken to send the proposals to Government.

Highways Department

The Highways Department has proposed the following infrastructure works for flood mitigation to avoid inundation of Velachery & Madipakkam and Semmanchery & Perumbakkam areas for a sum of Rs.117.25 crore

- Construction of Macro Drain in Pallavaram Thoraipakkam Road at Km 9/0-10/6 and OMR ECR Link Road Km 0/0 and 0/8 for a length of 2400 m at an estimated cost of Rs. 70 crores

- Construction of Macro Drain at Km 4/0-5/7 of Medavakkam – Sholinganallur - Kudimiyandithoppu Road and OMR ECR Link Road Km 0/0 and 0/8 for a length of 1700 m at an estimated cost of Rs. 47.25 crores

The above proposals were submitted to Government and are under consideration by the Government for funding.

CMWSSB

The Chennai Metro Water Supply and Sewage Board has suggested for setting up of modular STP and underground sewage system for treating the sewage water entering marsh by carrying out following works

- Setting up Modular STP with tertiary treatment facility capacity of 15 MLD subject to availability of land 1500 sq.mtr per MLD at an estimated cost of Rs. 60 crores.

- Construction of Madipakkam Underground Sewage scheme at an estimated cost of Rs. 205 crores

The maps showing the existing and proposed storm water network of this area are furnished in **Figure – XIV** and **Figure – XV**.

Figure – XIV

Pallikaranai

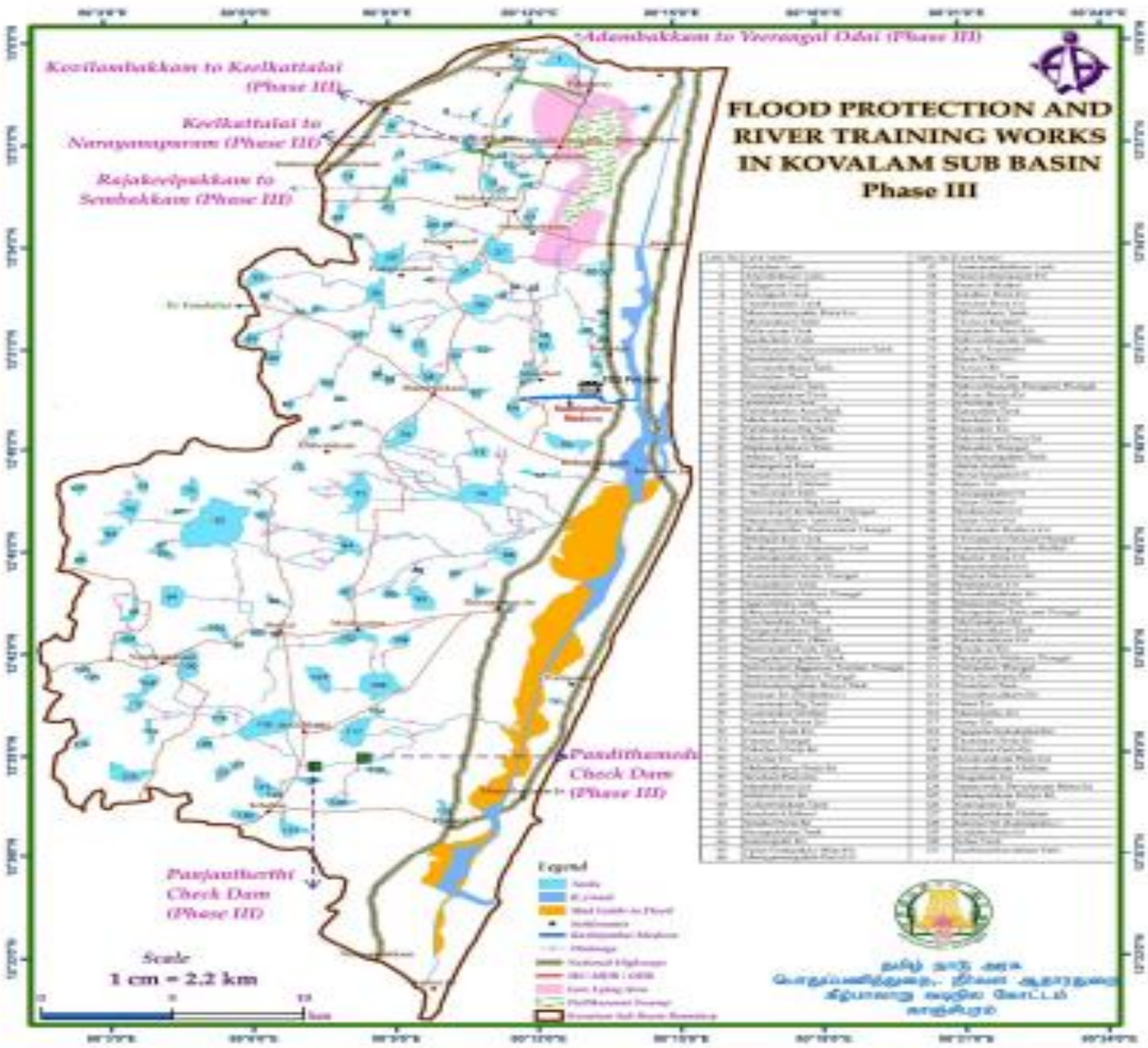


Figure – XV

Semmancheri

Area IX: Peerkankaranai, Irumbuliyur Perungalathur area

Peerkankaranai, Irumbuliyur and Perungalathur villages are situated on the South of Tambaram. There are minor irrigation tanks namely Peerkankaranai tank, Irumbuliyur tank, Perugalathur Chitheri and Perugalathur Periya Eri, the Ayacut and Foreshore lands of which are developed into residential and commercial areas without planning for the ways for inflow / outflow channels of the above tanks. Hence, the stakeholders' departments viz., WRD and Commissioner of Town Panchayat are taking action to implement the projects for creating cut

and cover macro drains below the roads for the flow of surplus waters as detailed below:

Areas highlighted in press reports	Drainage water shed	Final Disposal to the Macro Drain	River Basin
Peerkankaranai, Irumbuliyur Perungalathur area	Perungalathur Tank Water shed	To Adayar canal through and cut and cover Macro drain along bye-pass and service road	Adayar

Stakeholder Department / Organization responsible for the preventive measures:

WRD, DTP

Time Bound Action Plan for Long term Measures for permanent Mitigation

WRD has already constructed Cut & Cover macro drains from Tambaram Periya eri to Adayar River upto Pappan Channel (Dhurgas Road) in the Long-Term Flood Mitigation Project – phase I & phase II in the years 2018-19 and 2019-20. To provide a Permanent Flood Mitigation to Mudichur, Perungalathur and Irumbuliyur areas the following works are proposed by WRD:

1. Cut & Cover macro-drain linking Peerkankaranai Tank and Irumbuliyur tank to the newly constructed cut and cover macro drain constructed along the service road of bye pass road (Irumbuliyur – Maduravoyal) is proposed at a cost of Rs. 60 Cr and DPR is ready to be sent to the Government for approval.

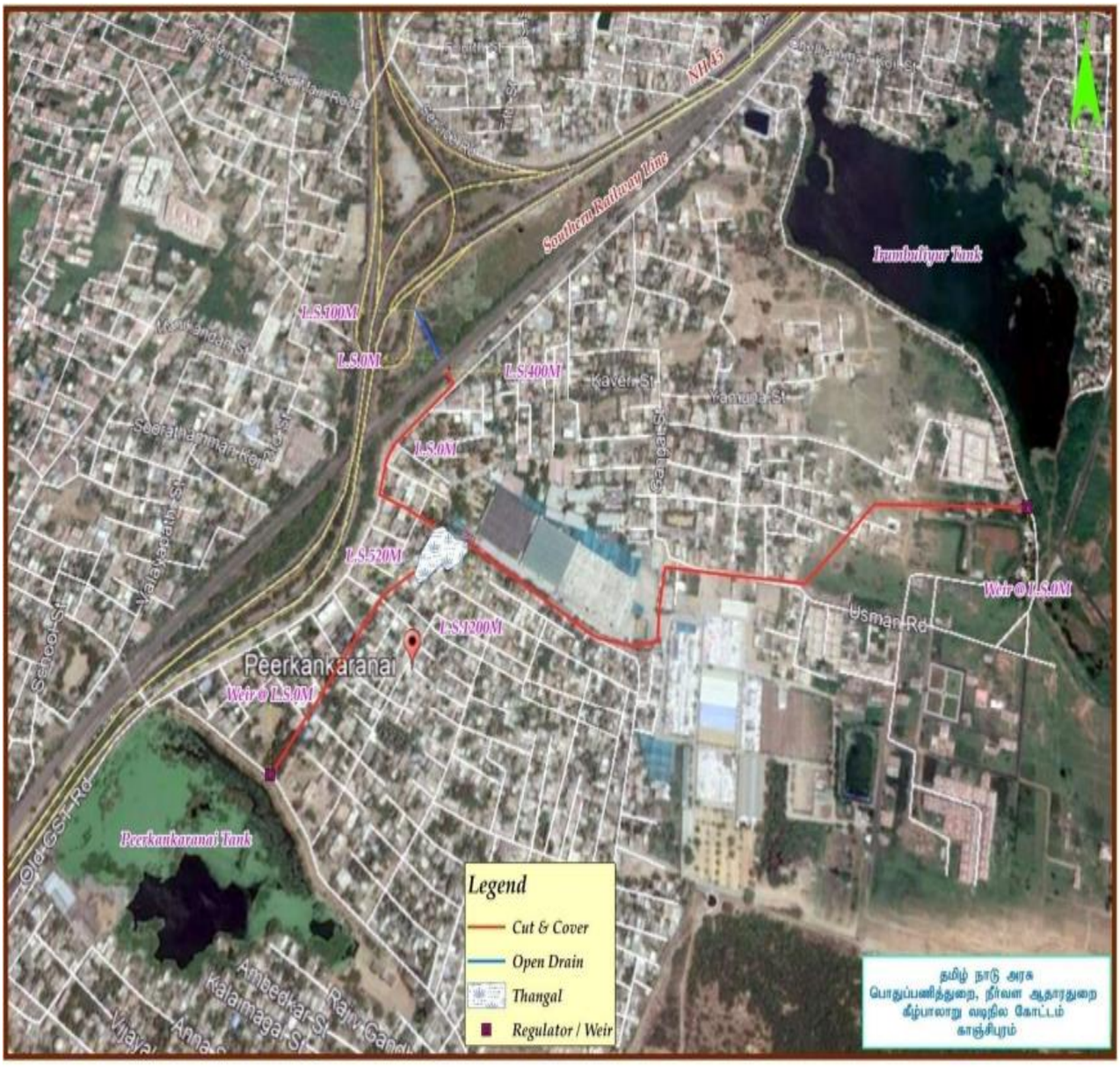
2. Cut & Cover macro drain linking Perungalathur Chitheri to Mudichur Seekananeri upto Mudichur Road – ORR (Vandaloor - Poonamalee) Junction and linking it to Adayar River in Mudichur at a cost of Rs. 40.50 Cr and DPR is ready to be sent to the Government for approval.

Commissioner of Town Panchayat has been requested to take action for the construction of storm water drainage network in Perungalathur Town Panchayat area for disposal of water into the above proposed cut and cover macro drain, once the macro drains by WRD are completed.

The map showing the existing and proposed storm water network of this area is furnished in **Figure – XVI**.

Figure – XVI

Tambaram



Area X: Mangadu

Mangadu is a Town Panchayat located on the down stream side of Chembarambakkam tank. Most of the areas of this Town Panchayat are developed in the Ayacut lands of Chembarambakkam tank, the run of from which drains into Adayar river. All the above drainage channels were once patta channels which were converted as residential layouts. Hence, Commissioner of Town Panchayats have taken action to construct storm water drainage network in this area as detailed below:

Areas highlighted in press reports	Drainage water shed	Final Disposal to the Macro Drain	River Basin
Mangadu	Porur Tank Water shed	Adayar river through Kolappakkam channel	Adayar

Stakeholder Department / Organization responsible for the preventive measures: Commissioner of Town Panchayat

Time Bound Action Plan for Long term Measures for permanent Mitigation

The Superintending Engineer, Commissionerate of Town Panchayat, informed that at present, Mangadu Town Panchayat is having only kutcha earthen drain for storm water drainage arrangements. A proposal has been prepared for construction of storm water drainage network for disposal into Kolapakkam channel at an estimated cost of Rs.6.15 crore and awaiting sanction for want of funds. It was requested to address the Government for getting sanction under General funds so that bidding may be made before end week of September 2021.

Area XII: Redevelopment of the slum at New Boopathy Nagar near Osankulam in Chetpet

This slum areas called Osan kulam layout which was developed through TNSCB under Madras Urban Development Project (MUDP) for plot development by individual. At present the area is facing inundation during rainy seasons for which TNSCB and GCC are taking the following actions.

Areas highlighted in press reports	Drainage water shed	Final Disposal to the Macro Drains	River Basin
Redevelopment of the slum at New Boopathy Nagar near Osankulam in Chetpet	Isolated water shed adjoining Cooum river in Chetpet	To Cooum river through cut and cover storm water drain	Cooum

Stakeholder Department / Organization responsible for the preventive measures: TNSCB, GCC

Time Bound Action Plan for Long term Measures for permanent Mitigation

The Managing Director, TNSCB informed that Osan kulam layout was developed through TNSCB under Madras Urban Development Project (MUDP) for plot development by individual. At present, there are 240 tenements existing. Redevelopment was planned for resettling the tenements in a multi-storied building which was held up for want of approval due to inadequate width of its approach road. The residents are also challenging the proposal and demanding proper drainage arrangements to avoid inundation during rainy season.

GCC officials informed that the culvert across the railway track has to be desilted and linked to Cooum river by constructing cut and cover drain from New Boopathy Nagar crossing Spurtank Road. The GCC officials were requested to explore the possibility of constructing cut and cover macro drain from New Bhoopathy Nagar to Cooum river.

Sewage Overflow issues

I. Saligramam, Virugambakkam and Velachery

Stakeholder Department / Organization responsible for the preventive measures: *CMWSSB*

The Jai Swarnakala apartments is located in Arcot road, Virugambakkam in Depot 129, Area-X. It is reported by CMWSSB officials that the main cause of sewage stagnation in the apartments is due to the existence of toilets in the ground floor at a level lower than the road level.

CMWSSB officials have been advised to ascertain the level of ground floor of apartments with respect to the road level and it was suggested that the GCC and CMWSSB officials may take appropriate action with the apartment owners to raise the level of ground floor if it is below the road level.

Also, the rain water from a part of Arcot Road and 80 feet road has to be drained via Anna Main Road into MGR canal. During the monsoon period 2020, the rain water stagnation occurred due to non-functioning of existing storm water drain. At present, the restoration work is in progress by GCC.

The existing sewer system in the above location is inadequate to ensure the sewer disposal from the above areas and hence regular preventive maintenance is being carried out using desilting, Jet rodding and super sucker to maintain free flow of sewage in the sewer system.

II. Puzhal and Kallikuppam

Stakeholder Department / Organization responsible for the preventive measures: District Collector, Tiruvallur, WRD and CMWSSB, GCC, WRD.

i. Kallikuppam

It is reported by WRD officials that the area under stagnation in Kallikuppam is located in the foreshore of Redhills tank below its Full Tank Level of Redhills tank which should be protected by forming a foreshore bund. Also, GCC has to provide storm water drain to drain rain water and PWD(WRD) has to take action to remove encroachment in the lake area and to construct bund in the fore shore of Redhills tank to avoid out flanking of surplus waters from Redhills tank.

ACS/CRA has requested the District Collector to take necessary action to evict the encroachment and WRD to form the bund before the ensuing North East Monsoon. WRD officials informed that the surveying work has been completed and the enumeration work is in progress by the Revenue Department and WRD will co-ordinate with the Revenue Department in this process.

Regular preventive maintenance is being carried out using desilting, jet rodding and super sucker so as to maintain free flow of sewage in sewer system.

ii. Puzhal

It is reported by WRD officials that the areas are situated on the northern side of Madavaram tank through which the surplus water of Madavaram tank is flowing as sheet flow since, there is no defined canal for the surplus waters. Also, underground sewage blockage has occurred in the entire area of Puzhal - Vinayagapuram, Kanchi Nagar. Because of this, sewage water from underground sewage, overflows through lids of underground sewage into the roads and stagnates on the roads. This causes health problems.

The ground level of Vinayagapuram and Kanchi nagar are lower than the road level and there is no Storm Water Drain (SWD) available, causing flooding of rain water during rainy season. Further, rain water

enters into sewer system at lower points. Rain water gets mixed with sewage and overflows in Maintenance holes during rainy season. Hence GCC has been requested to provide Storm Water Drain at the earliest to drain the rain water during rainy season and WRD has been requested construct the surplus canal for the Madhavaram tank left flank weir.

Regular preventive maintenance is being carried out using desilting, jet rodding and super sucker so as to maintain free flow of sewage in sewer system.

III. K.K. Nagar and MGR Nagar

Stakeholder Department / Organization responsible for the preventive measures: *CMWSSB, GCC*

MGR Nagar

The above streets are not having storm water drains. During heavy down pour, rain water enters into the existing sewer system causing overflow of sewage mixed rain water in the lowest portion of the streets. Greater Chennai Corporation has to provide SWD to drain the rain water for which GCC has already prepared estimate and awaiting sanction under CMCDM/TURIF/CGF.

The existing sewer system is adequate and regular preventive maintenance is being carried out using desilting, Jet rodding and Super sucker so as to maintain free flow of sewage in sewer system.

IV. Jalladianpettai, Medavakkam and Pallikaranai

Stakeholder Department / Organization responsible for the preventive measures: GCC, CMWSSB

Pallikaranai

i. Providing Comprehensive Sewerage Scheme to Pallikaranai was sanctioned by Central Sanctioning and Monitoring Committee of JnNURM on 03.01.2009 for Rs.5861.00 lakhs and later revised to Rs.9215.00 lakhs.

ii. Physical progress so far achieved is 93%.

iii. Initially due to slow progress of the work by the contractor, the contract was terminated.

To complete the balance works, tenders were invited and awarded to a different contractor for a contract value of Rs.2431 lakhs on 04.09.2020 with contract period of 18 months. Accordingly, the work commenced on 20.11.2020 and the scheduled date of completion is 30.11.2022.

The possibility of constructing underground storage tanks for storing flood water of the drains flowing into wetlands without any usage of its water like Pallikaranai swamp and use the water after recycling is yet to be examined.

As informed by CMWSSB officials during the meeting on 07.12.2020, the following works are proposed.

Modular STP with Tertiary treatment facility of capacity 15 MLD at a cost of Rs. 60 crores and period of completion as 24 months subject to availability of land 1500 sq. m. per MLD. The proposal has been sent to the District Forest Officer on 05.12.2020 and is awaiting clearance from Forest Department.

Jalladianpettai

For providing comprehensive sewerage scheme to Jalladianpettai. DPR has been prepared for Rs. 90 crores. Awaiting funds.

Medavakkam

CMWSSB has initiated "Dial for septic tank clearance", for clearing the septic tank in the areas wherever sewer system is not available. Sewer lorries are used to clear the septic tanks whenever the public make bookings.

V. Palavakkam and Kottivakkam area along ECR

Stakeholder Department / Organization responsible for the preventive measures: CMWSSB

The Kottivakkam and Palavakkam areas are located on both sides of East Coast Road covering Depots 183 & 185 where the preparation of Detailed Project Report for the UGSS has been completed. This DPR is included in the combined UGSS scheme for Kottivakkam , Palavakkam, Nellankarai, Injambakkam & Okkiyam Thoraipakkam. The total estimated cost for the above said locations is Rs. 750 crores and is awaiting fund allocation.

CMWSSB has initiated "Dial for septic tank clearance", for clearing the septic tank in the areas wherever sewer system is not available. Sewer lorries are used to clear the septic tanks whenever public make bookings.

VI. Serapanancheri near Padappai in Kancheepuram District

Stakeholder Department / Organization responsible for the preventive measures*: Kancheepuram District* Admininstration, Village Panchayat, TNPCB

The District Collector, Kancheepuram informed that the residential apartment complex by name "Arun Excello" is on the foreshore of Serapanancheri tank along Vandalur-Wallahjahbad road and the residents of this complex are letting out water directly into Serapanancheri tank without treatment and that notices were issued to them under Section 133 Cr.P.C – causing nuisance to public. ACS/CRA suggested that action may be taken for levying penalty for non-commissioning of treatment plant and that th ey may be booked under section 31A of Air (P&CP) Act through TNPCB. It is stated by the District Collector that O.A 106 of 2020 is still pending in the hon'ble National Green Tribunal (SZ), Chennai for next hearing.

The District Collector, Kancheepuram has also informed that the owners of two apartments have come forward to carryout remedial measures and the owners of other two apartments have not come forward to carryout remedial measures. The District Collector has been instructed to issue notices to the owners of the two apartments who refused to do the remedial measures and to take appropriate actions against them.

VII. Sai Balaji Nagar

Stakeholder Department / Organization responsible for the preventive measures: CMWSSB, GCC

i. Sai Balaji Nagar consists of 36 streets located in Depot 189 in which UGSS work has been completed in 2 streets.

ii. No SWD arrangements in 35 streets except one main street having SWD.

iii. The project for constructing integrated storm water drainage network is in progress through Greater Chennai Corporation under KFW assistance.

iv. CMWSSB has initiated "Dial for septic tank clearance", for clearing the septic tank in the areas wherever sewer system is not available. Sewer lorries are used to clear the septic tanks whenever public make bookings.

VIII. Rajaji Salai, Amaravathi Nagar, Jalladiyanpettai

Stakeholder Department / Organization responsible for the preventive measures: CMWSSB

The Jalladempet WSS is nearing completion and the major pipeline work is in progress along Amaravathi Nagar, Rajaji Salai and the scheme is proposed for commissioning shortly. On completion of pipeline work, the road will be handed over to Greater Chennai Corporation for restoration.

Suggestions made for the Unsewered areas around Chennai City and its sub urbs

In the unsewered areas, it is suggested that CMWSSB may commence scheduled evacuation of septic tanks through registered GPS fitted sewage tankers, so that letting out sewage into drains and water bodies can be prevented.

Conclusion

A clinical analysis was made during the meetings held on 22.07.2021, 29.07.2021 and 02.08.2021 to find solution to the issues relating to the flooding and sewage overflows in each area highlighted in the Newspapers, as ordered by Hon'ble National Green Tribunal in original application no. 264 of 2020 (SZ).

To address the problems, Long Term Mitigation Plans have been drawn up by various departments. As these projects are at various stages, there is a need for continuous monitoring of the progress of the projects covered by above plans.

These works were reviewed on 07.09.2021 and 14.09.2021. These works are exepected to reduce the flooding and sewage overflow. It is proposed to continue the review process with the stakeholder departments / organisations on the progress of above projects till they are completed. Short Term Mitigation Measures required for the temporary relief also will be monitored.

(K.Phanindra Reddy)
Additional Chief Secretary /
Commissioner of Revenue Administration &
State Relief Commissioner