

# **Environmental and Social Assessment of Storm Water Drains for the Selected Areas of Corporation of Chennai**

## **Executive Summary**

### **INTRODUCTION**

1. Government of Tamil Nadu has proposed to implement the World Bank supported Tamil Nadu Sustainable Urban Development program (TNSUDP) to improve the delivery of urban services with Tamil Nadu Urban Infrastructure Financial Services Ltd. (TNUIFSL), Chennai as the fund Manager. The provision of Storm Water Drains to selected areas of Corporation of Chennai is one of the sub-projects proposed to be implemented by the Corporation of Chennai (CoC).

### **PROJECT AREA**

2. Chennai is the fourth largest metropolitan city in India with a population of 4.68 million (as per census 2011). The city has about 205 Km of drains of width 0.60 m or more and total drains of about 1660.31 km. Two rivers meander through Chennai, the Cooum River through the centre and the Adyar River to the south. A part of the Adyar river forms a tidal creek before joining the sea.

3. The Corporation of Chennai (COC) has expanded its area during 2011. Storm water drainage system in these areas is not sufficient and adequate. The drains do not have proper connectivity and ultimate linkage to natural waterways/ water bodies for efficient disposal of storm water runoff.

4. Corporation of Chennai is responsible for provision of civic amenities with in Chennai including provision of Storm Water Drains (SWD) and has prepared Detailed Project Report for the providing Storm Water Drainage to the expanded areas of Chennai Corporation. The Project area comprises of the expanded area of Chennai Corporation covering an area of 53.79 sq. km comprising 3 zones of the Corporation of Chennai, namely Ambattur, Valasaravakkam, Alandur.

### **PROJECT DESCRIPTION**

5. The sub project proposes to provide storm water drainage to Part of Zone VII Ambattur – Padikuppam –Nolumbur area, Zone XI Valasaravakkam, Ramapuram and Porur Area and Part of Zone XII Alandur – Mugalivakkam, Meenambakkam and Manappakkam area.

6. The total length of the drains to be constructed is about 270.33 kilometres including the 11.05 km length in the canals. This sub-project involves 39 contract packages including new storm water drains, rehabilitation of existing/unsized/dilapidated storm water drains and improvements to the existing canals. The estimated cost of the project is Rs.1104.43 crores.

### **APPLICABILITY OF ESMF**

7. Projects proposed under TNSUDP shall be implemented safeguarding the

environmental and social concerns of the development activity. The requirements for ensuring environmental and social safeguards have been stipulated in the TNUIFSL's Environmental and Social Management Framework exclusively prepared for TNSUDP.

8. The project as per the ESMF, is categorized as E2 category with lesser impacts than E1 projects and requires Environmental assessment to be carried out and management measures be prepared.

9. Due to the displacement involved, this sub-project is classified as S1 Category and accordingly a Social Impact Assessment was carried out to determine the nature and magnitude of impacts and based on the assessment, a Resettlement Action Plan (RAP) is prepared.

#### ENVIRONMENTAL ASSESSMENT

10. The EA was carried out with an objective to identify and assess the environmental impacts arising out of implementation of the Storm Water Drain Construction and develop an Environmental Management Plan (EMP) to mitigate the identified impacts. The EA involved screening of the project, quantitative and qualitative surveys to collect the relevant information, field visits to the project area, catchment areas, canals, etc. and consultations with the community.

#### ENVIRONMENTAL REGULATORY REQUIREMENTS

11. A review of national, state, regional and World Bank environmental laws, rules and regulations relevant to the proposed SWD project indicates that in addition to the safeguard policies of the Bank and construction safety requirements, the project would require permission to cut the trees (41 nos) that will be cut during the construction phase of the project.

#### BASELINE ENVIRONMENTAL PROFILE

12. Chennai city is underlain by various geological formations from ancient Archaeans to recent Alluviums and the climate is generally hot and humid. The ambient air quality ranges between a high of  $175\mu\text{g}/\text{m}^3$  at Thiruvottiyur to a low of  $8\mu\text{g}/\text{m}^3$  at NEERI CSIR campus. The noise levels are generally high in commercial areas and the soil/sediment quality in the city reflects that there is no toxic element present beyond to the safe limits. Ground water with a pH of 7.4-7.9, electrical conductivity 780-1288  $\mu\text{mho}/\text{cm}$ , Total Dissolved Solids of 580-910 mg/l, total and calcium hardness of 260-482 mg/l and 168-340 mg/l, the ground water quality is within the prescribed standards.

#### ASSESSMENT OF IMPACTS

13. The major impacts of the project are expected to be during the construction phase leading air and noise quality deterioration, Health and Safety impacts to the works and local communities, traffic diversion and utility shifting, access to private properties,

back flow of water from the canals, solid waste dumping and disposal of excavated silt from the drains.

14. The project is expected to lead to cutting of about 41 trees. In addition, another 242 trees located in the construction area of the proposed drains. The project proposes to carry out compensatory plantation of 10 times the trees that may be lost due to the project.

#### ENVIRONMENTAL MANAGEMENT PLAN (EMP)

15. In summary, the expected impacts are of small scale, temporary and site specific depending on the implementation of the project and will not exceed the construction and major environmental norms. To mitigate the identified impacts an Environmental Management Plan has been prepared along with specific cost estimated for implementation and is provided provided in Section 7 in Table 7.1 of the EA report. The EMP will be form part of the contract document.

16. In addition the project proposes (i) groundwater recharge through construction of catchpits at 10m interval and recharging structures at 100m in the proposed storm water drainage network. Recharging structures will be increased in short distances wherever feasible (ii) construction of sediment trap at the confluence point of drain with the water body, so that the sediments are deposited in the silt trap at every 10m (iii) design of box type drains in RCC with cover on top, MS frame with wire mesh for major drains, flow of storm water through FRP gratings and public awareness programs to minimize the solid waste deposits in the drains.

17. To avoid back flow from the rivers in to the drains, flap gates are proposed in the drains. Further, Anna University is carrying out an overall storm water drainage modelling, based on which suitable mitigation measures will be implemented to manage flooding and other impacts (if any).

18. A detailed environmental management plan has been developed integrating these aspects and also the measures monitoring the implementation of EMP. A budget of about Rs. 8.0 million has been provided for the EMP measures of the project.

19. The EMP shall be implemented by the Corporation of through its dedicated environmental and social safeguards specialists and will submit monthly reports on the status of compliance with the ESMF requirements to TNUIFSL.

#### RESETTLEMENT ACTION PLAN

20. This sub project proposed to implement in the roadsides and canals and doesn't involve acquisition of private land or transfer of any Government land. All land required for implementation of this component is owned by the Corporation of Chennai. However, this sub-project is expected to affect 19 encroachers and displace 311 non-title holders (Squatters) who are staying along the canals and require to be resettled in line with the process and provisions of Environmental and Social Management Framework (ESMF) adopted by TNUIFSL for this project.

21. The Storm Water Drains project for the selected areas of Corporation of Chennai proposed to be taken up under proposed Tamil Nadu Sustainable Urban Development Project (TNSUDP). This project involves construction of storm water drains and canals. This sub project proposed to be implemented in the 3 Zones of the CoC. The total length of the drains to be constructed is about 329.18 kilometres including the 11.05 km length in the canals. This sub-project involves 39 contract packages including canals, new storm water drains, rehabilitation of existing/unsized/dilapidated storm water drains and improvements to the existing canals. While most of the contract packages related to network will be implemented within the existing RoW of the road sections and there are no impacts to be affected, though there will be temporary impacts in the nature of loss of access to residences during the implementation. The impacts will be restricted in 4 canal packages.

22. The social impact is assessed through a socio economic survey among the potential displaced families and consultations in the canal part of the expanded areas of CoC. This is due the fact that the construction of storm water drains is in the road sides of the expanded areas of corporation and owned by the CoC. Hence no impacts related to private land acquisition is envisaged in the construction of storm water drains; though a substantial displacement of non-title holders is triggered. The resettlement and transitional support to these displaced families will be extended in line with the provisions of ESMF.

23. In order to assess the social impacts, socio economic census survey was carried out by the corporation and found out that it involves resettlement of 330 Project Affected Families including about 25% women headed families. Due to the substantial displacement this sub-project is classified as **S1** Category and accordingly a Social Impact Assessment was carried out to determine the nature and magnitude of impacts and based on the assessment, a Resettlement Action Plan (RAP) is prepared. And the details, such as baseline socio-economic characteristics of the displaced families, outcome of consultations and plan for resettlement in coordination with the procurement and civil works time table and proposed implementation arrangements are presented in this RAP

24. The census socio-economic survey reveals that the displaced families are mostly residences in the site for several years and are belonging to the poor and marginal section of Chennai with about 31 % belongs to Scheduled Castes. The average monthly income is about Rs.7800/- ( USD 126). The housing condition include most of them have a decent housing with average size of about 465.79 sq.ft with access to basic amenities in their houses Most of them are engaged in informal jobs and less than 3% have regular earnings. .

25. The PAFs are proposed to be relocated in the Tamil Nadu Slum Clearance Board (TNSCB) tenements, which is already constructed and ready to occupy. The CoC is in close consultation with the TNSCB to finalise the resettlement of the PAFs. The choice of alternative sites among those available, will be discussed with displaced families will be finalised. The estimated R&R cost for this sub project is about Rs.24.05 Crores (about USD 4 Million) which is subject to correction. The entire cost will be met out of CoC own

funds. This RAP will be implemented by Storm Water Drains Department of CoC and will have environment and social specialists who will support the implementation. The project Management consultants (PMC) will assist CoC in the implementation of this component and PMC team will have social specialists having experience with resettlement and community development aspects and will be supported by social workers who will mobilise the displaced families and prepare them for resettlement and new way of life in the new resettlement site. TNUIFSL will carry out concurrent monitoring and a final impact evaluation will be carried through independent consultants to assess the changes in the living standards of the affected families after one year of their resettlement. The project level grievance committee consists of Zonal Officer/Assistance Commissioners of CoC, person of repute from the local area and elected representative and Superintending Engineer (SWD) will be constituted to deal with the grievances and complaints of the PAPs and local people. The RAP's implementation will be coordinated in such way that the key actions will be completed prior to invitation of bids and the displaced families will be moved and paid other eligible R&R assistance prior to award of contract.

26. In order to implement RAP and other safeguard measures, two safeguard specialists will be inducted in Corporation of Chennai (CoC) and Project Management consultants will have safeguard specialists in their Team to support RAP implementation. In addition to these adverse impacts, there will be downstream impacts during storm surge and a local institute having expertise in this area is carrying out overall storm water drainage modelling to assess impacts and if the study identifies adverse impacts, then mitigation measures will put in place for advance warning systems and other eventualities.

Disclosure of EA and RAP:

27. The final version of EA and RAP are available in the websites of TNUIFSL (EA- [http://www.tnuifsl.com/Public\\_Disclosures/Final%20EA%20SWD.pdf](http://www.tnuifsl.com/Public_Disclosures/Final%20EA%20SWD.pdf) and RAP - [http://www.tnuifsl.com/Public\\_Disclosures/Final%20RAP-%20ISWD%20sent%20by%20CoC.pdf](http://www.tnuifsl.com/Public_Disclosures/Final%20RAP-%20ISWD%20sent%20by%20CoC.pdf)) and Corporation of Chennai (EA- <http://www.chennaicorporation.gov.in/images/swd/Final%20EA%20SWD.pdf>, RAP - <http://www.chennaicorporation.gov.in/images/swd/Final%20RAP-%20ISWD%20sent%20by%20CoC.pdf>).