German Financial Cooperation with India

CONSULTING SERVICES FOR PROGRAMME MANAGEMENT AND ACCOMPANYING MEASURES FOR THE CHENNAI STORM WATER DRAINAGE PROGRAMME, M1 AND M2 COMPONENTS OF KOVALAM BASIN

Greater Chennai Corporation (GCC), Tamil Nadu

Funded by the German Financial Cooperation through KfW

Environmental and Social Impact Assessment and Management Plan (ESIA/ESMP) for Fast Track Works (M12, M19 and M24)

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NON-TECHNICAL SUMMARY

I. Introduction

Chennai city, the capital of Tamil Nadu state is located on the south-eastern coast of Bay of Bengal. It is a flat coastal terrain having low-lying areas and within a climate zone that is prone to occurrence of tropical cyclones and heavy rains. Such a situation frequently results in catastrophic flooding which causes heavy damages to infrastructure and people.

The existing storm water drainage systems, especially in the extended areas of Greater Chennai Corporation (GCC) falling into Kovalam basin are not able to cope with storm water during monsoon period. The discharge of storm water in the basin is not effective that results into water logging and inundation at many locations. With the massive development, the natural drains in the basin were choked, diverted or vanished in due course of time. The backflow of seawater further exacerbates the problems. The extended areas are developing rapidly, which do not have any comprehensive drainage network and local residents have been facing many problems for several years.

In this backdrop, Government of Tamil Nadu (GoTN) decided for the Integrated Storm Water Drainage Programme (ISWDP) in Kovalam basin comprising of three components (M1, M2 and M3). GCC is responsible for the implementation of the ISWDP funded by the Kreditanstalt für Wiederaufbau (KfW), German Development Bank.

Tetra Tech India Limited prepared a Detailed Project Report (DPR) in 2014 for an integrated storm water drainage system to alleviate the flooding and its consequences in the extended areas of Kovalam basin. KfW on behalf of GCC engaged the H.P. Gauff and DHI WASY GmbH consortium, who carried out the feasibility study in M1 and M2 components and prepared the Final Feasibility Report in 2019. The civil works contracts are to be awarded to Contractors, one for each package or more depending on their competence and the civil works is expected to be commenced in March 2022.

This report is for the Environmental and Social Impact Assessment (ESIA) conducted for the ISWDP and focuses specifically on the Fast Track Works (FTW).

II. Scope of Fast Track Works

For ISWDP FTW there are 3 no. packages (M12, M19 and M24), which include a total of 39,784 m (12,529 m reconstruction and 27,255 m new drains) of storm water drainage (SWD) was proposed to be constructed on one side of the roads mostly in the residential areas located in 234 streets. The new drains include 15,305 m additional drains. In addition, 31,331 m existing drains will be retained for draining purpose in the 03 packages/sub-network. In addition, 79 rainwater harvesting structures (RWHSs), 17 sluice gates, 134 screens and 15 outfalls meant for distributed discharge of the surface drains will be constructed for draining of storm water into the Pallikarnanai marshland and accumulated water into Buckingham canal and ultimately into the sea, the Bay of Bengal.

The FTW area fall into zones XII and XIV which have been administered by GCC. The SWD will be constructed along the RoW of existing road owned by GCC. The RWHSs will be constructed in the available land along the drains. The required statuary permission will be obtained from the Departments namely Tamil Nadu State Pollution Control Board, Traffic, etc. In addition, the public utilities such as electricity and telephone cables and PVC water containers will be shifted in consultation with the concerned authorities.

RWHSs will be constructed for retention and infiltration of rainwater in the aquifer and excess rainwater after harvesting will be discharged into Pallikarnanai marshland by 15 individual Outfalls

spread into total 6.51 sq.km drainage area covered under first 03 packages of FTW. The drains passing through the built up and busy area will be covered to avoid dumping of solid waste.

The terms 'Programme' and 'Project' are interchangeable, under which there are components (M1 and M2) and packages e.g. M12, M19 etc.

III. ESIA Study

The ESHS assessment to identify potential risks and impacts and suggest mitigation measures is needed to meet the KfW Development Bank's safeguards policy requirements prior to commencing the implementation of programme activities. The ESIA study is aimed to assess and analyse the ESHS risks and impacts and suggest mitigation measures during the pre-construction, construction, operation and decommissioning stages of the programme. A comprehensive methodology was adopted to update and validate the available data and collect the additional data from the programme area as required. The data were gathered using the desk research and review of available reports and secondary sources, besides the collection of primary data through conducting social survey with the local communities, Project affected Persons (PAPs) and Focus Group Discussions (FGDs) at selected locations with the available stakeholders.

Baseline data: The baseline data as detailed out in Chapter 4 help understand the existing environmental conditions and socio-economic characteristics of the referred programme area. It is required to compare and assess the impacts on ESHS aspects caused during the programme life cycle. The programme related baseline data were collected on climate, meteorology, land usage, water, air, noise, soil, flora, fauna and social profile of local population among others. Details of social impact is provided in the Livelihood Restoration Plan (LRP) prepared as standalone document. The major findings of the key parameters are summarized hereunder.

Soil: The analysis reveals that pH of the soil in the study area varied from 7.45 to 8.93, which indicate that soil was slightly alkaline to strongly alkaline. Heavy metals such as lead, arsenic, cadmium, mercury and chromium are below the permissible range at all locations. The iron, copper, zinc, nickel, manganese were within the permissible limits.

Ambient air quality: In the study area, the maximum and minimum concentrations for PM10 were recorded as 61.7 µg/m^3 at AAQ4 and 55.9 µg/m^3 at AAQ9 locations. The ambient air quality standard for PM10 was observed to be higher than World Health Organisation (WHO) standards at all locations but were within the prescribed limit per Indian standards. The maximum and minimum concentrations for PM 2.5 were 27.2 µg/m^3 and 23.7 µg/m^3 at AAQ4 and AAQ9 respectively. The maximum and minimum SO2 concentrations recorded were 22.9 µg/m^3 and 10.7 µg/m^3 at AAQ10 and AAQ4 locations respectively, which were within the prescribed limit per Indian standards. The maximum concentration of NO2 was 31.6 ug/m^3 at AAQ10 and minimum 18.9 ug/m^3 at AAQ9 locations and these values were found within the prescribed limits of Indian standards.

Ground water quality: The range reported for pH was 7.42 to 7.66 and for chlorides 80 mg/l to 118 mg/l. Lead and BOD were found below the quantification limits. In general, the water quality of ground water was found to be within the prescribed IS 10500:2012 norms for drinking to human population.

Surface water quality: The pH value of surface water samples of Arthanareeswarar Temple tank and other waterbody were within the permissible limit. Similarly, other parameters like Total Dissolved Solid (TDS), Total hardness, sulphates, fluorides, iron, etc. were found to be within the respective standard limits. The oil and grease, cyanides, phenols, pesticides, etc. were absent and lead was below detectable limit.

Noise: Ambient noise levels reported were in the range of 73.2 dB (A) to 67.1 dB (A) at N5 and N3 locations. While comparing with the International Finance Corporation (IFC) and National standards, the monitored ambient noise levels were above the permissible standard limit at all locations.

IV. E&S Impact

The findings of the study reveal that almost all the baseline data on environmental parameters, barring the values reported above, were within the prescribed national and international limits. Such parameters are unlikely to change due to the minimal or moderate impact envisaged during the construction and operation related activities of the programme. A total of 609 native trees species exist on the identified sites, which may be affected due to the construction of drains. The impact of programme construction works will result into the generation of solid and liquid wastes, spillage of oil and lubricants, emission of NOx, SO2, CO2, suspended particles from the vehicles and machineries, etc. It may cause contamination and pollution of the local environment and natural resources if not managed properly. The safety of labours and local communities and traffic management are other key concerns.

The construction of storm water drains, silt catch pit along the ROW of existing roads and the sunken wells for RWHS in available land owned by GCC may cause low impact on human settlements, ecologically sensitive areas such as notified reserve forest, natural parks, sanctuary, cultural places and the sensitive receptors such as schools, hospitals, religious places. The construction of storm water drains, outfalls and RWHSs shall be confined to the land of Non-CRZ category.

Total 44 vendors undertaking informal business activities along the RoW of roads will be impacted for 15 days during the construction phase. The 44 vendors have families and are regarded as Projects Affected Families (PAFs), which are comprised of 138 members or Project Affected Persons (PAPs). Further, paved ramps and a few stairs located in the identified drain site will be dismantled fully and partly. These will be reconstructed and original condition will be restored by the Contractors without any cost to the house owners as per Contract Agreement. The access to residential and commercial structures will be disrupted for about 15 days during the construction activities. The access will be provided at such affected places by placing gangway with railing for safety. GCC informed to adopt the approach of not demolishing any existing private structures and the common property resources (CPRs) by diversion and adjustments in the alignment of SWD. It is considered necessary to avoid public opposition to the proposed programme.

The ISWDP for FTW phases and subsequently in other catchment areas of M1 and M2 watersheds in phase 2 & 3 are expected to improve the physical, biological environments and socio-economic status of local communities. The flooding in low lying areas during monsoon is a major problem of Chennai city. The local residents, the beneficiaries of the programme expect permanent solution against the recurring flood situations and its ESHS impacts. The construction of sufficient number of RWHSs will help raising the ground water table and recharging the aquifer. It will contribute to potable water availability to the local residents and will control the volume and flow of storm water. The minimized incidence of water borne diseases are expected to improve health status, reduce expenditure on medical treatment and time loss to people. During construction and operation phases of the SWD and associated works will create opportunities to the local persons, who will be employed in the programme works on priority.

All the stakeholders will be engaged in the process of implementation of the Programme and ESHS plans from the early stage. The local residents consulted during the study have also reported that people at large facing problems due to water flooding and inundation are receptive to the programme. GCC is committed to comply with the applicable state and national laws, including Coastal Regulation Zone (CRZ) Notification, 2011 (amended in 2019) and KfW Sustainability Guideline and Separate Agreement.

The programme is anticipated to cause low or moderate risk and affects social (temporary impact on the income of PAPs), environmental attributes (air, water, noise, and soil) and ecology (flora and fauna) during construction and operation phases. Further, the programme impacts on environment and local communities will be minimized or mitigated through the implementation of Environmental and Social Management Plan (ESMP), Stakeholder Engagement Plan (SEP), Comprehensive Waste Management Plan (CWMP), Traffic Management Plan (TMP), Tree Management Plan and Livelihood Restoration Plan (LRP).

V. Institutional Arrangement

GCC is the project executing agency (PEA) for the FTW packages in M1 and M2 watershed components of the ISWDP. The Commissioner, Project Director is supported by the Chief Engineer-cum-Executive Director of the project, who is responsible for the project management. He is assisted by the Executive Engineer (EE), who is designated as a Nodal Officer and assigned the responsibilities for accomplishing all the activities related to project in coordination with other stakeholders. The Nodal Officer will work under the supervision of Superintending Engineer (SE), who is designated as the Project Manager, assisted by the Assistant Executive Engineer (AEE) and other staff.. The PIU and Steering committee are set up for the efficient implementation of the programme. The Contractors staff, particularly the Engineer In charge (site) and ESHS Officer deployed as per Contract Agreement by each Contractor are responsible for the implementation of ESMP and sub-plans under the supervision of PMC.

In order to improve the efficiency of existing Grievance Redressal Mechanism (GRM), establishing of the Grievance Redressal Committee (GRC) at the GCC level and each zone level are proposed. The GRC will comprise of the representatives of the local residents, Resident Welfare Associations (RWAs), local Non-Governmental Organisation / Communicate Based Organisations (NGOs/CBOs) and the GCC officials with the Superintending Engineer (Chairperson) and Nodal Officer as convenor. The Zonal Officer will be Chairperson and another concerned official at the Zone will be the convenor. Overall, the GRCs will work under the supervision of the Chief Engineer and guidance of the Commissioner, GCC. The grievance mechanism will enable the stakeholders and complainants to express their concerns and complaints directly to the GRC that will resolve the grievances in time bound manner without any cost to aggrieved parties.

VI. ESMP and Sub-plans

The ESMP and sub-plans prepared are summarized hereunder.

(a) Environmental and social management plan (ESMP)

The ESMP for packages/sub-networks (M12, M19 and M24) emphasizes on the implementation of mitigation measures to minimize or offset the risks and impacts on environment and people caused by the programme activities during its life cycle. Initially this will be in regards to the Contractors material stores, batching plants, labour camps, site offices to be established for the construction works. The provision of outsourcing concrete from RMC for construction works is also given to the Contractors. The transportation of material, machineries, and construction works carried out by labour on site shall follow the applicable guidelines and good engineering practices. The prevention of mixing of domestic waste and industrial effluent into rainwater, control and clearance of sedimentation and siltation in the operation phase to avoid contamination of water, clogging of drains are required for smooth flow of storm water and draining of excess water into the marshland, Buckingham canal and the sea. The environmental attributes (air, water, noise, soil) and all other construction related activities will be monitored regularly by the Contractors supported by the PMC under the supervision of GCC.

The ESMP also covers the training and capacity building on disaster management, health and safety aspects of labour and local communities, which are of paramount importance.

(b) Stakeholder engagement plan (SEP)

Stakeholder engagement plan has been designed to ensure engagement of all the stakeholders required for effective implementation and management of the programme activities. Public consultations and meaningful meetings will continue to be organized regularly/periodically or when required at the package and GCC levels respectively during the programme life cycle. These are aimed to explain about the programme progress and solicit continued support and engagement of local residents and other stakeholders. The Information, Education and Communication (IEC) material and media platform such as local newspaper and TV channels as appropriate will be utilized to disseminate/update the programme progress regularly and to build a positive perception among the stakeholders. The implementation of SEP will facilitate the social inclusive, participative and consultative approach under the programme.

The then Chief Minister of Tamil Nadu state announced the need for implementation of storm water drainage programme. GCC uploaded in its website[1] and disclosed the details of ISWDP in Kovalam basin.

(c) Comprehensive waste management plan (CWMP)

The mismanagement of waste causing pollution in terrestrial and aquatic ecosystems is a critical issue**.** The CWMP developed for the programme includes activities and actions required to manage waste from its inception to final disposal. It covers the collection, transport, treatment and disposal of waste and its monitoring in accordance with the regulations of the waste management.

The wastes to be generated during the programme construction and operation phases include construction debris, concrete residue, excess soil, oil spillage from transport vehicles and machineries. In addition, the wood and green waste will be generated due to the cutting of trees in the FTW 03 packages. The waste will be disposed of at the Perungudi dumping site available for the purpose. The waste management and minimization based on the principle of reduce, reuse, recycle and recover shall be adopted as mentioned in the Plan.

(d) Traffic Management Plan (TMP)

The purpose of road works and traffic control is to provide safe and effective work areas and to warn, control, protect and guide vehicular and pedestrian movement. The Contractors under the supervision of GCC and PMC shall at all times, carry out the construction of SWD works in a manner creating least interference to the flow of traffic while consistent with the satisfactory execution of works. They shall take all necessary measures for the safety of traffic during construction and provide, erect and maintain barricades, including signs, marking, flags, lights and flagmen as per the traffic management plan in line with the applicable regulations and guidelines. Almost all the construction of storm water drain works along the roads in FTW will be carried out in the residential areas and market at some locations. Traffic will be managed by the Contractor's Engineer Incharge (site), ESHS Officers of Contractors under the supervision of PMC with the cooperation of traffic police and people on site.

(e) Tree Management Plan

The proposed tree management plan is aimed at causing the minimum loss of trees and restoration of such loss by transplantation, compensatory plantation, protection, survival and growth with proper care, watering and close monitoring of plantations. Total 609 trees and plants of native species exist in the different streets and surrounding locations of FTW 03 packages (M12, M19 and M24). These trees may be affected due to the construction of drains under ISWDP in FTW 03 packages.

All the possible efforts will be made to minimize the number of tree cutting. Mitigation and compensation measures are to be coordinated with the responsible authority and to be included in the respective ESMPs / Tree Management Plans. The Contractors upon mobilization will update the number of trees and saplings on the alignment and inform to GCC/PMC.

Where practical with other buried services and obstructions the alignment of drains will be adjusted to avoid the cutting or removal of trees. Where a tree is retained and the roots are exposed from adjacent construction activities, the Contractor shall take care to minimise root damage (such as manual works) and protect roots during construction. Where trees are of suitable size, they will be transplanted to a location instructed by GCC.

Before commencement of work the Contractor will inspect the site and inform to GCC about the intervention of trees in the alignment. In case of unavoidable situation trees will be cut by GCC as per the process of Green Committee and compensatory plantation of 10 trees of native species for each tree cut will be ensured through its Park Department. The compensatory plantation will be carried out in consultation with local communities at the same or near to the location of tree cut depending on the availability of land and physical conditions in the project area. Growth and survival of trees planted shall be monitored at least for a period of 03 years.

VII. Monitoring and Evaluation

Chennai based GITEC-IGIP India Pvt. Ltd. appointed as Programme Management Consultant (PMC) shall have the responsibility of guiding and monitoring the environmental and social safeguards progress and performance under the programme.

The ESIA and sub-plans upon issuance of Non-Objection-Certificate (NOC) from KfW for FTW 03 packages will be implemented by the Contractors and assisted by Implementing NGOs under the supervision of the Accompanying Measures Consultant (AMC) as support and in coordination with the GCC. Staff of the PMC assisted by the Contractors Engineer Incharge will be responsible for monitoring ESHS safeguards activities of the programme on a daily basis. The PMC has one environmental expert and one additional ESHS may be engaged as per the terms of the Contract. The monitoring of compensatory plantation will be the responsibility of Park department.

VIII. Budget and Timeframe

KfW will finance INR 979.72 crore (Euro 122.465 million), Government of Tamil Nadu and GCC will contribute INR 463.90 crore (Euro 57.987 million) during construction phase. It includes a sum of INR 150.47 crore allocated for the construction in FTW. The expenditure for the project operation and maintenance will be incurred from the State budget. The construction works for the 03 packages are expected to be completed in 24 months.