

Environmental Due Diligence Report

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INDIA: Integrated Urban Flood Management of the Chennai-Kosasthalaiyar Basin Project

(Infection Prevention and Control of COVID-19
through Wash Services Improvement for Integrated
Pandemic and Disaster Risk Management for the
Urban Poor in Chennai in Kosasthalaiyar Basin under
JFPR Grant) - PART A

CURRENCY EQUIVALENTS

(as of 2 June 2021)

Currency unit	–	Indian rupee(₹)
₹1.00	=	\$0.0137
\$1.00	=	₹72.854

ABBREVIATIONS

ADB	–	Asian Development Bank
GCC	–	Greater Chennai Corporation
GRM	–	Grievance Redressal Mechanism
GoTN	–	Government of Tamil Nadu
IUFMCKBP	–	Integrated Urban Flood Management for Chennai - Kosasthalaiyar Basin Project
MAWS	–	Municipal Administration and Water Supply Department
PMU	–	Project Management Unit
PSC	–	Project Supervision Consultants
SPS	–	Safeguards Policy Statement

NOTE

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I. INTRODUCTION

A. Background

1. As of 20 May 2021, India has more than 25 million confirmed cases of COVID-19, the second-highest national total in the world. Tamil Nadu has been among the most severely affected states in India, with about 1.7 million confirmed cases and over 19,000 fatalities. Chennai is the seventh worst affected city in India, with about 460,000 confirmed cases.¹ The project area, Chennai-Kosasthalaiyar river basin, is part of the Greater Chennai Corporation (GCC). The spread of virus is through airborne and contact occurs directly through person-person, hence any mass gathering (including meetings, public functions, temple gathering) are the key source of spread of infection among the communities, it is also observed that lack of Infection Prevention and Control (IPC), especially Water Supply Sanitation and Hygiene (WaSH) services also leads to the spread of the virus.

2. Since the start of the 20th century, Tamil Nadu has witnessed severe drought condition, tropical flood, intense monsoon seasons, cyclone impacts and other climatic issues. The recorded flood in 2015 and 2020 have tested the capability of available infrastructure facilities including storm water drain. From the lessons learnt during the 2015 floods, GCC have expended the storm water network across most of zones having dense population, which have performed well in controlling the 2020 floods. However, based on the warnings given by the Meteorological Department, Chennai, there was a need to evacuate the public living in the low-lying areas, who are vulnerable for flooding and economically poor in order to have access to a better location (preferably schools and health centers), under the prevailing COVID crisis and chances for communicable diseases, it was a challenging task to the GCC.

B. Proposed Japan Fund for Poverty Reduction (JFPR) Grant

3. The proposed JFPR grant is attached to the proposed ADB loan for “Integrated Urban Flood Management for Chennai - Kosasthalaiyar Basin Project” (IUFMCKBP) in Greater Chennai Corporation. The proposed project grant aims to improve Coronavirus Disease 2019 (COVID-19) infection prevention and control (IPC) through interventions to enhance water sanitation and hygiene (WASH) in low-income flood-prone urban areas of the Chennai–Kosasthalaiyar basin. It supports GCC efforts to (i) strengthen WASH services, products, and training with behavior interventions in schools; (ii) enhance COVID-19 IPC and WASH measures in community health centers; (ii) improve the surveillance system for the IPC of COVID-19 and other communicable diseases; and (iv) enhance preparedness in low-income flood-prone urban communities and their responses to future pandemics and flooding.

4. The grant will strengthen the integrated risk management of epidemics and disasters in flood-prone areas under the proposed project Integrated Urban Flood Management for the Chennai–Kosasthalaiyar Basin. This grant project will be a pilot intervention of ADB's COVID-19 and WASH nexus support in India and a model for scaling up integrated response to epidemics and disasters in urban areas across South Asia.

5. **Project area.** Project area is the same as the project area of the IUFMCKBP, funded by ADB, to which the grant is attached. The GCC proposed to utilize the JFPR Grant, to improve IPC

¹ World Health Organization Coronavirus (COVID-19) Dashboard. <https://covid19.who.int/>. Health and Family Welfare Department, Government of Tamil Nadu. 2021. Media bulletin of Government of Tamil Nadu, available at <https://stopcorona.tn.gov.in/wp-content/uploads/2020/03/Media-Bulletin-20-05-21-COVID-19-6-PM.pdf> Accessed on 22 May 2021.

and WaSH facilities in 65 government (primary, middle and high) schools and 17 urban primary health centers (UPHC) run by GCC in the project area. The project area - Chennai - Kosasthalaiyar Basin, falls in the following four zones of GCC: Thiruvotriyur (Zone 1), Manali (Zone 2), Madhavaram (Zone 3) and Ambattur (Zone 7). Figure 1 shows the project location in GCC area.

6. The proposed outputs of the JFPR Grant are as follows.

7. **Output 1: WASH services, products, and training strengthened with behaviour interventions in 65 schools in flood-prone low-income urban communities.** The output includes improving (i) hand hygiene by providing reliable access to running water in sufficient quantities at regularly cleaned foot pedal operated handwashing stations with elbow operated soap dispensers, as well as ensuring safe drinking water with the provision of drinking water stations with foot pedal-operated taps and devices, and covered containers for storing treated water; (ii) environmental hygiene by establishing cleaning schedules, periodically cleaning frequently touched objects, mopping classrooms and toilets with commercial disinfectant, disinfecting the surface where required, and providing to cleaning staff such personal protective equipment (PPEs) as boots, gloves, and masks; (iii) waste management by providing pedal-operated waste collection bins with liners at points of use and facilities for the separate collection and onsite disposal of menstrual hygiene waste, used tissues, and masks; (iv) gender-sensitive and inclusive sanitation management to ensure adequate numbers of clean toilets, including disabled-accessible boys' toilets and girls' toilets with private stalls, cleaning and disinfection supplies, and improving facilities to safely collect and dispose feces and wastewater; (v) the personal sanitation habits of students, teachers, and other staff in schools through training on the safe management of handwashing stations and drinking water points, personal hygiene, and the enforcement of IPC methods such as physical distancing; (vi) the promotion of behavior change to improve hygiene and prevent infection in schools to minimize disease transmission risk; and (vii) toilet disinfection through enhanced on-the-job training for cleaning staff during disasters and epidemics.

8. **Output 2: COVID-19 IPC and WASH measures strengthened in 17 community health centers in flood-prone low-income urban communities.** The output includes improving (i) IPC plans in health-care facilities and associated staff training on patient placement, the designation of isolation room or units, the safe use and disposal of PPEs, proper sterilization and disinfection, and periodic monitoring; (ii) hand hygiene by providing reliable access to running water in sufficient quantities at regularly cleaned foot pedal operated hand washing stations with elbow operated soap dispensers at entrances and exits, near baths and toilets, and at all points of care (screening, observation, and treatment), as well as ensuring safe drinking water with the provision of drinking water stations with foot pedal-operated taps and devices; (iii) environmental hygiene by establishing disinfection schedules, ensuring the availability of proper disinfectant and cleaning materials, periodically cleaning and disinfecting floors and frequently touched objects and surfaces, and providing PPEs to cleaning staff; (iv) waste management by enabling color-coded waste segregation in a three-bin system (for infectious waste, sharp objects, and general waste), establishing proper storage locations and ensuring final disposal in incinerators and autoclaves, as well as providing PPEs to waste handlers; (v) gender-sensitive and inclusive sanitation management to ensure adequate numbers of clean toilet blocks for patients, ensuring the availability of cleaning and disinfection supplies, ensuring that sewage is safely managed without posing risks to nearby communities; (vi) toilet disinfection by enhanced on-the-job training for cleaning staff during disasters and epidemics; and (vii) awareness of personal hygiene and infection prevention through awareness campaigns and the promotion of behavior change in health centers.

9. **Output 3: Surveillance systems for COVID-19 and other communicable diseases improved in flood-prone low-income urban communities.** For lack of essential public health personnel and adequate health facilities in low-income urban communities, the local government is unable to identify sources of infection for COVID-19 and other communicable diseases or take effective early measures to monitor and contain community transmission. As low-income urban communities are hotspots of COVID-19 transmission in Chennai, the government needs to establish an innovative disease surveillance system to better address the aforementioned challenges. Further, such a system will enhance periodic scheduled testing and accessible decision support information on COVID-19 and other communicable diseases in low-income communities, generate more accurate disease data, and strengthen local government capacity to prevent and control outbreaks. This output includes (i) establishing eight mobile medical and diagnostic units attached to primary health centers that will conduct scheduled camps with spot sampling of infectious diseases including COVID-19 for centralized lab testing and (ii) strengthening water quality surveillance and wastewater epidemiology for water-borne diseases and COVID-19 through four mobile water quality labs, which will spot test and collect samples for centralized testing in the GCC Public Health Laboratory or other labs. Spot and lab testing results will provide a real-time picture of geographic and demographic trends in the local transmission of COVID-19 and other communicable diseases, generating early warning information that will allow local governments to act quickly to prevent the spread of disease. The mobile surveillance activities will be implemented with linkage to awareness campaigns and the promotion of behavioral changes in communities.

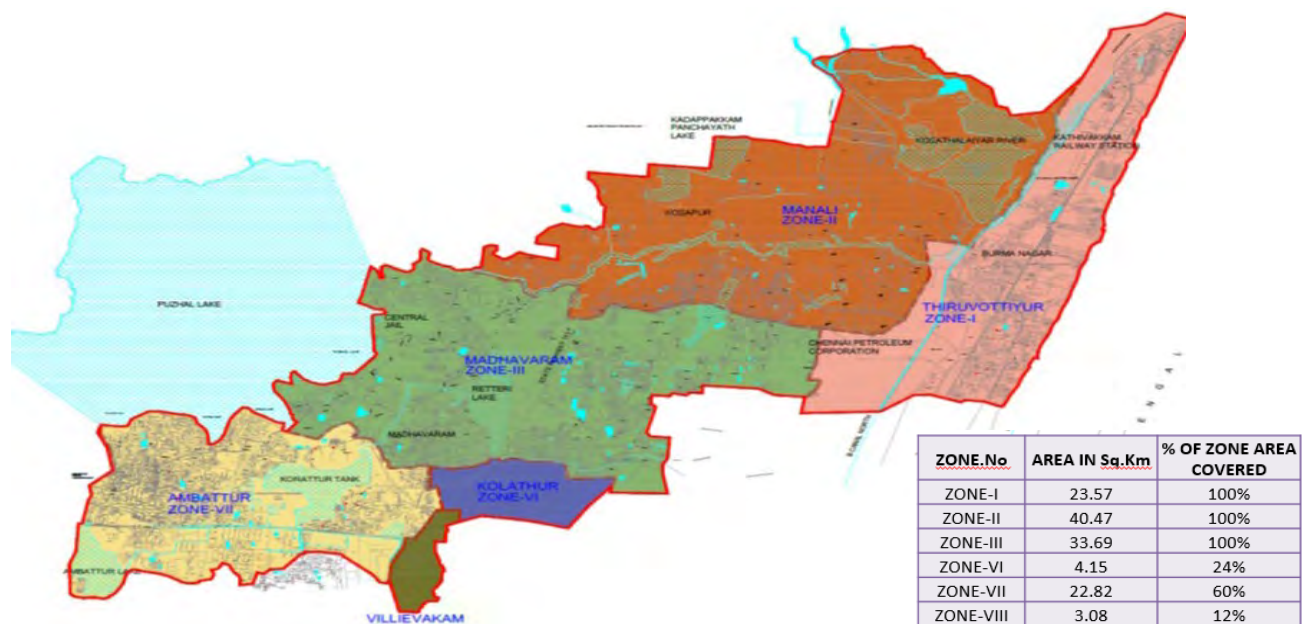
10. **Output 4: Preparedness for pandemic and flood disaster response enhanced in flood-prone low-income urban communities.** The long-term sustainability of the city's improved response to future epidemics and flood disasters in vulnerable communities crucially depends on institutionalizing the processes and mechanisms strengthened under this project. This output supports developing (i) a gender-responsive and integrated response plan for epidemics and flood disaster with standard operating procedures in targeted communities and (ii) a simple system to monitor the functionality of WASH and IPC services and an O&M manual for schools and health centers. The integrated response plan will include special early warnings for locked-down communities to ensure their effective evacuation or sheltering in place and assurance of safety from disasters to prevent panic, physical distancing in rescue centers, the prioritized provision of WASH to rescue and health centers, and emergency management arrangements to sustain health services provided by primary and critical care facilities.

C. Implementation Arrangements

11. JFPR Grant component will be implemented by GCC along with the ADB financed "Integrated Urban Flood Management for the Chennai-Kosasthalaiyar Basin" under the same implementation set up. Executing agency (EA) for the project is Municipal Administration and Water Supply (MAWS) Department of Government of Tamil Nadu, and implementation agency (IA) will be the Greater Chennai Corporation. GCC established a Project Management Unit, and a PIU is established in the storm water drain department of GCC for the project implementation.

D. Purpose this Due Diligence Report

12. ADB requires the consideration of environmental issues in all aspects of the bank's operations, and the requirements for environmental assessment as described in ADB's Safeguard Policy Statement, 2009 (ADB SPS). ADB SPS applies to all ADB-financed and/or ADB-administered sovereign and non-sovereign projects, and their components regardless of the



II. DESCRIPTION OF PROJECT

A. Existing Situation and Practices in Schools and UPHCs

15. The GCC DPR consultants conducted a preliminary site assessment study across all the schools and urban primary health centers included in the subproject scope to identify the existing infrastructures in these 65 Government Schools and 17 Urban Primary Health centers (UPHCs) for providing WaSH facility (list of schools and UPHCs provided in Appendix 2). Site assessment² has been conducted using a checklist-based study and physical observation at subproject sites as most of these places were shut down due to the pandemic and detailed interactions with the students / teachers / community could not be conducted. School-wise assessment is presented in Appendix 3, and UPHC-wise assessment is presented in Appendix 4. The key indicators in the check list includes existing condition for (i) Water Supply, (ii) Toilets, (iii) Hand Wash area and (iv) Drinking water facility. A brief description on how environmental management practices wastewater and solid waste management are implemented currently at these locations is also provided at the end of this section. The findings from the assessment have been discussed in the following sections.

1. Schools

16. **Toilet Facilities.** Around 40 to 60% of school toilets are having accessibility, functionality, privacy and cleanliness standards in line with the National WaSH Standards. Some schools are provided with new toilet facilities with the help of the NGOs. 4 schools with disabled children but not having disabled friendly toilets have been identified. Around 30% of the schools do not have area for construction of additional toilet blocks. The toilets use septic tanks / soak pit arrangements in areas where the sewage lines are not directly connected to the system.



17. **Hand washing facilities.** 85% of schools had outdoor hand washing facilities and remaining 15% are having indoor hand washing facilities. Due to the ongoing closure of the schools

² Due diligence details of (a) Urban Primary Health Center for different zones included as Appendix – 5; (b) Schools as Appendix-6.

(because of the COVID 19 pandemic) the water pipelines, sewage pipelines, water taps and other infrastructure are observed to be damaged. The basic requirements for hand wash including the soaps / liquid hand wash are not available.

18. **Drinking water Facility.** Around 90% of the schools are having RO system for treating the water, which is supplied either by the Chennai metro water or individual bore well. However, it was observed that nearly 30 to 40% of the RO system is not functioning.



19. **Solid Waste Collection and Disposal.** Dust bins for the collection of solid waste are not available. Waste is disposed off via municipal solid waste management system.

20. **Menstrual Hygiene Management (MHM).** Menstrual Hygiene privacy rooms are not available in most of the schools. Nearly 40% of the schools are provided with incinerators for sanitary pad disposal, however it is observed that very few are in working condition. There is no provision for menstrual pad dispenser or separate hand wash facility.

21. **Students with disabilities.** Though the ramp facility to the toilet has been provided in many of the schools, it is not in use, due to the lack of students with disabilities. It was also informed that students with disabilities are joining special schools.

2. Urban Primary Health Centers

22. **Toilet Facility.** Around 90% of the toilet are having accessibility, functionality, privacy and cleanliness standards in line with the National WaSH Standards. However regular cleaning and

staff training of cleanliness may require. Though 90% of the toilets are provided with ramp facility, but it is not suitable for disabled persons.

23. **Hand washing facilities.** Temporary hand washing facility is available, provided with a stainless steel wash facility with small water tank. The soap dispensers are not in working condition.

24. **Drinking water Facility.** Similar to the schools, UPHC are also provided with water supply from METRO or bore wells. Around 90% of the UPHC are provided with the RO facility, however nearly 30 to 40% of the RO system are observed to be not working.

25. **Solid Waste Collection and Disposal.** Infrastructure facilities for disposal of Biological waste and solid waste are not observed in the UPHC. However, it was informed that appropriate procedures are adopted.

3. Existing Environmental Management Practices:

26. **Wastewater disposal.** Wastewater outlets from washing facilities and toilets of schools and UPHCs. are connected to city sewerage system operated by Chennai Metro Water Supply and Sewerage Board (CMWSSB). In the schools and UPHCs that are in areas where there is no existing sewerage system, wastewater is discharged into septic tanks. Sewerage system is expanded continuously by CMWSSB, and as and when sewerage system is available in the area, outlets will be connected to the sewerage system. Of the total 127.80 sq. km of project area of Chennai-Kosasthaiyar Basin, nearly 76% (96.78 sq km) of the area is covered with the sewerage system. Sewerage system is already proposed for the remaining area. Detailed project report (DPR) has been prepared for 12.14 sq.km and is ready for execution, while DPR is under preparation for an area of 18.88 sq km. There are 3 sewage treatment plants of total capacity 250 MLD in operation, and another 31 MLD STP is under construction. CMWSSB is continuously expanding the treatment capacity to meet its demand.

27. **Solid waste management:** Solid waste generated in schools and UPHCs (except biomedical waste) is disposed via municipal solid waste management system operated by GCC. GCC provided door-to-door collection of waste, and waste generated in schools and UPHCs is handed over to the collection vehicles daily. Every day around 5400 metric tons of solid waste is collected from the GCC area and processed and disposed off via various processing and disposal facilities. GCC continuously expanding capacity of its facilities to meet the growing demand.

28. **Biomedical waste management:** Per Bio-medical Waste Management Rules, 2016 of Government of India, "bio-medical waste" means any waste, which is generated during the diagnosis, treatment or immunization of human beings or animals or research activities pertaining thereto or in the production or testing of biological or in health camps. Proper handling, and disposal of biomedical waste is a must as medical waste can be infectious or biohazardous. Urban primary health centers generate biomedical waste from its activities, and this waste is managed as per the above stated Rules, 2016. Accordingly, all the UPHCs in Chennai (there are 140 in total) have made an agreement with common biomedical waste management facilities authorized by TNPCB. There are two such facilities available: GJ Multiclave India Private Limited and Tamil Nadu Waste Management Limited. These agencies collect, transport, process and dispose the waste as per the Rules.


B. Proposed Grant Components

29. Proposed grant components and design considerations for the interventions in each out the four proposed outputs are provided in Table 1.

Table 1: Proposed Grant Output-wise Components and Interventions

Output	Components	Design Considerations for the Proposed Interventions
Output 1: WASH services, products, and training strengthened with behaviour interventions in 65 schools in flood-prone low-income urban communities	Gender-Related Design	<ul style="list-style-type: none"> • Gender-specific facilities and entrances • Privacy-minded stall layouts, doors, and sides • Safe lighting provisions • Easy maintenance/cleanliness • Discreet MHM facilities (i.e., incinerators, washing stations, pad dispensers) • Smaller, child-friendly seats (to support women's role as caretakers)
	Toilet for Disable Students	<ul style="list-style-type: none"> • Toilet design criteria should be in line with the relevant Architectural and Engineering Design Guidelines • Additional space (at least an extra 1m²) with enough space inside for a wheelchair user to enter, turn, close the door and park by the toilet • A wider door (minimum 80 cm wide) • Handrails for support attached either to the floor or side walls • Door handle and seat should be within reach of wheelchair or crutches/stick users, including a fixed raised pan or movable raised toilet seat • An access ramp should be available if toilet facilities are elevated with an ideal gradient of 1:20 (maximum 1:12 if space is limited)
	Water supply	<ul style="list-style-type: none"> • The main tank of the facility has to be easily approachable for service and should be periodically cleaned and treated for pathogens and particles. • There should be separate water tank for toilets and should be periodically cleaned and treated for pathogens and particles.
	Toilets	<ul style="list-style-type: none"> • Toilets doors should be repaired and checked for locks • There should be a separate water storage for the toilet in concrete (secured). Even precast can be considered to expedite the construction. However, the structure should be able to take up the tank which has to be provided • All the water pipelines have to be concealed into walls and not exposed (secured). If the pipeline has to be exposed it should be made of galvanized iron (GI) and properly secured. • All the toilets should have taps and the taps shall be made of GI / High strength plastic. • The sewage pipe line should be re-designed properly with the large services access (pits) and correct flow levels. This is to avoid clogging of toilet sewage pipeline • Most of the schools have the sewage sump and some of the sumps are to be repaired and properly sealed • Floor and wall tilling work of most of toilets has to be repaired

Output	Components	Design Considerations for the Proposed Interventions
		<ul style="list-style-type: none"> Internal and external wall has to be repainted to keep the toilets clean.
	Hand washing facilities, water and soap	<ul style="list-style-type: none"> All the current hand wash facility to be repaired or replaced with new facility. Location of the wash facilities are kept near toilets (both girls and boys) All the water pipelines should be concealed into walls and should not be exposed. The new construction has to be made of precast concrete for various sizes. (Double, triple and four students). And this should be able to install at various heights to accommodate different height of the students. Taps should be installed with secured method. Water supply for the hand wash facilities should be from clean storage. Preferably from the separate water tank of the toilets. In addition to the hand operated piped hand wash facility foot operated hand wash facility with elbow operated soap dispenser also has to be provided to accommodate the COVID19 requirements
	Drinking water	<ul style="list-style-type: none"> RO water treatment system has to be repaired for filters, motors and pipelines. Water dispensing station made of stainless should be provided with proper tap and drain. In addition to the hand operated piped drinking water dispensing facility foot operated drinking water dispensing facility also to be provided to accommodate the COVID19 requirements.

Output	Components	Design Considerations for the Proposed Interventions
	Menstrual hygiene management (MHM)	<ul style="list-style-type: none"> A separate privacy room for menstrual hygiene management should be provided for all the 30 schools having classes from class 6 (grade 5). The privacy room shall be provided with an incinerator with exhaust, hand wash basin with proper water inlet and proper outlet with closed drainage and a menstrual pad dispenser The wall and floor shall be tiled and should be designed for easy maintenance. Incinerators for sanitary pad disposal to be provided Incinerators' capacity will be from five to 10 napkin pads per cycle with a minimum of 200 pads per day. Incinerators, having a length of 2.5 meters, also come with thermally insulated front door. Emission outlets of the incinerators include a metal pipe exhaust on top and flexible steel hose of a minimum length of two meter with clamp provision. Complete burning of napkins only less than 1 g ash per napkin is generated. The exhaust gas meets the solid waste management rules 2016/CPCB guidelines. Ash collection with easily openable and ash disposable  <p>(Representative image) Incinerator</p>
Output 2: COVID-19 IPC and WASH measures strengthened in 17 community health centers in flood-prone low-income urban communities	Water supply	<ul style="list-style-type: none"> The main tank of the facility has to be easily approachable for service and should be periodically cleaned and treated for pathogens and particles. There should be separate water tank for toilets and should be periodically cleaned and treated for pathogens and particles.
	Hand washing facilities	<ul style="list-style-type: none"> New COVID 19 related hand wash locations need to be kept near entrance. Hand wash facility should have pipe connection and proper drain connection. Water supply for the hand wash facilities should be from clean storage. The hand wash facility will be foot operated hand wash facility with elbow operated soap dispenser provided to accommodate the COVID19 requirements.
	Drinking water	<ul style="list-style-type: none"> Foot operated drinking water dispensing facility to be provided to accommodate the COVID19 requirements.
	Waste disposal	<ul style="list-style-type: none"> All UPHC should be supplied with colour coded bin for segregated disposal
Output 3: Surveillance systems for	Mobile Lab for COVID19 and	<ul style="list-style-type: none"> 08 (Eight only) mobile COVID19 and communicable disease sample collection vans. Increase the throughput of current central facility

Output	Components	Design Considerations for the Proposed Interventions
COVID-19 and other communicable diseases improved in flood-prone low-income urban communities.	communicable diseases	
	Mobile lab for water quality test	<ul style="list-style-type: none"> The mobile lab should have the capability of measuring various parameters of water quality like TDS, hardness, pH, residual chlorine, alkalinity, nitrite, turbidity, zinc and Fluoride etc. It should aid in quick on-the-spot identification of the water quality problem. GPS position of the vehicles. Increase the throughput of current central facility
Output-4: Preparedness for pandemic and flood disaster response enhanced in flood-prone low-income urban communities.	Preparedness of flood-prone urban low-income communities to respond to future pandemic	<ul style="list-style-type: none"> Preparation of disaster response plan and standard operating procedures pertaining to the targeted community (low-income urban poor) in Chennai in Kosasthalaiyar Basin A simple system to monitor functionality of WASH and IPC services and operational and maintenance manual in school and health centres.

Source: DPR, GCC

C. Contract Packaging of Goods and Works

30. The project components are proposed to be procured using three goods (supply) packages, one civil work package. There will also be a consultancy services package to procure Implementation Support Consultant (ISC) for enhancing IPC.

- (i) Goods package 1: procure all equipment and consumables for providing WASH and health care systems in schools and UPHCs.
- (ii) Good package 2: procure laptop computers and projectors to be supplied to schools and UPHCs for project outcome related uses.
- (iii) Goods package 3: procure 8 mobile diagnostic labs and 4 mobile water quality monitoring labs including vehicles.
- (iv) Civil works package: works related to installation of the equipment procured, plumbing for water and sanitation, construction of borewells, construction/modification of toilets and privacy rooms etc.
- (v) Consultancy package: procure ISC to support implementation of identified targeted interventions in WASH and IPC in schools and UPHCs, to establish a surveillance system for IPC and to prepare an integrated disaster management and pandemic response plan targeting urban poor. Trainings and awareness campaigns targeting behavioral changes is an integral part of the assignment.

31. List of items to be procured from the market under the grant are given below via the three goods packages. Detailed specifications are included in the bid based on applicable standards and guidelines.

Table 2: Bill of Quantities of Items to be procured

No.	Description	Quantity – numbers
I	WASH related items, equipment, kits and consumables	
1	Foot operated hand wash Sink with elbow operated soap dispenser	385
2	Foot operated drinking water dispensing unit	385
3	PPE kit for cleaning and sanitation staff	55,000
4	Pedal Operated waste collection bin Green / Grey	30
5	Sanitary pads	142,000
6	Pad dispenser	30
7	Consumables liners for waste collection bins	21,600
8	Janitor / Cleaning Cart with 3 mobs color coded	17
9	Floor Cleaning Liquids 5L pack	1,020
10	Toilet Cleaning liquids 5L pack	1,020
11	Pedal Operated waste collection bin Yellow	68
12	Pedal Operated waste collection bin Red	68
13	Pedal Operated waste collection bin Blue	68
14	Pedal Operated waste collection bin Black	68
15	Pedal Operated waste collection bin Green / Gray	68
16	Consumables liners for waste collection bins Yellow	24,480
17	Consumables liners for waste collection bins Red	24,480
18	Consumables liners for waste collection bins Blue	24,480
19	Consumables liners for waste collection bins Black	24,480
20	Consumables liners for waste collection bins Green / Gray	24,480
21	Projector	77
22	Laptop	77
23	Projector screen	77
24	Door foot handle	308
25	Vital Sign for Students	22
II	Laboratory Vehicles, medical and analytical equipment	
1	Mobile Diagnostic labs for Covid-19 sample collection	8
2	Equipment under the mobile lab	
a.	Sample Refrigerator	8
b.	Transport Box (Passive)	16
3	Communicable diseases diagnostic equipment package for central lab	
a.	Real Time PCR system	1
b.	Automated Nucleic Acid Extraction System	1
c.	Immunoassay analyser	1
d.	Laboratory refrigerator (+2°C to +8°C)	2
e.	Ultra-Low Temperature Freezer (-70°C)	2
4	Providing infrastructure for additional equipment such as lab benches, electrical works	Lump sum
5	Mobile Water collection & quality testing lab	4
6	Analytical testing equipment and related item, consumables under the mobile Water collection & quality testing labs	
a.	pH Meter	4
b.	Conductivity Cum TDS Meter (Range Up To 2.0 L PPM)	4
c.	Biological Oxygen Demand (BOD) Incubator	4
d.	Flame Photometer	4
e.	Chemical Oxygen Demand (COD) Digester	4
f.	Turbidity Meter with sensor	4
g.	Single Pan Electronic Weighing Balance	4
h.	Sample storage Refrigerator	4
i.	Transport Box (Passive)	8

j.	Glassware (Beakers, Jars, Pipette etc.)	4sets
k.	Chemicals for water testing (Start-up Consumables-one time supply)	4sets
7	Sample storage equipment for central water quality testing lab package	
a.	Laboratory refrigerator (+2°C to +8°C)	2
b.	Sample Filtration System with Manifold, Dispenser and Pump	1
c.	Rapid Detection System	1
d.	Biological Oxygen Demand (BOD) Incubator (250to300L)	1
e.	Dry Bath Incubator	1
f.	Micro Centrifuge	1
g.	Water bath	1
h.	Bio safety Cabinet class II	1
i	Providing infrastructure for additional equipment such as lab benches, electrical works	Lump sum

D. Details of Civil Works package

32. Based on the school-wise and UPHC-wise assessment conducted, list of works to be conducted in each school and UPHC is identified. A summary of civil works related to these interventions in schools are presented in below table, and detailed facility-wise list is provided in Appendix 5. In UPHC the civil works are only those related to providing water piping to the hand wash and drinking water stations. It may be noted that at present, the civil works are identified, and proposals are designed in outline and further detailed designs will be conducted prior to award of the contract. Footprint of facilities will be specific to each school/UPHC. Proposed works are presented in below table, including both new construction and repair and rehabilitation to existing facilities.

Table 3: Proposed Civil Works

Civil work item	New construction	Repair / modification to existing
	<i>Number of units</i>	
Schools		
Bore wells with pumps	10	2
Toilet rooms	49	10
Urinals	37	5
Disabled friendly toilets,	4	-
Privacy rooms for girl students	7	19
Incinerators for disposal of sanitary pads	17	1
Water storage facilities,	7	
Hand washing stations,	104	
Septic tanks (with fully sealed bottom and sides to prevent seepage of collected sewage and contamination of groundwater)	4	1
Portable water treatment units (RO based)	18	6
Plumbing works for hand wash stations and drinking water	As required in all 65 schools	
Plumbing works for hand wash stations and drinking water	As required in all 17 UPHCs	

Source: Detailed Project Report and Greater Chennai Corporation

III. REGULATORY REQUIREMENTS

A. ADB Safeguard Policy Statement (2009)

33. ADB requires the consideration of environmental issues in all aspects of ADB's operations, and the requirements for environmental assessment as described in ADB SPS, 2009. This states that ADB requires an environmental assessment of all ADB investments.

34. **Screening and categorization.** The nature of the environmental assessment required for a project depends on the significance of its environmental impacts, which are related to the type and location of the project; the sensitivity, scale, nature, and magnitude of its potential impacts; and the availability of cost-effective mitigation measures. Projects are screened for their expected environmental impacts, and are assigned to one of the following four categories:

- (i) **Category A.** Projects could have significant adverse environmental impacts. An EIA is required to address significant impacts.
- (ii) **Category B.** Projects could have some adverse environmental impacts, but of lesser degree or significance than those in category A. An IEE is required to determine whether significant environmental impacts warranting an EIA are likely. If an EIA is not needed, the IEE is regarded as the final environmental assessment report.
- (iii) **Category C.** Projects are unlikely to have adverse environmental impacts. No EIA or IEE is required, although environmental implications are reviewed.
- (iv) **Category FI.** Projects involve a credit line through a financial intermediary or an equity investment in a financial intermediary. The financial intermediary must apply an environmental management system unless and until all projects will result in insignificant impacts.

35. Based on the assessment using the REA checklist (Refer Appendix 1), this subproject is categorized as "C" and accordingly this Due Diligence Report has been prepared.

B. National Environmental Laws

36. **Applicable environmental regulations.** There are various other acts, rules, policies, and regulations currently in force in India that deal with environmental issues that could apply to this subproject (for output 1 and 2). The specific regulatory compliance requirements of the subproject are shown in following table.

Table 4: Applicable Environmental Regulations

Law	Description	Requirement
Environment (Protection) Act, 1986 and CPCB Environmental Standards.	Emissions and discharges from the facilities to be created or refurbished or augmented shall comply with the notified standards	To comply with applicable notified standards

Law	Description	Requirement																										
Water (Prevention and Control of Pollution) Act of 1974, Rules of 1975, and amendments	<p>The act was enacted to provide for the prevention and control of water pollution and the maintaining or restoring of wholesomeness of water. Control of water pollution is achieved through administering conditions imposed in consent issued under this Act.</p> <p>Under this law, it is mandatory to obtain consent from Tamil Nadu State Pollution Control Board (TNPCCB) for discharge from construction activities.</p>	For the renovated or newly constructed Septic Tanks, appropriate mitigation measures should be taken in preventing Seepage of collected sewage from the Septic Tank, which will lead to the contamination of the nearby water sources (including groundwater)																										
Noise Pollution (Regulation and Control) Rules, 2000 and amended	Rule 3 of the Act specifies ambient air quality standards in respect of noise for different areas/zones.	To comply with the CPCB Ambient Noise Standards. (see rule 3(1) and 4(1))																										
Air (Prevention and Control of Pollution) Act, 1981, amended 1987 and it's Rules, 1982.	Applicable for equipment and machinery's potential to emit air pollution (including but not limited to diesel generators and vehicles);	There may be likely air pollution during the construction or repair works involved in this subproject. Care/ mitigation measures have to be taken in minimizing the anticipated impacts.																										
Municipal Solid Wastes Management Rules, 2016	Rules to manage municipal solid waste generated; provides rules for segregation, storage, collection, processing, and disposal.	<p>The solid waste generated at proposed facilities (schools and UPHC) shall be managed and disposed of by following the SWM Rules. Emissions from the proposed incinerators shall comply with the Schedule II C (standards for incineration) of the Rules, provided below:</p> <table border="1"> <thead> <tr> <th>Parameter</th><th>Emission standard</th><th></th></tr> </thead> <tbody> <tr> <td>Particulates</td><td>50 mg/Nm³</td><td rowspan="7">Standard refers to half hourly average value</td></tr> <tr> <td>HCl</td><td>50 mg/Nm³</td></tr> <tr> <td>SO₂</td><td>200 mg/Nm³</td></tr> <tr> <td>CO</td><td>100 mg/Nm³</td></tr> <tr> <td>Total Organic Carbon</td><td>20 mg/Nm³</td></tr> <tr> <td>HF</td><td>4 mg/Nm³</td></tr> <tr> <td>NO₂</td><td>400 mg/Nm³</td></tr> <tr> <td>Total dioxins and furans</td><td>0.1 ng TEQ/Nm³</td><td>Standard refers to 6-8 hours sampling.</td></tr> <tr> <td>Cd + Th + their compounds</td><td>0.05 mg/Nm³</td><td rowspan="2">Standard refers to sampling time anywhere</td></tr> <tr> <td>Hg and its compounds</td><td>0.05 mg/Nm³</td></tr> </tbody> </table>	Parameter	Emission standard		Particulates	50 mg/Nm ³	Standard refers to half hourly average value	HCl	50 mg/Nm ³	SO ₂	200 mg/Nm ³	CO	100 mg/Nm ³	Total Organic Carbon	20 mg/Nm ³	HF	4 mg/Nm ³	NO ₂	400 mg/Nm ³	Total dioxins and furans	0.1 ng TEQ/Nm ³	Standard refers to 6-8 hours sampling.	Cd + Th + their compounds	0.05 mg/Nm ³	Standard refers to sampling time anywhere	Hg and its compounds	0.05 mg/Nm ³
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Law	Description	Requirement		
		Sb + As + Pb + Cr + Co + Cu + Mn + Ni + V + their compounds	0.05 mg/Nm ³	between 30 minutes and 8 hours.
Bio Medical Waste Management Rules 2016	No untreated bio-medical waste shall be mixed with other wastes. The bio-medical waste shall be segregated into containers or bags at the point of generation in accordance with Schedule I prior to its storage, transportation, treatment and disposal.	Bio medical waste management rules has to be adopted for Menstrual hygiene management (MHM)		
Construction and Demolition (C & D) Waste Management Rules, 2016	Rules to manage construction and waste resulting from construction, re-modelling, repair and demolition of civil structure. Rules define C & D waste as comprising of building materials, debris resulting from demolition / re-modelling or repairs.	Construction and demolition waste generated from the subproject construction shall be managed and disposed as per the rules		
Labor Laws	The contractor shall not make employment decisions based upon personal characteristics unrelated to job requirements. The contractor shall base the employment relationship upon the equal opportunity and fair treatment and shall not discriminate concerning aspects of the employment relationship, including recruitment and hiring, compensation (including wages and benefits), working conditions and terms of employment or retirement, and discipline. The contractor shall provide equal wages and benefits to men and women for work of equal value or type.	Appendix 6 provides applicable labor laws including amendments issued from time to time applicable to establishments engaged in the construction of civil works.		
Inter-State Migrant Workmen (Regulation of Employment and Conditions of Service) Act, 1979	Act is applicable to any establishment that employs 5 or more inter-state migrant workers through an intermediary (who has recruited workers in one state for employment at an establishment situated in another state).	Contractor for subprojects to register with the Labour Department in case of hiring of inter-state migrant workers. Adequate and appropriate amenities and facilities to be provided to workers including housing, sanitation, portable water, medical aid, traveling expenses from home to workplace, etc.		

Law	Description	Requirement
Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996	It regulates the employment and conditions of service of building and other construction workers and provides for their safety, health and welfare	This act is applicable for safeguarding the construction labours/ workers engaged in this subproject.
Indian Motor Vehicle Act 2019	Provides for substantive changes in the existing traffic rules and penalties. On the other hand, the bill also provides medical assistance to citizens in case of any road mishap. Moreover, the compensation amount given in case of death/injury has increased	The vehicle used for making the mobile lab should be certified as a mobile laboratory and not any other commercial or load vehicles types
Indian Public Health Standards (IPHS) Guidelines for Primary Health Centers Directorate General of Health Services Ministry of Health & Family Welfare Government of India	The performance of Primary Health Centres are assessed against the set standards with respect to functional requirements for building, manpower, instruments and equipment, drugs and other facilities etc.	Applicable to all urban primary health centers.

C. Manual and Guidelines on Sanitation and Menstrual Waste Management

37. **National School Sanitation Manual.** The School Health Policy and the Manuals propose to view health in schools in a holistic and integrated manner by utilizing all possible educational opportunities for health promotion including formal and informal approaches in curriculum pedagogy. Providing a safe school environment, an activity oriented health education curriculum to avoid health-related risk behavior, ensuring physical fitness activities and sports, providing nutritious snacks in the school canteen, ensuring access to primary health care services, integrated family and community activities and a staff health promotion policy are some of the expectations that a school should fulfill as was advised earlier in a circular issued to all schools regarding the setting up of Health Clubs. Besides this, the safe and appropriate disposal of waste and conservation of green spaces are the main objectives of this Manual.

38. **Guidelines on gender issue in sanitation from Ministry of Drinking Water and Sanitation (GOI).** The approach to the toilet should feel and be safe for women and girls e.g. ensuring that there are no public gathering spots on the path to the toilet where men gather socially. Adequate water and space inside the toilet should be ensured for the women users to change napkins/cloth and to wash themselves.

39. **Guidelines for management of sanitary waste issued by Central Pollution Control Board (CPCB) in May 2018 per the Municipal Solid Waste Management (MSWM) Rules, 2016.** Guidelines summarizes the provisions related to sanitary waste and menstrual hygiene management in MWSM Rules, 2016, Menstrual Hygiene Management National Guidelines, 2015, and Menstrual Hygiene Management (MHM) in the Swachh Bharat Gramin Guidelines, 2017, and summarizes the current practices. It also recommends waste management options, and roles of

various stakeholders in the sanitary waste management. Waste management options include: installation of electric incinerators in schools/girls toilets in various establishments like schools, community toilets, etc., to dispose sanitary napkins. Guidelines also provide specifications and pollution control norms for small-scale electric incinerators and requires compliance with general emission standards mentioned under Standard for incineration section in SWM Rules, 2016. Incinerators proposed in this grant component confirms to these guidelines.

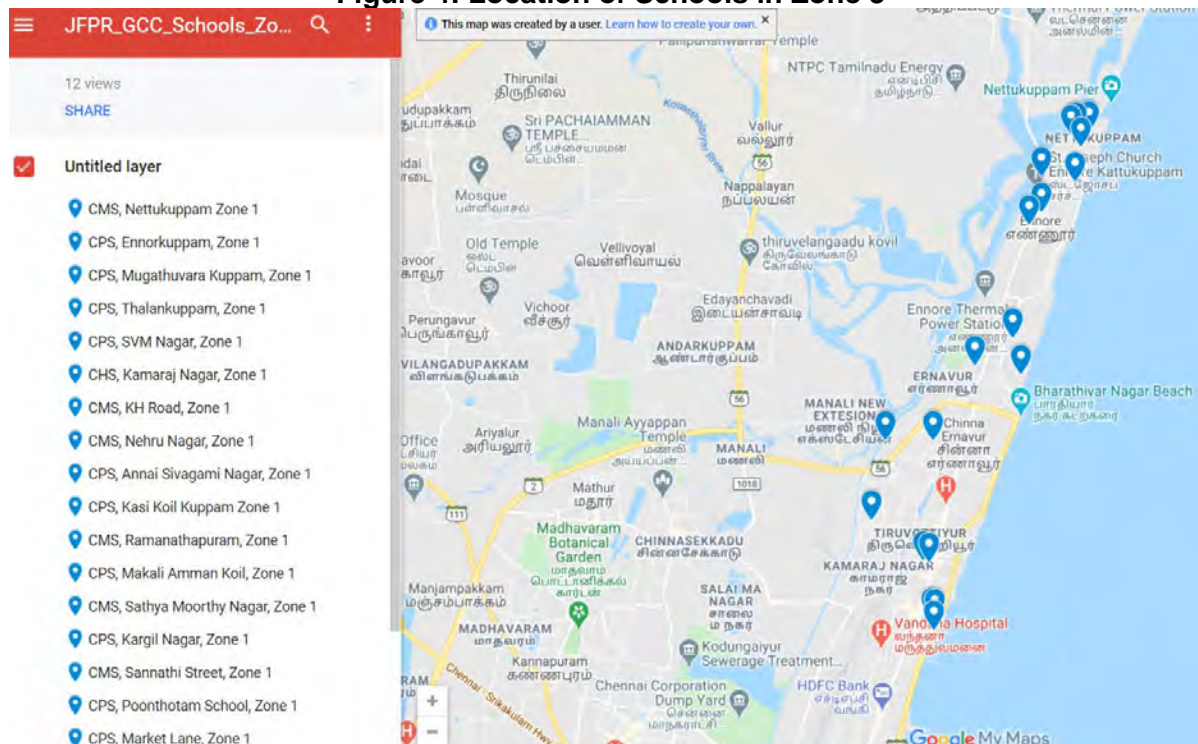
42. GCC has proposed to have improved Infection Prevention and Control (IPC) and WaSH facilities in the government schools and urban primary health centres located in the Kosasthalaiyar River Basin zones, Thiruvotriyur (Zone 1), Manali (Zone 2), Madhavaram (Zone 3) and Ambattur (Zone 7). The 65 Government schools and 17 Government Urban Primary Healthcare Centers (UPHC) where the subproject will be implemented are generally located in the urban and semi-urban areas and are not in the vicinity of any reserved forest or protected areas. Zone-wise location of schools is shown in Figure 2 to 5.

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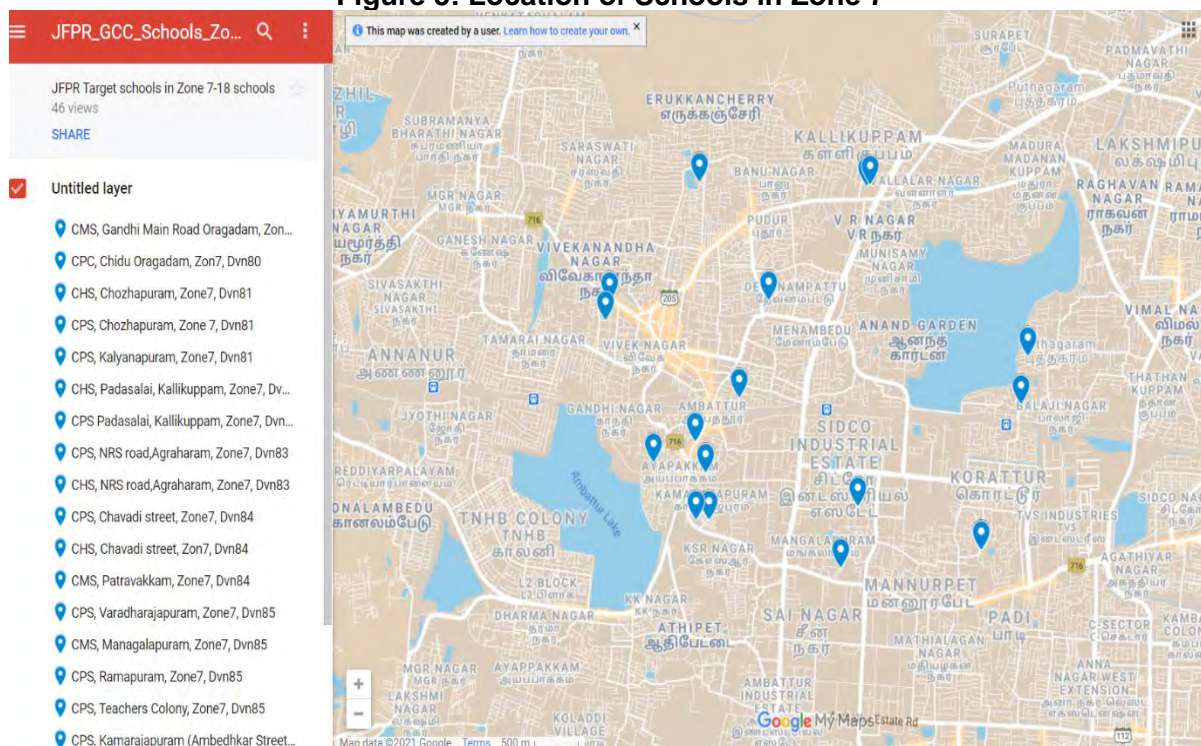
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Figure 4: Location of Schools in Zone 3



<https://www.google.com/maps/d/edit?mid=1jUlaaifo5U18li-omkeMp0RzVemdNKH0&usp=sharing>

Figure 5: Location of Schools in Zone 7



<https://www.google.com/maps/d/viewer?mid=1xUkWLPSmtqoREBTgliREjUcaHidUneFK&hl=en&usp=sharing>

A. Physical Environmental

43. **Topography.** The subproject area (Kosasthalaiyar basin) boundary in the northern part of GCC located at latitudes 13°05'40" to 13°12'50" and Longitudes 80°08'20" to 80°19'20" is characterized by flat terrain and sloping gently from west to east direction. The elevation ranges between 27m msl to 1m msl.

44. **Geology and Soils.** The Kosasthalaiyar River basin has varied geology. The western part is underlain by hard crystalline rocks (Precambrian) while the eastern part contains sedimentary rocks, alluvium, and Laterite. Sand and clay are predominant within the subproject area. Specific gravity was found in the range of 2.35 to 2.66. Natural moisture content in the soil was found in the range of 17 to 40%.

45. **Climate.** The subproject area experiences tropical wet and dry climate. For most of the year, the weather is hot and humid. The hottest part of the year is late May and early June with maximum temperatures around 38°C to 42°C. The coolest part of the year is January, with minimum temperatures around 18°C to 20°C.

46. **Rainfall.** The subproject area gets most of its seasonal rainfall from the north-east monsoon, from mid-September to mid-December. The most prevailing wind direction is the Southwesterly between the end of May to end of September and the Northeasterly during the rest of the year. The maximum amount of monthly rainfall (1104.2 mm) occurred during the month of November 2015 and maximum amount of daily rainfall (320 mm) occurred on 2nd December 2015.

47. **Air Quality.** Based on the land-use pattern, 24-hour Ambient Air Quality (AAQ) monitoring has been conducted at 5 locations in the subproject area, in April 2019 and analyzed for the key

parameters including SO₂, NO₂, PM₁₀, PM_{2.5}, O₃, CO, and NH₃ by GCC through their Consultants. It was observed that the PM₁₀ was in the range of 61 to 112 µg/m³ slightly exceeding the standard (100 µg/m³) at three monitoring locations per National Ambient Air Quality Standards, 2009 (NAAQS). All the other parameters monitored were within the NAAQS. In comparison with the World Bank Group's (WBG) Environment, Health and Safety (EHS) General Guidelines 2007 (Table 1.1.1), PM₁₀ is exceeding the guideline value (50 µg/m³) at all monitoring locations, while PM_{2.5} is exceeding the guideline value (25 µg/m³) at four out of five locations.

48. **Noise Quality.** Ambient noise was measured by GCC through their consultants at 5 locations in silent, commercial and industrial zones for 24 hours duration in June 2019 to determine the ambient noise quality around the subproject area. From the inference, it is evident that the ambient noise levels (both day and night) in the study area (39.2 – 64.3 dB(A)) are well within the stipulated limits for respective zones as per the Noise Pollution (Regulation and Control) Rules 2000 (40 – 75 dB(A)) as well as WBG EHS Noise Level Guidelines (45 – 70 dB(A)).

49. **Ground Water Quality.** Groundwater samples were collected and analysed by GCC through their Consultants in June 2018 for pH, Total dissolved solids (TDS), Sulphate (SO₄), Chloride (Cl⁻), Iron (Fe) and Lead (Pb) at 5 locations (Ambattur (Hand pump), Pattaravakkam, Retteri, Manali and Ennore) covering the subproject area. From the observation, the concentration of TDS, Chloride and Sulphate were recorded high for all the sampling stations. Other parameters are well within the limits in comparison with the drinking water standard (IS 10500).

50. **Surface water Quality.** Water samples has been collected from 10 surface water bodies (Ambattur Lake, Korattur Lake, Retteri Lake, Thanikachalam Drain, Puzhal Surplus – 1, Puzhal Surplus – 2, Kosasthalaiyar watershed, Buckingham Canal near Ennore, Surapet Lake and Hari krishnapuram Pond) within the subproject area and analysed for the key water quality parameters as per IS 2296 by GCC through their Consultants in January 2018. The outcome of the analysis indicates that Ambattur, Korattur and Retteri surface water can be used for drinking water purposes with proper treatment as the test results are within prescribed limits. In Thanikachalam drain, due to sullage discharge, the BOD concentration was observed to be high. Similarly, due to industrial effluent discharge from thermal power plants and fertilizer industries located closed to Ennore, high content of TDS, Iron (Fe), Chloride (Cl), Manganese (Mn) are observed in Kosasthalaiyar Water Shed and Buckingham Canal.

B. Biological Environment

51. The project area includes 7 major lakes (namely Ambattur Lake, Korattur Lake, Retteri Lake, Madhavaram Lake, Ariyallur Lake, Kadapakkam Lake and Sadayankuppam Lake) connecting surplus / macro drains. Of the seven lakes surveyed, three lakes fall under the peri-urban limit, the Ariyalur Lake, Kadapakkam Lake and the Sadayankuppam Lake. Four lakes, the Ambattur Lake, Korattur Lake, Retteri Lake, Madhavaram Periyathoppu fall under the urban limit, where the landuse is dominated by residential and industrial. For flora and fauna assessment, a rapid ecological and environmental survey was conducted in September and October 2020 by the Biodiversity Specialist, consultant using a comprehensive checklist which was prepared to capture the information of the existing flora and fauna in the project area. The checklist included: (i) information pertaining to flora: its canopy composition; the condition of each vegetation tier; the ecological trend of each tier; special plants (rare, threatened, local, distribution limits, anomalies); and the threats to the vegetation, impacts upon it and management needs, and (ii) information pertaining to fauna: the relative abundance, condition and trend of birds, bats, reptiles, frogs, fish and invertebrates; special fauna; and management needs. The magnitude of the threats and impacts and their urgency for management are subjectively quantified.

52. **Flora.** Floral species recorded in the subproject area includes Marcophytes, Herbs/weeds/climbers, Shrubs and Trees. Secondary information from the literature/ published documents/ reports have also been referred for the assessment. Based on the floral assessment, of the 73 floral species 10 species are macrophytes, 35 species are herbs and climbers, 10 species are shrubs and 18 species of trees. The macrophytes are observed in the lake areas located at Korattur, Ariyallur and Kadapakkam. For other locations, based on the available area/ space, Herbs/ weeds/ climber, Shrubs and Trees are evenly distributed. It is also observed that all the identified floral species are categorized as least concern (LC) per International Union for Conservation of Nature (IUCN) red list of threatened species. The subproject activities will be mostly confined in the school and UPHC premises. There are no trees or protected flora species in the subproject locations which will be impacted during construction and O&M phase.

53. **Fauna.** Faunal species recorded include butterflies, fishes, amphibians, reptiles, birds and mammals. Based on the assessment, the Ariyalur Lake and Kadapakkam Lake has the maximum species diversity, which is followed by Sadayankuppam Lake, though Sadayankuppam Lake is smaller in size it has good vegetation cover, this lake is located within 100 mts from the Kosasthalaiyar River. The presence of species like *Nelumbo nucifera*, *Nymphaea pubescens* and *Nymphaea nouchali* in all the three lakes indicate the water quality is good and can be used for drinking with minor treatment. The Ariyalur Lake, Kadapakkam Lake and Korattur Lake had good numbers of macro fauna compared to the other lakes, all the three lakes represent more than 54 species of birds of the 61 species recorded all together, which shows a healthy eco-system in the project area. All the identified fauna species are categorized as least concern (LC) per International Union for Conservation of Nature (IUCN) red list of threatened species. The subproject activities will be mostly confined in the school and UPHC premises. There are no specific species of animals in the subproject locations which will be impacted during the construction and O&M phase.

54. **Ennore Creek.** Chennai is a coastal city, situated on east coast of India, along Bay of Bengal. Kosasthalaiyar river flowing through the project area discharges into Ennore Creek, a backwater shallow water body (2-3 m deep), located on the coast, at the northern end of project area. Once a dense mangrove swamp, due to various human activities and interferences, the Creek is at present is in highly degraded state. Mangroves are only present in patches, and are highly fragmented and disturbed, and stunted growth observed at most of the places due to heavy siltation and high salinity.

C. Biodiversity Assessment

55. The Integrated Biodiversity Assessment Tool (IBAT) has been utilized for identifying the critical habitat / hotspots/ areas having rich biodiversity in the subproject area. Screening and assessment indicated two protected areas within 50km radius from the project area: (i) Guindy National Park, 18 km southwest of project area, and (ii) Pulicat Bird Sanctuary, 27 km north of project area. Details are provided below. Given their location far away from project area, project activities unlikely to interfere with these environmentally sensitive areas, and therefore no adverse impacts anticipated.

56. **Pulicat Lake (Pulicat Bird Sanctuary).** The vegetation in the islands are dominated by the Tropical Dry Evergreen Forest (TDEF) species, Mangrove and Mangrove associated flora and the Halophytes. A total of 180 floral species are found in the Pulicat Lake, of which 117 species are dicotyledonous plants, 51 species are of monocotyledonous plants. 6 species of mangroves and 35 mangrove associated species are recorded, the most dominant species was *Excoecaria agallocha* now its *Avicennia marina*. TDEF species such as *Manilkara hexandra*, *Albizia amara*,

Strychnos nux-vomica and *Maba buxifolia* are observed in good numbers. There are 88 species of Zooplankaton, 81 species of Benthos. 12 species of prawns, 19 species of crabs and 168 species of finfish are recorded from and Pulicat Lake. 115 species of birds are listed from both water (aquatic) as well as land (terrestrial) in the Pulicat Bird Sanctuary.

57. **Guindy National Park.** It is a protected area of Tamil Nadu, located in Chennai, India, is the 8th smallest National Park of India and one of the very few national parks situated inside a city. 350 species of plants include shrubs, herbs, climbers, and grasses, there are more than 24 variety of trees, including the sugar-apple, *Atlantia monophylla*, wood-apple, *Annona squamosa*, *Atlanta monophylla*, *Feronia limonia*, *Azadirachta indica* and many others are found in this park. The park and the diverse vegetation provides an ideal habitat for over 150 species of birds. 9 species of amphibians, 14 species of mammals, 3 species of tortoise and turtles 60 species of spiders and 60 species of butterflies.

D. Socio-economic Environment

58. **Demography.** As per census 2011, the population in the Kosasthalaiyar River Basin is 25,79,645. Within the subproject area, the urban population is observed to be high in the Zone VII Ambattur and low in Zone II Manali. Rural population is almost nil for Zone I Tiruvottiyur and high in Zone VII Ambattur. Nearly 3.68% and 96.32% lives in rural and urban areas respectively.

59. **Sex ratio.** Among the total population, male and female sex ratio are 50.27% and 49.73% respectively.

60. **Work Force.** Highest workforce population is in Zone VII Ambattur and lowest work force population is in Zone II Manali. Among the total work force, male and female work force are 77.23% and 22.77% respectively.

61. **Land use.** The land use pattern was dominated by the residential (41.62 sq km), followed by commercial cum residential (20.61 sq km), Industrial (19.52 sq km), Water bodies (13.71 sq km) and CRZ area (3.19 sq km).

62. **Transport and Traffic.** There are four types of roads in the project area that provide regional connectivity namely National Highway (NH), State Highway (SH), Major District Roads (MDR) and Other District Roads (ODR). National Highways and State Highways are connected by the internal roads. These include Thiruvottiyur high road, Manali high road, Madhavaram high road, Ennore high road, etc., Sub Urban rail transport exist in Zone 7 (Ambattur) and Zone 1 (Thiruvottiyur). Metro rail proposal from Chennai Airport to Zone 3 Madhavaram is under process.

63. **Education and Health.** Among the total population, 90.17% is educated out of which male literacy rate is 93.70% and women literacy rate is 92.47%. Within the subproject area, Zone VII Ambattur has highest literate population and Zone II Manali has lowest literate population.

64. **Water Supply.** Piped water supply system exist in Zone I (Thiruvottiyur) and Zone VII (Ambattur) of the subproject area. In Zone II (Manali) and Zone III (Madavaram) areas, construction of piped water supply system is in progress.

65. **Sewerage System.** The wastewater system for the City has been divided into five drainage zones. These zones of macro systems covering the entire City has independent zonal collections, conveyance, treatment and disposal facilities. (i) Zone-I of sewerage system covers the areas of Tondaiarpur, Washermenpet, Royapuram, George Town, Chindadripet etc. The

sewage collected from this Zone-I is drained to the treatment plant located at Kodungaiyur (Zone-I Plant) which was commissioned in 1991 for the capacity of 80 MLD (ii) Zone-II is the largest of the five macro systems and serves the Central and Northern portions of the City. The area served are Nungambakkam, Chetpet, Kilpauk, Egmore, Purasaiwalkam, Ayanavaram, Perambur, Vyasarpadi, Sembium, Kolathur, Periyar Nagar, Jawahar Nagar and Kodungaiyur etc. The wastewater generated in this Zones is drained into the treatment plant at Kodungaiyur (Zone-II Plant) which was commissioned in the year 1989 for the capacity of 80 MLD. (iii) Zone-III comprises Thyagaraya Nagar, Kodambakkam, Arumbakkam, Anna Nagar and Koyambedu. The wastewater generated in this Zone is conveyed to the treatment plant at Koyambedu (Zone-III Plant), which was commissioned in the year 1978 for the capacity of 34 MLD. (iv) Zone-IV is the smallest of the macro systems covering Ashok Nagar, Saidapet, Jaffer Khanpet, K.K. Nagar and Nesapakkam. The wastewater generated in this Zone is conveyed to the treatment plant at Nesapakkam (Zone-IV Plant) which was commissioned in the year 1974 for the capacity of 23 MLD. (v) Zone-V areas covered are Icehouse, Mylapore, Adyar, Guindy, Velacherry, Gandhi Nagar, Indra Nagar etc. The wastewater collected in this Zone is conveyed to the treatment plant at Perungudi (Zone-V Plant) which was commissioned for primary treatment only in the year 1980 for the capacity of 45 MLD.

66. Out of 127.80 sq km of the subproject area, nearly 96.78 sq km area is covered with the sewerage system (work is commissioned and in operation). For the remaining 31.02 sq.km, DPR is prepared and ready for execution for 12.14 sq.km and DPR is under preparation for an area of 18.88 sq km. In Kodungaiyur, 3 STP units having an individual capacity of 110 MLD, 70MLD and 70MLD is in operation. In Thiruvottiyur, 31 MLD STP is under construction.

67. **Industry.** The subproject area is known for industrial activities; small and medium scale manufacturing industries are functioning in Ambattur Industrial Estate. In Thiruvottiyur, major industries are Chennai Petroleum Corporation Limited (CPCL), Madras Fertilizers Limited (MFL), Toshiba Limited, Manali Petro Chemicals Limited, SRF Limited, Ashok Leyland, Hinduja Foundries, Gulf Lubricants limited, Madras Rubber Factory Limited, etc.

V. SCREENING OF POTENTIAL ENVIRONMENTAL IMPACTS

68. The proposed intervention is a small-scale construction activity within the school and UPHC premises. The proposed intervention shall include repair/ restoration/ retrofitting of the existing toilet blocks, provision of drainage/ sanitary facilities, water supply and electric connection. The implementation of the proposed interventions shall result in some environmental impacts typical to small construction activity even though the proposed facility is compatible with the existing activities taking place at these sites. The land for development of proposed interventions/facilities is available inside the existing school and UPHC premises, which is free from any encumbrances.

69. Subproject is unlikely to have any notable impacts either due to location or design. Proposed activities are located within existing premises of identified schools and UPHCs, and subproject design follows the facility design standards, and aspects related to drinking water quality, wastewater discharge from toilets and wash, solid waste management including biomedical waste, occupational health and safety etc., have already been considered in the subproject design. Most of the anticipated impacts are related to construction, and are mainly due to (i) the disposal of the construction and demolition waste generated from the construction activities, (ii) labor management, (iii) material handling, (iv) occupational and community health and safety aspects (including COVID 19 prevention and control) in the construction area, (v)

transportation of the construction materials, and (vi) air and water pollution from construction activities. These are typical impacts of any construction activity, and significance of which depends on the scale and location of activities. Given the small scale works, conducted within the premises of existing facilities, likely impacts are not significant. Following good construction practices and Implementation of general construction measures, will further mitigate/minimize the impacts. These are outlined in the Environmental Code of Practice for Project Construction Works.

70. During the project operation, there may be minor impacts due to (i) Solid waste management (generated from the schools and UPHCs), (ii) Bio medical waste management, (iii) Discharge of sewage water, (iv) health and safety of the students and staffs and (v) quality of water supply. As these aspects are duly considered in the design, no notable impacts are anticipated.

A. Location Impacts

71. All the schools and UPHCs located in the Kosasthalaiyar River Basin are located within low to medium density populated areas. Gaining free access and movement of workers, vehicles and other construction related machinery would not be an issue that will be dealt with by obtaining requisite permissions before commencement of construction works on site. If required, Identity cards & vehicle permits shall be provided by the contractor for all such movement to and from the site. None of the schools or UPHC's are located in a sensitive area and subproject activities in the identified locations will have minimal or no impacts.

B. Design Impacts

72. Most of the activities involve simple renovation and retrofitting works and they have been planned to ensure minimum or negligible impacts on environment. (a) Water will be mainly sourced from municipal water supply or existing borewells, except at 10 schools/UPHCs where new bore wells are proposed; groundwater abstraction will be minimal (b) Drinking water will be treated using small onsite portable treatment facilities to meet the standard requirements (c) appropriate safety measures for septic tanks / sewage sumps to be located in school (d) Biomedical waste management will be conducted as per the statutory requirements and suitable number of collection bins and other resources will be identified and allocated in advance, and collected waste will be handed over to agency authorized by Tamil Nadu State Pollution Control Board to dispose the biomedical waste as per the standards / rules. (e) solid waste / construction waste will be re-used or re-cycled where possible. Disposal will be made at authorized locations. Considering that the design specifications, installation and operation of the proposed Small on-site incinerators for sanitary pad disposal will be in compliance with the applicable CPCB Guidelines, air pollution potential is minimal and will be within the applicable standards. Small amount of ash (5%) that is generated can be handled easily and disposed via solid waste management system. Implementation support consultant of the JFPR grant will also conduct training programs to students and staff in use and operation of incinerators.

73. All the goods, equipment including Mobile water quality and medical diagnostic laboratories will be procured, mobilized/erected, and operated and maintained as per the applicable government standards and protocols, including handling and management of infectious/hazardous chemical/materials and wastes that used/generated during the process. Procurement of appropriate personal protection equipment is included. Further implementation support consultant (ISC) is also being engaged to provide technical assistance, training and

capacity building is provided standard operating procedures for all the activities under WaSH and IPC. Therefore, no adverse impacts envisaged.

C. Pre-Construction and Construction Impacts

74. As stated above, most of the impacts anticipated are related to construction activities. The impacts during the proposed construction works are generic to the construction activities and are not expected to be significant. Proposed works at the schools and primary health centres are of small scale, conducted with small team of workers and mostly manually. Construction material requirement, usage of construction equipment and generation of waste/debris will be minimal. Key impacts during construction are discussed below. The generic construction measures, including environmental impact mitigation measures, that are to be followed by the contractor are outlined in the Environmental Code of Practice (ECOP) for Project Construction Works.

- (i) **Construction Schedule and Method.** As per the proposed design, the construction activities will take approximately 6 months. The infrastructure will be constructed manually as per the design specifications. Excavated soil and debris from construction and repair activities of septic tanks, toilet blocks, etc., will be reused to the maximum extent possible. There are no asbestos containing materials (ACM) used in the existing buildings, and therefore no ACM envisaged in demolition or repair works. In unlikely case of encountering ACM, it needs to be handled based on international best practice such as the World Bank's Good Practice Note on Asbestos: Occupational and Community Health Issues dated May 2009 and national regulations on ACMs. Materials will be brought to site by trucks and will be stored on unused areas within the school and UPHC premises and nearby vacant areas (with appropriate written permission of the land owner). The working hours will be 8 hours daily, and night works may be considered if the works likely to interfere with functioning of school / UPHC or in case of urgency. Night works will taken up only necessary safety measures, and avoiding interference / disturbance to surrounding residential areas. Contractor will procure material or mobilize equipment, if any, only when it is used, and will not unduly occupy the premises. The contractor will also need to remove all construction and demolition wastes on regular basis.
- (ii) **Consents, permits, NOCs, etc.** Subproject does not require any clearances or permissions such as environmental clearance from regulatory authorities. PIU and contractor need to check with concerned authorities for construction related permissions and obtain prior to start of construction.
- (iii) **Social and Cultural Resources.** There is a risk that any work involving ground disturbance can uncover and damage archaeological and historical remains. However, in this project, excavation work is very limited, and works are to be conducted within the existing facilities. No notable risk envisaged. Chance find protocol, however, included in construction ECOP.
- (iv) **Sites for construction work camps and areas for stockpile, storage and disposal.** The proposed interventions are within the existing school and UPHC premises where there is vacant space for construction work camps. However, for health and safety reasons, no workers camps / accommodation will be established in premises of schools if they are functional during construction works.
- (v) **Sources of construction materials.** Moderate amounts of gravel, sand and cement will be required for this project. The contractor will be required to procure construction materials from government authorised sources.

- (vi) **Access.** Hauling of construction materials and operation of equipment on-site can cause traffic problems. Proposed works will be confined to existing premises, and will not interfere with traffic or access. Material requirement is minimal, and therefore no significant material or waste transport activity is envisaged. Impacts on access will be minimal.
- (vii) **Impacts on Water Quality.** Most of the schools and UPHC does not have water bodies in the vicinity. Construction work area, including material and waste/debris will be properly protected to avoid entry of rain water or water logging of work sites. Temporary barriers or drains will be provided to contain silt laden run off. No notable impact envisaged.
- (viii) **Impacts on Air Quality.** There is potential for increased dust particularly during summer/dry season due to construction activities including stockpiling, transport, disposal of construction materials/debris. Emissions from vehicles used for transporting workers, construction materials and debris/materials to be disposed may cause increase in air pollutants within the construction zone. These are inherent impacts which are site-specific, low magnitude, short in duration and can be mitigated.
- (ix) **Noise and Vibration Impacts.** Most of the construction activities shall be done manually and no major construction machineries/ equipment's are supposed to be used therefore no significant noise and vibration impacts are expected.
- (x) **Impacts on Flora and Fauna.** As per the proposed designs, tree-cutting is not required for any of the project sites. The subproject has no direct and indirect impact zones and no diverse ecological biodiversity is found within the subproject area thus impacts on flora and fauna are not be envisaged.
- (xi) **Impact due to Waste Generation.** Constructions activities will result in excavated soils, construction materials and solid wastes (such as removed concrete, wood, packaging materials, empty containers, oils, lubricants, and other similar items). No major demolition activities envisaged in the project. Debris / waste material /soil will be reused to the extent possible, and surplus will disposed at identified sites safely as per ECOP provisions.
- (xii) **Impacts on Occupational Health and Safety.** Workers need to be mindful of occupational hazards. Exposure to work-related chemical, physical, biological and social hazard is typically intermittent and of short duration. Potential impacts are negative and short-term but reversible by mitigation measures. Overall, the contractor should comply with IFC EHS Guidelines on Occupational Health and Safety (this can be downloaded from <https://www.ifc.org/wps/wcm/connect/29f5137d-6e17-4660-b1f9-02bf561935e5/Final%2B-%2BGeneral%2BEHS%2BGuidelines.pdf?MOD=AJPERES&CVID=jOWim3p>
- (xiii) **Health and safety issues during sanitary systems / septic tanks repair.** Proposed works include repair/rehabilitation of sanitary lines, toilets and five sewage sumps. There is a risk of hazardous working conditions including oxygen deficiency and harmful gaseous emissions (hydrogen sulphide, methane, etc.), especially in works related to sewage sumps. manual cleaning will not be adopted, and workers will be provided with appropriate equipment, including PPEs. Oxygen cylinder masks will be provided for emergency use.
- (xiv) **COVID-19.** WHO has declared COVID-19 as a pandemic which has affected entire world including India. In view of the prevailing COVID-19 pandemic, the contractors and workers would need to take additional measures to avoid the spread of the disease and shall follow various guidelines/guidance notes issued by the national/state government, WHO, ILO, World Bank/IFC from time to time. As

described in these guidelines, the Contractors shall undertake a COVID risk assessment of project area and prepare a COVID Response and Management Plan (C-R&MP) and submit to GCC and PSC for approval. A brief guidance on “To Do” List prepared from these documents is provided in Appendix 7.

- (xv) **Post-Construction Impacts.** Site clean-up is necessary after construction activities. Contractor will be required to clear the site of any material, debris, waste; fill/restore up all excavated areas, undulating and loose soil surfaces, drainage lines etc.

75. **O&M Impacts:** The operation and maintenance of improved facilities in schools and health centres unlikely to have any significant impacts. Facilities require routine maintenance. O&M impacts may be mainly due to (i) improper handling and disposal of biomedical waste, (ii) not adhering to operating protocols of laboratory equipment and chemicals, (iii) non / inappropriate usage of personal protection equipment, and (iv) poor and unsafe operation / maintenance of sanitary lines, drains, and septic tanks. GCC will ensure that facilities will be properly operated and maintained. Standard operating procedures for water, wastewater, waste including bio-medical waste management will be implemented. Appropriate solid waste management practices will be adopted including: segregation of waste at source, and disposal via municipal solid waste management system; handling, storage and disposal of biomedical waste according to Biomedical Waste Management Rules 2016; regular cleaning and safe maintenance of sanitary systems and drains will be ensured. Indiscriminate handling and disposal of chemicals / harmful substances in mobilize laboratories may have impact on public health and environment. Though the quantities to be handled are very small, following standard procedures as per the equipment and substance manufactures, following MSDS (material safety data sheet) protocols will mitigate the impacts. Operation of the incinerators as per the design/manufacturers standard operating procedures, along with regular and preventive maintenance is necessary to ensure air emissions are within the standards. GCC will enter into an annual maintenance contract (AMC) with a competent agency; this will ensure good operating conditions.

D. Implementation Arrangements

76. The proposed JFPR grant component will be implemented along with the ADB funded “Integrated Urban Flood Management for the Chennai - Kosasthalaiyar Basin” to which the grant is attached. The implementing arrangement will same for both the grant and loan projects. EA for the project is the MAWS Department of GOTN and GCC is the IA. A PMU reporting to the MAWS Department shall be established within GCC and a PIU shall be established in the storm water drain department of GCC. An Executive Engineer in the PIU shall be the nodal officer for environmental and social safeguards who will be responsible to oversee all safeguard related activities (including the JFPR subproject components). PIU shall have an Environmental Unit headed by a dedicated environmental officer appointed to manage project’s compliance with environmental safeguards requirements of ADB SPS (including the JFPR subproject components). He/She will be supported by the environmental expert and the environmental safeguards support staff of the PSC. For the civil contract package under the JFPR the contractor’s environmental safeguards officer and safety engineer/ accident prevention officer shall be responsible for site supervision and EHS management.

77. The PMU shall ensure Environmental Code of Practice for Project Construction Works for the JFPR subproject components are implemented as agreed while the PIU shall have overall responsibility for implementing environmental safeguards including the JFPR subproject requirements by monitoring and ensuring compliance with ADB’s Safeguards Policy and government requirements and ensuring integration of environmental safeguards in all documents,

particularly in tender documents. PIU shall also prepare and submit to ADB semi-annual environmental monitoring reports, in which the implementation status of the JFPR subproject components shall be included.

VI. ENVIRONMENTAL CODE OF PRACTICE FOR PROJECT CONSTRUCTION WORKS

A. Environmental Code of Practice for Project Construction Works (ECoP)

78. The purpose of the Environmental Code of Practice for Project Construction Works (ECoP) is to ensure that the activities are undertaken in a responsible and non-detrimental manner.

79. ECoP will be updated by the contractor during the detailed design phase. A copy of the ECoP must be kept on work sites at all times. This ECoP will be included in the bid documents and will be further reviewed and updated during implementation. Non-compliance with, or any deviation from, the conditions set out in this document constitutes a failure in compliance.

Table 5: Environmental Code of Practice for Project Construction Works

Sl. No	Project Activity	Potential Impact	Mitigation Measures	Responsible for Implementation	Responsible for Supervision	Frequency of monitoring
Pre-Construction Stage						
1.	Approvals Licenses and Permits	Illegal activity	<ul style="list-style-type: none"> • All necessary approvals, permits and licences required by the state and local legislation will be obtained prior to commencing of the construction activity. • All approvals, permits and licences shall be maintained and complied with during the construction period. • Should there be any changes to the project which would require additional permits or licences, these shall be obtained 	Contractor shall obtain all necessary licenses and permits to carry out the construction activities	PSC/PIU	Prior to the start of the construction activity and at the regular licenses/ permits renewal time
2.	Loss of land	No additional land will be required, as all schools and UPHC construction works will be done within the school premises	<ul style="list-style-type: none"> • Resettlement and/or land acquisition problems are not anticipated in the construction activities within the schools and UPHC. 	PSC/PIU	PMU	
3.	Extraction of construction materials/mining	Disrupt natural land contours and vegetation resulting in accelerated erosion, disturbance in natural drainage patterns, ponding and waterlogging, and water pollution.	<ul style="list-style-type: none"> • Obtain construction materials only from existing government-approved quarries with prior approval of PIU • No new quarries shall be created 	PSC/PIU	PMU	Prior to start of construction and periodically during construction
4.	Construction labour camps, stockpile areas, storage areas, and disposal areas.	Conflicts with the local community; sensitive environmental features, etc.,	<ul style="list-style-type: none"> • No workers accommodation/camps shall be established within the premises of school if it is functional • Prioritize areas within or nearest possible vacant space in the project location; 	PSC/PIU	PMU	Prior to the start of the construction activity

Sl. No	Project Activity	Potential Impact	Mitigation Measures	Responsible for Implementation	Responsible for Supervision	Frequency of monitoring
			<ul style="list-style-type: none"> • If it is deemed necessary to locate elsewhere, consider sites that will not promote instability and result in the destruction of property, vegetation, irrigation, and drinking water supply systems; • Prioritize reuse of construction / waste debris, followed by disposal to an existing disposal sites, and lastly if new site required, selected on a barren/ infertile lands, and away from water bodies and settlements and without encroaching into any sensitive area 			
5.	Clearing of trees/Removal of vegetation	<ul style="list-style-type: none"> • Loss of trees and vegetation • Loss of top soil 	<ul style="list-style-type: none"> • Any trees and vegetation that needs to be removed shall be marked prior to clearance, and strict control on clearing activities will be implemented to ensure minimal clearance. • All reasonable measures shall be undertaken to ensure that no native fauna is harmed or placed at risk during the course of the clearing activities • Felled trees has to be replaced by compensatory plantation by adopting a minimum 1:10 ratio 	Forest Department/ PSC/PIU	PMU	Weekly/ Monthly monitoring
6.	Construction / Repair work – scheduling and planning	Impacts due to air pollution / noise / restriction to movement / restriction to use of toilets / other facilities	<ul style="list-style-type: none"> • Works inside schools and UPHC's shall be planned taking into account school timings / minimum impact and exposure to students during construction / works on weekly holidays, etc. 	PSC/PIU	PMU	Weekly / Monthly monitoring
7.	Drainage management	<ul style="list-style-type: none"> • Drainage congestion • Water logging • Vector proliferation 	<ul style="list-style-type: none"> • Design adequate drainage passage by following natural path • Natural drainage lines shall be identified and appropriate sediment controls will be designed and implemented prior to commencing of construction. • Fill ditches in schools and UPHC premises 	Contractor	PSC/PIU	Weekly/ Monthly monitoring

Sl. No	Project Activity	Potential Impact	Mitigation Measures	Responsible for Implementation	Responsible for Supervision	Frequency of monitoring
8.	Chance find protocol	Disruption / damage of socio cultural resources	<ul style="list-style-type: none"> • Create awareness among the workers, supervisors and engineers about the chance finds during excavation work • Stop work immediately to allow further investigation if any finds are suspected; • Inform archaeological department if a find is suspected 	Contractor	PSC/PIU	Weekly/ Monthly monitoring
Construction Phase						
9.	Spoil disposal	<ul style="list-style-type: none"> • Drainage blockage causing localized ponding and/or muddy runoff • Spoil tipped over slope may cause slide 	<ul style="list-style-type: none"> • Minimize spoil disposal by balancing cut and fill wherever possible • Manage spoil to reclaim land with proper landscaping and vegetation • Do not dispose spoil on drainage path • Dispose only at identified sites 	Contractor	PSC/PIU	<ul style="list-style-type: none"> • Daily inspection by contractor • Weekly visual inspection by PSC /PIU • Random inspection by PMU
10.	Transportation and storage of construction materials; impact on traffic / access to properties	<ul style="list-style-type: none"> • Nuisance to the general public • Fugitive emissions 	<ul style="list-style-type: none"> • The vehicles carrying the construction materials should be covered and secured to prevent loss or re-suspension of materials during travel • Construction materials should be stored in covered areas to ensure protection of surrounding areas from dust and emissions • Any transportation of materials on local roads shall be done during day light hours. • All vehicle movements or other construction activities shall be restricted to the delineated construction zone, the existing road network or previously disturbed areas. • Schedule transport and hauling activities during non-peak hours. 	Contractor	PSC/PIU	Daily / weekly inspection during construction

Sl. No	Project Activity	Potential Impact	Mitigation Measures	Responsible for Implementation	Responsible for Supervision	Frequency of monitoring
			<ul style="list-style-type: none"> Keep the site free from all unnecessary obstructions and drive vehicles in a considerate manner. Notify affected sensitive receptors by providing sign boards with information about the nature and duration of construction works and contact numbers for concerns/complaints 			
11.	Air and noise pollution	<ul style="list-style-type: none"> Dust nuisance to children from construction works Dust and noise generated by vehicles passing by schools Loud noise during construction 	<ul style="list-style-type: none"> Implement dust suppression measures, such as water sprinkling on loose soil surfaces, work areas Wherever feasible, dust generating type of work shall be done during off-school time Cover material during transportation Newly exposed surface areas shall be mulched and replanted as soon as possible in order to reduce the potential for erosion and suppress dust Avoid usage of equipment that will generate considerable noise; if noisy works are necessary, schedule between outside school hours and night Laborers' use of masks and safety gears 	Contractor	PSC/PIU	<ul style="list-style-type: none"> Daily inspection by contractor Weekly visual inspection by PSC/PIU Random inspection by PMU
12.	Water Quality	<ul style="list-style-type: none"> Construction waste water impact Impact on existing water resources 	<ul style="list-style-type: none"> The required water for the construction will be sourced from municipal water supply or through mobile water tankers. In absence of the water supply, the contractor shall obtain necessary clearance from the competent authority for utilising surface/groundwater Domestic effluent shall be discharged in soak pits. Schedule civil works during non-monsoon season, to the maximum extent possible. Ensure drainages within the construction zones are kept free of obstructions. Keep loose soil material and stockpiles out of drains and flow-lines. 	Contractor	PSC/PIU	Daily / weekly inspection

Sl. No	Project Activity	Potential Impact	Mitigation Measures	Responsible for Implementation	Responsible for Supervision	Frequency of monitoring
			<ul style="list-style-type: none"> • Avoid stockpiling of excavated and construction materials (sand, gravel, cement, etc.) unless covered by tarpaulins or plastic sheets. • Protect work site, material and waste piles from direct rains and surface runoff 			
13.	Employment opportunity	Local people employed in project activities	Contractors are encouraged to use local labor, wherever possible	Contractor	PSC/PIU	Daily / weekly inspection
14.	Waste management and minimization	Impacts on land, water and visual impacts showing poor housekeeping practices	<ul style="list-style-type: none"> • Recycled materials shall be used to the limits of design • Any waste generated from the construction site shall be contained within the boundary of the site and removed at regular intervals to an appropriate waste disposal. • The worksite shall be left in a tidy and rubbish free state upon completion of the works 	Contractor	PSC/PIU	Daily / weekly inspection
15.	Occupational health and safety	<ul style="list-style-type: none"> • Unsafe work site and working conditions • Lack of minimum required facilities of space, ventilation, sanitation, light and safe drinking water in construction camps. • Lack of safe construction practices • Vector disease 	<ul style="list-style-type: none"> • Adopt standard and safe construction practices; no ad hoc procedures and methods shall be adopted; equipment and platforms used must be checked for safety prior to use • Do not adopt manual cleaning of sanitary systems, especially sewage sumps / septic tanks. Provide workers with appropriate equipment, including PPEs. Oxygen cylinder masks will be provided for emergency use. • Provide H&S orientation training to all new workers to ensure that they are appraised of the rules of work at the site, personal protective equipment's and to prevent injury to fellow workers. • The use of hearing protection shall be enforced actively if the noise levels are high • Equipped first-aid shall be easily accessible throughout work sites and construction camps 	Contractor	PSC/PIU	Daily / weekly inspection

Sl. No	Project Activity	Potential Impact	Mitigation Measures	Responsible for Implementation	Responsible for Supervision	Frequency of monitoring
			<ul style="list-style-type: none"> • Secure construction zone from unauthorized intrusion and accident risks. • Provide supplies of potable drinking water. • Provide clean eating areas where workers are not exposed to hazardous or noxious substances. • Ensure moving equipment is outfitted with audible back-up alarms. • Mark and provide sign boards in the construction zone and areas for storage and disposal. • Provide labour accommodation with adequate space, ventilation, clean toilets, solid waste management, light and safe drinking water in the construction camps • Provide mosquito nets at labour camps • Keep camp and work area clean and safe 			
16.	COVID 19 risk and management	Spread of infection which causes serious symptoms like difficulty in breathing, chest pain and loss of speech or movement. If not treated it will lead to death	<ul style="list-style-type: none"> • Taking cognizance of situation at time of mobilisation, the Contractor shall undertake a COVID risk assessment of project area and prepare a COVID Response and Management Plan (C-R&MP) and submit to GCC and PSC for approval. • The preparation of C-R&MP shall consider guidance of Government of India, World Health Organisation, International Labour Organisation, International Financial Corporation and World Bank's interim guidance note etc. The key points on COVID Response and Management measures is at Appendix 7. • The contractor shall submit a weekly monitoring and progress report to GCC and PSC. 			

Sl. No	Project Activity	Potential Impact	Mitigation Measures	Responsible for Implementation	Responsible for Supervision	Frequency of monitoring
17.	Community health and safety	Safety and health risk to community, school children and staff of facilities	<ul style="list-style-type: none"> • Confine work areas within schools and UPHCs; prevent children/study and public access through the use of barricading and security personnel • Isolate work site / all construction activities with a separate access as feasible; ensure appropriate and safe passage for school children and public along the work site • Provide caution, warning and awareness sign boards • Restrict movement of workers, vehicles etc, within the identified area • Follow all public safety and traffic safety measures • Conduct awareness program to workers on the working in schools and health centres 	Contractor	PSC/PIU	Daily / weekly inspection
18.	Influx of migrant Workers	<ul style="list-style-type: none"> • Health and safety risks • Chances of spread of sexually transmittable diseases like HIV / AIDS • Water pollution 	<ul style="list-style-type: none"> • Local laborers to be given preference for job opportunities and each contractor should be bound by this commitment • Ensure labour-related regulations are met • In case of hiring outside labour, ensure that their working conditions as well as camps meet local regulations and the best practices of the industry • Provision of Condom vending machine at the construction camp to prevent sexually transmittable diseases like HIV / AIDS 	Contractor	PSC/PIU	Daily / weekly inspection

VII. CONSULTATION, INFORMATION DISCLOSURE AND GRIEVANCE REDRESS MECHANISM

80. The active participation of stakeholders including the local community, NGOs, etc., in all stages of project preparation and implementation, is essential for the successful implementation of the project. It will ensure that the subprojects are designed, constructed, and operated with utmost consideration to local needs, ensures community acceptance, and will bring maximum benefits to the people. Public consultation and information disclosure is a must as per the ADB policy.

81. Consultations have been conducted in the first week of March 2021. Three consultation meetings conducted by GCC with the support of PPTA safeguard consultants: Consultation meeting with Zonal Health Officials at GCC on March 2, 2021, and consultation meetings (with school teachers and parents) at Ambattur Municipal Higher Secondary School, and at Ambattur Municipal High School on 3 March 2021. In all 98 persons (33 male and 65 female) participated in the consultation meetings. Consultations conducted following all COVID19 related protocols. Participants supported the project, and provided certain suggestions on provision of adequate number of toilets, water facilities, etc. These will be considered in the project implementation. Appendix 8 provide details of consultations conducted during implementation. Consultation will be further continued during the implementation. DDR will be disclosed on websites of GCC and ADB.

82. **Grievance Redress Mechanism (GRM)** will be in place to redress social, environmental or any other subproject-related grievances. The JFPR subproject will follow the GRM developed by GCC for the loan project. An awareness session will be conducted with stakeholders to ensure that the project and its grievance redress procedures is generated. The Project Management Unit (PMU) and Project Implementation Unit (PIU) will ensure that their grievances are addressed.

VIII. CONCLUSION AND RECOMMENDATIONS

83. This Due Diligence Report reviewed the environmental implications of the proposed subproject “Infection Prevention and Control of COVID-19 through Wash Services Improvement for Integrated Pandemic and Disaster Risk Management for the Urban Poor in Chennai in Kosasthalaiyar Basin” to be implemented with JFPR Grant attached to the ADB funded “Integrated Urban Flood Management for Chennai - Kosasthalaiyar Basin Project” (IUFMCKBP). This subproject has been categorized as “C” per ADB SPS.

84. The proposed subproject (grant components) has 4 outputs, in which the Output 1 and 2 shall only have construction activities. There are no civil works in output 3 (surveillance system/ monitoring) and Output 4 (Preparation of Risk Management Plan and monitoring tools). Procurement of WaSH and IPC related equipment, PPE kits, and consumables, etc., are part of Output 1, 2 & 3. Proposed civil works are of small scale, which are basically proposed to improve water, sanitation and hygiene facilities (such as toilets, drinking water, hand wash, and menstrual hygiene) in 65 government schools and 17 urban primary health centers run by GCC in the project area of Chennai - Kosasthalaiyar Basin Project.

85. Subproject is unlikely to have any notable impacts either due to location or design. Proposed activities are located within existing premises of identified schools and UPHCs, and subproject design follows the facility design standards, and aspects related to water quality, wastewater discharge, solid waste management including biomedical waste, occupational health and safety etc., have already been considered in the subproject design. All the goods, equipment

including mobile water quality and medical diagnostic laboratories will be procured, mobilized/erected, operated and maintained as per the applicable government standards and protocols, including handling and management of infectious/hazardous chemical/materials and wastes that used/generated during the operation. An implementation support consultant will be engaged to provide training and capacity building in standard operating procedures for all the activities under WaSH and IPC. Therefore, no adverse impacts envisaged.

86. Anticipated construction impacts are typical of any construction activity resulting from construction dust and noise, occupation and community health and safety, COVID 19 risk, disposal of waste/debris, labour influx, etc., Given the small-scale works, conducted within the premises of existing facilities, likely impacts are not significant. Following good construction practices and Implementation of general construction measures, will further mitigate/minimize the impacts. These are outlined in the Environmental Code of Practice for Project Construction Works (ECoP), which will form part of bid/contract for implementation and monitoring.

87. During the project operation, there may be minor impacts due to (i) solid waste (ii) bio medical waste (iii) discharge of wastewater (iv) health and safety and (v) quality of water supply. As these aspects are duly considered in the design, no notable impacts are anticipated.

88. Based on this Due Diligence assessment, it is confirmed that the proposed subproject “Infection Prevention and Control of COVID-19 through Wash Services Improvement for Integrated Pandemic and Disaster Risk Management for the Urban Poor in Chennai in Kosasthalaiyar Basin” likely to have minimal environmental impacts. Generic ECoP for construction shall be implemented. Category C is confirmed, and no further assessment shall be required. DDR shall be updated prior to award of contract. ECoP requires contractor to prepare and implement a site specific COVID Response and Management Plan (C-R&MP). ECOP implementation shall be reported via semi-annual monitoring report to be submitted for overall ADB Project.

Rapid Environmental Assessment (REA) Checklist

Instructions:

- (i) The project team completes this checklist to support the environmental classification of a project. It is to be attached to the environmental categorization form and submitted to the Environment and Safeguards Division (RSES) for endorsement by the Director, RSES and for approval by the Chief Compliance Officer.
- (ii) This checklist focuses on environmental issues and concerns. To ensure that social dimensions are adequately considered, refer also to ADB's (a) checklists on involuntary resettlement and Indigenous Peoples; (b) poverty reduction handbook; (c) staff guide to consultation and participation; and (d) gender checklists.
- (iii) Answer the questions assuming the "without mitigation" case. The purpose is to identify potential impacts. Use the "remarks" section to discuss any anticipated mitigation measures.

Country/Project Title:

IND: Infection Prevention and Control of Covid-19 through Wash Services Improvement for Integrated Pandemic and Disaster Risk Management for the Urban Poor in Chennai in Kosasthalaiyar Basin under JFPR Grant of ADB

Sector Division:

Urban Development and Water Division

Screening Questions	Yes	No	Remarks
A. Project Siting Is the project area...			
▪ Densely populated?	✓		Kosathalaiyar project area lies in the expanded areas of GCC and it is densely populated. The total population is 25.80 Lakhs (2011 census). The density of the population is 20,187 / sq km
▪ Heavy with development activities?	✓		It is a developing area; Urban expansion is considerable.
▪ Adjacent to or within any environmentally sensitive areas?	✓		There are two critical habitat areas located within 50km radius of the project area (i) Pulicate Bird Sanctuary is located at a distance of 27 km away from the north boundary of the project area. (ii) Guindy National Park exists at a distance of 18km away from the south west boundary of the project area. However, as per MoEF&CC guideline for assessing biodiversity, the identified critical habitats are away from 10km buffer from the project area
• Cultural heritage site	✓		The project area is around 127.80 sq.km. and hence the chances of heritage sites are possible. However as per the inventory conducted for the surface drainage and surplus canals, it is evident that there is no ASI identified or cultural heritage of local importance has been observed
• Protected Area	✓		Both the critical habitats (Pulicat Bird Sanctuary and Guindy National Park) are

Screening Questions	Yes	No	Remarks
			declared protected areas. However, it is more than 10km buffer from the project area (as per the stipulated guideline from MoEF&CC)
• Wetland		✓	Pulicat lake is not considered under wetland category
• Mangrove	✓		Mangroves exist at a distance of 5km away from the north boundary of the project area.
• Estuarine		✓	Not applicable
• Buffer zone of protected area		✓	Not applicable
• Special area for protecting biodiversity		✓	Not applicable
• Bay		✓	Not applicable
B. Potential Environmental Impacts Will the Project cause...			
▪ impacts on the sustainability of associated sanitation and solid waste disposal systems and their interactions with other urban services.		✓	Project will only improve the existing practices in the existing schools and primary health centers, and there will not be any increase in generation of waste or wastewater. Schools and hospitals utilized city-wise solid waste and wastewater management systems. Where sewerage system is not available, on-site disposal via septic tank is practiced.
▪ deterioration of surrounding environmental conditions due to rapid urban population growth, commercial and industrial activity, and increased waste generation to the point that both manmade and natural systems are overloaded and the capacities to manage these systems are overwhelmed?		✓	The proposed subproject under the JFPR do not have any impacts on the surrounding environmental conditions, increased waste generation or overloading any of the natural systems. The implementation of the subproject adds more positive benefits to the population in prevention of COVID 19
▪ degradation of land and ecosystems (e.g. loss of wetlands and wild lands, coastal zones, watersheds and forests)?		✓	No such impact is anticipated.
▪ dislocation or involuntary resettlement of people?		✓	No such impact is anticipated.
▪ disproportionate impacts on the poor, women and children, Indigenous Peoples or other vulnerable group?		✓	No such impact is anticipated.
▪ degradation of cultural property, and loss of cultural heritage and tourism revenues?		✓	No such impact is anticipated.
▪ occupation of low-lying lands, floodplains and steep hillsides by squatters and low-income groups, and their exposure to increased health hazards and risks due to pollutive industries?		✓	No such impact is anticipated.
▪ water resource problems (e.g. depletion/degradation of available water supply, deterioration for surface and		✓	Project uses mostly the existing water resources. Water abstraction is very minimal and likely to have any impacts. Out of 4 project outputs, the output 1 and 2 shall

Screening Questions	Yes	No	Remarks
ground water quality, and pollution of receiving waters?			have the components of renovation of existing toilets and provision of or renovation of septic tank at identified locations. Wastewater outlets will be connected to sewerage system if available.
▪ air pollution due to urban emissions?		✓	No such impact is anticipated.
▪ risks and vulnerabilities related to occupational health and safety due to physical, chemical and biological hazards during project construction and operation?	✓		These are inherent to any construction works, however, given the small scale nature of the work, risk is significantly low. Following standard and safe construction practices, especially when working on height, confined spaces, and in renovation and repair of septic tanks, will further minimize/mitigate the impact. These will be included in the generic measures
▪ road blocking and temporary flooding due to land excavation during rainy season?		✓	No such impact is anticipated. Works are confined to existing premises of schools and UPHCs
▪ noise and dust from construction activities?	✓		Anticipated but minor
▪ traffic disturbances due to construction material transport and wastes?		✓	No such impact is anticipated.
▪ temporary silt runoff due to construction?	✓		Anticipated but minor
▪ hazards to public health due to ambient, household and occupational pollution, thermal inversion, and smog formation?		✓	No such impact is anticipated.
▪ water depletion and/or degradation?		✓	Works are of small scale nature; not anticipated
▪ overpaying of ground water, leading to land subsidence, lowered ground water table, and salinization?		✓	Proposed water abstraction is very small, no impact envisaged
▪ contamination of surface and ground waters due to improper waste disposal?		✓	Proper waste disposal method will be followed
▪ pollution of receiving waters resulting in amenity losses, fisheries and marine resource depletion, and health problems?		✓	No such impact is anticipated.
▪ large population influx during project construction and operation that causes increased burden on social infrastructure and services (such as water supply and sanitation systems)?		✓	No such impact is anticipated.
▪ social conflicts if workers from other regions or countries are hired?		✓	No such impact is anticipated.
▪ risks to community health and safety due to the transport, storage, and use and/or disposal of materials such as explosives, fuel and other chemicals during operation and construction?		✓	No such impact is anticipated.
▪ community safety risks due to both accidental and natural hazards, especially where the structural elements or components of the project are accessible to members of the affected		✓	No such impact is anticipated.

Screening Questions	Yes	No	Remarks
community or where their failure could result in injury to the community throughout project construction, operation and decommissioning?			

A Checklist for Preliminary Climate Risk Screening

Country/Project Title: IND: Infection Prevention and Control of Covid-19 through Wash Services Improvement for Integrated Pandemic and Disaster Risk Management for the Urban Poor in Chennai in Kosasthalaiyar Basin under JFPR Grant of ADB

Sector: Urban Development and Water Division

Subsector:

Division/Department:

Screening Questions		Score	Remarks ³
Location and Design of project	Is siting and/or routing of the project (or its components) likely to be affected by climate conditions including extreme weather related events such as floods, droughts, storms, landslides?	0	
	Would the project design (e.g., the clearance for bridges) need to consider any hydro-meteorological parameters (e.g., sea-level, peak river flow, reliable water level, peak wind speed etc.)?	1	Proposed bore wells need to consider reliable water levels, and septic tanks requires protection measures against water logging / flood.
Materials and Maintenance	Would weather, current and likely future climate conditions (e.g. prevailing humidity level, temperature contrast between hot summer days and cold winter days, exposure to wind and humidity hydro-meteorological parameters likely affect the selection of project inputs over the life of project outputs (e.g. construction material)?	0	
	Would weather, current and likely future climate conditions, and related extreme events likely affect the maintenance (scheduling and cost) of project output(s) ?	0	
Performance of project outputs	Would weather/climate conditions, and related extreme events likely affect the performance (e.g. annual power production) of project output(s) (e.g. hydro-power generation facilities) throughout their design life time?	0	

Options for answers and corresponding score are provided below:

Response	Score
Not Likely	0
Likely	1
Very Likely	2

Responses when added that provide a score of 0 will be considered low risk project. If adding all responses will result to a score of 1-4 and that no score of 2 was given to any single response, the project will be assigned a medium risk category. A total score of 5 or more (which include providing a score of 1 in all responses) or a 2 in any single response, will be categorized as high risk project.

Result of Initial Screening (Low, Medium, High): LOW

³ If possible, provide details on the sensitivity of project components to climate conditions, such as how climate parameters are considered in design standards for infrastructure components, how changes in key climate parameters and sea level might affect the siting/routing of project, the selection of construction material and/or scheduling, performances and/or the maintenance cost/scheduling of project outputs.

Other Comments: The proposed subproject is on “Infection Prevention and Control of COVID-19 through Wash Services improvement for integrated pandemic and disaster risk management for the urban poor in Chennai”. The implementation of this subproject do not have any climate change impacts as it has minimal construction activities having only renovation works.

Prepared by: Greater Chennai Corporation

List of UPHC in Project Area

Sl. No	Zone	Division	Name	Location
1	1	2	UPHC	Kathivakkam UPHC
2	1	4	UPHC	Ernavoor UPHC
3	1	6	UPHC	Kuppam UPHC
4	1	11	UPHC	Thiruvottiyur UPHC
5	1	12	UPHC	Sathangadu UPHC
6	1	14	UPHC	Thangal UPHC
7	2	15	UPHC	Mannali New Town UPHC
8	2	21	UPHC	Mannali UPHC
9	3	22	UPHC	Puzhal UPHC
10	3	26	UPHC	Madhavaram UPHC
11	3	31	UPHC	Kannabiran UPHC
12	3	32	UPHC	Lakshmipuram UPHC
13	7	79	UPHC	Oragadam UPHC
14	7	80	UPHC	Meenabedu UPHC
15	7	81	UPHC	Venkatapuram UPHC
16	7	83	UPHC	Korattur UPHC
17	7	85	UPHC	Varadharajapuram UPHC

List of GCC Schools in Project Area


Sl. No	GCC Administrative Zone	Name of School
1	1	CMS Nettukuppam
2	1	CPS Ennorkuppam
3	1	CPS Mugathuvara Kuppam
4	1	CPS Thalankuppam
5	1	CPS SVM Nagar
6	1	CPS Kamaraj Nagar
7	1	CMS KH Road
8	1	CMS Nehru Nagar
9	1	CPS Annai Sivagami Nagar
10	1	CPS Kasi Koil Kuppam
11	1	CMS Ramanathapuram
12	1	CPS Makali Amman Koil
13	1	CMS Sathya Moorthy Nagar
14	1	CPS Kargil Nagar
15	1	CMS Sannathi Street
16	1	CPS Poonthotam School
17	1	CPS Market Lane
18	1	CHS Market Lane
19	1	CPS Thiruchinakuppam
20	2	CMS Edayanchavdi Main Rd
21	2	CPS Old Nappalayam
22	2	CPS Manali New Town
23	2	CMS Kanniammanpet

24	2	CMS Andarkuppam
25	2	CPS Ariyallur
26	2	CMS Kosapur
27	2	CPS Theeyambakkam
28	2	CPS Vadaperumpakkam
29	2	CPS CPCL 3rd Street
30	2	CMS MMDA 59th Street
31	2	CMS Manjambakkam
32	2	CPS Padasalai St, Manali
33	3	CPS Kannappasamy Nagar
34	3	CHS Kannappasamy Nagar
35	3	CMS Gandhi Main road
36	3	CPS School Rd Soorappet
37	3	CMS JP Nagar (b)- Campus 2
38	3	CMS Bharathidasan Nagar 6th st
39	3	CMS Bharathidasan Nagar 1 cross st (Campus 2)
40	3	CMS Mariamman Koil St Murugambedu
41	3	CPS Balavinayagar Koil St
42	3	CHS Sembiam Road
43	3	CMS Madhavaram Milk Colony
44	3	CPS Perumal Koil Street
45	3	CHS Devarajan Street
45A	3	CPS Devarajan Street (same school as in 45 at a campus 400 m away)
46	3	CPS Rajaji Street
47	3	CHS Lakshmi Narayana Perumal St
48	3	CPS Lakshmi Narayana Perumal St
49	7	CMS Gandhi Main Road Oragadam
50	7	CPS Chidu Oragadam
51	7	CHS Chozhapuram
52	7	CPS Cholapuram
53	7	CPS Kalyanapuram
54	7	CMS CHS+CPS Padasalai, Kallikuppam
55	7	CPS NRS road,Agraharam
56	7	CHS NRS road,Agraharam
57	7	CPS Chavadi street
58	7	CHSS Chavadi street
59	7	CMS Patravakkam
60	7	CPS Varadharajapuram
61	7	CMS Managalapuram
62	7	CPS Ramapuram
63	7	CPS Teachers Colony

64	7	CPS Kamarajapuram (Ambedhkar Street)
65	7	CHS Kamarajapuram, (Jeeva Street)

CMS=Corporation Middle School, CHS=Corporation High School, CHSS= Corporation Higher Secondary School,
CPS=Corporation Primary School

Existing status assessment – UPHCs

Zone	01 - Tiruvottiyur	
Division	04	
Description	UPHC	
Location	Ramanathapuram	
Address	Ramanathapuram, Tiruvottiyur	

WATER

#	Issues addressed	Remarks
1	Source of water	Bore well
2	Bore well	Yes
3	Main water tank	Yes

TOILETS

#	Issues addressed	Remarks
1	Number of toilets	For Visitors 2 toilets (1 for Ladies and 1 for Gents) For Staff 1 toilet and Medical Officer 1 toilet.
2	Separate water tank for toilet	No
3	Condition	Usable

HAND WASH

#	Issues addressed	Remark
1	Hand wash facility and type	Conventional tap with soap
2	Number of outlets	4
3	Condition	The hand wash apparatus has been used but not kept clean. This may by it self pose a health hazard.

DRINKING WATER

#	Issues addressed	Remark
1	RO water tank	Yes
2	Number of drinking outlets	1
3	Condition	Usable


RECOMMENDATION

- Staff must be trained as well as supervised to adhere to WaSH norms and disciplinary action initiated in case of failure to follow laid down SOP with regards to washing hands, insisting on the patients who come to wash hands and follow protocol as well as regarding wearing Masks.
- The asset for hand wash has been abused by improper use. Running water connectivity and proper drainage for the same not provided. Sensitization of the staff on its importance and utilization must be insisted and followed up.

Zone	01 – Tiruvottiyur
Division	04
School Name	UPHC
Location	Ramanathapuram



Entrance

Zone	01 - Tiruvottiyur	
Division	11	
Description	UPHC	
Location		
Address	Mallikapuram, Tiruvottiyur	

WATER

#	Issues addressed	Remarks
1	Source of water	Bore well and Metro Water
2	Bore well	Yes
3	Main water tank	Yes

TOILETS

#	Issues addressed	Remarks
1	Number of toilets	For Visitors 2 toilets (1 for Ladies and 1 for Gents) For Staff 1 toilet and Medical Officer 1 toilet.
2	Separate water tank for toilet	No
3	Condition	Usable

HAND WASH

#	Issues addressed	Remark
1	Hand wash facility and type	Conventional tap with soap
2	Number of outlets	4
3	Condition	The hand wash apparatus has been used but not kept clean. This may by it self pose a health hazard.

DRINKING WATER

#	Issues addressed	Remark
1	RO water tank	Yes
2	Number of drinking outlets	2
3	Condition	Usable


RECOMMENDATION

- Staff must be trained as well as supervised to adhere to WaSH norms and disciplinary action initiated in case of failure to follow laid down SOP with regards to washing hands, insisting on the patients who come to wash hands and follow protocol as well as regarding wearing Masks.
- The asset for hand wash has been abused by improper use. Sensitization of the staff on its importance and utilization must be insisted and followed up.
- Ramp for handicapped provided.

Zone	01 – Tiruvottiur
Division	11
School Name	UPHC
Location	Thiruvotriyur



Entrance

Zone	01 - Tiruvottiyur	
Division	12	
Description	UPHC	
Location	Sathankadu	
Address	Sathankadu, Tiruvottiyur	

WATER

#	Issues addressed	Remarks
1	Source of water	Bore well
2	Bore well	Yes
3	Main water tank	Yes

TOILETS

#	Issues addressed	Remarks
1	Number of toilets	For Visitors 1 toilets (Common for Ladies and Gents) For Staff 1 toilet and Medical Officer 1 toilet.
2	Separate water tank for toilet	No
3	Condition	Usable

HAND WASH

#	Issues addressed	Remark
1	Hand wash facility and type	Conventional tap with soap
2	Number of outlets	4
3	Condition	The hand wash apparatus has been used but not kept clean. Improper drainage for used water. This may by itself pose a health hazard.

DRINKING WATER

#	Issues addressed	Remark
1	RO water tank	Yes
2	Number of drinking outlets	1
3	Condition	Usable

RECOMMENDATION

- Staff must be trained as well as supervised to adhere to WaSH norms and disciplinary action initiated in case of failure to follow laid down SOP with regards to washing hands, insisting on the patients who come to wash hands and follow protocol as well as regarding wearing Masks.
- The asset for hand wash has been abused by improper use. Running water connectivity and proper drainage for the same not provided. Sensitization of the staff on its importance and utilization must be insisted and followed up.
- Handicap Ramp not provided as the entrance is at lower level. But convenience for such persons can be provided.

Zone	01 – Tiruvottiyur
Division	12
School Name	UPHC
Location	Sathankadu



Entrance



Handwash

Zone	01 - Tiruvottiyur	
Division	14	
Description	UPHC	
Location	Malikapuram	
Address	Malikapuram, Tiruvottiyur	

WATER

#	Issues addressed	Remarks
1	Source of water	Bore well and Metro Water
2	Bore well	Yes
3	Main water tank	Yes

TOILETS

#	Issues addressed	Remarks
1	Number of toilets	For Visitors 1 toilet (Common for Ladies and Gents) For Staff 1 toilet and Medical Officer 1 toilet.
2	Separate water tank for toilet	No
3	Condition	Usable

HAND WASH

#	Issues addressed	Remark
1	Hand wash facility and type	Conventional tap with soap
2	Number of outlets	4
3	Condition	The hand wash apparatus has been kept idle and not utilized.

DRINKING WATER

#	Issues addressed	Remark
1	RO water tank	Yes
2	Number of drinking outlets	2
3	Condition	Usable


RECOMMENDATION

- Staff must be trained as well as supervised to adhere to WaSH norms and disciplinary action initiated in case of failure to follow laid down SOP with regards to washing hands, insisting on the patients who come to wash hands and follow protocol as well as regarding wearing Masks.
- The asset for hand wash has been abused by improper use. Sensitization of the staff on its importance and utilization must be insisted and followed up.

Zone	01 - Tiruvottiyur
Division	14
School Name	UPHC
Location	Mallikapuram



Entrance

Zone	02 – Manali	
Division	15	
Description	UPHC	
Location	Manali New Town	
Address	Manali New Town, Manali	

WATER

#	Issues addressed	Remarks
1	Source of water	Bore well. No metro water.
2	Bore well	Yes
3	Main water tank	Yes

TOILETS

#	Issues addressed	Remarks
1	Number of toilets	For Visitors 2 toilets (1 for Ladies and 1 for Gents) For Staff 1 toilet and Medical Officer 1 toilet.
2	Separate water tank for toilet	No
3	Condition	Usable

HAND WASH

#	Issues addressed	Remark
1	Hand wash facility and type	Conventional tap with soap
2	Number of outlets	4
3	Condition	The hand wash apparatus has been used but not kept clean. This may by it self pose a health hazard.

DRINKING WATER

#	Issues addressed	Remark
1	RO water tank	Yes
2	Number of drinking outlets	1
3	Condition	Usable

RECOMMENDATION

- Staff must be trained as well as supervised to adhere to WaSH norms and disciplinary action initiated in case of failure to follow laid down SOP with regards to washing hands, insisting on the patients who come to wash hands and follow protocol as well as regarding wearing Masks.
- The asset for hand wash has been abused by improper use. Running water connectivity and proper drainage for the same not provided. Sensitization of the staff on its importance and utilization must be insisted and followed up.
- Did not see a Ramp facility and the facility can be improved to include facilities for Handicapped persons with minor modifications.

Zone	02 - Manali
Division	15
School Name	UPHC
Location	Manali New Town (NT)



Entrance



Handwash

Zone	02 – Manali
Division	21
Description	UPHC
Location	Manali
Address	Manali



WATER

#	Issues addressed	Remarks
1	Source of water	Bore well. No metro water.
2	Bore well	Yes
3	Main water tank	Yes

TOILETS

#	Issues addressed	Remarks
1	Number of toilets	For Visitors 2 toilets (1 for Ladies and 1 for Gents) For Staff 1 toilet and Medical Officer 1 toilet.
2	Separate water tank for toilet	No
3	Condition	Usable

HAND WASH

#	Issues addressed	Remark
1	Hand wash facility and type	Conventional tap with soap
2	Number of outlets	4
3	Condition	The hand wash apparatus has been used but not kept clean. This may by it self pose a health hazard.

DRINKING WATER

#	Issues addressed	Remark
1	RO water tank	Yes
2	Number of drinking outlets	1
3	Condition	Usable

RECOMMENDATION

- Staff must be trained as well as supervised to adhere to WaSH norms and disciplinary action initiated in case of failure to follow laid down SOP with regards to washing hands, insisting on the patients who come to wash hands and follow protocol as well as regarding wearing Masks.
- The asset for hand wash has been abused by improper use. Running water connectivity and proper drainage for the same not provided. Sensitization of the staff on its importance and utilization must be insisted and followed up.
- Did not see a Ramp facility and the facility can be improved to include facilities for Handicapped persons with minor modifications.

Zone	02 - Manali
Division	21
School Name	UPHC
Location	Manali



Entrance



Handwash

Zone	03 – Madhavaram	
Division	22	
Description	UPHC	
Location	Puzhal	
Address	Puzhal, Madhavaram Zone	

WATER

#	Issues addressed	Remarks
1	Source of water	Bore well. No metro water.
2	Bore well	Yes
3	Main water tank	Yes

TOILETS

#	Issues addressed	Remarks
1	Number of toilets	For Visitors 2 toilets (1 for Ladies and 1 for Gents) For Staff 1 toilet and Medical Officer 1 toilet.
2	Separate water tank for toilet	No
3	Condition	Usable

HAND WASH

#	Issues addressed	Remark
1	Hand wash facility and type	Conventional tap with soap
2	Number of outlets	4
3	Condition	The hand wash apparatus has been used and kept clean. Probably one of the few UPHC where it is used properly.

DRINKING WATER

#	Issues addressed	Remark
1	RO water tank	Yes
2	Number of drinking outlets	1
3	Condition	Usable

RECOMMENDATION

- Staff must be trained as well as supervised to adhere to WaSH norms and disciplinary action initiated in case of failure to follow laid down SOP with regards to washing hands, insisting on the patients who come to wash hands and follow protocol as well as regarding wearing Masks.
- The asset for hand wash has been utilized properly. Running water connectivity and proper drainage for the same is provided. Sensitization of the staff on its importance and utilization must be insisted and followed up.
- Ramp for handicapped persons provided.

Zone	03 - Madhavaram
Division	22
School Name	UPHC
Location	Puzhal



Entrance



Handwash

Zone	03 – Madhavaram	
Division	26	
Description	UPHC	
Location	Swamy Nagar, Madhavaram	
Address	Swamy Nagar, Madhavaram	

WATER

#	Issues addressed	Remarks
1	Source of water	Bore well. No metro water.
2	Bore well	Yes
3	Main water tank	Yes

TOILETS

#	Issues addressed	Remarks
1	Number of toilets	For Visitors 2 toilets (1 for Ladies and 1 for Gents) For Staff 1 toilet and Medical Officer 1 toilet.
2	Separate water tank for toilet	No
3	Condition	Usable

HAND WASH

#	Issues addressed	Remark
1	Hand wash facility and type	Conventional tap with soap
2	Number of outlets	4
3	Condition	The hand wash apparatus has been used but not kept clean. This may by it self pose a health hazard.

DRINKING WATER

#	Issues addressed	Remark
1	RO water tank	Yes
2	Number of drinking outlets	1
3	Condition	Usable

RECOMMENDATION

- Staff must be trained as well as supervised to adhere to WaSH norms and disciplinary action initiated in case of failure to follow laid down SOP with regards to washing hands, insisting on the patients who come to wash hands and follow protocol as well as regarding wearing Masks.
- The asset for hand wash has been abused by improper use. Running water connectivity and proper drainage for the same not provided. Sensitization of the staff on its importance and utilization must be insisted and followed up.
- Ramp for handicapped persons not provided as the entrance is on flat ground. However, more comfortable services can be provided for such persons.

Zone	03 - Madhavaram
Division	26
School Name	UPHC
Location	Swamy Nagar, Madhavaram



Entrance



Handwash (Totally neglected condition)

Zone	03 – Madhavaram	
Division	31	
Description	UPHC	
Location	Kannabiran Koil street	
Address	Kannabiran Koil street, Madhavaram Zone	

WATER

#	Issues addressed	Remarks
1	Source of water	Bore well. No metro water.
2	Bore well	Yes
3	Main water tank	Yes

TOILETS

#	Issues addressed	Remarks
1	Number of toilets	For Visitors 1 toilet (Common for Ladies and Gents) 1 toilet for Staff and Medical Officer.
2	Separate water tank for toilet	No
3	Condition	Usable

HAND WASH

#	Issues addressed	Remark
1	Hand wash facility and type	Conventional tap with soap
2	Number of outlets	4
3	Condition	The hand wash apparatus has not been used.

DRINKING WATER

#	Issues addressed	Remark
1	RO water tank	Yes
2	Number of drinking outlets	1
3	Condition	Usable

RECOMMENDATION

- Staff must be trained as well as supervised to adhere to WaSH norms and disciplinary action initiated in case of failure to follow laid down SOP with regards to washing hands, insisting on the patients who come to wash hands and follow protocol as well as regarding wearing Masks.
- The asset for hand wash has not been used. Running water connectivity and proper drainage for the same not provided. Sensitization of the staff on its importance and utilization must be insisted and followed up.
- Metro water connectivity may be provided at the earliest.

A stainless steel handwashing station is positioned outdoors on a red brick-paved area. The station features a rectangular mirror mounted on a wall above a sink. A small, cylindrical soap dispenser is attached to the wall to the left of the sink. The entire unit is supported by a metal frame. In the background, there is a black metal gate and a yellow wall. A sign is visible on the wall to the right.

Handwash

Zone	03 – Madhavaram	
Division	32	
Description	UPHC	
Location	Lakshmipuram	
Address	Lakshmipuram, Madhavaram	

WATER

#	Issues addressed	Remarks
1	Source of water	Bore well. No metro water.
2	Bore well	Yes
3	Main water tank	Yes

TOILETS

#	Issues addressed	Remarks
1	Number of toilets	For Visitors 2 toilets (1 for Ladies and 1 for Gents) For Staff 1 toilet and Medical Officer 1 toilet.
2	Separate water tank for toilet	No
3	Condition	Usable

HAND WASH

#	Issues addressed	Remark
1	Hand wash facility and type	Conventional tap with soap
2	Number of outlets	4 + 1
3	Condition	The hand wash apparatus has been used but not kept clean. This may by it self pose a health hazard. 1 SS Washbasin with running water and proper drainage is available for Washing hands

DRINKING WATER

#	Issues addressed	Remark
1	RO water tank	Yes
2	Number of drinking outlets	1
3	Condition	Usable

RECOMMENDATION

- Staff must be trained as well as supervised to adhere to WaSH norms and disciplinary action initiated in case of failure to follow laid down SOP with regards to washing hands, insisting on the patients who come to wash hands and follow protocol as well as regarding wearing Masks.
- The asset for hand wash has been abused by improper use. Running water connectivity and proper drainage for the same not provided. Sensitization of the staff on its importance and utilization must be insisted and followed up.
- Ramp for handicapped persons not provided as the entrance is on flat ground. However, more comfortable services can be provided for such persons.

Zone	03 - Madhavaram
Division	32
School Name	UPHC
Location	Lakshmiapuram, Madhavaram



Entrance



Handwash (4 outlet not being used properly)

Zone	07 – Ambattur	
Division	79	
Description	UPHC	
Location	Oragadam	
Address	Oragadam, Ambattur Zone	

WATER

#	Issues addressed	Remarks
1	Source of water	Bore well. No metro water.
2	Bore well	Yes
3	Main water tank	Yes

TOILETS

#	Issues addressed	Remarks
1	Number of toilets	For Visitors 1 toilet (Common for Ladies and Gents) 1 toilet for Staff and 1 toilet for Medical Officer.
2	Separate water tank for toilet	No
3	Condition	Usable

HAND WASH

#	Issues addressed	Remark
1	Hand wash facility and type	Conventional tap with soap
2	Number of outlets	4 + 1
3	Condition	The hand wash apparatus has not been used. Only wash basin being used.

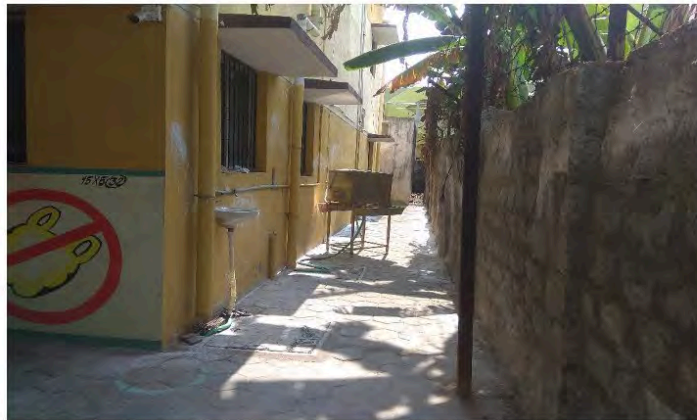
DRINKING WATER

#	Issues addressed	Remark
1	RO water tank	Yes
2	Number of drinking outlets	1
3	Condition	Usable

RECOMMENDATION

- Staff must be trained as well as supervised to adhere to WaSH norms and disciplinary action initiated in case of failure to follow laid down SOP with regards to washing hands, insisting on the patients who come to wash hands and follow protocol as well as regarding wearing Masks.
- The asset for hand wash has not been used. Running water connectivity and proper drainage for the same not provided. Sensitization of the staff on its importance and utilization must be insisted and followed up.
- Metro water connectivity may be provided at the earliest.

Zone	07 – Ambattur
Division	79
School Name	UPHC
Location	Gandhi Road, Oragadam



Hand Wash

Zone	07 – Ambattur
Division	80
Description	UPHC
Location	Menambedu
Address	Menambedu, Ambattur



WATER

#	Issues addressed	Remarks
1	Source of water	Bore well. No metro water.
2	Bore well	Yes
3	Main water tank	Yes

TOILETS

#	Issues addressed	Remarks
1	Number of toilets	For Visitors 2 toilets (1 for Ladies and 1 for Gents) For Staff 1 toilet and Medical Officer 1 toilet.
2	Separate water tank for toilet	No
3	Condition	Usable

HAND WASH

#	Issues addressed	Remark
1	Hand wash facility and type	Conventional tap with soap
2	Number of outlets	2
3	Condition	The hand wash apparatus has not been provided for this UPHC. They are using the available resources in an optimal way.

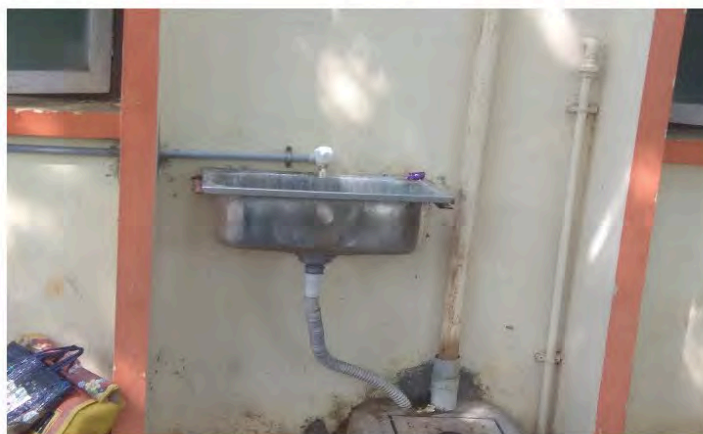
DRINKING WATER

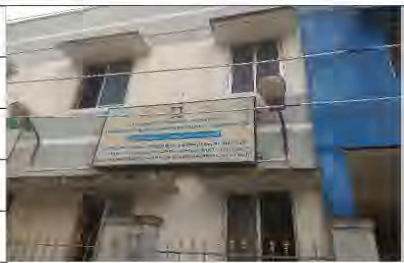
#	Issues addressed	Remark
1	RO water tank	Yes
2	Number of drinking outlets	1
3	Condition	Usable

RECOMMENDATION

- Staff must be trained as well as supervised to adhere to WaSH norms and disciplinary action initiated in case of failure to follow laid down SOP with regards to washing hands, insisting on the patients who come to wash hands and follow protocol as well as regarding wearing Masks.
- The asset for hand wash has not been provided. Running water connectivity and proper drainage for 2 wash basins provided and used properly. Sensitization of the staff on its importance and utilization must be insisted and followed up.
- Ramp for handicapped persons provided.

Zone	07 - Ambattur
Division	80
School Name	UPHC
Location	Menambedu, Ambattur

**Entrance****Handwash**

Zone	07 – Ambattur	
Division	81	
Description	UPHC	
Location	Venkatapuram	
Address	Venkatapuram, Ambattur	

WATER

#	Issues addressed	Remarks
1	Source of water	Bore well. No metro water.
2	Bore well	Yes
3	Main water tank	Yes

TOILETS

#	Issues addressed	Remarks
1	Number of toilets	For Visitors 2 toilets (1 for Ladies and 1 for Gents) For Staff 1 toilet and Medical Officer 1 toilet.
2	Separate water tank for toilet	No
3	Condition	Usable

HAND WASH

#	Issues addressed	Remark
1	Hand wash facility and type	Conventional tap with soap
2	Number of outlets	2
3	Condition	The hand wash apparatus has been provided for this UPHC but not being used. This may pose a health hazard also.

DRINKING WATER

#	Issues addressed	Remark
1	RO water tank	Yes
2	Number of drinking outlets	1
3	Condition	Usable

RECOMMENDATION

- Staff must be trained as well as supervised to adhere to WaSH norms and disciplinary action initiated in case of failure to follow laid down SOP with regards to washing hands, insisting on the patients who come to wash hands and follow protocol as well as regarding wearing Masks.
- The asset for hand wash has been provided but not being used. Running water connectivity and proper drainage for wash basins not provided. Sensitization of the staff on its importance and utilization must be insisted and followed up.
- Ramp for handicapped persons provided.

Zone	07 - Ambattur
Division	81
School Name	UPHC
Location	Venkatapuram, Ambattur

**Entrance****Handwash**

Zone	07 – Ambattur	
Division	83	
Description	UPHC	
Location	Korattur	
Address	Korattur, Ambattur	

WATER

#	Issues addressed	Remarks
1	Source of water	Bore well. No metro water.
2	Bore well	Yes
3	Main water tank	Yes

TOILETS

#	Issues addressed	Remarks
1	Number of toilets	For Visitors 2 toilets (1 for Ladies and 1 for Gents) For Staff 1 toilet and Medical Officer 1 toilet.
2	Separate water tank for toilet	No
3	Condition	Usable

HAND WASH

#	Issues addressed	Remark
1	Hand wash facility and type	Conventional tap with soap
2	Number of outlets	4 + 1
3	Condition	The hand wash apparatus has been provided for this UPHC but not being used. One tap is being used for washing hands. This may pose a health hazard also. Proper drain facility exists.

DRINKING WATER

#	Issues addressed	Remark
1	RO water tank	Yes
2	Number of drinking outlets	1
3	Condition	Usable

RECOMMENDATION

- Staff must be trained as well as supervised to adhere to WaSH norms and disciplinary action initiated in case of failure to follow laid down SOP with regards to washing hands, insisting on the patients who come to wash hands and follow protocol as well as regarding wearing Masks.
- The asset for hand wash has been provided but not being used. Running water connectivity and proper drainage for wash basins not provided. Sensitization of the staff on its importance and utilization must be insisted and followed up.
- Ramp for handicapped persons provided. Metro water connectivity can be easily provided.

Zone	07 - Ambattur
Division	83
School Name	UPHC
Location	Korattur, Ambattur Zone

**Entrance****Handwash**

Zone	07 – Ambattur
Division	85
Description	UPHC
Location	Varadarajapuram
Address	Varadarajapuram, Ambattur



WATER

#	Issues addressed	Remarks
1	Source of water	Bore well. No metro water.
2	Bore well	Yes
3	Main water tank	Yes

TOILETS

#	Issues addressed	Remarks
1	Number of toilets	For Visitors 2 toilets (1 for Ladies and 1 for Gents) For Staff 1 toilet and Medical Officer 1 toilet.
2	Separate water tank for toilet	No
3	Condition	Usable

HAND WASH

#	Issues addressed	Remark
1	Hand wash facility and type	Conventional tap with soap
2	Number of outlets	1
3	Condition	The hand wash apparatus has not been provided for this UPHC. One tap is being used for washing hands. This may pose a health hazard also. Proper drain facility exists.

DRINKING WATER

#	Issues addressed	Remark
1	RO water tank	Yes
2	Number of drinking outlets	1
3	Condition	Usable

RECOMMENDATION

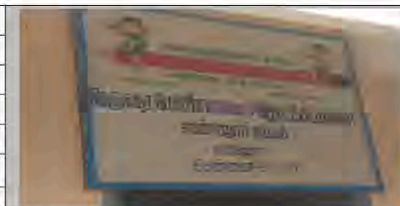
- Staff must be trained as well as supervised to adhere to WaSH norms and disciplinary action initiated in case of failure to follow laid down SOP with regards to washing hands, insisting on the patients who come to wash hands and follow protocol as well as regarding wearing Masks.
- The asset for hand wash has not been provided. Sensitization of the staff on its importance and utilization must be insisted and followed up.
- Ramp for handicapped persons not provided as the entrance is on flat surface. However, facilities for them can be enhanced. Metro water connectivity can be easily provided.

Zone	07 - Ambattur
Division	85
School Name	UPHC
Location	Varadarajapuram, Ambattur Zone

**Entrance****Handwash**

Existing status assessment – Schools

Zone	01 - Tiruvottiyur	
Division	01	
School Name	CPS	
Location	Ennorekuppam	
Address	Ennorekuppam, Ennore	
Number of Students	Boys	30
	Girls	31

**WATER**

#	Issues addressed	Remarks
1	Source of water	Bore well
2	Bore well	Yes.
3	Main water tank	Yes. Adequate safety measures and SOP for assets deployed must be provided.

TOILETS

#	Issues addressed	Remarks
1	Number of toilets	Toilets for boys 2 toilet with urine platform
		Toilets for girls 2 toilet with urine platform
3	Privacy rooms (Menstrual Hygiene)	Not applicable
4	Incinerator for menstrual pads	Not applicable
5	Separate water tank for toilet	Yes
6	Condition	Girls toilet under construction. HM Complained of poor facilities

HAND WASH

#	Issues addressed	Remark
1	Hand wash facility and type	Conventional tap with soap facility
2	Number of outlets	3
3	Condition	Working

DRINKING WATER

#	Issues addressed	Remark
1	RO water tank	Yes
2	Number of drinking outlets	1
3	Condition	Usable

Zone	01 –Tiruvottiyur
Division	01
School Name	CPS
Location	Ennorekuppam



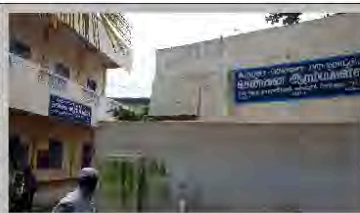
Entrance

BoysToilets



RO Water set up

Zone	01 - Tiruvottiyur	
Division	01	
School Name	CHS	
Location	Kamaraj Nagar	
Address	3 rd Street, Kamaraj Nagar, Ennore	
Number of Students	Boys	23
	Girls	22

**WATER**

#	Issues addressed	Remarks
1	Source of water	Bore well
2	Bore well	Yes
3	Main water tank	Yes

TOILETS

#	Issues addressed	Remarks
1	Number of toilets	For boys 1 toilet and a urinal platform For girls 3 toilets and a urinal platform
3	Privacy rooms (Menstrual Hygiene)	Not available
4	Incinerator for menstrual pads	Yes and Working
5	Separate water tank for toilet	Yes
6	Condition	Usable

HAND WASH

#	Issues addressed	Remark
1	Hand wash facility and type	Conventional tap with soap
2	Number of outlets	5
3	Condition	The hand wash taps are broken / non- usable condition.

DRINKING WATER

#	Issues addressed	Remark
1	RO water tank	Not available
2	Number of drinking outlets	0
3	Condition	Not available. Providing good RO is an immediate requirement

Zone	01 - Tiruvottiyur
Division	01
School Name	CHS, Kamaraj Nagar
Location	3 rd Street, Kamaraj Nagar, Ennore



Entrance



Handwash- Entrance



Open Drain- Entrance

Zone	01 - Tiruvottiyur	
Division	01	
School Name	CPS	
Location	KasikoilKuppam	
Address	KasikoilKuppam, Ennore, Chennai- 57	
Number of Students	Boys	45
	Girls	40

**WATER**

#	Issues addressed	Remarks
1	Source of water	Bore well
2	Bore well	Yes
3	Main water tank	Yes

TOILETS

#	Issues addressed	Remarks
1	Number of toilets	For boys 1 toilet and Urinal platform
		For girls 2 toilets and Urinal platform
3	Privacy rooms (Menstrual Hygiene)	Not applicable
4	Incinerator for menstrual pads	Not Applicable
5	Separate water tank for toilet	No
6	Condition	Usable

HAND WASH

#	Issues addressed	Remark
1	Hand wash facility and type	Conventional tap with soap
2	Number of outlets	3
3	Condition	The hand wash taps are working

DRINKING WATER

#	Issues addressed	Remark
1	RO water tank	Yes
2	Number of drinking outlets	3
3	Condition	Usable

Zone	01 - Tiruvottiyur
Division	01
School Name	CPS
Location	KasikoilKuppam, Ennore, Chennai- 57

Entrance



Zone	01 - Tiruvottiyur	
Division	01	
School Name	CPS	
Location	Mugadhuvarakuppam	
Address	Mugadhuvarakuppam, Ennore	
Number of Students	Boys	20
	Girls	22

**WATER**

#	Issues addressed	Remarks
1	Source of water	Bore well
2	Bore well	Yes
3	Main water tank	Yes

TOILETS

#	Issues addressed	Remarks
1	Number of toilets	For boys 1 toilets and 2urinal platform For girls 1 toilets and a urinal platform
3	Privacy rooms (Menstrual Hygiene)	Not applicable
4	Incinerator for menstrual pads	Not Applicable
5	Separate water tank for toilet	No
6	Condition	Usable

HAND WASH

#	Issues addressed	Remark
1	Hand wash facility and type	Conventional tap with soap
2	Number of outlets	3
3	Condition	The hand wash taps are broken / non-usable condition.

DRINKING WATER

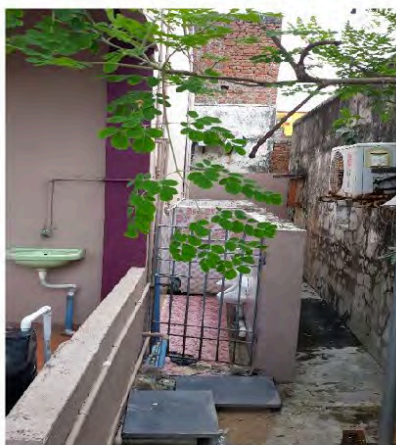
#	Issues addressed	Remark
1	RO water tank	Yes
2	Number of drinking outlets	1
3	Condition	Usable

Zone	01 - Ennore
Division	11
School Name	CPS
Location	Mugadhuvarakuppam



Entrance

Girls Toilet



Boys Toilet and Urinal