# Land Acquisition and Resettlement Due Diligence Report

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# India: Integrated Urban Flood Management for the Chennai-Kosasthalaiyar Basin Project – Additional Financing

# Restoration of Ecosystem Services of Kadapakkam Lake in the Chennai-Kosasthalaiyar Basin Project

Prepared by Greater Chennai Corporation, Government of Tamil Nadu.

## CURRENCY EQUIVALENTS

(as of 04 March 2022)

| | | |
|---|---|---|
| Currency unit | – | Indian rupee (₹) |
| ₹1.00 | = | $0.013 |
| $1.00 | = | ₹75.84 |

## ABBREVIATIONS

| | | |
|---|---|---|
| ADB | - | Asian Development Bank |
| BPL | - | Below Poverty Line |
| CMA | - | Chennai Metropolitan Area |
| DMS | - | Detailed Measurement Survey |
| FMB | - | Field Measurement Book |
| GEF | - | Global Environment Facility |
| GOTN | - | Government of Tamil Nadu |
| GCC | - | Greater Chennai Corporation |
| GRC | - | Grievance Redressal Committee |
| GRM | - | Grievance Redress Mechanism |
| NOC | - | No Objection Certificate |
| PWD | - | Public Works Department |
| PMU | - | Project Management Unit |
| SWD | - | Storm Water Drains |
| SPS | - | Safeguard Policy Statement |
| UGSS | - | Underground Sewage System |
| WRD | - | Water Resource Department |

## WEIGHTS AND MEASURES

| | | |
|---|---|---|
| $^{o}C$ | - | degree Celsius |
| km | - | kilometer |
| LPCD | - | liters per capita per day |
| m | - | meter |
| MLD | - | million liters per day |
| mm | - | millimeter |
| dia | - | diameter |
| $km^2$ | - | square kilometer |

**NOTE**

In this report, $ refers to United States dollars.

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# I. INTRODUCTION

## A. Background

1. Water bodies across India are facing a myriad of ecological challenges due to rapid industrialization and urbanization. Issues like loss of watershed, increasing pollution levels, deteriorating water balance, encroachment and illegal constructions have led to a reduction in the number of urban water bodies and a dire lack of groundwater recharge has impacted the health of existing water bodies over time. Such issues coincide with an influx of population in Indian cities leading to an increase in demand of water resources for personal consumption and for industry. To cater to this rising demand for water across India, augmenting the number of water bodies and improving their health is crucial from a public health and ecological perspective. Water bodies like ponds and lakes provide various ecosystem services that are required to manage microclimate, biodiversity and nutrient cycling. In the Indian context, millions rely on these ecological services provided by water bodies and historically rainwater harvesting has been used as an easy, low-cost and locally adoptable technique to maintain water storage.

2. Chennai Metropolitan Area (CMA) has many water bodies in the form of Tanks/Kanmoi/Kulam/Lakes/Eri which contribute for sustainable water resources and for groundwater recharge. However, the nature of almost all these water bodies has changed and became seasonal due to fast growing urban settlements and unsustainable human interventions. The erratic rainfall pattern, unplanned and unregulated land use change in the catchment area and unsustainable exploitation of resources, unauthorized extraction of groundwater within the catchment, illegal construction and encroachments are the main negative externalities causing the degeneration of most of the Lakes/ Water Bodies.

3. Government of Tamil Nadu(GOTN)recently announced the policy of sustainable water security mission, under this policy many lake projects being improved across the state and various funding programs adopted to improve the surface water quality and quantity of storage is initiated. GCC is implementing various water body improvement and rejuvenation projects to improve the water bodies to counter erratic climate and to improve the underground water quality in Chennai region

4. Greater Chennai Corporation (GCC) has identified the Kadapakkam lake in North Chennai which is one among the major water bodies located near to Manali in Greater Chennai Corporation and within the Kosathalaiyar Basin area with the association ofAsian Development Bank (ADB) under program of Global Environment Facility (GEF). This lake has been identified by the GCC for restoration and protection works by studying the interventions in the basin and catchment area for water recharging and retaining the lake area from future encroachments as per ADB Green initiative principles which is to be funded by GEF program.

5. Kadapakkam being pristine land, comparatively, in the GCC region which is bound to be urbanized as the development is fast paced with Industrial demand, protecting the unpolluted lake is the model for any future urban developments and this protected place will provide the necessary urban lung space for the future rising population. GEF Program which has the objective to combat climate change and combat urban challenges had selected the Chennai, Kosathalaiyar basin as one of the showcasing areas to develop a sustainable model project in the line of GEF guidelines.

## B. About the Project

6. The proposed Kadapakkam lake rejuvenation projects envisaged to be a part of Nature-based approach for building climate resilience against flood risks in the Kosasthalaiyar River Basin. The identified area is in the northern part of the city that has low urban density compared to other parts of Chennai.The lake which measures about 134.8 acres, is relatively undisturbed and its inflow comes formivore lake in the upstream and flows to Ariyalur lake in the downstream and it falls within Kosasthalaiyar river basin.

7. With the assistance from ADB, GCC envisaged this project to be combination of urban centric lake restoration without diluting the essence of the lake which is still partly being used for irrigation purpose. North Chennai is predominantly being developed as industrial area, therefore, development of Kadapakkam lake will prevent the lake from being polluted and provide pulmonary relief to the growing urban population.

8. The proposed project is aimed for definite objectives, as defined below:

(i) To restore the Lake to ensure water is retained throughout the year by deepening and desilting and improving the water holding capacity and to increase the depth of the lake;
(ii) To provide a space for North Chennai residents to hang out, natures getaways and to provide a space for pollution-free breathing in the fast-growing industrial area;
(iii) To protect the lake from any future potential encroachments from either fast paced urban squatter settlement or from industrial pollution; and
(iv) Development of waterfront in the lake and explore the ways of usage of available space and its potential by introducing variety of attractions like walkways, forest plantation, parks, etc.

9. Municipal Administration and Water Supply (MAWS) Department, GOTN will be the executing agency for this project. A state level steering committee chaired by Chief Secretary will provide overall policy and strategic guidance to the project. There will be an Executive Committee in MAWS with Additional Chief Secretary, MAWS as Chairman and Commissioner, Deputy Commissioner (Works) and Chief Engineer from GCC as members with full powers of Government in project related matters. GCC will establish a project management unit (PMU) for the project which will be headed by Commissioner, GCC as Project Director and a project implementation unit (PIU) in the Storm Water Drain (SWD) Department of GCC headed by Chief Engineer (SWD).

10. The project is assessed as technically viable. Inflow to Kadapakkam Lake will pass through a shallow forebay to improve water quality before entering the main lake. The forebay will be periodically cleaned during low-flow periods, which will reduce the necessary frequency and cost of desilting the main lake. Locally available and environmentally friendly materials will be used for developing the lake bund, furnishings, and bird island. A lake management committee comprising various stakeholders including representatives from civil society organization(s) will be constituted to review maintenance, oversee water and environmental quality monitoring, and initiate coordinated works to resolve any operational issues. Community awareness will be raised to deter solid waste dumping and protect water bodies.

11. Kadapakkam Lake can be approached from three directions; one is the Vichoor main road in the north eastern direction or Kadapakkam Road in the eastern direction or Sendrapakkam-Vichoor road in the south-west direction. The existing approach roads are adequate and will not

cause any temporary impacts during construction. No land acquisition, physical, and economic displacement is envisaged in the components supported by the additional financing. The lake site belongs to government (Water Resources Department, Government of Tamilnadu). Lake rejuvenation will support farmers' livelihood by improving access to the surplus flow from renewed sluice gates and replenished groundwater through their bore wells. The components financed through additional financing under GEF are Category C for involuntary resettlement as well as indigenous peoples impacts.

### C. Scope of this Report

12. This due diligence report (DDR) is prepared for the proposed 'Restoration of Biodiversity and Ecosystem Services in Kadapakkam Lake in Chennai' under GCC. The report is prepared based on the available preliminary design and the draft detailed project report (DPR) prepared for this project by GCC.

13. A due diligence process was conducted to examine the land acquisition and resettlement issues in detail based on the preliminary design and information, aligned with Asian Development Bank's Safeguard Policy Statement (ADB SPS), 2009 and no land acquisition or involuntary resettlement impacts have been identified as the entire lake area including lake bund in owned by Water Resource Department (WRD), Public Works Department (PWD), Government of Tamil Nadu. The entire area is free from any encumbrances. Any adverse impact in terms of permanent or temporary such as land acquisition, physical displacement, economic displacement, adverse impact on livelihood, community properties or any other impact is not anticipated due to the proposed project. The due diligence has verified that there are no informal encroachments; this is also certified by Greater Chennai Corporation. This report describes the findings and provides copies of relevant documents, community consultations and photographs.

14. The DDR is updated and reconfirmed for final impacts following detailed design and based on detailed measurement survey (DMS) and public consultation.The final DDR will be disclosed on GCC and ADB websites.

15. The final social safeguards document have been reviewed and will be disclosed onImplementation Agency and ADB websites. No civil works contract package are awarded, and construction started before the completion of final safeguard document. The project Implementing Agency is responsible to hand over the project land/site/s to the contractor free of encumbrance.

## II. PROJECT DESCRIPTION

### A. About the Project Area

16. TheKadapakkam village is located on the outskirts of Chennai city within the Greater Chennai Corporation area. Improvement of infrastructural facilities in the area by the GCC and proximity to EnnoreKamarajar Port has led to change in land use around the Kadapakkam village. Agricultural lands are converted into container storage yards and industrial units. The proposed activities under the project focus to protect the lake from encroachments, improve storage capacity and lake environment.

17. Kadapakkam Lake is located in GCC Zone-II (Manali), ward number 16, a developing residential area in North Chennai, a metropolitan city in Tamil Nadu, India, with Edayanchavadi in the East, Vichoor in the West, Vellivoyal in the North, and Mathur to the South. Kadapakkam

Panchayat and other nearby villages such as Ariyalur, Semimanual and Vichoor has become fast developing neighbourhood with number of new Industries in the town. The lake is approached by following the Vichoor main road from Tiruvottiyur- Ponneri High Road and also by following Kanniyammanpettai Kadapakkam road from Andarkuppam-Red hills Road.

18. Storm water and sewerage networks data were collected from secondary data and primary survey. There are no existingstorm water drains (SWD) and underground sewage system (UGSS) around the lake. The following table provides the availability of SWD facility around the study lake.

**Table 1: Connectivity status of Kadapakkam Lake**

| Name of Lake | SWD Network | UGSS | Name of ULB |
|---|---|---|---|
| Kadapakkam lake | Available in the downstream of lake | Not Available | GCC |

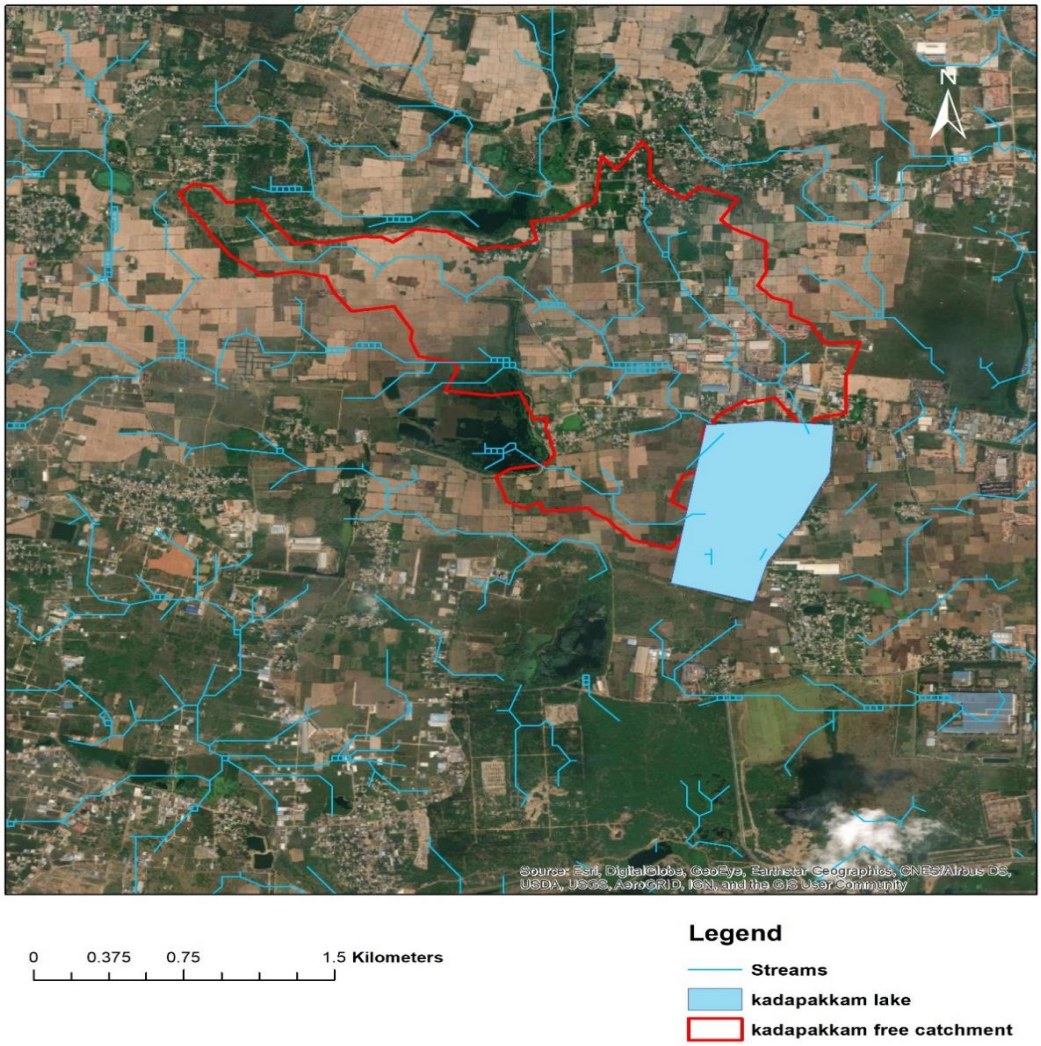
Source: Detailed Project Report, Volume 1, Kadapakkam Lake. PMU

**Table 2: Capacity of Kadapakkam Lake**

| Name | Lake Area ($km^2$) | Catchment Area ($km^2$) | | Water spread area ($km^2$) | Capacity ($M\ m^3$) |
|---|---|---|---|---|---|
| | | Free | Combined | | |
| Kadapakkam lake | 0.5 | 3.2 | 13.4 | 0.5 | 1.19 |

Source: Detailed Project Report, Volume 1, Kadapakkam Lake. PMU

**Figure 1: Catchment Map for Kadapakkam Lake**




Source: Detailed Project Report, Volume 1, Kadapakkam Lake. PMU

19. All existing water inlets and outlet drain of the lake were surveyed and cross sections details were measured to estimate the quantity to be de-silted. Number of Inlets and outlets of the Lakes and its existing condition were identified. List of inlets and outlet of the lake is provided in the Table 3.

20.

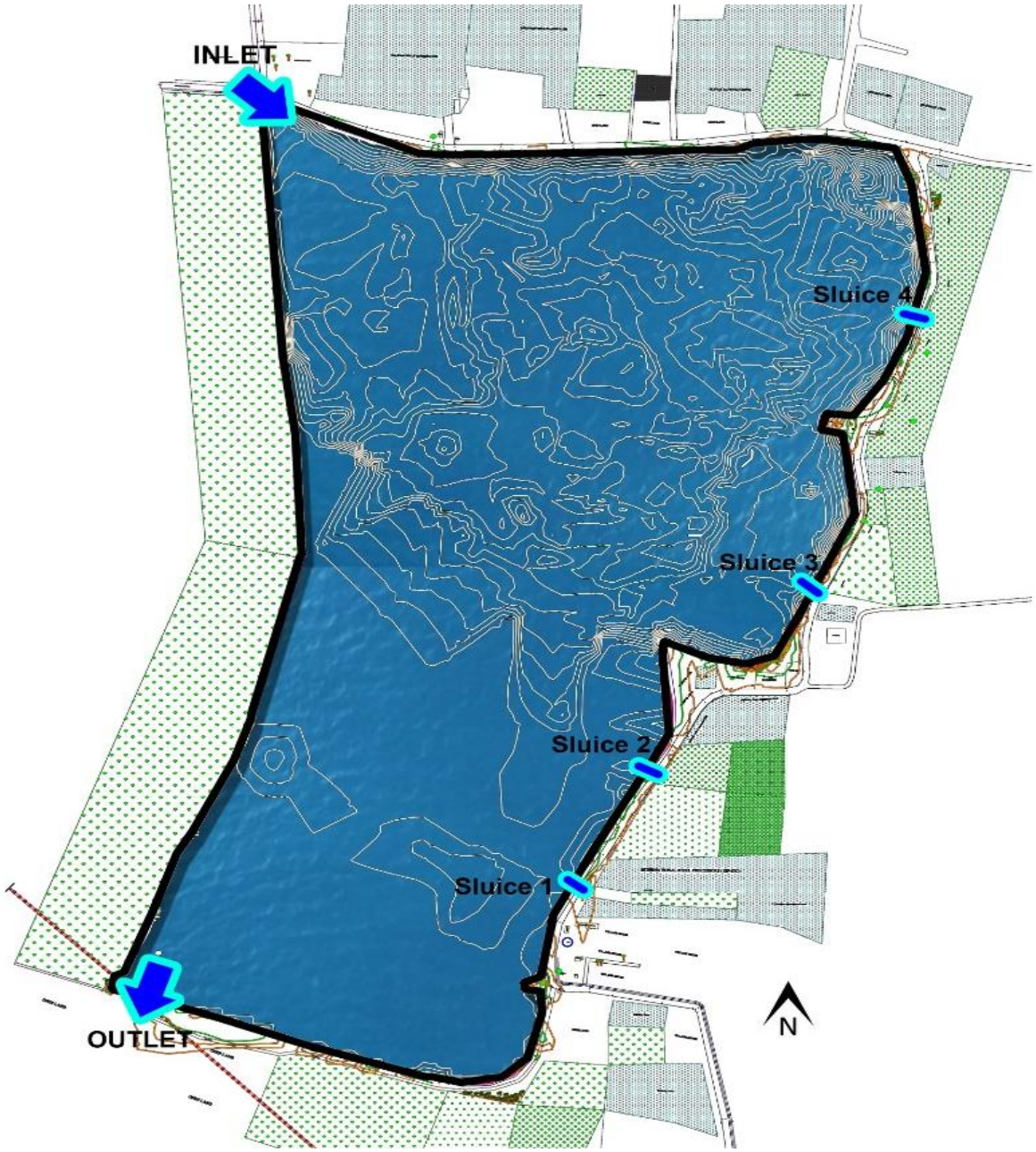
**Table 3: Number of Inlet and Outlet locations of the Kadapakkam Lake**

| Name of the Lake | No. of Inlets | Tank Sluices | Surplus Weir |
|---|---|---|---|
| Kadapakkam lake | 1 | 4 | 2 |

Source: Detailed Project Report, Volume 1, Kadapakkam Lake. PMU

21. There is one major inlet to the lake. Inlet 1 is from Sembium ManaliLake which enters the Lake from north westernend. There are fouroutlets located on the bund at various locations. Status of outlets and tank sluice is shown in Figure 2.

**Figure 2: Survey Map Showing Inlets and Outlet in Kadapakkam lake**




Source:Detailed Project Report, Volume 1, Kadapakkam Lake. PMU

## B. Project Components

22. The following table describes the proposed components for rejuvenation of Kadapakkam Lake.

**Table 4: Description of Work for Kadapakkam Lake**

| S. No | Description of work |
|---|---|
| 1 | Desilting and Deepening of Lake around 7,00,000 cu.m |
| 2 | Strengthening of Bund and Bund Formation 2.5 Km<br>(Clearing of Prosopisjuliflora jungle and strengthening of Bund & Bund formation using Clay core, Boulders and Excavated Good earth from the site and using Geo textile to control soil erosion and turfing with plant materials. and bund formation for bird island). |
| 3 | Providing Foot Path arrangements (using Precast fly ash Kerb and fly ash Pavers) |
| 4 | Construction of Peripheral Drain along the eastern bund |
| 5 | Children's Park and Play Field<br>(Using Precast fly ash Pathway, Outdoor play equipment's, Open Lawn, Sculpture using Recycled materials, Construction of OAT, |
| 6 | Lighting system<br>(LEDs for streetlights, Bollards, High mast lights, post tops, laser lights etc) |
| 7 | Construction of Toilet Blocks<br>(Using fly ash bricks, Terracotta jali, Art works on outer wall) |
| 8 | Precast structures Shaded Seaters<br>(Seating and canopies,) |
| 9 | Construction of Entrance Arch/Plaza<br>(With Water feature, Pathway, Pergola and Planting materials- using fly ash pavers, cobble stone and Precast structure). |
| 10 | Construction of Admin Block with Library (using fly ash bricks) |
| 11 | Rejuvenation of Inlet and Outlet Channels |
| 12 | Construction of Play area |
| 13 | Construction of Bio fencing along the lake bund |
| 14 | Rejuvenation of Surplus Weirs - 2Nos |
| 15 | Rejuvenation of Tank Sluices - 4 Nos |
| 16 | Supply and Fixing of Dust Bins (3 models) Tilting type managed by GCC. Provisions will be made to collect bio-degradable and non-biodegradable wastes separately and biodegradable wastes will be composted in in-house compost yard. Non-biodegradable wastes will be sent to recyclers. |
| 17 | Supply and fixing of Signage Boards |
| 18 | Urban Forest using Native species<br>Bio fencing, Installation of Irrigation for Soft Landscapes |
| 19 | Bore well and R.O |

Source: Detailed Project Report, Volume 1, Kadapakkam Lake. PMU

23. Considering the complex problem of the catchment area and ecosystem of Kadapakkam Lake, the following set of works were identified as essential for sustainable restoration of Lake in an integrated manner:

**Table 5: Interventions and proposed activities**

| Interventions | Proposed Activities |
|---|---|
| Hydrologic Interventions | • Hydraulic Improvement of Feeders (Cleaning, deepening, widening and Embankment stabilization including),<br>• Periodical Maintenance of all the Hydraulic Structures<br>• Deepening of Lake<br>• Forebay Pond provision<br>• Sluice Gate improvements |

| Interventions | Proposed Activities |
|---|---|
| Environmental cum Ecological Intervention | • Creating Awareness on solid waste dumping in the lake ecosystem<br>• Stakeholder Involvement in the maintenance of lakes.<br>• Bund Strengthening and improvements.<br>• Urban Forest using Native species), Bio fencing, Installation of Irrigation for Soft Landscapes<br>• Supply and fixing of Signage Boards<br>• Supply and Fixing of Dust Bins<br>• Provision of Bird Island |
| Engineering Interventions | • Renovating the Existing inlet and outlet structures of the lake for their contribution in storing the water in the lake and taking corrective measures<br>• GCC though Revenue Department to carry out a detailed survey of inlet and outlet channel and Parembole lands to prevent unauthorized encroachments.<br>• Adequate fencing and security of lake periphery to stop unauthorized entry.<br>• Regularization of excavation of soil from lake bed. |
| Recreational and Architectural Interventions | • **Children's Park and Play Field** (using Precast fly ash Pathway, Outdoor play equipment, Open Lawn, Sculpture using Recycled materials, Construction of OAT,).<br>• **Pre-cast structures** (Seating and canopies,)<br>• **Construction of Entrance Plaza** (With Water feature, Pathway, Pergola and Planting materials- using fly ash pavers, cobble stone and Precast structure).<br>• **Construction of Admin Block with Library** (using fly ash bricks) |

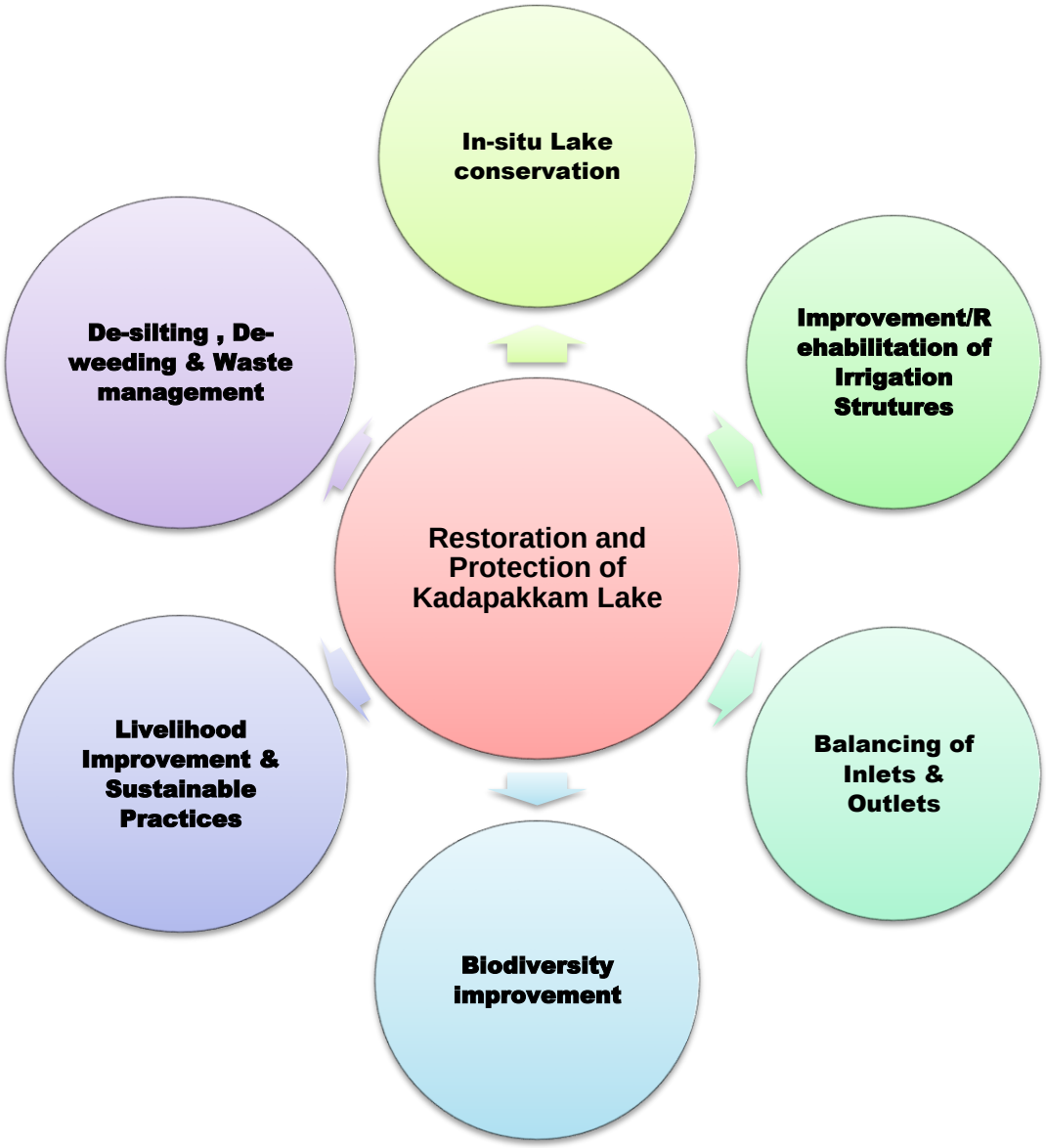
Source: Detailed Project Report, Volume 1, Kadapakkam Lake. PMU

* Note: Dredging activities are not anticipated to cause any involuntary resettlement impacts as all activities during construction will be undertaken within the project area or lake area. The dredged materials are proposed to be used for project construction work. Any leftover materials will be disposed in GCC's Kodungaiyur landfill site in a controlled manner, as discussed in the IEE for the project (paras 94, 97, 98).

24. The master plan[1] for deciding the interventions towards restoration of Kadapakkam lake was developed based on the analysis and conclusions derived from the engineering, hydrological, environmental, ecological and social intervention aspects of the Lake and its catchment. The suggestions provided by the stakeholders and line departments during the various consultations and focus group discussions have been fully considered. The Master Plan was developed in such a manner to ensure the sustainable restoration and protection of Lake, following is the indicative theme of project development.

[1] Second Master Plan for Chennai Metropolitan Area, 2026, approved by Government of Tamil Nadu in G.O.Ms. No. 190 H&UD dated 2.9.2008. Notification was made in the Tamil Nadu Government Gazettee Extraordinary No.266, Part II-Section 2 dated September 2, 2008.

**Figure 3: Interventions proposed for Restoration and Protection of Kadapakkam Lake**




Source: Detailed Project Report, Volume 1, Kadapakkam Lake. PMU

**Figure 4: Intervention Strategies for Kadapakkam Lake**


Source: Detailed Project Report, Volume 1, Kadapakkam Lake. PMU

25. The primary restoration measures for Kadapakkam lake:

(i) De-silting for a depth of 2 m average;
(ii) Strengthening and widening of bund around the lake;
(iii) Development of walking track, hedge rows and tree plantation on the bund;
(iv) Construction of shallow ponds at inlets and formation of bird island with dense Forest plantation;
(v) Restrictionto cart and vehicle washing and bathing activities;
(vi) Removal of water plants and weeds from the water spread areas and Lake foreshore bund; and
(vii) Restrict open defecation.

26. Apart from the above suggested primary measures, the other options which focus the thrust on preservation, restoration, conservation and combination of preservation and conservation (merging urban design).

(i) Formation of foot path on the bund with paver block, enclosed by kerb wall on both sides.
(ii) Repair and Reconstruction of 4 Number of existing tank sluices.
(iii) Strengthening of existing bund and stone pitching
(iv) Formation of foreshore bund with an inlet provision for every 100 m.
(v) De-silting of lake bed up to 2 m depth.
(vi) Providing Revetment in the front side slope of the tank.
(vii) Restoration of inlet and outlet channels with RCC lining.
(viii) Turfing along the main bund and also at the sides of foot path.
(ix) RCC lining of supply main channel from Sembium Manali Lake
(x) Clearance of thorny trees from the southern side of the lake.

27. The Project is proposed to restore water quality and improve ecological status by preventing the pollutants reaching the water body

(i) De-silting and deepening of Lake
(ii) Strengthening of the existing bund
(iii) Development of existing inlet and outlet channels
(iv) Providing Maintenance Road
(v) Supply and Erection solar Light Post on the maintenance road.
(vi) Supply and erection of solid waste bins.
(vii) Information Education and communications (IEC) activities.
(viii) Post project seasonal water quality monitoring for 4 years.

28. Project proposes 5m wider bund with exclusive walking path. Bund to be developed with natural method of using boulders in one layer and excavated clay in one layers which is to be formed as ideal earthen dam and will prove to best solution for any seepage loss.

29. By deepening the Lake, the capacity of the water body will increase and the excavated earth will be used for the creation of bund over the existing bund. Which will be further stabilized with layers of clay core and boulders in the centre of the bund and the slope will be retained using Geotextile fabric. Bund will be created with two levels, which will provide access and movement for different users.4m wide maintenance road is proposed along the lake boundary

30. Bird Island proposed with 5 acres of land and facility to be provided with Open Air theatre, children's play area, library along with facility of Hobby fishing, like leisure facilities which are ideal for Chennai residents to use this as ideal getaway place for family picnic. One of the bird islands will be restricted for public interventions to support biodiversity.

31. Project is predominantly designed to use green materials for any construction and all the elements are based in sustainable development methods, inflow is filtered with forebay pond with shallow depth to ensure better quality treated water is entering into main lake and shallow pond will become dry in the summer which will provide opportunity for easy maintenance and all the polluted materials can be removed every year.

32. Sluice Gate with the control structure to release water up to 3m for irrigation use in the existing location is proposed, which can be operated by community cooperation.

33. LED Light is proposed along the Walking and cycling track for illuminating them during them.

34. To prevent people from dumping the municipal solid waste into the lake, it is proposed to provide solid waste bin, 1.50 $m^3$ capacity at selected locations.

## C. Operation and Maintenance plan

35. The overall objective is to determine the most cost effective and efficient manner of providing high quality management and maintenance of the proposed facility.

### (i) Maintenance of Pathways

(a) Maintenance of pathways along with the maintenance of edges.
(b) Stabilizing damaged areas.
(c) Filling the cracks with mixed earth between the interlocked tiles.
(d) Regular collection and disposal of solid waste.

### (ii) Bund Protection

(a) Checking and preventing erosion.
(b) Stabilizing the damaged areas

### (iii) Water Quality Analysis

36. The water, sludge and extent of eutrophication in the lake should be monitored from various locations and has to be scientifically executed. Following physio-chemical and biological parameters would be monitored on a continuous basis as per the pre-planned schedule.

(a) Physiochemical analysis of the water samples.
(b) Chemical analysis of sludge and bottom sediments.
(c) Biological analysis
(d) Bacteriological analysis of the lake water
(e) For each category a total of 5 samples shall be collected and analyzed from various location around the lake for the parameters enlisted by Lake Management Committee / GCC.

(iv) **Operation & Maintenance of Septic Tank**

(a) Manpower
(b) Equipment / machinery maintenance
(c) Operation maintenance

(v) **Minor Repair works for Civil Structures**

(a) Toilet sanitary wares and Plumbing
(b) Solar lighting
(c) Hydrology structures (Sluices, Weirs, Inlet and Outlet structures)
(d) Service road

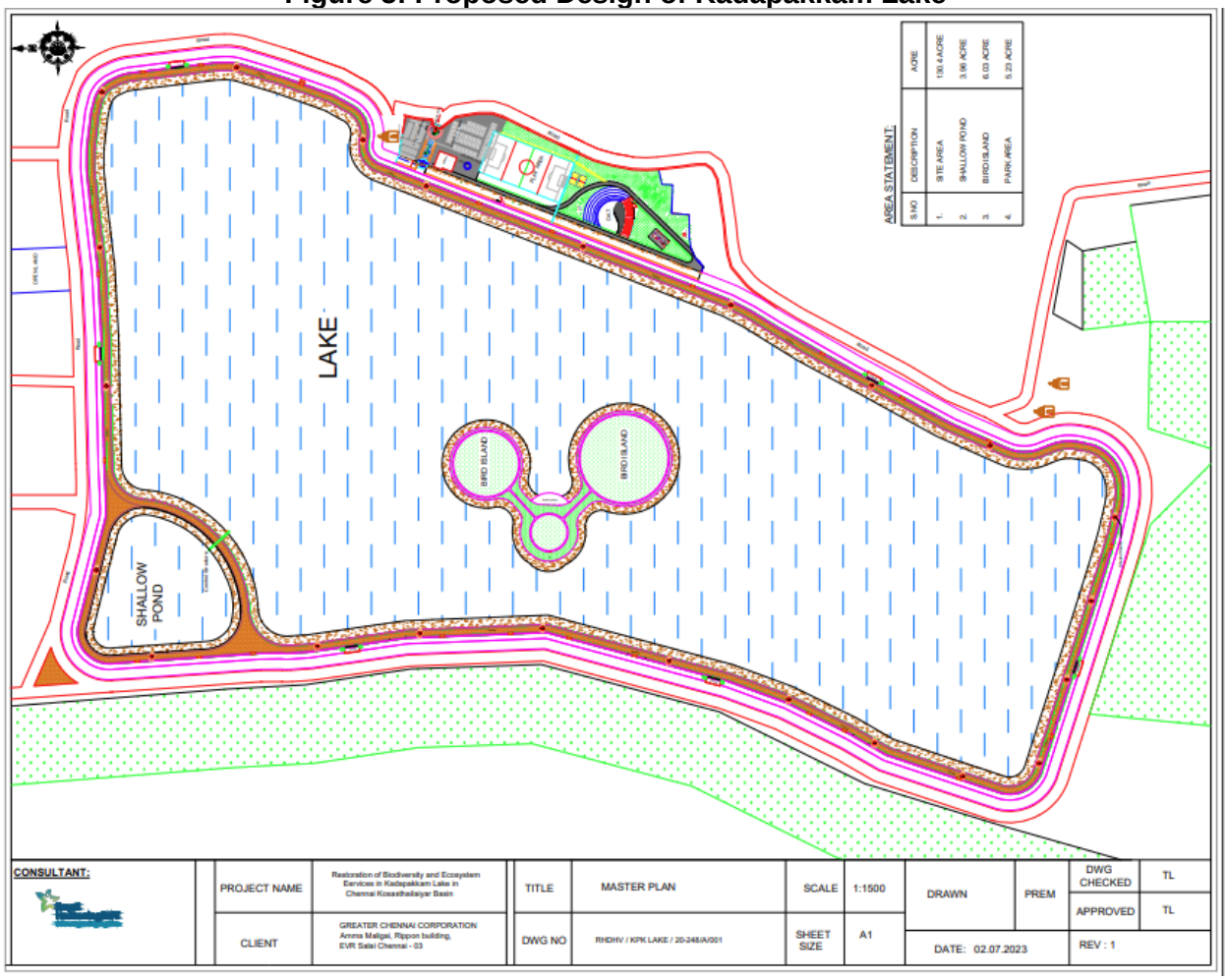
(vi) **Plantation (Hedges, Trees and Miyawaki Forest)**

(a) Application of Bio-manures (Compost and Vermi-compost)
(b) Watering and Protection works.
(c) Replacement of causalities
(d) Regular pruning of Hedge rows

37. Implementation of the proposed project does not involve any Land Acquisition or major construction activities. The entire work is proposed within the lake area including existing lake bund with is free from any types of encumbrances.

38. There is no adverse impact related to land acquisition and involuntary resettlement such as land acquisition, physical displacement, economic displacement, adverse impact on livelihood, community properties or any other impacts is assessed due to proposed project activity. No additional land is required for carrying out the proposed project activity. No economic displacement due to the project activity is anticipated, both during construction and operation.

**Figure 5: Proposed Design of Kadapakkam Lake**




**III. SOURCE: DETAILED PROJECT REPORT, VOLUME 1, KADAPAKKAM LAKE. PMU**

## SCOPE OF LAND AVAILABILITY AND RESETTLEMENT IMPACTS

### A. Land Acquisition and Involuntary Resettlement

39. The scope of land acquisition and involuntary resettlement is assessed during the field visits. The project will not result in any permanent or temporary land acquisition, and no involuntary resettlement impact is envisaged as the proposed site and development activities are within the lake area. Due diligence based on GCC's certification and field visits helped confirm that there is no encroachment by any private entities on the land. There are no squatters residing or kiosks conducting any commercial activities within the site area.

40. The lake area falls under Zone-II of GCC (Manali) in Ward 16. The entire Lake is owned by WRD, PWD, GOTN. The Lake falls under Kosasthalayar Basin Division, WRD, PWD as shown in the following table; however, development rights have been transferred to GCC from PWD. A scanned copy of declaration in this regard has been issued by SWDD,GCC is provided in Appendix 3. The details related to ownership of the lake have been provided in Table 6.

**Table 6: Ownership / maintenance authority for Kadapakkam Lake**

| | |
|---|---|
| **Ownership** | Water Resource Department ( WRD) GOTN |
| **Immediate Authority** | Executive Engineer, Kosasthalayar Basin Division |
| **Development Rights** | GCC |
| **ULB Jurisdiction** | Zone II – Manali, Ward 16, Greater Chennai Corporation |
| **Taluk Office** | Thiruvottriyur |

Source: Detailed Project Report, Volume 1, Kadapakkam Lake. PMU

41. Total area of the Lake as per the field measurement book (FMB) is 60.375 hectare which is 149 acres. As per the survey (undertaken during DPR preparation), the present lake area is 134.8acres, are duction by 9.53% (14.2 acres) compared to FMB records. Inaccurate method of measuring the lake area, construction of bund by PWD with boundary stone are the reasons for reduced lake size; cross checking with digital mapping revealed that the actual area of the lake is only 134.8 acres and no encroachment is seen around the lake. Hence, the actual area available now is 134.8 acres. Comparison is provided in the below table.

**Table 7: Area extent comparison of Kadapakkam Lake**

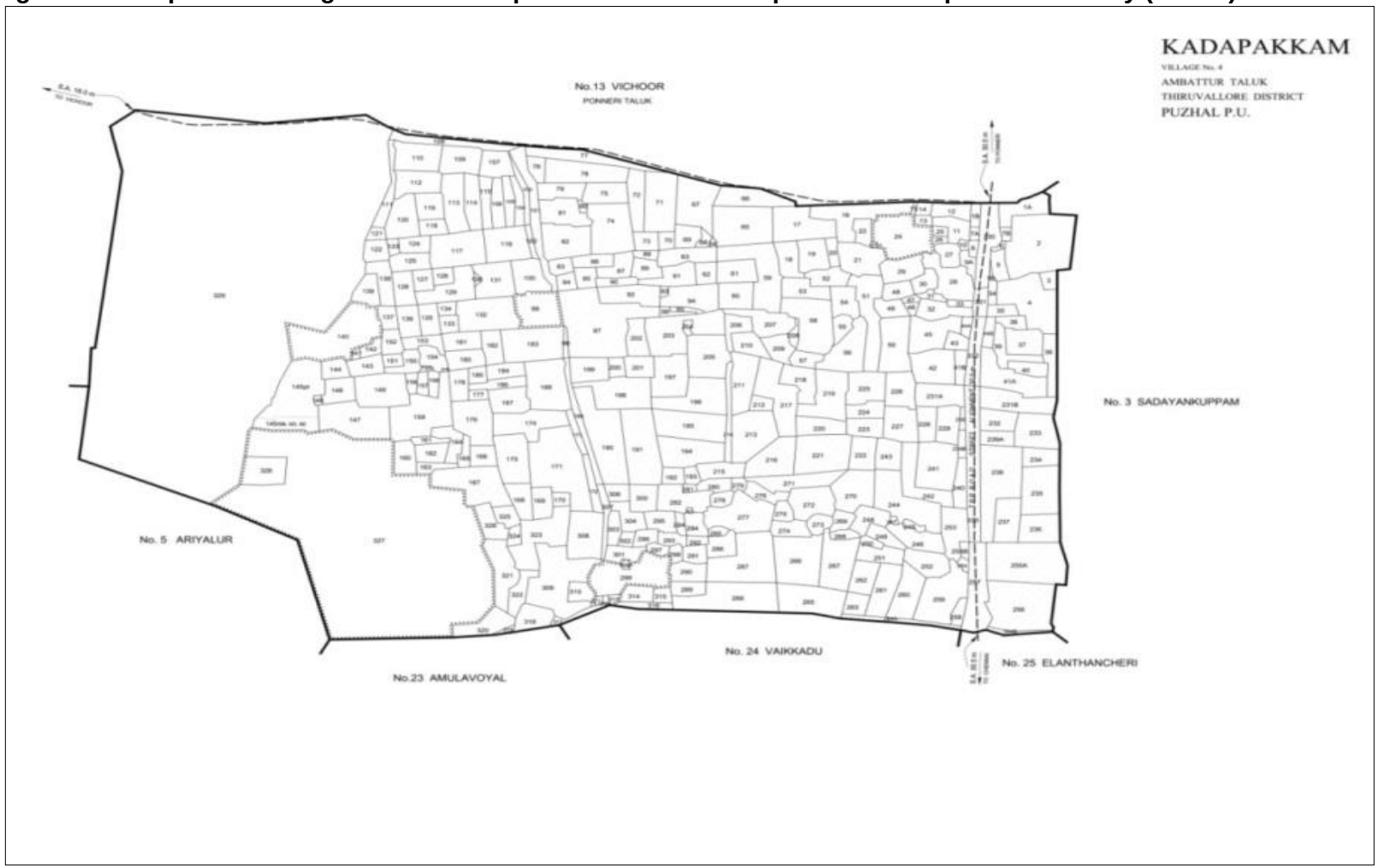
| Name | Present Lake Area as per Survey (Acre) | Original Area as per FMB / *Adan gal* (Acre) | % Reduction in Area |
|---|---|---|---|
| Kadapakkam Lake | 134.8 | 149 | 9.53 (14.2 acres) |

Source: Detailed Project Report, Volume 1, Kadapakkam Lake. PMU

42. The reduction in the lake area is due to the increase in the Berm Area caused during the laying of the pathway. However, this area will also be restored as part of the project.

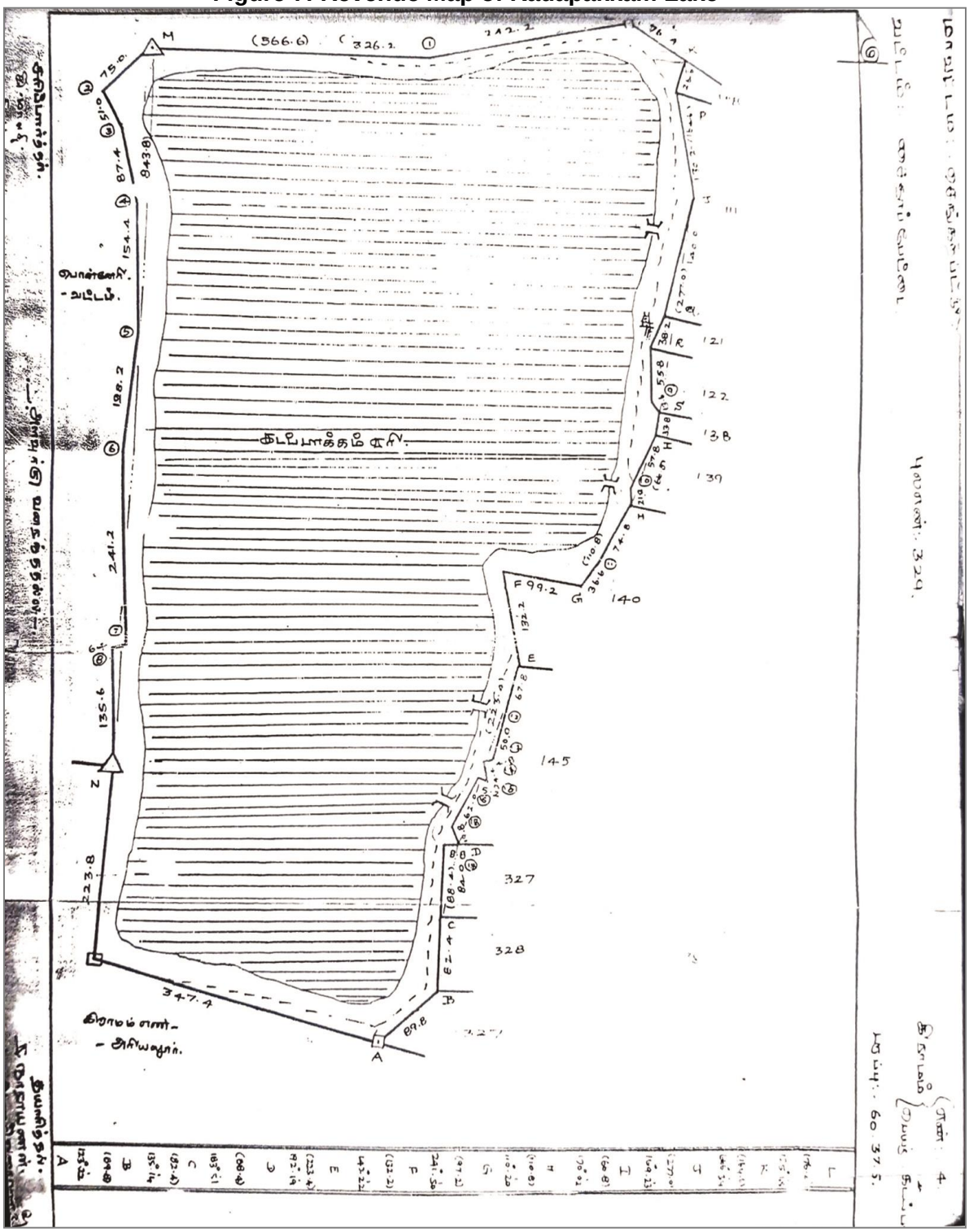
43. The project's civil works including all the common amenities, information centres etc. will be done within the existing lake area, which includes the banks. There are three small temples in the area which will not be disturbed as per the proposed design and hence no adverse impacts to the temples are anticipated due to project activity. Access to these temples will continue from the abutting road on the eastern side, even during the construction phase. The temple and the lake will be separated by a wall. No impact to the temples/CPRs is therefore assessed.

**Figure 6: Kadapakkam Village Cadastral Map from Chennai Metropolitan Development Authority (CMDA) Master Plan**




Source: Detailed Project Report, Volume 1, Kadapakkam Lake. PMU

**Figure 7: Revenue Map of Kadapakkam Lake**



Source: Detailed Project Report, Volume 1, Kadapakkam Lake. PMU

44. As a part of field study, aerial views of the lake area have been captured by using drones. The photographs below clearly show that there are no encroachments or habitat that can potentially be impacted due to construction work. All habitations and cultivation lands are beyond the lake bund and will have no impact during construction period. The entire construction work has been proposed within the lake area including Lake Bund. The catchment area of the Lake is manly used for agricultural purposes and command area is being used for both agriculture and industrial purposes also.

**Figure 8: Over all view of the lake**

Source: Detailed Project Report, Volume 1, Kadapakkam Lake. PMU

**Figure 9: View of the lake - North**

Source: Detailed Project Report, Volume 1, Kadapakkam Lake. PMU

**Figure 10: Southwest view of the lake**

Source: Detailed Project Report, Volume 1, Kadapakkam Lake. PMU

45. As per the CMDA Master plan 2026,[2] the proposed landuse types for development around Kadapakkam are presented below in Table 8.

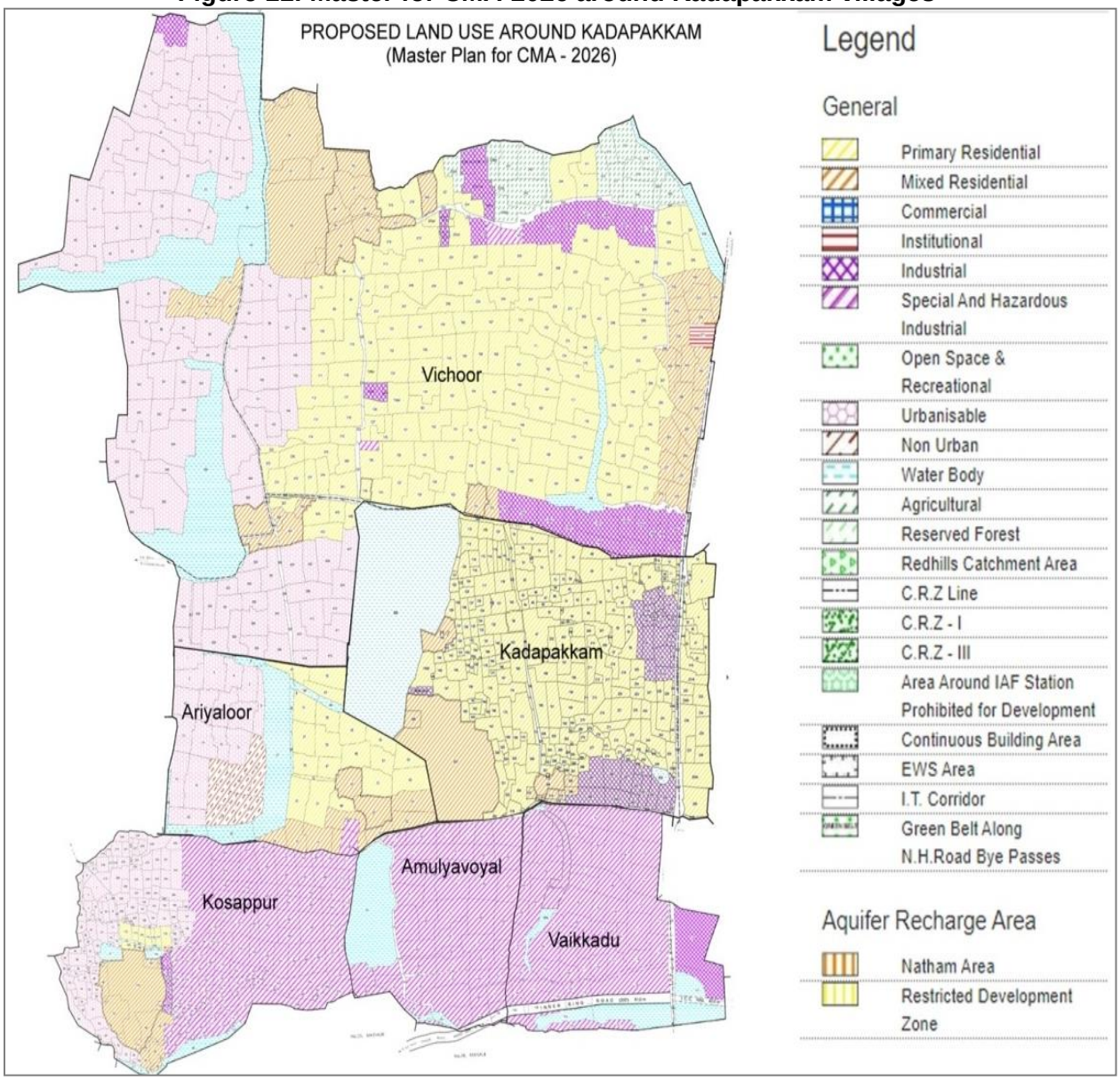
**Table 8: Land use details**

| Village | Proposed CMDA 2026 land use type for development |
|---|---|
| Kadapakkam<br>(Lake command area) | Primarily residential, mixed residential and Industries. |
| Sadayankuppam<br>(Lake downstream) | Primarily residential, mixed residential and Industries, Non-Urban, Agriculture and CRZ I areas |
| Vichoor<br>(Lake Catchment area) | Primarily residential, mixed residential and Industries and Special and Hazardous Industrial areas |
| Ariyaloor<br>(Part of Lake Catchment) | Primary residential |
| Ammulyavoyal<br>(Adjacent village on Southern side) | Special and Hazardous Industrial areas |
| Vaikkadu<br>(Adjacent village on Southern side) | Special and Hazardous Industrial areas and Industrial |

Source: Detailed Project Report, Volume 1, Kadapakkam Lake. PMU

[2] Second Master Plan for Chennai Metropolitan Area, 2026.

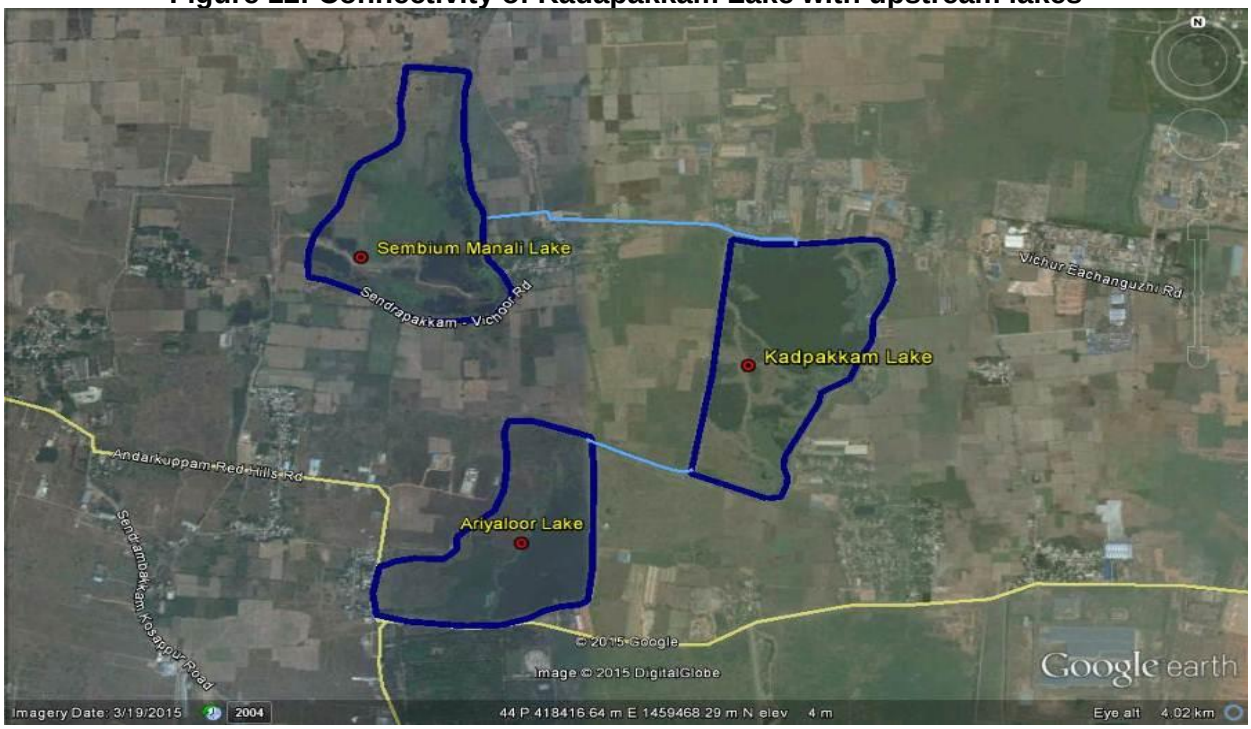
**Figure 11: Master for CMA-2026 around Kadapakkam villages**




Source: Detailed Project Report, Volume 1, Kadapakkam Lake. PMU

46. The Lake is connected in the upstream with immediate water bodies Samnium Manali Lake in the north and Ariyaloor Lake in the south via interconnection channels located at northern and southern end of the lakes respectively as shown in the Figure 13. The excess water overflows through the outlet sluices located on the bund to command area then reaches the Kosathalaiyar River by surface flow.

**Figure 12: Connectivity of Kadapakkam Lake with upstream lakes**




Source: Detailed Project Report, Volume 1, Kadapakkam Lake. PMU

47. The agricultural activities in the catchment area of Kadapakkam Lake partially depend on the water resource of the lake (especially during the monsoon season). During field visits, consultation and sample survey it has been noted that the overflow water from the lake is being released through existing sluice gates throughout the year except in summer seasons for 3-4 months. The overflow water of Kadapakkam Lake is the primary source of cultivation of the area other than summer seasons. In summer seasons, the water demand for agriculture is being met through available ground water of the region. Use of bore wells, shallow pumps, deep tube wells etc. are predominant in the area which are being used for extracting ground water during summer seasons (Appendix 2) for cultivation purpose.

48. Keeping in view the prevailing practice of the area and considering the water demand for agricultural purpose; it is proposed that the existing sluice gates will be renewed through the project and the construction work will be carried out during summer seasons (March – June) prior to commencement of rainy seasons. By doing so adverse impact will be avoided as the dependency on lake water during summer season is nil among the local cultivators. In this regard it is needed to be mentioned that, in Chennai; rainy seasons normally starts from July and last till September. The augmentation of the sluice gates will ensure more water supplies in the following seasons. Current patterns of usage will not be affected by the lake development. The farmers will continue to have access to the water from the surplus flow channel as earlier, which will also help replenish the ground water. Other than agriculture, the lake is used for hobby fishing and not for any other livelihood generating activity. The lake is currently not used for any other purpose. Thus, the proposed activity under ‘Kadapakkam lake rejuvenation project’ will not trigger ADB SPS for involuntary resettlement as there will no impact due to loss of livelihood.

49. One-to-one consultationswere conducted with 17 households in the month of February 2021, indicating that noloss of livelihood is anticipated. During the operations phase, as

mentioned in point 35, the farmers will continue to have access to the water from the surplus flow channel as earlier, which will also help replenish the ground water.

50. The GCC confirmed that the proposed project will have no adverse impact on existing water users (farmers). Presently, at downstream areas of the lake, farmers grow seasonal crops using the water available through the discharge sluices. When the storage goes below the sluice level there are instances of farmers resorting to pumping. The project interventions shall not alter the overflow weir level or the sluice levels and therefore shall not affect the present water availability of the farmers. Moreover, strengthening of bunds and desilting would enhance storage capacity of the lake leading to longer water availability period and thus help farmers to further improve the crop types and cropping pattern and negate the need for pumping, which was concluded based on the technical design and field visits by GCC.

# IV. FIELD WORK AND PUBLIC CONSULTATION

## A. Outline of Field Work

51. Field visit and transect walk was carried out in the project component locations. Field visit team comprised DPR consultants, safeguard consultants and representatives from GCC. No person or community is being adversely affected by this project implementation. The entire population of Kadapakkam lake area will benefit due to improved water supply facility. No land acquisition is required for this project. Thus, no physical or economical displacement (temporary or permanent) is assessed. No common property resources will be affected. Also, vulnerable groups such as the poor, women and their children, persons with disability, the elderly, scheduled tribes, other ethnic groups and non-titleholder will not be adversely impacted. One to one consultation meetings were conducted with local community, key informants by project team members to collect information and conduct a due diligence of the project. GCC will conduct continuous consultation and information sharing on technical aspects of GEF components with all user farmers, and detailed documentation of such consultations will be done. GCC will share all technical details that will guarantee availability of water for cultivation to the existing user farmers, in consultation meetings.

## B. Public Consultations

52. One-to-one interactionwas conducted (due to COVID-19 safety protocols) with the key stakeholders (farmers, women, shopkeepers, laborers) in line with the ADB's requirements pertaining to environmental, economic and social considerations (Appendix 1). Community level consultation were held in August 2022 as the COVID pandemic situation eased.During public consultation ( Minutes of meeting attached in Appendix 5) the concerns of the people were observed to be mostly on the usage of lake water and that the water availability for farming requirements need to be ensured. The people mainly opposed the proposed boating facility and hence the boating proposal is droppedin the revised proposal. Moreover, GCC and the local MLA present during public consultation ensured that the proposed project will not cause any hindrance to their agricultural water availability, rather would contribute to increase the water availability due to lake restoration activities.

53. During interaction with individuals, it has been clearly mentioned that the construction work will be undertaken in such a way that there will be no harm caused to any person due to project execution activity. Project outcomes and benefits were explained to the stakeholders. During the consultation, community people were explained in detail regarding the proposed developments of the Lake under the grant linked to the ADB project. All the participants confirmed their extended support for the success of the project. In total 17 people have been consulted among which 7 people (41%) were farmers who owns the land adjacent to the lake.

54. The proposed restoration work shall bring lot of visitors to the Lake; this will help development of infrastructures around the lake and provide optionsto the local people for alternate livelihood by establishing eateries and shops to meet the needs of visitors. This will boost the local economy. The proposed project activity will not affect the social life and livelihood of the people;continued consultation with the community will be beneficial to help them to understand the project contour, its immediate and long-term benefits.

55. Public information campaigns to explain the project details to a wider population will be conducted throughout project lifecycle. Public disclosure meetings will be conducted at key project stages to appraise community members. Prior to start of construction, the PIU will issue

notification on the start date of implementation in local newspapers. A notice board showing the details of the project will be displayed at the construction sites for the information of public.

56. Public participation will be generated through use of various methods, such as, stakeholder consultation meetings, FGDs with different groups (including women), key informant interviews etc. This is also expected to offer platform to people in different areas within the city to (i) know about the Program, and (ii) express their opinion regarding priorities and concerns related to the project.

## V. GRIEVANCE REDRESS MECHANISM

### A. Common Grievance Redress Mechanism

57. A grievance redress mechanism (GRM) will be established at three levels and will cover both environment and social issues of project components, interdepartmental concerns related to utility shifting and/or damages to utilities, and improvements proposed to Kadapakkam Lake under the GEF grant. The GRM will be established to evaluate, and facilitate the resolution of affected persons concerns, complaints, and grievances related to social and environmental issues related to the project in a time-bound manner. GRM will be accessible, inclusive, gender-sensitive and culturally appropriate for receiving and facilitating the resolution of affected persons' grievances related to the project. GCC has a well-established public grievance and redressal system to address concerns, complaints and grievances related to the various functions and services of GCC.3 The project GRM to be well integrated with the existing public grievance redress system of GCC.

58. The GRM will be disclosed to the affected communities and households prior to the mobilization of contractors for the project. The PIU safeguard officers will be responsible for registration of grievances, disclosure and communication and timely resolution of grievances. A complaint register will be maintained contractor’s site office(s), PIU and PMU levelswith details of complaint lodged, date of personal hearing, action taken, and date of communication sent to complainant. Registration of grievances will be facilitated by the contractor's social expert. Contact details and the process of grievance redressal will be disclosed to the communities through leaflets. Sample grievance registration form is given in the Appendix 5.

59. Affected persons will have the flexibility of conveying grievances/suggestions by submitting the grievance/suggestion in writing, through telephone call to Executive Engineer, PIU safeguards officer, or by writing in the complaints register at the Division Office or by submitting grievance/suggestion by email to GCC.Further, affected persons and/or persons can convey their grievances/suggestions through the public grievance and redressal system of GCC either through internet or by calling the telephone number ‘1913’ or by writing to the Commissioner.

### B. Grievance Redressal Process

60. In case of grievances that are immediate and urgent in the perception of the complainant, the Executive Engineer on-site will provide the most easily accessible or first level of contact for quick resolution of grievances. Contact phone numbers and names of the concerned Executive Engineer, PIU safeguard officers,contractors and that of the public grievance redressal systemwill be displayed at all construction sites at visible locations. The second level will be a four-member

[3]https://erp.chennaicorporation.gov.in/pgr/

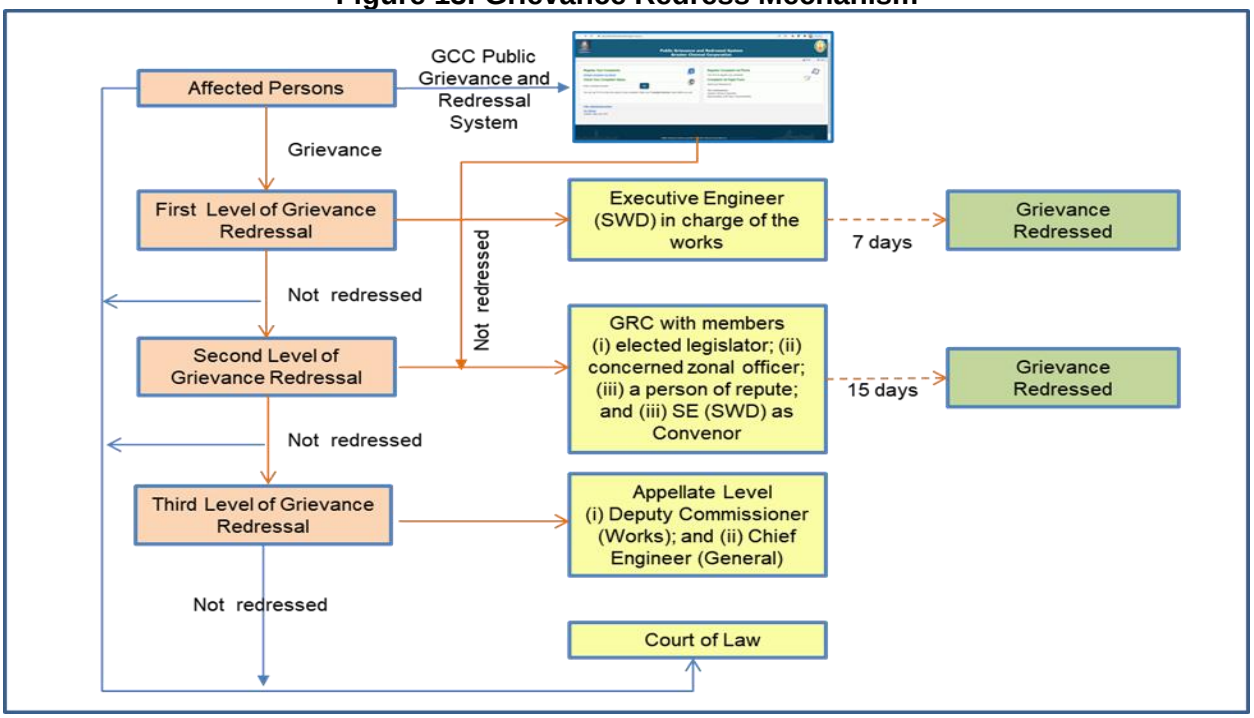
committee with the Superintending Engineer (SWD), GCC acting as its convenor. Third level will be the appellate level with the Chief Engineer (General) and Deputy Commissioner (Works).

(i) **1st Level Grievance.** The phone number of the site in charge Executive Engineer and of the public grievance redressal systemshould be made available at the construction site signboards. The contractors and field unit staff can immediately resolve grievances onsite and seek the advice of the Executive Engineer as required and resolve grievances within seven days of receipt of a complaint/grievance.

(ii) **2nd Level Grievance.** All grievances that cannot be redressed within seven days at field level will be reviewed by the GRC at PMU level comprising of 4-members, with preferably one member being a woman. The committee will have any one elected member of the legislature, concerned zonal officer, a person of repute and standing in locality, nominated by the Commissioner, GCC and the Superintending Engineer (SWD) acting as its convenor.

(iii) **3rd Level Grievance.** All grievances that cannot be redressed within 15 days at PMU level, will be placed before the Chief Engineer (General), who will consult the Deputy Commissioner (Works) in grievance resolution.

**Figure 13: Grievance Redress Mechanism**




GRC = grievance redress committee, SE = Superintending Engineer, SWD = Storm Water Drain

Source: Project Administration Manual; Integrated Urban Flood Management for the Chennai-Kosasthalaiyar Basin Project.

61. **Court of Law**: Despite the project GRM, an aggrieved person shall have access to the country's legal system at any stage and accessing the country's legal system can run parallel to accessing the GRM and is not dependent on the negative outcome of the GRM.

62. **ADB Accountability Mechanism**: In the event that the established GRM is not in a position to resolve the issue, the affected person also can use the ADB Accountability Mechanism through directly contacting (in writing) the Complaint Receiving Officer (CRO) at ADB headquarters or the ADB India Resident Mission (INRM). The complaint can be submitted in any of the official languages of ADB's developing member countries.

# VI. CONCLUSIONS

## A. Summary and Conclusion

63. The proposed 'Restoration of Biodiversity and Ecosystem Services in Kadapakkam Lake in Chennai' will provide much necessary lung space for all the localities. Under this restoration project, the selected Kadapakkam lake will be de-silted, deepened, inlet and outlet will be cleaned ofobstructions and the bunds will be strengthened. Also, the project is integrated with various components like walking path, bird island, shallow pond and children play area. The entire Lake area including lake bund is owned by WRD, PWD, GOTN. The Lakearea falls under Kosasthalayar Basin Division, Water Resource Division.No additional land is required. The proposed site is free from any encumbrances and is not anticipated to cause any involuntary resettlement impact due to proposed construction work or operation.

64. No adverse impact on existing water users (farmers). The project interventions shall not alter the overflow weir level or the sluice levels and therefore shall not affect the present water availability of the farmers. Moreover, strengthening of bunds and desilting would enhance storage capacity of the lake leading to longer water availability period and thus help farmers to further improve the crop types and cropping pattern

65. The impacts of project have been re-assessed (prior to start of civil work) upon finalization of detailed design. The DDR has been updated and reconfirmed for final impacts following detailed design and based on detailed measurement survey (DMS). The draft DDR will be reviewed and disclosed on GCC and ADB websites.

66. During civil work, a participatory approach will be pursued, and information dissemination requirements of the project will be adhered to. A grievance redress mechanism will also be established in the project. The Executing Agency will ensure compliance to all applicable laws and the ADB SPS.

## B. Next Steps

67. The DDR has been updated following detailed design. Any change in site or alignments during detailed design will require to be assessed afresh for land acquisition, involuntary resettlement impacts. The following information are included in the updated DDR:

(i) Photographs, and minutes of the meetings of public consultations held, particularly with user farmers, communities surrounding the lake and civil society organizations are attached

(ii) All property owners adjacent to the Lake Kadapakkam and all existing water users were identified. All such persons were consulted to ensure they are well informed of the impacts and benefits, clear about encroachment concerns, informed of availability of GRM and also that their inputs to the proposed project are considered. This will be done during detailed measurement survey/finalization of

detailed engineering design. Consultations with farmers recommended in the CAPP (Appendix 21 of PAM) will be implemented;

(iii) One more round of publicconsultation will be heldduring the time of project execution. Such consultations will identify landowners and water users and include the summary of gender-disaggregated participants, photographs of consultations, and minutes or summary of key points discussed. Such consultations will be presented in the Updated DDR.

**Appendix 1: Photographs of consultations in surrounding areas of Kadapakkam Lake**

| | | |
|---|---|---|
|  Mr. Kumaresan |  Ms. Saraswathy |  Mr Selvaraj |
|  Ms. Mahalakshmi |  Mr. Muthukrishnanan |  Mr. K.N.Muthu |
|  Ms. Poornima |  Mrs. Indumathi |  Mr. Kirubakaran |
|  Mr. Meganathan |  Ms. Mala |  Mr. Arumugam |
|  Mr. Pachaippan |  Mr. Perumal |  Mrs. Nagamma |
|  Mr. Murugan |  Ms. Kundhavai | |

## Summary of Consultations

In order to understand the present dependency of the lake, one-to-one consultations were conducted to identify the perception, concerns and apprehensions of the local residents, if any, towards the execution of the project. One-to-one interactions with local people were planned and utmost precautions were taken during the meeting due to COVID -19 restrictions. All participants were provided with face mask, hand sanitizers and maintained social distance throughout the process.

As per Asian Development Bank (ADB) direction, the farmers who own land adjacent to the lake were met during face-to-face interaction and their valuable opinions were documented. Non-agricultural sector persons were also consulted to understand their views, concerns and opinions. A questionnaire, which was translated to regional language (Tamil) for ease understanding of local people, was administered. The questionnaire primarily focuses on person's occupation, income status for the entire year, lake water usage, in case of farmers- land details, crops and seasonal variations in cropping/water use and water irrigation source and whether they are likely to be affected due to this project. Due care was taken to cover the entire year's crop selection pattern and water source details. The consultation was conducted on 23 February 2021. A public consultation was also conducted in August 2022 on the eco-restoration of Kadapakkam Lake Project (Minutes of Meeting attached in Appendix 5). During consultation, it was noted that the local farmers do not directly depend on lake water. The design of the project is made in such a wayt o allow farmers to have access to the water from the surplus flow of the Kadapakkam lake both during construction and in the operations phase. As the farmers expressed objections to have a boating facility as a part of the project, the boating component has been dropped from the revised proposal and the DDR has been updated accordingly. Since, post the implementation of restoration works, the holding capacity of the lake will almost double, the farmers can benefit with increased ground water recharge. None of the consulted person falls under BPL Category. Due to rapid transition of semi-urban to urban, many locals have access to employment. All the people have responded about their secondary occupation to support their needs. It was specifically highlighted during interaction that there will be no adverse impact on the local people due to the proposed project rather with successful implementation of the project it is expected that tourism will flourish which in turn can prove beneficial for the local residents.

**Key points discussed:**

(i) The Kadapakkam residents are interested in the lake restoration project.
(ii) The farmers are dependent on borewell water for the irrigation of their fields across all seasons including the summer seasons. During the interactions, it was noted that surplus water from the lake is allowed to flow via surplus discharge channel and this recharges the ground water. This input was noted, and the design is such that the farmers will have access to the lake water surplus during construction in addition to the operation period, ensuring that there is no impact of the project on the farmers.
(iii) In the last decade, seven children were drowned to death after which locals stopped using the lake water for drinking and household activities.
(iv) Farmers requested the provision to use the surplus water for agricultural uses. This input has been noted and incorporated in the design to allow undisturbed access to the surplus water as currently prevalent, including during the construction and operations phase.

(v) Women insisted on fencing the restored lake to stop/avoid unauthorized activities like open defecation on the lake bund.

(vi) Local residents requested a drinking water treatment facility and supply along with the lake restoration project as they get Municipal water supply once in three days.

(vii) Among the non-user group of lake water; owners of tea shop, grocery shop, bakery etc. were consulted to register their opinion and expectations out of this project. They expressed their aspiration towards the tourism and infrastructure development outcomes of the proposed project.

(viii) Fishing activity in the lake is for self-consumption and as a hobby, hence livelihood impact due to loss of income from fishing is not anticipated.

**Appendix 2: Photographs of alternative source of water for farmers during summer seasons**


Bore well and Sump Supply

**WATER RESOURCES DEPARTMENT**
**(Public Works Department)**

**FROM**
**Er. K.Asokan. B.E, M.Tech.,**
Chief Engineer, WRD.,
Chennai Region,
Chepauk, Chennai-5.

**TO**
The Chief Engineer,
SWDD, BRR & Special Projects, Greater
Chennai Corporation,
Ripon Building, Chennai- 3,

**Lr. No. T1 / AE1 / F- GCC-7 TANKS / 2018 Dated. 20 .09.2019.**

Sir,

Sub: Greater Chennai Corporation – Storm water Drain Department – Sustainable water security mission – Restoration and Rejuvenation of 7 water bodies – No Objection Certificate -Requested – Approval accorded - Regarding.

Ref: 1. Chief Engineer, SWDD, BRR & Special Projects, Greater Chennai Corporation, Ripon Building, Chennai- 3, S.W.D.C.No. B3/264/2018 Dt: 02.08.2019.

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In reference cited, the Greater Chennai Corporation had requested No Objection Certificate for Restoration and Rejuvenation of following 7 water bodies under the control of Public Works Department (WRD).

| S.No | Zone Number | Name of the Water bodies |
|---|---|---|
| 1 | II | Kadapakkam Lake |
| 2 | XIV | Nesavalar Lake |
| 3 | III | Sadayankuppam Tank |
| 4 | XI | Alapakkam Lake |
| 5 | XIV | Anai Eri ( Near Ambal Nagar) |
| 6 | XIV | Anna Nedunsalai |
| 7 | XIV | Periya Eri (near Bhavani Amman Koil) |

In this regard, the Superintending Engineer, WRD, Palar Basin Circle, 5 has submitted his recommendation for NOC to Alapakkam (Maduravoyal) Tank in Maduravoyal Taluk and Jalladaiyanpet Eri (Zone XIV) Dn 191, Pallikkaranai Anai Eri (Zone

XIV) Dn 190 and Pallikkaranai Periya Eri (Zone XIV) Dn 190 in Sholinganallur Taluk of **Chennai District** which are under the control of this department.

The Superintending Engineer, WRD, Palar Basin Circle, Chennai-05 has stated that the permission sought by Greater Chennai Corporation for Restoration and Rejuvenation of water bodies in the jurisdiction of Lower Palar Basin Circle Area is identified that, Jalladaiyanpet Eri (Zone XIV) Dn 191, Pallikkaranai Anai Eri (Zone XIV) Dn 190 and Pallikkaranai Periya Eri (Zone XIV) Dn 190 in Sholinganallur Taluk of Chennai District and this has to be confirmed with Public Works Department officials along with relevant records of the tank.

The No Objection Certificate is hereby given for carrying out of Restoration and Rejuvenation of 1) Alapakkam (Maduravoyal) tank in Chennai District 2)Jalladaiyanpet Eri (Zone XIV) Dn 191, 3)Pallikkaranai Anai Eri (Zone XIV) Dn 190 and 4)Pallikkaranai Periya Eri (Zone XIV) Dn 190 in Sholinganallur Taluk of Chennai District by the Greater Chennai Corporation which are under the control of Water Resources Department with the following conditions :-

1) The encroachments in water spread area of this tank should be completely evicted and should be restored to original extent as per FMB before commencement of the restoration and rejuvenation.
2) Any encroachments found in the channel poromboke, Eri ulvoy, Thandukkarai poromboke should be evicted completely before commencement of project.
3) Necessary provisions has to be made in the DPR for Relocation & Rehabilitation of existing encroached tenements.
4) Provisions may be made in the DPR the cost of eviction of encroachments.
5) The PWD officials should be allowed to inspect the site at any time during execution.

6) The hydraulic parameters and hydraulics of the tanks, tank appurtenances and tank infrastructures should not be changed at any cost. The tank bund has to be super standardized with free board of minimum 1.80m and the same should be reported to concerned Executive Engineers, W.R.D., and Superintending Engineer, P.W.D., W.R.D., Palar Basin circle, Chepauk, Chennai – 5.

7) After commencement of works any flood mitigation works, emergency flood control works in respect of this tank should be done only by Greater Chennai Corporation.

8) These tanks were severely affected by floods due to breaching of bund during historical flood 2015 (North East rainfall) and due technical care should be taken to close these breached portions permanently to avert breach in future.

9) The Local Bodies have laid many roads, provided infrastructures with in the tank boundary for the encroached layouts. This roads / infrastructures should be evicted immediately before disconnecting the electricity for complete eviction of the encroachments.

10) The Greater Chennai Corporation is the fully responsible for maintenance during the project execution, flood management and overall safety of the structure, tank proper and larger public interest. As per the Department codes, any alteration / changes in the hydraulic standards should be approved by the Superintending Engineer, P.W.D., W.R.D., Palar Basin circle, Chepauk, Chennai - 5 / Chief Engineer P.W.D., W.R.D., Chennai Region, Chepauk, Chennai – 5 in concurrence with the District Collector, Kancheepuram.

11) The site i.e., tanks should be handed over officially to the Executing Agency (i.e.,) t the Greater Chennai Corporation in turn to its Contractor for execution of work until all the work are completed and same is confirmed by the Competent Authorit of the Department.

12) Erecting information board and advertisement board are not encouraged.

13) The water spread area should not be reduced.

14) The Earth (Savudu) should not be removed from the Tank and not conveyed outside the tank.

15) Failing to comply with any of the above conditions, PWD,WRD reserves the right to withdraw the NOC for restoration and rejuvenation of the above said tanks in future.

16) In addition to the above, the parameters to be adopted without any alteration for Alapakkam Tank is as follows:-

The top of bund should be kept at the level of (+) 15.620m from MSL, top width minimum 3.00m, side slopes at rear side 2:1 and front side 1.50:1. The new weir should be constructed newly at left flank for drain out the excess water and crest level of the proposed weir should be maintained as (+) 13.950m MSL and design should be got approved from PWD. The surplus course should be excavated from weir to Cooum river for drain out the excess water. The Cut & Cover channel also should be provided wherever required.

20.9.19

for CHIEF ENGINEER, WRD.,
CHENNAI REGION, CHENNAI-5

20.9.19

**Appendix 3: Self Declaration issued by the Officials of Greater Chennai Corporation**

SWD.C.No.B4/4442 /2017

Greater Chennai Corporation
Storm Water Drain Department

**CERTIFICATE**

The Eco Restoration of Kadapakkam lake has been taken up under GEF grant of ADB. Public works department has granted NOC to GCC for taking up the Restoration of Kadapakkam lake and other lakes.

In this regard PWD has given NOC stating that encroachments in the lakes /Ponds to be removed and restoration be taken up.

In this connection it is certified that there is no encroachments in the Kadapakkam lake.

26/7/2021
Executive Engineering/ SWDD

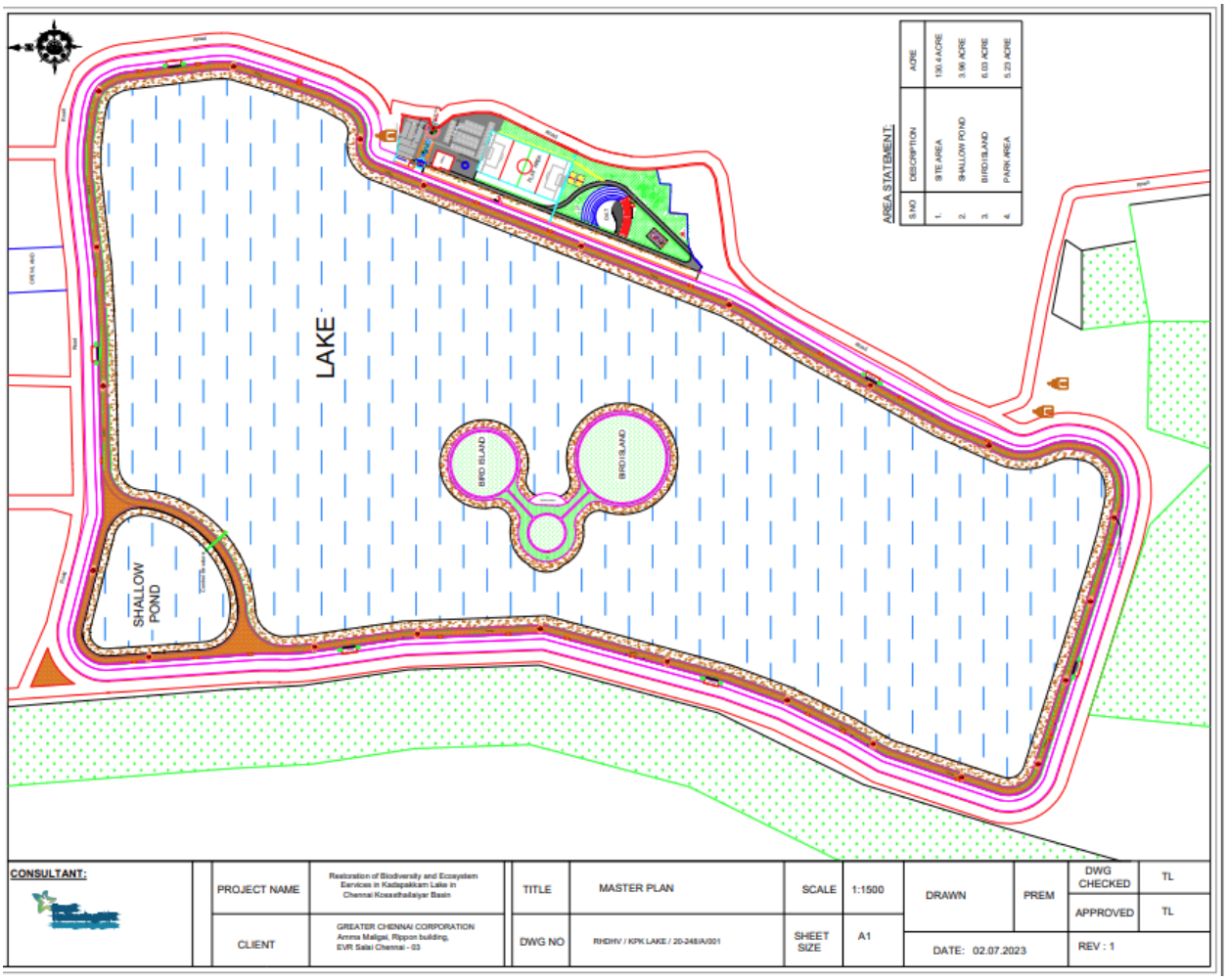
26/7/2021
Superintending Engineering/ SWDD

26/7/2021
Chief Engineer (General)

**Figure 1**

The field inspection by the project consultants, GCC engineers found no encroachments in the lake area. (Signed undertaking by GCC attached – Figure 1)

## Appendix 4: Aesthetic Photographs of the proposed work at Kadapakkam Lake



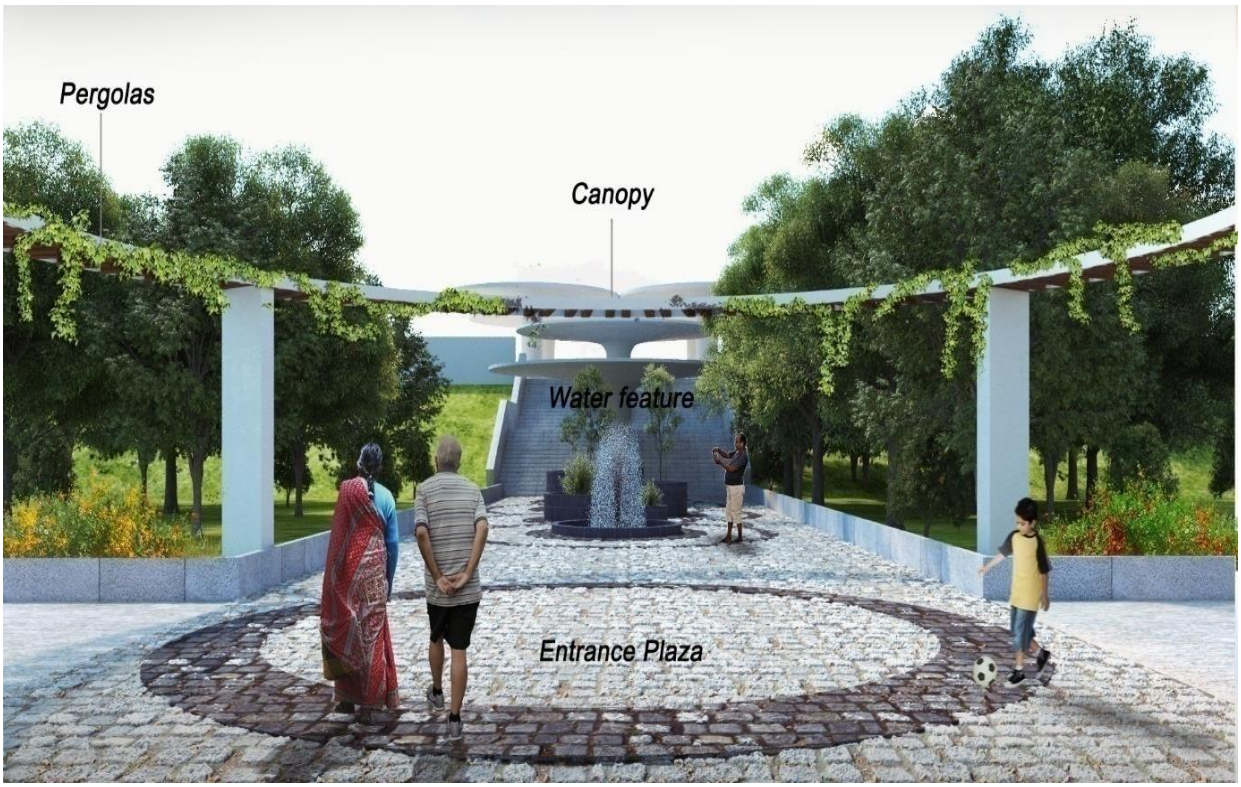



**Figure 2: Entrance Plaza**


**Figure 3: Entrance Plaza**

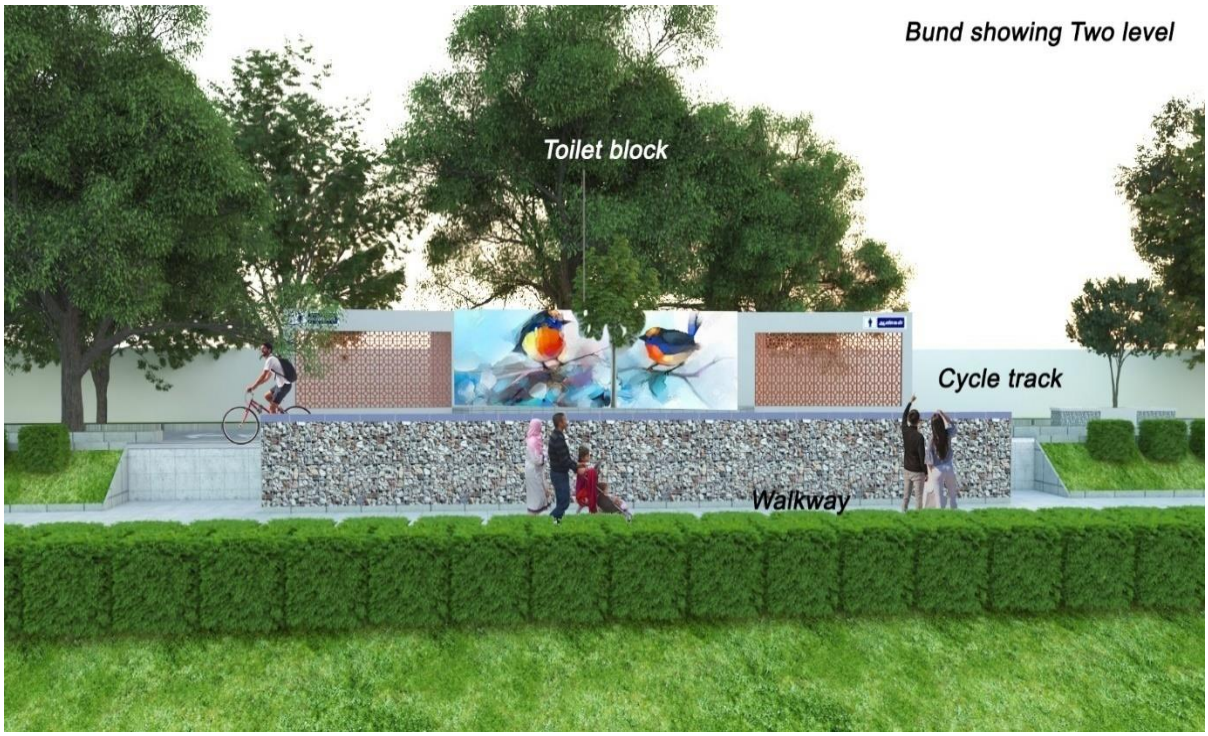



**Figure 4: Pathway**


**Figure 5: Play area**


**Figure 6: Play area**


**Figure 7: Parking**


**Figure8: Bird Island**

**Appendix 5: Kadapakkam lake public consultation conducted on 8th august 2022.**

**Minutes of the meetings**

| S. No | Public | Queries discussed | Responses | Action Plan |
|---|---|---|---|---|
| 1 | Mr. Raja, Kulakari Village | 1) Why is Greater Chennai Corporation (GCC) planning to develop and restore only Kadapakkam Lake and what is the status of rejuvenation of other surrounding water bodies?<br>2) If the fencing is done for the lake, the public are afraid that | 1) RDC - The Kadapakkam lake has been identified by the ADB, and a grant has been given to rejuvenate it. The GCC is acting to manage its water resources, and as a first step, they are identifying all of the water bodies in order to restore them.<br>2) RDC - The solution envisioned is bio- | **Points no: 1, 3, 4, 7**<br>Queries clarified immediately during public consultation.<br>**Points2, 5 & 6**<br>2) Bio fencing/ chain link fencing around the lake will be made with adequate entry points to retain the access for public, |

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| | | they will not be able to take their domestic animals for washing and the people will not be able to use the lake water for washing their clothes.<br>3) If the Lake area is developed for activities like tourism, then people from other areas will settle in Kadapakkam and eventually it will affect the home-land population (sons-of-soil) and create conflicts.<br>4) The already existing sanitary facilities such as public toilets are not maintained and are in poor conditions in the villages. Can this fund be used to improve the conditions?<br>5) With the grant fund carry out the bund strengthening and cleaning the lake area but other than this don't make it as a tourist/ commercial | fencing, which won't interfere with access to the lake.<br>3) MLA - When the lake is restored it will serve the agricultural purposes and it will not affect home-land population.<br>4) RDC - This fund can be utilized only in rejuvenating the Kadapakkam lake. The GCC will look into the proper maintenance of the toilets and sanitary facilities in the area.<br>5,6) RDC & MLA – Yes, the project is planned in such a way that that it would primarily benefit the agriculture.<br>7) MLA & RDC – The GCC officials will identify the encroachments and remove them | local farmers and cattle.<br><br>5 & 6) Recreational facilities such as boating have been dropped from the project plan incorporating suggestions from public.<br><br>The lake restoration project is primarily aimed to increase the storage capacity of the lake. This would in turn improve the groundwater levels in the surrounding area and support agriculture while also creating a natural recreational space for the community. |

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| | | spot as it would affect the agriculture activity.<br>6) In 1996, it was considered as unfit residential area but we farmers of Kadapakkam never gave-up agriculture. So if this project aids agriculture then the local people will support and if not they will not support the project<br>7) The inlet and outlet channels of the lake were illegally encroached by some industrial constructions and he requested the GCC to identify such locations and remove the encroachments . | | |
| 2 | K. Shankar, Kanniyamman Pettai | 1) The ADB has proposed this Kadapakkam Lake Grant majorly focusing on making the lake into a recreational area but we are traditionally using the lake for agricultural purposes till date. If the | 1) RDC & MLA – The project will exclusively concentrate on rejuvenating the lake in light of the public consultation's recommendations<br>2) RDC - The lake will be desilted, deepened, and have an even base as desired in order to increase the lake's capacity. This | **Points no: 1,3,5,6,**<br>Queries clarified immediately during public consultation.<br>**Point No: 2 & 4**<br>As per public request, lake levels will be examined and suitable action will be assured to allow surplus water flow for |

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| | | project is executed, agriculture will get affected.<br>2) The lake water is not flowing through the sluice due to mining (in the past by the private companies) and uneven condition of the lake bottom. So, the farmers are now using pumping motors to pump the water for agricultural purposes. It is requested to level the base of the lake area to improve<br>3) He requested to desilt and increase the length of the Thiruvottiyur - Ponneri - Panchetti (TPP) Road canals which joins the Kosasthalaiyar river. This will help to avoid flooding in the fields.<br>4) A separate platform has to be built for the water pumping motors.<br>5) The three weirs of the lake have to be fixed (one in | will eventually help the water flow naturally through the sluice.<br>3) RDC - The SWD canals that already exist are being desilted<br>4) The mentioned point will be addressed and a service platform will be constructed near the sluice<br>5) RDC - To assess the likelihood, this will be done in cooperation with the concerned engineers.<br>6) MLA & RDC – The eight point grievances given in written will be taken into consideration and suitable action will be taken in consultation with WRD and Revenue department officials. | agricultural purposes.<br><br>**Point 5:** All the sluice gates and the weirs of the lake will be rejuvenated. |

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| | | the south and two in the north).<br>6) Submitted letter stating the eight-point grievances and upon implementation welcome the project for the sustainable utilization of water management. | | |
| 3 | Mr. Manigandan, Kanniyamman Pettai | 1) Restoration of Kadapakkam lake is fine but the seven villages surrounding the lake have small water bodies when they will be restored and pathways be provided for the public's use? | 1) RDC - The GCC is acting to manage its water resources, and as a first step, they are identifying all of the water bodies in order to restore them. | Query clarified immediately during public consultation. |
| 4 | Mr. K. Venkatesan, Kanniyamman Pettai | 1) There are warehouses and godowns that have encroached the out let areas. It is requested to remove such encroachments .<br>2) He asked why this lake cannot be left as it is now.<br>3) Farmers are dependent on this lake traditionally for irrigation but no | 1) MLA & RDC – The GCC officials will identify the encroachments and remove them.<br>2) MLA – To endure the monsoon and boost the flood resilience of Kadapakkam and the adjacent communities, the lake has to be strengthened and deepened.<br>3) RDC – Rejuvenating the lake will definitely contribute for agriculture, which will be beneficial to both | **Points no: 1, 2,3,4,5**<br><br>Queries clarified immediately during public consultation. |

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| | | provisions were shown in the project objectives that would benefit the farmers.<br>4) We are not able to take the water via sluice due to silt mining in the past as it has deepened the base of the lake not near the sluice. Even though there is sufficient water in the lake, it doesn't flow through the sluice. So, they are using a pumping motor for pumping the water for agricultural purposes<br>5) If the fencing is done for the lake, then the public will not able to use for their domestic purposes and the cattle for grazing and drinking water. And if there is a specific entry points and certain proceedures is followed, then the farmers will not be able to access it as they do now. | farmers and the general public.<br>4) RDC - The lake will be desilted, deepened, and have an even base as desired in order to increase the lake's catchment area. This will eventually help the water flow naturally through the sluice.<br>5) RDC - The solution envisioned is bio-fencing, which won't interfere with access to the lake. The access to the farmers and domestic animals will be taken into consideration. | |

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| 5 | Mr. Adhi Thamizhan, Kanniyamman Pettai Colony | 1) In the Kattupalli port project the public were cheated stating that they will be benefitted by providing new facilities. What is the assurance that we the public of Kadapakkam won't be cheated?<br>2) Just do the restoration and rejuvenation of the lake; other than that don't make it a park (recreational area) as it will affect the agriculture in the area.<br>3) He supports restoring and strengthening the lake bunds. But if the fencing is done for the lake, then the public and the domestic animals will not be able to use the lake as they do now. So, he requested to remove the lake fencing plan.<br>4) He suggested appointing personnel for lake security purposes instead of any other authority | 1) RDC - The Project's goals are extremely clear that it will only rejuvenate and restore the lake's capacity, which will ultimately improve agriculture and water resource management. As a result, the project has no ulterior motives.<br>2) RDC & MLA – Yes, rejuvenation is the priority over the recreation of the lake<br>3) RDC - The solution envisioned is bio-fencing, which won't interfere with access to the lake. The access to the farmers and domestic animals will be taken into consideration while preparing the project report. | **Points no: 1,3,5**<br><br>Queries clarified immediately during public consultation.<br><br>**Point no: 2**<br><br>The lake restoration project is primarily aimed to increase the storage capacity of the lake by desilting and bund strengthening the bunds . This would in turn improve groundwater levels in the surrounding area and support agriculture while also creating a natural recreational space for the community.<br><br>Recreational facilities such as boating have been dropped from the project plan incorporating suggestions from public.<br><br>**Point no: 4**<br><br>GCC will undertake Lake maintenance and surveillance after the completion of restoration works. |

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| | | being in-charge. | | |
| 6 | Mr. Thanga sivam, Kanniyamman Pettai | 1) He said that all the water in the lake must be used only for agriculture and not for any other purposes.<br>2) He says he is aware of the act which doesn't allow the public to pump the water below the sluice level of the lake but here it is being done by the farmers due to the silt mining in thee past which artificially deepened the lake's base area not near the sluice. So, he requested that the pumping should be allowed even in the future and this should be legally sanctioned and also has to be provided in-writing in the project report.<br>3) The Kadapakkam lake's water should be given even if it is the last piece | 1 & 3. MLA - When it comes to using lake water, agriculture will be prioritized.<br>2) RDC – The water will naturally flow through the sluice once the lake base has been levelled to its original shape. Therefore, no water pumping motor will be required.<br>4) RDC - The access to the farmers will be taken into consideration.<br>5) RDC – The recommendation to construct wells will be considered in consultation with the concerned engineers. | **Points no: 1, 2, 3, 5**<br>Queries clarified immediately during public consultation.<br>**Point 4.**<br>As per public request, lake levels will be examined, and suitable action will be assured to allow surplus water flow for agricultural purposes.<br>Service platforms will also be created next to sluice gates as a part of the project. The service platforms can be used by farmers for pumping facilities with NOC from Water Resource Dept.<br>**Point 5**<br>It is not possible to construct the wells adjacent to sluice gates due to lack of space.<br>However as mentioned above, lake levels will be examined, and suitable action will be assured to allow surplus water flow for agricultural purposes. |

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| | | of agricultural land.<br>4) The motor room which will have pump sets, in-charge and maintenance has to be given to the farmers, so that there won't be any kind of administrative issues in accessing the lake water for pumping for irrigation at any point of time.<br>5) It was also requested to build 4 wells adjacent to the 4 sluices; it will be easy for the farmers to access lake water at any time.<br><br>6) The initial project disclosure totally defies the idea of the public and farmers in kadapakkam but it was informed the concerns raised by the public consultation will be incorporated in the report and hence we have given our | | **Point 6**<br><br>The project has taken due consideration of the land use and the livelihoods of farmers. The lake restoration project is aimed to increase the storage capacity of the lake which will help in ground water recharge and support agricultural activities.<br><br>The following actions are planned in the project:<br><br>• In accommodating community request, the proposal for boating facility is dropped.<br><br>• Bio fencing/ chain link fence around the lake is proposed with adequate entry points so as to retain the access of the local communities and cattle.<br><br>• lake levels will be examined and suitable action will be assured |

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| | | suggestions as a petition for consideration. | | during desilting to allow surplus water flow for agricultural purposes. |
| 7 | Mr. Divakar, Kanniyamman Pettai | 1) We can't accept the fencing of the lake area<br>2) There are some families which do country fishing and collect lotus & lily flowers for their livelihood. If the government makes this lake into a park then will these families be allowed to access the lake for their livelihood?<br>3) CCTV surveillance has to be established to monitor the activities in the lake area. | 1) RDC & MLA - The families can continue to engage in their current modes of subsistence. The project will be designed to mitigate its negative effects on the families and consider their means of subsistence.<br>2) RDC - CCTV surveillance will be installed in the Lake area. | **Point 1.**<br>The purpose of fencing is to prevent illegal encroachment and misuse for waste dumping.<br><br>Bio fencing/ chain link fence around the lake is proposed with adequate entry points so as to retain the access of the local communities and cattle.<br><br>**Point 2**<br>Queries clarified immediately during public consultation.<br><br>**Point 3**<br>CCTV surveillance will be installed in the Lake area. |
| 8 | Mr. Murugan, Kanniyamman Pettai | 1) The lake area is deep, and the water doesn't flow through the sluice and that is why they are using diesel engine motors to pump the water. So, it is requested to give | 1) RDC – The water will naturally flow through the sluice once the lake foundation has been levelled to its original shape.<br>2) RDC - To create a design, the lake's hydrology is carefully examined. However, the weirs will once more be examined to ensure the correct | **Points no: 1, 2, 3.4.**<br><br>Queries clarified immediately during public consultation |

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| | | permission to continue the same in the future.<br>2) The proposed weir in the project is given in the wrong direction and the outlet channels are in the reverse flow.<br>3) There are old canals in the Kadapakkam area but they are currently encroached. It is requested to identify these old canal channels and restore it for the proper flow of water to avoid flooding.<br>4) The Kadapakkam villagers have collectively drafted a petition letter stating the objectives and suggestions of the farmers and the public to improve the conditions of the lake. | water flow.<br>3) MLA – The old waterways and canals that once traversed the Kadapakkam region will be restored after the old revenue documents have been examined. Even if they are currently being encroached, the indicated waterways will be restored.<br>4) MLA & RDC – The recommendations will be taken into consideration while preparing the revised comprehensive project report.<br>5) MLA – Suggested the GCC in collaboration with the Revenue department to collect all documents related to lake to identify the encroachments. | |
| 9 | Mr. Dhayalan<br>Mr. Dharani<br>Mr. Magesh Kumar<br>MrThangasivam of Kanniyamman Pettai | All these participants welcome the project objective. | Public support was appreciated. | - |

## Appendix 6: Sample Grievance Registration Format

The _____Project welcomes complaints, suggestions, queries and comments regarding project implementation. We encourage persons with grievance to provide their name and contact information to enable us to get in touch with you for clarification and feedback. Should you choose to include your personal details but want that information to remain confidential, please inform us by writing/typing *(CONFIDENTIAL)* above your name. Thank you.

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| **Date** | | **Place of registration** | | | |
| **Contact Information/Personal Details** | | | | | |
| **Name** | | **Gender** | * Male<br>* Female | **Age** | |
| **Home Address** | | | | | |
| **Place** | | | | | |
| **Phone no.** | | | | | |
| **E-mail** | | | | | |
| **Complaint/Suggestion/Comment/Question** Please provide the details (who, what, where and how) of your grievance below:<br><br>If included as attachment/note/letter, please tick here: | | | | | |
| **How do you want us to reach you for feedback or update on your comment/grievance?** | | | | | |

**FOR OFFICIAL USE ONLY**

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| **Registered by:** (Name of Official registering grievance) | |
| **Mode of communication:**<br>Note/Letter<br>E-mail<br>Verbal/Telephonic | |
| **Reviewed by:** (Names/Positions of Official(s) reviewing grievance) | |
| **Action Taken:** | |
| **Whether Action Taken Disclosed:** | Yes<br>No |
| **Means of Disclosure:** | |
| **Grievance Related to Project Component / Modalities of Financing:** | |

## Appendix 7: Social Safeguards QPR checklist

| Activity | Yes / No | Remarks (If Answer Is No) |
|---|---|---|
| ***A. For subproject packages under bidding*** | | |
| 1. RPs/DDRs/IPPs cleared by ADB? | No | Updated DDR shared with ADB for approval |
| 2. RPs/DDRs/IPPs included in the bidding documents? | Yes | |
| 3. RP includes cut-off-date? | No | |
| 4. Are there changes in the scope of work of the cleared RPs/DDRs/IPPs? | Yes | Boating facility is removed from the proposal and top bund width is reduced from 20m to 5 m. |
| 5. ID cards prepared for APs and distributed? | NA | |
| 6. Are specific actions identified in RP/IPP, if any, that are required of the contractor for impact avoidance or mitigation, incorporated in bid documents? | NA | Not Applicable |
| 7. BOQ line item includes any requirements specified in RP/DDR/IPP? | No | Not Applicable |
| 8. RP/IPP disclosed in form and language understood by stakeholders and affected persons (APs)? | No | Not Applicable |
| 9. Consultations with stakeholders and affected persons/IP held? | Yes | Minutes of meeting attached in Appendix5 |
| 10. Is the GRM in place and GRC constituted? | No | The framework for GRM has been prepared and the GRC will be constituted once the civil contract is awarded. |
| ***For subproject packages with contracts awarded (no works yet) - NA*** | | |
| 1. All NOCs/land transfers obtained? | | |
| 2. Agreement of sale/transfer and third-party certificate obtained for negotiated settlement/voluntary donation? | | |
| 3. All compensation paid in full? | | |
| 4. Detailed measurement survey conducted jointly by contractor, project consultant and PMU/PIU? | | |
| 5. All community concerns and grievances related to specific sites mitigated through consultations or agreed actions? | | |
| 6. All common property resources (CPR, including small shrines, trees of worship etc.) identified and plan for continued access prepared? | | |
| 7. Each contractor designated social safeguards and grievance registration officer? | | |
| 8. For DBO packages, detailed design completed and updated RP/DDR/IPP submitted to ADB? | | |
| 9. For DBO packages, serial no. 1-7 accomplished? | | |
| ***For subproject packages with contracts awarded and works on-going - NA*** | | |
| 1. Contractors have appointed social safeguards and grievance registration officer per subproject package? | | |

| Activity | Yes / No | Remarks (If Answer Is No) |
|---|---|---|
| 2. Site-specific signages with date of start and end of construction and contact number for grievances and safety instructions for general public posted onsite? | | |
| 3. Grievance registration register available at each work site? | | |
| 4. Site fencing/protection works etc. undertaken before start of physical construction work? | | |
| 5. Contractors provided PMU/PIU with a notification/incident report of any grievance or unanticipated impact within 24 hours? | | |
| 6. Reports of complaints/grievances reported monthly to PMU? | | |
| 7. Records of information disclosure/consultations submitted by PIUs to PMU monthly? | | |
| 8. Records of site inspection by PIU and DSC submitted to PMU monthly? | | |
| 9. Records of site inspection by PMC submitted to PMU monthly? | | |